

Jacques Cousteau (JAC) NERR Water Quality Metadata
(formerly known as Mullica River (MUL) NERR)
1 January 2004 – 31 December 2004
Latest Update: August 12, 2020

I. Data set and Research Descriptors

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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. If such anomalies can be identified as caused by sonde or probe failure, fouling, or some other equipment- or user-based error, they are noted and dealt with accordingly (either notation or deletion and notation) during data editing.

Pre-deployment and post-retrieval readings are identified by depth and salinity values near zero. “Post-deployment calibration check” values taken at the time of sonde deployment and retrieval with a YSI 600 sonde paired with a 610-DM or 650-MDS display. The comparisons are documented on tracking sheets.

Deployment files are exported from EcoWatch as “.csv” files and are then imported into an Excel macro (import(rev3).xls) created by the NERR Central Data Management Office (CDMO). The CDMO import(rev3).xls macro allows PC users with 30-minute

data to automatically create a monthly Excel file from a 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.

The CDMO EQWinFormat.xls macro allows the user to automatically format column widths to the correct number of decimal places based on YSI sensor specifications. This action formats the data so that it can be imported into EQWin. Once in EQWin, the data are also QA/QC'ed using queries, specifically identifying missing data points and finding all data points that fall outside the range of what the data logger is designed to measure (outliers). Once checked for these errors and omissions, the data are added to the EQWin-based archive of yearly water-quality data from that station.

Missing data are denoted by blank cells () and documented in section 13 (Missing data) of this document. Any erroneous data that are determined as being caused by probe failures, as determined upon examination of the data plots, are deleted and noted in the (section 12) (Deleted Data). 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. Sensor readings that greatly deviate from known values of standards after deployments are not necessarily the result of probe failure. These erroneous readings may be the result of fouling. If fouling is known to be the reason for these aberrant data, they may be removed from the dataset and noted in section 12 (Deleted Data) of this document. If fouling is only suspected to be the cause of the anomalous data, or if the specific cause of the anomalies cannot be identified, the data are not deleted and the date and timestamp of the questionable data/events are noted in section 11 (Data Anomalies) of this document.

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 averages about two meters in depth. 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 data loggers are programmed to record temperature, specific conductance, salinity, dissolved oxygen, pH, depth, and turbidity every 30 minutes. Presently, four SWMP monitoring sites are established in the Mullica River/Great Bay 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.

Because of hardware damage, equipment loss, and inability to access the SWMP sites due to ice-over and ice-floe movements during the previous winter of 2002-2003, the JCNERR opted to remove dataloggers from their respective sites at the first sign of ice formation. This action proved to be prudent as conditions and damages similar and exceeding those experienced during the ice-over of 2002-2003 were experienced during the winter of 2003-2004. Because of these damages it was decided to deploy dataloggers in cages at Buoys 126 and 139 for the remainder of 2004. These cages, measuring 1m x 1m x 1m, are made of 1/4" steel with diagonal cross-pieces in the center. The dataloggers were housed in approximately 1m-long pieces of 4" PVC pipe (to protect the sondes from mechanical damages) that were affixed with heavy-duty cable ties to center cross-pieces of the cages. 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. 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 (there were some issues concerning the cages lifting slightly in strong currents) in 2005 and we will return to the method utilizing PVC pipe for the all 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 were recorded. After approximately

14 days, the data logger was removed from the PVC pipe or cage. This period of time was often extended during 2004 because of weather restrictions. A YSI 600 data logger attached to a YSI 610-DM or 650-MDS handheld unit was then lowered to depth in order to sample in-situ water conditions at approximately the same depth at which data was recorded. A different calibrated and programmed YSI data logger was then switched with the data logger being replaced. The data logger was brought back to the laboratory for downloading, post-deployment calibration checking, cleaning, and re-calibration. For some retrievals (due to one of our three 6600 dataloggers being out for repairs or our desire to keep the same datalogger at the same SWMP site for consistency), the datalogger was not replaced but rather brought back to RUMFS, processed as described above, and re-deployed the next day or as soon as possible. The beginning and end of each data file was compared to the YSI 600 values and the data were checked for probe failure and fouling. The data loggers were programmed to start recording data a few hours before they are deployed in the field.

Upon retrieval, dataloggers were wrapped in a white towel and placed in a cooler for transport back to the laboratory. Dataloggers were then placed in an aerated bucket of tap water overnight before post-processing according to SWMP SOP's. Post-processing involved the placing of the un-cleaned datalogger in standards and recording of the displayed values, to judge how well the probes maintained calibration, determine the effect of bio-fouling (if any), and judge whether probe failure occurred during the deployment. After this post-deployment calibration check, probes were cleaned as per SWMP SOP's and either re-calibration for the next deployment or capped for storage for later calibration and deployment.

Calibration standards required for pH and conductivity were purchased from Fisher Scientific supply. A two point calibration was used for pH, the first being pH 7 followed by pH 4 (we will be going with a 3-point calibration for 2005, utilizing pH 4, pH 7, and pH 10 standards). A standard of 20,000 $\mu\text{S}/\text{cm}$, approved by Y.S.I., inc., was used to calibrate for conductivity. The membrane on the oxygen probe was changed when anomalous data was recorded, and almost every deployment during the summer months. The membrane was stretched over the face of the probe and was 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 was 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 was placed in the cup. The sensors are allowed to equilibrate in the cup before DO (% saturation) was calibrated. DO calibrations were performed immediately before deployment. Calibration of the turbidity probe was performed with a 0 NTU (National Turbidity Units) standard (de-ionized water) and a 123 NTU standard (supplied by YSI, inc.) in the datalogger cup/cap; the depth of each solution was always 3 inches or greater, as was the distance between the probe optics and the bottom of the calibration cup. Turbidity wipers were replaced after every deployment. Used conductivity and pH standards were stored for rinsing probes and performing post-deployment calibrations after retrieval and prior to cleaning loggers. Great care was taken to clean the data loggers before calibration, and each used standard is used as a rinse solution at least once

before being discarded (unless egregious contamination is suspected). Servicing an instrument generally took 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 (JCNERR) 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 four locations can be characterized by having little macroalgae (few to no established beds in the immediate locale; only occasional seasonal and structurally-dependent fouling-type macroalgal communities) 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) Buoy 139 (B9) - 39° 29.883'N, 74° 22.873' W- is 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.

