Jacques Cousteau (JAC) (formerly known as Mullica River) NERR Water Quality Metadata
1 January 2006 – 31 December 2006
Latest Update: 01 October 2019

I. Data set and Research Descriptors

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2) Entry verification

The data are uploaded to the PC from the YSI sondes (also: “dataloggers” or “data sondes”) 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. Field data values are taken at the time of sonde deployment and retrieval with a YSI 600 sonde paired with a YSI 650-MDS display (also: "handheld unit"). The comparisons are documented on tracking sheets.

Deployment files are exported from EcoWatch as ".csv" files and are then imported into an Excel macro (EQWinFormat.xls) created by the NERR Central Data Management Office (CDMO). This macro allows PC users with 30-minute data to automatically create a monthly Excel file from a deployment 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 datalogger 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 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. Gregg Sakowicz is responsible for data management.

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 hinders 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 dataloggers. 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 cooler ocean waters can have dramatic effects on the growth rates of many different species living in the area. Dataloggers 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 dataloggers are programmed to record temperature, specific conductance, salinity, dissolved oxygen, depth, pH, and turbidity every 15 or 30 minutes. Presently, four SWMP monitoring stations are established 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 dataloggers cover a total of 33 kilometers in this estuarine system.

Calibration standards required for pH were purchased from YSI. (003822 (pH 7), 003823(pH 10), and p/n 003821 (pH 4)). A two or three point calibration was employed for pH, the first being pH 7 followed by pH 10. An optional third point (pH4) was also applied at the operator's discretion.

Calibration standards required for conductivity were purchased from YSI. A standard of either 20 mS/cm or 10 mS/cm (p/n 060911), approved by YSI, Inc., was used to calibrate for conductivity. Production of the 20,000 us/cm solution was ceased in 2005 and replaced by the production of the 10,000uS/cm solution; the 20,000 uS/cm solution remaining in stock was used briefly in the beginning of 2006 for some stations and then discontinued, resulting in the use of the 10,000 us/cm solution for the remainder of 2006.

Dissolved oxygen was calibrated early in the year via a calibration cup filled with about 1/4 inch tap water, which creates a 100% water-saturated air environment for the sensor. The sensors were allowed to equilibrate in the cup before DO (% saturation) was calibrated. Later in the year, a new methodology was employed: an aerator was used to saturate tap water in which the DO probe was calibrated as described above. The membrane on the oxygen probe was changed

when anomalous data was recorded, when bad diagnostic values were observed during calibration or post-calibration, when the DO membrane was visible punctured, folded, or otherwise damaged, or when the terminals of the DO probe were tarnished or otherwise discolored, and prior to almost every deployment during the summer months. Installation of the D.O. membrane was as follows: the datalogger was inverted (probes facing upwards) and the reservoir of the DO probe was filled with the appropriate solution, allowing a meniscus bubble to form over the DO terminals. The DO membrane was then stretched over the face of the probe and secured using a rubber O-ring. The membrane was inspected for folds or trapped bubbles. The membrane was then "burned in" by allowing the datalogger to run in an unattended sampling mode sampling every 30 minutes for at least six hours.

Calibration of the turbidity probe was performed with a 0 NTU (Nephelometric Turbidity Units) solution (de-ionized water) and a 123 NTU standard (supplied by YSI, inc., p/n 607300) 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 dataloggers before calibration, and each used standard was used once as a post-calibration solution and once as a rinse solution before being discarded (unless egregious contamination was suspected). Servicing an instrument generally took about two hours for each datalogger plus the time involved with retrieval and deployment.

Dataloggers were deployed by inserting them in PVC pipes that are affixed to a permanent structure (in this case, two US Coast Guard channel markers, one bridge, and one commercial dock). A line was used to lower and recover the dataloggers within the pipes. A cross-pin (stainless steel bolt) was inserted across the bottom of the pipe and served as an end-stop for the datalogger during its descent, assuring a maximum fixed depth and retaining the datalogger if the line parted. Vent holes or slots were drilled or cut in the bottom of the pipe to allow for circulation of water across the probes. An antifouling paint (Petit Trinidad SLR) was used to coat the last few meters of the PVC pipes, both inside and out, to retard biofouling and subsequent blockage of the holes/vents. A locking cap provided security.