3) 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.

4) 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.

6) Data Collection Period

Site	File Name	Deploy Date	Time	Retrieve Date	Time
B6	B6040804	04/08/04	14:00	04/27/04	09:00
	B6043004	04/30/04	13:30	05/12/04	08:30
	B6051404	05/14/04	09:00	06/02/04	11:30
	B6060404	06/04/04	13:00	06/25/04	09:00
	B6062504	06/25/04	13:30	07/19/04	12:00
	B6071904	07/19/04	12:30	08/02/04	14:00
	B6080204	08/02/04	14:30	08/20/04	09:30
	B6082004	08/20/04	10:30	09/10/04	12:30
	B6091004	09/10/04	13:00	10/08/04	12:30
	B6100804	10/08/04	13:00	10/28/04	11:30

B6102804	10/28/04	15:30	11/10/04	09:00
B6111104	11/11/04	16:00	12/03/04	10:30
B6120304	12/03/04	11:00	12/22/04	13:30

Site	File Name	Deploy Date	Time	Retrieve Date	Time
B9	B9033104	03/31/04	12:00	04/27/04	09:00
	B9050404	05/04/04	12:30	05/26/04	12:00
	B9052704	05/27/04	13:30	06/17/04	10:00
	B9062304	06/23/04	07:30	07/15/04	09:30
	B9071504	07/15/04	10:00	08/24/04	10:00
	B9082404	08/24/04	10:30	09/16/04	10:30
	B9091604	09/16/04	11:30	10/07/04	10:00
	B9100704	10/07/04	10:30	10/18/04	13:00
	B9101804	10/18/04	13:30	11/17/04	11:30
	B9111704	11/17/04	12:30	12/09/04	09:30
	B9120904	12/09/04	10:00	12/22/04	13:30

Site	File Name	Deploy Date	Time	Retrieve Date	Time
NE	NE022604	02/26/04	12:00	03/16/04	11:00
	NE031804	03/18/04	14:30	03/31/04	15:00
	NE040204	04/02/04	15:30	04/27/04	10:30
	NE042904	04/29/04	15:30	05/18/04	09:30
	NE052104	05/21/04	11:00	06/02/04	13:00
	NE060304	06/03/04	15:00	06/22/04	09:30
	*NE062504	06/24/04	N/A	07/08/04	N/A
	NE071604	07/16/04	10:00	08/11/04	10:30
	NE081304	08/13/04	10:00	09/02/04	09:00
	NE090704	09/07/04	14:30	10/04/04	14:00
	NE100704	10/07/04	10:00	10/27/04	10:30
	NE102704	10/27/04	11:00	11/10/04	19:30
	NE111504	11/15/04	15:30	12/02/04	13:30
	NE120204	12/02/04	14:00	12/13/04	14:00
	NE121304	12/13/04	14:30	12/30/04	13:30

Site	File Name	Deploy Date	Time	Retrieve Date	Time
BA	BA121103	12/11/03	14:30	01/08/04	10:00
	BA041404	04/19/04	13:30	05/11/04	10:30
	BA051104	05/11/04	11:30	06/02/04	11:30
	BA060204	06/02/04	12:00	06/16/04	12:00
	BA061604	06/16/04	12:30	07/01/04	13:30

BA070104	07/01/04	14:00	07/28/04	09:30
BA072804	07/28/04	10:30	08/11/04	11:30
BA081104	08/11/04	12:00	08/25/04	14:30
BA082504	08/25/04	15:00	09/23/04	12:30
BA092804	09/28/04	09:00	10/18/04	13:00
BA101804	10/18/04	14:00	11/10/04	13:30
BA111104	11/10/04	14:00	11/29/04	13:00
BA112904	11/29/04	13:30	12/06/04	14:30
BA120604	12/06/04	15:00	12/22/04	11:30
BA122204	12/22/04	12:00	01/11/05	14:30

*= Deployment NE062504 does not exist as a file; the actual deployment of a sonde occurred, but because the operator forgot to activate the unit, no data were collected during the intended period.

7) Distribution

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 this 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 Principal investigators and contact persons), from the Data Manager at the Centralized Data Management Office (please see personnel directory under the general information link on the CDMO home page) and online at the CDMO home page <http://cdmo.baruch.sc.edu/>. Data are available in text tab-delimited format.

8) Associated Researchers and Projects

During 2004, 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 a bridge 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.

Stephanie Szerlag, a student from St. Joseph's University and a JCNERR summer intern, tagged adult female terrapins on Great Bay Boulevard and tracked their movements, both terrestrial and aquatic. SWMP water-quality data were used in her analysis of these data.

Drs. Kenneth W. Able and Thomas Grotheus, as well as Doctoral Candidate Clare Eng, 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 Barneget Bay, and the coastal ocean outside of Little Egg Inlet off Tuckerton, New Jersey. Visit www.stripertracker.org for more information.

Graduate student Dana Rowles is studying the species distributions, daily movements, and seasonal migration patterns of summer flounder using implanted and bridled hydroacoustic transmitters. This study is being conducted in the same manner as the Striper Tracker study mentioned previously.

Dr. Mark Sullivan is conducting research concerning eel ontogeny and distributions in the Little Egg Harbor-Mullica River waters. SWMP data will be used in the analysis of his data.

Jackie Toth will use water-quality data from Buoy 126 (B6) in her analyses of Atlantic bottle-nose dolphin distributions and social behaviors observed in reserve waters.

Data from the Chestnut Neck (NE) and Lower Bank (BA) SWMP stations were used for comparative and ground-truthing purposes for numerous research activities by RUMFS at Hog Island, Lower Bank, and adjacent sites.

RUMFS faculty and staff conducted their annual trawl survey at numerous sites from offshore of Little Egg Inlet to the freshwater interface up the Mullica River. SWMP data will be used in the analysis of community composition and species assemblage.

Other projects orchestrated in the year 2004 in the JCNERR include the continuation of a biofouling project that was initiated in 2003. Conducted by the Research Coordinator and JCNERR staff, several biofouling panels constructed of PVC plates were secured to cages and placed on the bottom. Many of these panels were deployed at and near SWMP sites. 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.

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, 139, and in the RUMFS boat basin in 2004. 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) Sensor Specifications

YSI 6600/YSI 6600EDS datalogger

Parameter: Temperature
Units: Celsius (C)
Sensor Type: Thermistor
Model #: 6560
Range: -5 to 45 °C
Accuracy: +/-0.15 °C
Resolution: 0.01 °C

Parameter: Conductivity
Units: milli-Siemens per cm (mS/cm)
Sensor Type: 4-electrode cell with autoranging
Model #: 6560

Range: 0 to 100 mS/cm
Accuracy: +/-0.5% of reading + 0.001 mS/cm
Resolution: 0.001 mS/cm to 0.1 mS/cm (range dependent)

Parameter: Salinity
Units: parts per thousand (ppt)
Sensor Type: Calculated from conductivity and temperature
Range: 0 to 70 ppt
Accuracy: +/- 1.0% of reading or 0.1 ppt, whichever is greater
Resolution: 0.01 ppt

Parameter: Dissolved Oxygen % saturation
Units: percent air saturation (%)
Sensor Type: Rapid Pulse – Clark type, polarographic
Model #: 6562
Range: 0 to 500 % air saturation
Accuracy: 0-200 % air saturation, +/- 2 % of the reading or 2 % air saturation, whichever is greater; 200-500 % air saturation, +/- 6 % of the reading
Resolution: 0.1 % air saturation

Parameter: Dissolved Oxygen mg/L (Calculated from % air saturation, temperature and salinity)
Units: milligrams per Liter (mg/L)
Sensor Type: Rapid Pulse – Clark type, polarographic
Model #: 6562
Range: 0 to 50 mg/L
Accuracy: 0 to 20 mg/L, +/- 2 % of the reading or 0.2 mg/L, whichever is greater; 20 to 50 mg/L, +/- 6 % of the reading
Resolution: 0.01 mg/L

Parameter: Non-Vented Level – Shallow (Depth)
Units: feet or meters (ft or m)
Sensor Type: Stainless steel strain gauge
Range: 0 to 30 ft (9.1 m)
Accuracy: +/- 0.06 ft (0.018 m)
Resolution: 0.001 ft (0.001 m)

Parameter: Vented Level – Shallow (Depth)
Units: feet or meters (ft or m)
Sensor Type: Stainless steel strain gauge
Range: 0 to 30 ft (9.1 m)
Accuracy 0-10 ft: +/- 0.01 ft (0.003 m)
Accuracy 10-30 ft: +/- 0.06 ft (0.018 m)
Resolution: 0.001 ft (0.001 m)

Parameter: Vented Level – Deep (Depth)

Units: feet or meters (ft or m)
Sensor Type: Stainless steel strain gauge
Range: 0 to 656 ft (200 m)
Accuracy: +/- 1 ft (0.3 m)
Resolution: 0.001 ft (0.001 m)

Parameter: pH (specify whether EDS probe or not)
Units: units
Sensor Type: Glass combination electrode
Model #: 6561
Range: 0 to 14 units
Accuracy: +/- 0.2 units
Resolution: 0.01 units

Parameter: Turbidity
Units: nephelometric turbidity units (NTU)
Sensor Type: Optical, 90 ° scatter, with mechanical cleaning
Model #: 6136
Range: 0 to 1000 NTU
Accuracy: +/- 5 % reading or 2 NTU (whichever is greater)
Resolution: 0.1 NTU

The reliability of the dissolved oxygen (DO) data after 96 hours post-deployment for non-EDS (Extended Deployment System) data sondes may be problematic due to fouling which forms on the DO probe membrane during some deployments(Wenner et al. 200*). Many reserves have upgraded to YSI 6600 EDS data sondes, which increase DO accuracy and longevity by reducing the environmental effects of fouling. The user is therefore advised to consult the metadata and to exercise caution when utilizing the DO data beyond the initial 96-hour time period. However, this potential drift is not always problematic for some uses of the data, ie. periodicity analysis. It should be noted that the amount of fouling is site specific and that not all data are affected. The Research Coordinator at the specific NERR site should be contacted concerning the reliability of the DO data because of the site and seasonal variation in the fouling of the DO sensor. All data sondes used at DNERR sites in 2002 were non-EDS models.

The NERRS System-Wide Monitoring Program utilizes YSI data sondes that can be equipped with either depth or water level sensors. Both sensors measure water depth, but by convention, level sensors refer to atmospherically vented measurements and depth refers to non-vented measurements. Standard calibration protocols for the non-vented sensor use the atmosphere pressure at the time of calibration. Therefore, changes in atmospheric pressure between calibrations appear as changes in water depth. The error is equal to approximately 1.03 cm for every 1millibar change in atmospheric pressure. This error is eliminated for level sensors because they are vented to the atmosphere throughout the deployment time interval. If proper atmospheric pressure data is available, non-vented sensor depth measurements can be corrected for deployments between calibrations. Readings for both vented and non-vented sensors are automatically

compensated for water density changes due to variations in temperature and salinity. The Research Coordinator at the specific NERR site should be contacted in order to obtain information regarding atmospheric pressure data availability. All data sondes used at the DNERR sites in 2002 were non-vented models.

10) Coded Variable Definitions

Sampling Station:	Sampling Site Code	Station Code
Lower Bank	BA	jacbawq
Chestnut Neck	NE	jacnewq
Buoy 126	B6	jacb6wq
Buoy 139	B9	jacb9wq

jac = Jacques Cousteau National Estuarine Research Reserve (formerly Mullica River Reserve)

RUMFS = Rutgers University Marine Field Station

wq = water quality data

example 1: B6040804 = this demonstrates the naming convention for deployment files. This denotes a deployment at Buoy 126 starting on 04/08/04.

example 2: jacB6wq2004 = the Jacques Cousteau National Estuarine Research Reserve's water quality data from Buoy 126 for the year 2004

11) Anomalous/Suspect Data

Station B6 (Buoy 126) anomalous data

Mismatch between last turbidity values of the B6040804 deployment at 04/27/04 09:00 and first sample of B6043004 deployment at 04/30/04 13:00; noted but action taken.

All D.O. and pH values from the B6062504 deployment (06/25/04 13:30 - 07/19/04 12:00) appear suspect. Noted, not deleted.