In 2006, two methods of deployment and data collection were employed. The first being a stand alone deployment during which a datalogger autonomously collected data on 30-minute intervals on Eastern Standard Time (EST) and record these data internally, to later be downloaded onto a desktop/laptop computer post-retrieval. This method was employed for the entire year at stations Buoy 139 (B9) and Lower Bank (BA), and for an early portion of the year at B6 and NE. The second method employed was the pairing of dataloggers with telemetry equipment that received data from the dataloggers and broadcast it to the GOES satellite for receipt by the NOAA Hydrometeorological Automated Data System (HADS). These data were also recorded independently in Eastern Standard Time (EST) by the dataloggers for redundancy and to continue with the pre-existing NERRS SOP. Telemetry was employed at Buoy 126 (B6) and Chestnut Neck (NE) in 2006. For more detail concerning these telemetered datalogger stations, see the following two paragraphs:

A Sutron Sat-Link2 transmitter was installed at this Buoy 126 (B6) on 06/22/06 and transmits data to the NOAA GOES satellite, NESDIS ID #3B00C264. The transmissions are scheduled hourly and contain four (4) datasets reflecting fifteen minute data sampling intervals. The telemetry data are "Provisional" data and not the "Authentic" dataset used for long term monitoring and study. These data can be viewed by going to http://cdmo.baruch.sc.edu

A Sutron Sat-Link2 transmitter was installed at Chestnut Neck (NE) on 09/19/06 and transmits data to the NOAA GOES satellite, NESDIS ID #3B03E386. The transmissions are scheduled hourly and contain four (4) datasets reflecting fifteen minute data sampling intervals. The telemetry data are "Provisional" data and not the "Authentic" dataset used for long term monitoring and study. These data can be viewed by going to http://cdmo.baruch.sc.edu

During each sampling period measurements of specific conductance, salinity, temperature, dissolved oxygen, (percent saturation and concentration measured in mg/L), water level (depth), pH, and turbidity were recorded. After approximately 30 days dataloggers were removed from the PVC pipe. Deployment periods were often extended during 2006 because of weather restrictions. A YSI 600 datalogger attached to a YSI 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 datalogger was then deployed to replace the datalogger being recovered. The recovered datalogger 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 the field station, processed as described above, and re-deployed or replaced later that day or the following day.

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 standard operating procedures. Post-processing involves 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.

Dataloggers were programmed to start recording data (a few hours or up to one day) before they were deployed in the field and allowed to run in an aerated water-filled bucket, so these deployment files often contained "tail ends" of non-deployment (also: out-of-water) data, which were used to diagnose the probes but deleted before the data were processed for import into the yearly datasets. The beginning and end of each data file was compared to the 600/650MDS handheld unit values and the data were checked for probe failure and fouling.

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 with a tidal range of up to 2 meters. All sites are in an undisturbed area with little impact from development or pollution. There were four active sampling stations in 2006:

1) Buoy 126 (B6) - 39º 30.478' N, 74º 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, but it is located about 0.5 kilometers from an area in the Intracoastal Waterway that is dredged regularly. The datalogger at this location is attached to Intracoastal Waterway Buoy 126 and is the closest monitoring station to Little Egg Inlet. Average depth at the sample site is approximately 4.03 meters. This site can be characterized by having strong tidal currents, 2-3 knots, fine to course sand bottom with an extensive blue mussel bed surrounding the area. 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. In 2006, salinities at this station averaged 27.0ppt, with a range of 14.1-32.3ppt.