Mismatch in last pH value of B6080204 deployment (08/20/04 09:30) and first pH value of the B6082004 deployment (08/20/04 10:30). Noted, not deleted.

Mismatch in last DO values of B6080204 deployment (08/20/04 09:30) and first DO values of the B6082004 deployment (08/20/04 10:30). Post deployment calibration reading low (79.8%). Data suspect but not deleted.

All pH values from the B6091004 deployment (09/10/04 13:00 - 10/08/04 12:30) should be considered suspect (pH 4 post-calibration values were a bit high).

All depth values from the B6091004 deployment (09/10/04 13:00 - 10/08/04 12:30) should be considered suspect; bottom tether to housing broke and datalogger may have lifted in stronger currents. Noted, but no values were deleted.

All values for all parameters from the B6091004 deployment (09/10/04 13:00 - 10/08/04 12:30) should be considered suspect because battery compartment may have developed a leak and one battery was corroded. Data therefore has some gaps, and not sure how it affected accuracy of the data.

All values for all parameters from the B6100804 deployment (10/08/04 13:00 - 10/28/04 11:30) should be considered suspect because there was apparently some sort of power-issues (possibly a leaking compartment, bad battery, etc.) Data therefore has some gaps, and not sure how it affected accuracy of the data.

All values for all parameters from the B6102804 deployment (10/28/04 15:30 - 1/10/04 09:00) should be considered suspect because there was apparently some sort of power-failure(s). There were numerous voltage drops, but no apparent leaking of the battery compartment or corroded batteries. Data therefore has some gaps, and not sure how it affected accuracy of the data.

All values for all parameters from the B6120304 deployment (12/03/04 11:00 - 12/22/04 13:30) should be considered suspect because there was apparently some sort of power-failure(s). There were numerous voltage drops, apparent leaking of the battery compartment, and corroded batteries. Data therefore has some gaps, and not sure how it affected accuracy of the data.

There were some very shallow depths recorded by the datalogger starting on 12/01/04 15:30. It is suspected the may have been datalogger was lifted by particularly strong currents during this period, but because this cannot be confirmed, this incident is noted but not deleted.

B9 (Buoy 139) Anomalous Data

The accuracy of the conductivity/salinity values during the B9033104 deployment (03/31/04 12:00 – 04/27/04 09:00) should be considered suspect because the values steadily drop throughout the deployment and mis-match with the successive deployment's first reported conductivity/salinity values on 05/04/04 12:30. However, because the post-calibration values from the B9033104 deployment were acceptable, these values were retained but should be considered suspect (note that the depth and D.O. mg/L values during this deployment should also be considered suspect because the accuracy of those values is dependent on the accuracy of the conductivity/salinity probe).

Single turbidity spike at 04/19/2004 04:30:00. Suspect but not deleted.

Slight mismatch in pH values between the B9050404 and B9052704 deployments. It appears that the pH values for the B9050404 deployment (05/04/04 12:30 – 05/26/04 12:00) may be slightly depressed/low. Suspect but not deleted.

Single slight turbidity spike at 06/23/2004 18:00:00. Suspect but not deleted.

A cluster of turbidity spike values were reported for 07/13/2004 09:30:00 - 07/14/2004 05:00:00. Suspect, not deleted.

Two periods of slightly elevated turbidity noted 06/05/04 16:30 – 18:00 and 06/23/04 18:00. Suspect but not deleted.

Small mismatch in salinity values between the B9062304 and B9071504 deployments. Noted but not deleted.

All data obtained from the B9071504 deployment (07/15/04 10:00 – 08/24/04 10:00) should be considered suspect because of heavy fouling on the PVC pipe housing the sonde.

Bad (near-zero) post-deployment calibration values for D.O from the B9071504 deployment. However, the data obtained for D.O. during that deployment appear normal. Therefore, all D.O. data obtained during the B9071504 deployment (07/15/04 10:00 – 08/24/04 10:00) are considered suspect but were not deleted.

All turbidity data between 08/11/04 17:00 – 08/19/04 17:00 are considered suspect because they fall between two periods of high turbidity values that were deleted because of fouling issues. However, these values are plausible, so they were not deleted.

All data from the B9082404 deployment (08/24/04 10:30 – 09/16/04 10:30) are considered suspect because the sonde and probes were heavily fouled with tunicates and other growth upon retrieval.

Mismatch in salinity, DO, and pH values between last value of B9082404 deployment (09/16/04 10:30) and first value of the B9091604 deployment (09/16/04 11:30). It is suspected that the B9082404 deployment may be the problem (see above comment concerning fouling), but neither set was deleted or altered.

Some high turbidity values between 09/01/04 12:00 – 09/03/04 01:30 are considered suspect but not deleted.

There was a steady decline in specific conductivity, salinity, and D.O. values starting approximately on 09/29/04 until 10/07/04 10:00 (the end of the B9091604 deployment), resulting in a mis-match in values between 10/07/04 10:00 and 10/07/04 10:30. The

suspected cause of this was fouling towards the end of the B9091604 deployment. Noted, but data were not deleted.

Mismatches in salinity values between the last sample of the B9091604 deployment (10/07/04 10:00) and the first sample of the B9100704 deployment. Noted, not deleted.

Mismatches in salinity and D.O. values between last sample of the B9101804 deployment (11/17/04 11:30) and the first sample of the B9111704 deployment (11/17/04 12:30). Noted, not deleted.

Single large turbidity spike at 11/28/2004 02:00:00; noted, not deleted.

Mismatch in last pH value of the B9111704 deployment (12/09/04 09:30) and the first pH value reported in the B9120904 deployment (12/09/04 10:00). Noted, not deleted.

Station NE (Chestnut Neck) anomalous data

Mismatch in pH values 03/16/04 11:00:00 and next pH value at 03/18/04 14:30:00; noted, not deleted.

Numerous turbidity “spike” values during the NE022604 deployment between 03/15/04 02:00:00 and 03/16/04 11:00:00; suspect but not deleted.

Numerous turbidity “spike” values during the NE031704 deployment between 03/18/04 14:30:00 – 03/31/04 15:00:00. Noted, not deleted.

Numerous turbidity “spike” values during the NE040204 deployment between 04/02/04 15:30:00 – 04/27/04 10:30:00. Noted, not deleted.