2) Buoy 139 (B9) - 39º 29.883'N, 74º 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 datalogger at this location is attached to Intracoastal Waterway Buoy 139. The closest landform is an extensive salt marsh approximately 1.5 kilometers wide, which borders the upland area. This area is dredged by the U.S. Army Corp of Engineers approximately every five to six years to maintain the channel at a depth of approximately 2.5 meters. The surrounding depth of the bay is approximately 1.5 to 2 meters. Average depth at the sample site is approximately 3.16 meters. This site is characterized by having maximum currents of about 1.5 knots with a muddy sand bottom and with little structure or shell. 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. In 2006, salinities at this station averaged 27.0ppt, with a range of 17.2-32.1ppt.

3) Chestnut Neck (NE) - 39º 32.872' N, 74º 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 datalogger 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. Average depth at the sample site is approximately 2.31 meters. The site is characterized by having tidal currents of less then one knot, during both ebb and flood tide, and has a mixed organic mud/sand bottom. Freshwater input is primarily from groundwater and watershed runoff. In 2006, salinities at this station averaged 13.4ppt, with a range of 1.1-29.7ppt.

4) Lower Bank (BA) - 39º 35.618' N, 74º 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 datalogger is located at the center of a bridge spanning the Mullica River. Average depth at the sample site is approximately 2.87 meters. 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 mixed organic mud and sandy sediment. Freshwater input is primarily from groundwater and watershed runoff. In 2006, salinities at this station averaged 2.0ppt, with a range of 0.0-14.7ppt.

6) Data Collection Period

Site	File Name	Deploy Date	Time	Retrieve Date	Time
B6	B6120105	12/01/05	12:00	01/17/06	11:00
	B6011706	01/17/06	12:00	02/21/06	10:30
	B6022106	02/21/06	11:00	03/28/06	11:30
	B6032906	03/29/06	12:00	05/03/06	10:00
	B6050406	05/04/06	11:00	06/15/06	09:30
	B6061506	06/15/06	10:00	06/20/06	10:00
	B6062006	06/20/06	10:30	06/22/06	09:00
	B6062206	06/22/06	10:00	06/26/06	12:00
	B6062606	06/26/06	12:30	07/19/06	09:15
	B6071906	07/19/06	09:45	08/07/06	09:30
	B6080706	08/07/06	15:00	09/20/06	13:30
	B6092006	09/20/06	13:45	11/21/06	14:00
	B6112106	11/21/06	14:30	01/04/07	14:15
B9	B9111405	11/14/05	14:00	01/10/06	11:30
	B9011006	01/10/06	12:00	02/16/06	10:00
	B9021606	02/16/06	10:30	04/10/06	10:00
	B9041806	04/18/06	12:00	05/24/06	10:30
	B9052506	05/25/06	11:30	06/08/06	09:30
	B9060806	06/08/06	10:00	07/12/06	09:30
	B9071206	07/12/06	10:00	08/18/06	13:00
	B9081806	08/18/06	15:30	09/27/06	13:00
	B9092706	09/27/06	13:30	11/27/06	14:00
	B9112706	11/27/06	14:30	01/18/07	10:30
NE	NE122805	12/28/05	16:00	01/11/06	08:30
	NE011106	01/11/06	14:30	01/25/06	09:00
	NE012506	01/25/06	14:00	02/11/06	12:30
	NE021106	02/11/06	15:30	02/25/06	12:30
	NE022506	02/25/06	16:30	03/11/06	12:00