Numerous turbidity “spike” values during the NE042904 deployment between 05/01/04 03:30:00 – 05/18/04 09:30:00. Noted, not deleted.

Numerous turbidity “spike” values during the NE052104 deployment between 05/22/04 09:00:00 – 06/02/04 13:00:00. Noted, not deleted.

Numerous turbidity “spike” values during the NE060304 deployment between 06/06/04 10:30:00 – 06/22/04 09:30:00. Noted, not deleted.

Negative turbidity values at 07/22/2004 13:30:00 and 06/09/2004 10:30:00; noted but not deleted because they were still in the acceptable range of error (± 2 NTU's).

Numerous turbidity “spike” values during the NE07/16/04 deployment between 07/16/04 19:30:00 – 08/11/04 10:30:00. Noted, not deleted.

Numerous turbidity “spike” values during the NE081304 deployment between 08/13/04 21:30:00 – 09/02/04 09:00:00. Noted, not deleted.

Mismatch in DO values between last value of the NE081304 at 09/02/04 09:00:00 and the first value of the NE090704 deployment at 09/07/04 14:30:00. Noted, not deleted.

Mismatch in pH values between last value of the NE081304 deployment at 09/02/04 09:00:00 and the first value of the NE090704 deployment at 09/07/04 14:30:00. Noted, not deleted.

All turbidity values from the NE081304 deployment (08/13/04 10:00 - 09/02/04 09:00) should be considered suspect due to heavy fouling growth on the turbidity probe as well as bad post-deployment values. Suspect, not deleted.

Numerous turbidity “spike” values during the NE090704 deployment between 09/07/04 14:30:00 – 10/04/04 14:00:00. Noted, not deleted. (NOTE: There are numerous turbidity values in excess of 1000 NTU’s. Normally these values are deleted as out-of-range characters, but they were retained in this instance because they are part of a lot of large, but below 1000 NTU’s, values that are likely resultant of a fouling event; they were retained to demonstrate the severity of the fouling event).

DO values appear to degrade towards the end of the NE090704 deployment, are mismatched with the successive deployment (NE100704), and appear a bit low during the post-deployment calibration check. Noted, not deleted.

Single turbidity spike at 11/02/2004 06:30:00; noted, not deleted.

Numerous turbidity “spike” values during the NE111504 deployment between 11/15/04 21:30:00 and 12/02/04 13:30:00. Noted, not deleted.

Numerous turbidity “spike” values during the NE120204 deployment between 12/02/04 14:00:00 and 12/13/04 14:00:00. Noted, not deleted.

Numerous turbidity “spike” values during the NE121304 deployment between 12/13/04 14:30:00 and 12/30/04 13:30:00. Noted, not deleted.

Site BA (Lower Bank) anomalous data section

Mismatch in pH values between last sample of BA041404 deployment (05/11/04 10:30) and first sample of BA051104 deployment (05/11/04 11:30). Noted, not deleted.

All turbidity data from the BA060204 deployment (06/02/04 12:00 - 06/16/04 12:00) should be considered suspect because the post-deployment calibration check revealed a – 0.7 NTU reading in 0.0 solution (DI water). Suspect, but not deleted.

Single large turbidity spike at 06/29/2004 10:00:00; suspect but not deleted.

Some erratic and low D.O. measurements during the BA070104 (07/01/04 14:00 - 07/28/04 09:30). The calibration and post-deployment calibration checks appear acceptable and this deployment period was characterized by drought conditions followed by heavy rain events, so the data is considered suspect, but not deleted.

Some large turbidity spikes were recorded during the BA070104 deployment at 07/01/04 09:00, 07/02/04 21:30, 07/04/04 02:00, 07/04/04 23:00, 07/13/04 10:30, 07/19/04 19:00. Noted but not deleted.

Some very low D.O. values recorded during the BA072804 deployment for the following dates: 07/28/04 10:30 – 08/11/04 11:30 were considered suspect. The calibration and post-deployment calibration checks appear acceptable, so this deployment was noted but not deleted.

Some very low D.O. values were reported during the BA081104 deployment (08/11/04 12:00 - 08/25/04 14:30). The post-deployment calibration check read low and data are suspect at the end of the deployment, but because the month of August was characterized by some low-rain events, these data have been retained and not deleted.

Some large turbidity spikes were recorded during the BA081104 deployment: 08/12/04 20:30, 08/15/04 05:00, 08/16/04 03:00, 08/17/04 00:30, 08/29/04 08:30. Considered suspect but not deleted.

Post-deployment calibration check for D.O. for the BA082504 deployment (08/25/04 15:00 - 09/23/04 12:30) was a bit low, likely due to fouling, and there were some low DO values recorded during the deployment, so DO data are considered suspect but were not deleted.

Some large turbidity spikes were recorded during the BA082504 deployment at 09/03/04 19:30, 09/08/04 16:00, 09/08/04 20:00, and 09/11/04 15:30. Considered suspect but not deleted.

All DO data from the BA092804 deployment (09/28/04 09:00 - 10/18/04 13:00) should be considered suspect due to poor post-deployment calibration test.

Some large turbidity spikes were recorded during the BA092804 deployment at 10/03/04 07:30, 10/08/04 11:30, 10/08/04 13:30, 10/09/04 17:00. Considered suspect but not deleted.

Single large turbidity spike at 12/17/2004 12:30:00; suspect but not deleted.

12) Deleted Data

Station B6 (Buoy 126) deleted data

NOTE: For the B6 data, single turbidity spikes of approximately 100 NTU's or greater, when occurring during periods of generally low turbidity, were deleted. Sustained events of greater than 100 NTU's were often noted but not deleted. This action was taken, in part, because of the data's relevance to, and utilization in, numerous research activities occurring at the Rutgers University Marine Field Station (RUMFS) that required more sensitive filtering of the turbidity data. Turbidity data from the other three SWMP sites (B9, NE, and BA) were not edited using the same rigorous standards; instead, turbidity spikes and brief events of greater than 1000 NTU's were deleted while any anomalous events less than 1000's NTU's were not deleted, but noted as suspect.

Deleted D.O. % and DO mg/L values for 04/20/04 16:00:00 – 04/27/04 09:00:00; reason: numerous plummeting values during this period suggest that probe was fouled or membrane was compromised, although DO post-calibration values were acceptable).