	NE031106	03/11/06	15:30	03/25/06	12:00
	NE032506	03/25/06	15:00	04/05/06	08:00
	NE040506	04/05/06	12:30	04/22/06	10:30
	NE042206	04/22/06	14:00	05/09/06	10:00
	NE050906	05/09/06	15:30	05/23/06	10:00
	NE052306	05/23/06	14:00	06/05/06	12:00
	NE060506	06/05/06	15:00	06/10/06	08:30
	NE061906	06/19/06	14:30	07/05/06	08:00
	NE070506	07/05/06	13:30	07/19/06	09:00
	NE071906	07/19/06	15:30	08/02/06	12:00
	NE080206	08/02/06	12:30	08/22/06	09:00
	NE082206	08/22/06	12:30	09/19/06	12:30
	NE091906	09/19/06	12:45	09/28/06	14:00
	NE092806	09/28/06	14:15	10/24/06	08:15
	NE102406	10/24/06	12:15	11/29/06	11:45
	NE112906	11/29/06	16:00	12/22/06	09:45
	NE122206	12/22/06	13:00	01/30/07	09:15
BA	BA122805	12/28/05	14:00	01/11/06	12:30
	BA011106	01/11/06	14:00	01/25/06	11:30
	BA012506	01/25/06	12:00	02/08/06	12:00
	BA020806	02/08/06	13:00	02/27/06	11:30
	BA022706	02/27/06	12:00	03/29/06	11:00
	BA032906	03/29/06	11:30	04/12/06	09:00
	BA041206	04/12/06	10:00	04/26/06	14:30
	BA050906	05/09/06	11:00	05/23/06	11:00
	BA052306	05/23/06	11:30	06/01/06	09:30
	BA060106	06/01/06	10:00	06/19/06	14:00
	BA061906	06/19/06	14:30	07/19/06	08:30
	BA071906	07/19/06	15:30	08/17/06	10:30
	BA081706	08/17/06	14:30	09/21/06	08:00
	BA092106	09/21/06	13:30	10/12/06	08:30
	BA101206	10/12/06	13:30	11/22/06	11:00
	BA112206	11/22/06	16:00	12/21/06	09:00
	BA122106	12/21/06	13:30	01/19/07	06:00

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

In addition to the ongoing SWMP meteorological and nutrient data collection at JC NERR, the following research may correlate with or enhance the water quality data:

During 2006, weekly ichthyoplankton sampling at Little Sheepshead Creek Bridge (LSCB) continued as part of the long-term sampling conducted by the Rutgers University Marine Field Station (RUMFS) in the Jacques Cousteau National Estuarine Research Reserve (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 JCNERR.

RUMFS conducted an 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.

A wire-mesh trapping survey of fish and crustaceans conducted by RUMFS within the RUMFS boat basin also continued in 2006 as part of long-term sampling within the Reserve.

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.

Drs. Kenneth W. Able and Thomas Grotheus from the Rutgers University Marine Field Station (RUMFS) 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. Dr. Thomas Grotheus is using the 2006 SWMP water quality data extensively in his multivariate statistical analyses. Visit www.stripertracker.org for more information.

Dr. Mark Sullivan, RUMFS, 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.

Master's student candidate Jackie Toth (Rutgers University) 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.

Master's candidate and NERRS Graduate Research Fellow (GRF) Jaimie Tirado (Rutgers University) conducted surveys of submerged aquatic vegetation (SAV) and epiphytic loading in the Little Egg Harbor estuary. 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.

Beth Condon of the Virginia Institute of Marine Sciences conducted an analysis of nutrient and water data compiled from numerous NERRS reserves, including those data collected within the JCNERR.

During the summer months of 2006, RIOS (Research In Oceanographic Sciences) students, hosted by the Institute of Marine and Coastal Sciences (IMCS), utilized SWMP water-quality data in their summer projects. Among these students who utilized SWMP data were: Margaret A. Malone (project: Distribution of telemetered smooth dogfish, *Mustelus canis*, in a southern New Jersey estuary), Greg Henkes (project: Investigating feasibility of acoustic telemetry and habitat use of adult hickory shad, *Alosa mediocris*, in the Mullica River/Great Bay Estuary, New Jersey), and Paul Clerkin (project: Movement of sub-adult striped bass (*Morone saxatilis*) within an estuarine ecosystem).

Other projects orchestrated in the year 2006 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.

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: pH
Units: units
Sensor Type: Glass combination electrode (glass "globe" type)
Model #: 6561
Range: 0 to 14 units
Accuracy: +/- 0.2 units
Resolution: 0.01 units

Parameter: pH
Units: units
Sensor Type: Glass combination electrode (flat glass type)
Model #: 605091
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. 2001). 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, -i.e. 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.

The NERR 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. Readings for both vented and non-vented sensors are automatically compensated

for water density change due to variations in temperature and salinity; but for all non-vented depth measurements, changes in atmospheric pressure between calibrations appear as changes in water depth. The error is equal to approximately 1.03 cm for every 1 millibar change in atmospheric pressure, and is eliminated for level sensors because they are vented to the atmosphere throughout the deployment time interval.

Beginning in 2006, NERR SWMP standard calibration protocol calls for all non-vented depth sensors to read 0 meters at a (local) barometric pressure of 1013.25 mb (760 mm/hg). To achieve this, each site calibrates their depth sensor with a depth offset number, which is calculated using the actual atmospheric pressure at the time of calibration and the equation provided in the SWMP calibration sheet or Digital Calibration Log. This offset procedure standardizes each depth calibration for the entire NERR System. If accurate atmospheric pressure data are available, non-vented sensor depth measurements at any NERR site can be corrected. The Research Coordinator at the specific NERR site should be contacted in order to obtain information regarding atmospheric pressure data availability.

Important Notes:

In 2006, the two "downriver stations" (B6 and B9) were monitored using non-vented YSI 6600EDS (Extended Deployment System) sondes with deployment periods of approximately 30 days. The depth-offset was applied to calibrations at B6 starting 02/20/06, and at B9 on 02/15/06.

The two "upriver stations" (NE and BA) were monitored using vented level YSI6600 and YSI6600EDS sondes. The depth-offset is not applicable at either of these stations. Non-EDS sondes with deployment periods of approximately 14 days were employed at NE until 08/22/06 and at BA until 11/29/06, after which 6600EDS sondes were used with occasional deployments of non-EDS sondes when EDS sondes were not available (see metadata).

10) Coded Variable Definitions

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

jac = Jacques Cousteau National Estuarine Research Reserve (formerly Mullica River Reserve)
RUMFS = Rutgers University Marine Field Station

wq = water quality data

example 1: B6031805 = this demonstrates the naming convention for deployment files. This denotes a deployment at Buoy 126 starting on 03/18/05.

example 2: jacB6wq2005 = the Jacques Cousteau Reserve's water quality data from Buoy 126 for the year 2005.

11) Anomalous/Suspect Data

B6

The calibration of the DO probe appeared to slowly degrade during the B6120105 deployment, post-calibration values were poor (84-86% in a 100% environment) and the post-calibration DO Gain value was high and just within the acceptable range. Therefore, all DO values (both DO% and DO Conc) 12/01/05 12:00 - 01/17/06 11:00 should be considered suspect but were not deleted.

The following turbidity "spikes" from the B6011706 deployment are considered suspect (but were not deleted) because they occurred during a period of otherwise low turbidity and do not appear to be associated with any events that would lead to short periods of elevated turbidity:
02/09/06 03:30
02/09/06 17:00

As suggested by a sudden increase in depth values, the datalogger appears to have "hung up" part way down the PVC pipe during B6022106 deployment on 02/21/06 11:00 until approximately 03/04/06, when it appears to have dropped to the bottom of the pipe. Therefore all depth data from 02/21/06 11:00 – 03/28/06 11:30 should be considered suspect but were not deleted. Likewise, all other data collected during this period should be considered suspect as they were recorded inside the pipe at an inappropriate location in the vertical water column. Actions have been taken to prevent this issue from occurring again.

Some turbidity "spiking" appears in the B6022106 deployment record between 03/14/06 and 03/28/06. Upon retrieval, it was discovered that some algae had become lodged in the mesh/probe guard, and may have periodically obstructed the turbidity optics. Because it is difficult to discern what values were caused by this phenomenon and what are considered real, these spikes are considered suspect but were not deleted.

Some turbidity "spiking" appears in the B6032906 deployment record 03/29/06 12:00 – 05/03/06 10:00. Upon retrieval, it was discovered that some small mussels had begun to colonize the mesh and probe guard and may have periodically obstructed the turbidity optics. These spikes are therefore considered suspect but were not deleted.