Deleted the following turbidity values (reason: “spike” values, suspected fouling or loss of calibration): 04/26/04 15:30:00, 04/26/04 17:30:00, 04/26/04 19:30:00. 04/26/04 21:00:00 - 21:30:00, 04/26/04 22:30:00, 04/27/04 03:30:00 – 04:00:00, 04/27/04 05:30:00 – 06:00:00.

Deleted the following turbidity values (due to frequent “spiking” and fouling of optics as noted on the calibration sheet): 06/24/04 07:00:00 – 06/25/04 09:00:00.

Deleted the following turbidity values (due to “spiking”): 06/29/04 04:30:00.

Deleted the following turbidity values (due to elevated turbidity values and turbidity probe fouling and wiper blocking optics as noted on calibration sheets): 07/08/04 17:00 – 07/19/04 12:00.

Deleted the following turbidity values (due to elevated turbidity values and turbidity probe fouling and wiper blocking optics as noted on calibration sheets): 07/30/04 12:30:00 – 08/01/04 19:30:00.

Deleted turbidity value (due to “spiking”): 08/18/04 20:00:00.

Deleted the following turbidity values due to “spiking”: 09/04 1730; 09/05/04 06:00:00, 20:00:00; 09/15 0930; 09/27 0800; 09/28 0330, 0500 – 0600, 0930, 2130; 09/29 0130, 1600.

Deleted all turbidity data 09/05/04 22:30:00- 09/10/04 12:30:00 because of calcareous growth on the turbidity probe optics (noted on calibration sheets).

All DO% and DO mg/L values for the B6100804 deployment (10/08/04 13:00:00 – 10/28/04 11:30:00) were deleted because a perforation in the DO membrane was

discovered during post-calibration, and all values for that deployment appear low and erratic.

The following turbidity values were deleted because of “spiking”: 10/03/04 01:00:00, 10/03/04 17:00:00, 10/03/04 21:00:00, 10/03/04 23:30:00, 10/07/04 03:30:00, 10/07/04 13:30:00, 10/08/04 05:30:00-06:00:00, 10/22/04 13:30:00, 10/22/04 20:00:00, 10/22/04 21:30:00, 10/23/04 06:00:00, 10/23/04 09:00:00, 10/23/04 10:30:00, 10/23/04 18:00:00, 10/24/04 06:30:00, 10/24/04 22:00:00, 10/25/04 00:30:00-01:00:00.

The following turbidity values were deleted because of “spiking”: 11/26/04 03:30:00, 11/30/2004 11:30:00

Station B9 (Buoy 139) Deleted Data

Failure of conductivity probe on 06/16/04 08:30 until the end of the B9052704 deployment. Therefore, spec cond, salinity %, depth, and D.O. mg/L were deleted for the following dates: 06/16/04 08:30 – 06/17/04 10:00.

Deleted single large turbidity spike in excess of 1000 NTU’s on 07/27/04 15:00.

Deleted all turbidity data from 08/09/04 16:30 – 08/11/04 16:30 due to many values in excess of 1000 NTU’s as well as heavy fouling noted on the calibration sheets.

Deleted all turbidity data from 08/19/04 17:30 – 08/24/04 10:00 due to many very high values, including some in excess of 1000 NTU’s as well as heavy fouling noted on the calibration sheets.

Deleted a single large turbidity spike in excess of 1000 NTU’s at 09/03/04 11:30.

Station NE (Chestnut Neck) deleted data

Deleted all pH data from NE022604 deployment (02/26/04 12:00 - 03/16/04 11:00) due to bad post-deployment values and mis-match with groundtruth data and pH data of successive deployment

Deleted turbidity value at 04/02/04 16:00:00 due to out-of-range “spiking”.

Deleted turbidity value 05/25/04 11:00:00 due to “spiking”.

Deleted turbidity value at 06/06/04 02:00:00 due to out-of-range “spiking”.

Deleted all DO data from the NE071604 deployment (07/16/04 10:00 - 08/11/04 10:30) due to excessively high DO values, poor post-deployment values, and heavy growth on probes as noted in calibration sheets.

Deleted turbidity value at 7/19/2004 12:00:00 due to out-of-range “spiking”.

Deleted turbidity value at 7/30/2004 07:30:00 due to out-of-range “spiking”.

Deleted all D.O. data from the NE102704 deployment (10/27/04 11:00 – 11/10/04 19:30) due to obvious mismatch with DO data from previous and subsequent deployments as well as comparison with questionable ground-truth data.

Deleted all D.O. data from the NE121304 deployment (12/13/04 14:30 - 12/30/04 13:30) due to a mismatch with previous deployment’s DO values, bad deployment values (as compared to groundtruth data from the handheld unit), and poor post-deployment calibration.

Site BA (Lower Bank) Deleted Data Section

Deleted all turbidity data for BA121103 deployment (12/11/03 14:30:00 – 01/08/04 10:00) due to a problem with the turbidity probe (wiper was blocking optics as reported on the calibration sheet), many negative data reported for the deployment, as well as a very negative (-20 NTU’s) post-deployment calibration value.

All D.O. data for the BA041404 deployment (04/19/04 13:30:00 – 05/11/04 10:30:00) were deleted due to poor field calibration and pre- and post-deployment values.

Deleted turbidity value at 05/04/04 03:30 because of spiking.

Deleted turbidity value at 05/23/04 21:00 because of spiking.

Deleted all DO data from BA060204 deployment (06/02/04 12:00:00 – 06/16/04 12:00) due to bad pre- and post-deployment values.

Deleted all DO data from BA061604 deployment (06/16/04 12:30:00 – 07/01/04 13:30:00) due to bad pre- and post-deployment values.

Deleted the following turbidity values due to “spiking”: 06/06/04 11:00, 06/06/04 15:00, 06/07/04 11:30, 06/13/04 17:00-17:30, 06/25/04 14:00.

Deleted the following turbidity values because of spiking in excess of 1000 NTU’s: 07/04/04 09:00, 07/12/04 05:00, 07/17/04 15:00, 07/19/05 15:30 – 16:00, and 07/29 06:00.

Deleted the following turbidity values because of spiking in excess of 1000 NTU’s: 08/15/04 02:30, 08/15/04 21:00-21:30, 08/16/04 19:00, 08/17/04 10:00.

Deleted single large turbidity spike at 09/06/04 10:30 in excess of 1000 NTU’s.

Deleted large turbidity spikes at 10/07/04 21:30 – 22:00 in excess of 1000 NTU's.

All D.O. data for the BA112904 deployment (11/29/04 13:30 - 12/06/04 14:30) were deleted due to poor post-deployment values, poor comparison with groundtruth values (handheld unit), and poor comparison with prior and successive deployments

13) Missing Data

Station B6 (Buoy 126) missing data

Missing all data from 01/01/04 00:00:00 – 04/08/04 13:30:00. No datalogger was deployed due to over-winter damages.

Missing data from deployment file: 12/22/2004 14:00:00- 12/31/04 23:30:00; dataloggers pulled due to ice-over.

We observed numerous gaps in our datasets; later examination revealed that the battery compartment had flooded due to a cracked housing and one or more batteries had failed (leaked, corroded, etc.), presumably affecting power to the motherboard and/or probes. The following list denotes periods when no data were collected for any of the parameters at station B6 (B126), presumably due to the aforementioned issue:

09/14/2004	17:00:00
09/15/2004	13:30:00
09/16/2004	01:00:00
09/16/2004	05:30:00
09/16/2004	09:00:00
09/16/2004	14:30:00
09/16/2004	18:30:00
09/16/2004	20:30:00
09/17/2004	09:00:00
09/17/2004	18:30:00
09/18/2004	08:30:00
09/19/2004	08:30:00
09/19/2004	16:30:00
09/20/2004	09:30:00
09/20/2004	10:30:00
09/20/2004	11:30:00
09/21/2004	12:30:00
09/21/2004	23:30:00
09/22/2004	00:00:00
09/22/2004	12:00:00
09/22/2004	12:30:00
09/22/2004	19:30:00

09/23/2004	02:00:00
09/23/2004	11:00:00
09/23/2004	11:30:00
09/23/2004	13:30:00
09/23/2004	14:00:00
09/23/2004	14:30:00
09/23/2004	15:00:00
09/24/2004	02:30:00
09/24/2004	13:30:00
09/24/2004	14:00:00
09/24/2004	14:30:00
09/24/2004	15:00:00
09/25/2004	14:30:00
09/26/2004	15:00:00
09/26/2004	15:30:00
09/26/2004	22:00:00
09/26/2004	22:30:00
09/27/2004	00:00:00
09/27/2004	03:30:00
09/27/2004	06:30:00
09/27/2004	12:30:00
09/27/2004	23:30:00
09/28/2004	01:30:00
09/28/2004	16:30:00
10/01/2004	13:30:00
10/02/2004	15:00:00
10/03/2004	03:30:00
10/14/2004	17:30:00
10/14/2004	18:30:00
10/14/2004	19:00:00
10/16/2004	13:30:00
10/18/2004	08:00:00
10/18/2004	08:30:00
10/21/2004	10:30:00
10/23/2004	15:00:00
10/24/2004	15:30:00
10/24/2004	16:00:00
10/24/2004	17:00:00
10/28/2004	05:30:00
10/31/2004	06:00:00
10/31/2004	06:30:00
10/31/2004	07:00:00
10/31/2004	08:30:00
11/01/2004	07:30:00
11/01/2004	09:00:00
11/01/2004	20:00:00

11/02/2004	10:30:00
11/02/2004	22:30:00
11/04/2004	20:30:00
11/04/2004	21:00:00
11/04/2004	21:30:00
11/04/2004	22:00:00
11/04/2004	22:30:00
11/04/2004	23:00:00
11/04/2004	23:30:00
11/05/2004	09:30:00
11/05/2004	10:00:00
11/05/2004	11:00:00
11/05/2004	11:30:00
11/05/2004	12:00:00
11/05/2004	14:00:00
11/05/2004	18:30:00
11/05/2004	19:00:00
11/05/2004	19:30:00
11/05/2004	20:00:00
11/05/2004	20:30:00
11/05/2004	21:00:00
11/05/2004	21:30:00
11/05/2004	23:00:00
11/06/2004	02:00:00
11/06/2004	05:00:00
11/06/2004	05:30:00
11/06/2004	06:00:00
11/06/2004	06:30:00
11/06/2004	07:00:00
11/06/2004	07:30:00
11/06/2004	08:00:00
11/06/2004	08:30:00
11/06/2004	09:30:00
11/06/2004	10:00:00
11/06/2004	11:00:00
11/06/2004	11:30:00
11/06/2004	12:00:00
11/06/2004	13:30:00
11/06/2004	14:00:00
11/06/2004	17:00:00
11/06/2004	17:30:00
11/06/2004	18:00:00
11/06/2004	18:30:00
11/06/2004	19:00:00
11/06/2004	20:00:00
11/06/2004	20:30:00

11/07/2004	00:00:00
11/07/2004	01:30:00
11/07/2004	11:00:00
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12/22/2004	04:30:00

Station B9 (Buoy 139) missing data

Missing all data 01/01/04 00:00 – 03/31/04 11:30; datalogger was pulled in December 2003 due to ice-floes and not reinstalled until 03/31/04 12:00 due to ice-related damages.

Missing all data 12/22/04 14:00 – 12/31/04 23:30; no datalogger was deployed during this period due to ice.

Station NE (Chestnut Neck) missing data

Missing all data: 01/01/04 00:00:00 – 02/26/04 11:30:00 ; no datalogger deployed due to ice.

Missing all data: 06/24/04 – 07/08/04; datalogger deployed, but not activated (operator error).

Missing all data 12/30/04 14:00:00 – 12/31/04 23:30:00; no datalogger deployed due to ice.

Site BA (Lower Bank) Missing Data Section

Missing all data: 01/08/04 10:00:00 – 04/19/04 13:00:00 ; no datalogger deployed due to over-winter damage of pipe and the need to replace the entire structure.