04/19/06 12:30
05/01/06 16:00
05/02/06 20:30

Salinity/Conductivity post-calibrated a bit low after the B6032906 deployment because there were some small mussels blocking the ports of the Temperature/Conductivity probe. Because the accuracy of the Conductivity probe affects the precision of measurements of specific conductivity, salinity, DO mg/L and depth, data collected for those parameters from this deployment (03/29/06 12:00 – 05/03/06 10:00), especially those between (approximately) 04/20/06 and 05/03/06 10:00, should be considered suspect, but were not deleted.

Some turbidity "spiking" appears in the B6050406 deployment record. Upon retrieval, it was discovered that some small mussels had begun to colonize the mesh and probe guard and may have periodically obstructed the turbidity optics. Some mud/sediment had also collected in the bottom of the probe guard. The following spikes are therefore considered suspect but were not deleted.

05/09/06 10:30:00
05/24/06 00:30:00
05/25/06 20:30:00
05/28/06 14:00:00

As with the previous deployment using this datalogger, Salinity/Conductivity post-calibrated a bit low after the B6050406 deployment. In addition there is a marked discrepancy between readings at the end of the B6050406 deployment and those taken with the new deployment. All specific conductivity and salinity data from this deployment (05/04/06 11:00 – 06/15/06 09:30) should be considered suspect but were not deleted.

A Sutron telemetry unit was installed at B6 on 06/20/06. Upon review of all 2006 data at this reserve and others, it was discovered that many pH readings, obtained with YSI data sondes connected to these telemetry units, appeared elevated as compared to previous years' data at the same stations, and appeared to lose the patterns typically associated with tidal patterns. Therefore, all pH data obtained at B6 from 06/20/06 10:15 (approximate time) to 12/31/06 23:45 should be considered suspect but were not deleted.

Isolated turbidity spikes were recorded during the B6062606 deployment between 07/10/06 03:00 and 07/17/06 11:30. These are considered suspect but were not deleted:

There is also a period of elevated turbidity at the end of the B6062606 deployment (starting approximately 07/17/06 11:30:00 and running until the time of retrieval at 07/19/06 09:15:00). The probe came back considerably covered by fouling organisms. These data are considered suspect but not deleted.

Fouling may have also affected Specific Conductivity readings (as well as dependent Salinity, DO mg/L and Depth data) from approximately 7/18/06 at 00:00 to the time of retrieval at 7/19/06 09:15. Specific Conductivity and Salinity values are depressed and there is a marked discrepancy between the end of the old deployment and beginning of the new (7/19 09:45).

The dissolved oxygen values appeared to degrade through the second half of the B6071906 deployment and recorded some suspiciously low values, but the D.O. probe and membrane post-

calibrated well. Therefore, all D.O. data between 07/19/06 09:30 - 08/07/06 09:30 can be considered suspect but were not deleted.

There were a number of "spiky" turbidity values recorded during the B6071906 deployment between 07/19/06 09:30 - 08/07/06 09:30. When recovered, this datalogger had some long filamentous algae on some of the probes that might have waved in front of the turbidity probe optics occasionally. The elevated turbidity values recorded during this deployment should be considered suspect but were not deleted.

Some slightly negative turbidity values were recorded during the B6071906 deployment between 07/19/06 09:30 - 08/07/06 09:30, but were within the +/- 2.0 NTU error of the turbidity probe, so these values should be considered suspect but were not deleted.

The B6080706 deployment was a particularly long deployment, so biofouling became a considerable issue, affecting the data.

Heavy fouling during the second half of the B6080706 deployment by filamentous algae, mussels, and sediment appears to have affected specific conductivity/salinity readings. There is a marked discrepancy between the end of this deployment and the next one. Therefore, all specific conductivity/salinity data from approximately 08/26/06 09:00:00 to the end of the deployment on 09/20/06 13:30 should be considered suspect but were not deleted. As per SWMP SOP's, when the conductivity probe records questionable data, DO concentration and depth during the concurrent period (approximately 08/26/06 09:00:00 to the end of the deployment on 09/20/06 13:30) must also be considered suspect (but were not deleted).