14) Post deployment information

Order: Deployment file name, sonde identification number, DO%, pH 7, pH 4, Depth (0.00 m), Turbidity (in a 0 NTU solution), SpCond (in a 20 mS/cm standard), Logger Battery (volts)

B6040804	13	101.3	7.10	4.10	0.217	1.7	20.36	11.3
B6043004	13	103.1	7.02	4.03	-0.060	1.3	19.87	11.3
B6051404	13	107.1	7.18	4.24	-0.062	0.2	19.99	11.0
B6060404	13	104.2	7.17	4.36	0.019	6.9	20.04	10.7
B6062504	13	100.1	6.98	4.11	-0.060	1.3	19.81	10.1
B6071904	14	97.3	7.08	4.18	0.063	NR	20.22	12.4
B6080204	13	79.8	7.10	4.15	-0.008	2.2	19.70	12.7
B6082004	14	105.8	7.03	4.10	0.071	14.4	19.26	12.0
B6091004	11	97.4	7.36	5.30	-0.040	0.4	19.69	10.7
B6100804	14	75	6.99	4.12	-0.104	-0.2	19.69	11.5
B6102804	13	101.5	6.95	4.08	-0.053	0.3	20.31	7.3
B6111104	14	98.9	7.22	4.58	-0.020	-0.5	19.28	12.7
B6120304	11	101.2	7.03	4.05	0.083	0.1	20.09	10.2
B9033104	14	106.1	7.17	4.02	-0.090	1.2	20.44	11.0
B9050404	14	101.5	7.05	4.25	-0.178	1.6	19.95	10.7
B9052704	14	NR	7.10	4.04	0.041	0.9	near 0	10.1
B9062304	14	103.1	7.01	4.02	-0.072	0.3	19.76	12.7
B9071504	11	1.0	7.14	5.43	0.215	-0.4	20.30	11.4
B9082404	13	100.5	7.13	4.33	0.055	0.6	19.78	12.4
B9091604	14	94.7	7.13	4.34	0.106	0.5	19.81	11.7
B9100704	13	101.5	7.01	3.99	0.007	1.3	19.57	11.3
B9101804	11	106.8	6.99	3.93	0.003	-0.5	20.07	11.4
B9111704	13	97.3	6.96	4.04	-0.257	-0.1	20.42	12.5
B9120904	14	100.9	7.15	4.17	-0.036	0.5	19.99	12.4
BA121103	5	108.1	7.05	4.24	0.001	-20.0	19.85	10.4
BA041404	13	82.7	7.10	4.06	-0.012	0.05	19.83	13.3
BA051104	15	103.7	7.05	4.12	-0.007	0.7	20.3	10.1
BA060204	12	78.5	7.26	4.39	0.001	-0.7	19.75	12.7

BA061604	5	82.9	7.10	4.16	0.001	0.2	19.79	12.1
BA070104	12	105.2	7.05	4.12	0.000	0.8	19.69	12.0
BA072804	5	102.1	6.84	4.04	0.000	-0.1	19.86	11.8
BA081104	12	89.1	7.04	4.10	0.000	2.4	19.87	11.4
BA082504	5	92.5	7.07	4.04	0.003	0.1	19.71	11.5
BA092804	12	76.5	7.01	4.07	-0.001	-2.1	20.35	10.5
BA101804	X	103.4	6.91	3.89	-0.002	1.3	20.26	10.3
BA111004	5	100.2	7.01	3.96	0.000	-0.1	20.11	10.7
BA112904	12	75.3	6.94	3.93	-0.001	1.1	20.72	13.8
BA120604	X	91.8	6.96	3.98	-0.002	1.5	20.13	12.1
BA122204	5	101.7	7.03	4.10	-0.001	1.7	20.2	10.1
NE022604	6	101.7	7.37	5.19	0.002	-0.3	20.34	11.3
NE031704	6	95.0	7.27	3.99	0.001	-0.3	19.39	11.1
NE040204	6	107.7	7.05	4.17	-0.001	2.8	19.49	10.8
NE042904	6	100.4	7.01	4.48	0.000	-0.1	19.76	10.7
NE052104	NR	91.6	6.91	4.17	0.000	7.0	19.28	12.3
NE060304	6	101.5	7.08	4.16	-0.003	-2.7	20.11	11.9
NE062504	6	N/A	N/A	N/A	N/A	N/A	N/A	N/A
NE071604	6	76.6	7.02	4.33	0.007	7.6	19.7	11.5
NE081304	6	98.5	6.96	4.20	-0.001	308.9	19.19	11.1
NE090704	6	95.7	7.08	4.05	-0.001	-0.5	19.97	10.7
NE100704	5	100.8	7.00	3.94	0	0.2	19.73	11.0
NE102704	12	80.90	7.1	4.1	0.001	3.6	19.95	failed
NE111504	X	103.1	7.06	4.0	0.002	1.7	20.19	10.1
NE120204	5	102.4	6.98	3.96	0.0	0.1	19.92	10.5
NE121304	12	167	7.05	4.05	-0.001	-1.6	19.19	13.3

NR = Not Reported

N/A = not applicable; in the case of the NE062504, the sonde was not activated, so no post-deployment data were taken

15) Other remarks/notes

On 08/12/2020 this dataset was updated to include embedded QAQC flags for anomalous/suspect data. System-wide monitoring data beginning in 2007 were processed to allow for QAQC flags and codes to be embedded in the data files rather than detailed in the metadata alone (as in the anomalous/suspect, deleted, and missing data sections above). Prior to 2006, rejected data were deleted from the dataset so they are unavailable to be used at all, but suspect data were only noted in the metadata document. Suspect data flags <1> were embedded retroactively in order to allow suspect data to be easily identified and filtered from the dataset if desired for analysis and reporting

purposes. No other flags or codes were embedded in the dataset and users should still refer to the detailed explanations above for more information.

Note to users: When utilizing these data, it is always best to also review the SWMP Weather Station (MET) dataset to provide weather conditions that may effect the SWMP Water Quality (WQ) data. For example, strong precipitation and strong sustained winds may cause elevations in turbidity and alter dissolved oxygen levels. Periods of drought may alter salinity patterns and lead to anoxic conditions in poorly-circulated regions of reserve waters. Hurricane and Nor'easter events may alter WQ parameters in the above, and other, manners. The JAC MET data will be available at the CDMO website (<http://cdmo.baruch.sc.edu/>) in June 2005.

There were a few instances at this NERR site where turbidity recorded small negative values (-0001 and -0002). Because turbidity has a range of accuracy of +/-2 NTU, the technician did not edit or deleted these values in any way.