Some "spiky" turbidity values were recorded at 08/18/06 05:00:00 and 08/21/06 17:30 and should be considered suspect but were not deleted.

Heavy fouling during the second half of the B6080706 deployment by filamentous algae, mussels, and sediment resulted in a long period of elevated turbidity. Therefore, all turbidity data from 08/26/06 09:00 to the end of the deployment on 09/20/06 13:30 were deleted.

Heavy fouling during the second half of the B6080706 deployment by filamentous algae, mussels, and sediment resulted may have affected pH readings during this deployment. Therefore, all pH data from 08/26/06 09:00 to the end of the deployment on 09/20/06 13:30 should be considered suspect but were not deleted.

Dissolved oxygen values degraded during the second half of the B6080706 deployment. While the EDS wiper kept the DO membrane quite clear and the post-calibration values of the DO probe were acceptable, fouling of the sonde cap and mesh collected sediment and may have restricted water flow, leading to artificially low DO values. Therefore, D.O. data from this deployment, particularly those from (approximately) 08/29/06 to 09/20/06 13:30 should be considered suspect but were not deleted.

The B6092006 deployment was a particularly long deployment, so biofouling became a considerable issue, affecting the data.

Numerous spiky turbidity values were recorded during the B6092006 deployment from approximately 10/06/06 and the end of the deployment at 11/21/06 14:00. These should be considered suspect but were not deleted.

Dissolved oxygen values read a bit high during post-calibration of the B6092006 deployment. Therefore, DO data collected 09/20/06 13:45 - 11/21/06 14:00 should be considered suspect but were not deleted.

Some slightly negative turbidity values were recorded during the B6092006 deployment but were within the +/- 2.0 NTU error of the turbidity probe, so these values falling within the 09/20/06 13:45 - 11/21/06 14:00 period should be considered suspect but were not deleted.

Specific Conductivity post-calibrated low for the B6092006 deployment, possibly due to fouling of the probe. All specific conductivity data between 09/20/06 13:45 - 11/21/06 14:00 should be considered suspect but were not deleted. Likewise, according to SMWP SOP's, salinity, DO concentration (mg/L) and depth data from this period must also be considered suspect.

Deployment: B6112006

The datalogger was "hung up" in the pipe during the B6112006 deployment from time of deployment until we were able to return with a long "push pole" on (approximately) 11/28/06 10:50. Therefore all data from 11/21/06 14:30 - 11/28/06 10:45 were taken from a too-shallow location in the pipe. These data were retained and not deleted, but should be considered suspect and not used in further analyses. Likewise, all other data collected during this period should be considered suspect as they were recorded inside the pipe at an inappropriate location in the vertical water column.

A single large turbidity spike was recorded on 12/03/06 17:15 during the B6112006 deployment. This datum should be considered suspect but was not deleted.

B9

DO values during the B9111405 deployment appear to have slowly degraded over the duration of the deployment. Post-calibration values were low, 74% and 81% and there was a marked discrepancy with the following deployment. All diagnostic values (DO charge, DO gain, membrane integrity test) were well within acceptable limits. It is also noted that this was an unusually long deployment, so the DO prob may have "fallen off calibration" due to its extended activity. All DO values (DO Conc and DO%) 11/14/05 14:00 – 01/10/06 11:30 should be considered suspect but were not deleted.

Water seepage into the Temperature/Conductivity probe port during the B9011006 deployment led to some very high (obviously erroneous) Temperature and Conductivity values that were deleted (along with all affected parameters). Since it is unclear exactly when this seepage

occurred, or what other data may have been affected, the entire deployment should be considered suspect: 1/10/2006 12:00 – 2/16/2006 10:00

The following turbidity "spikes" occurred during the B9011006 deployment and are considered suspect (but were not deleted) because they occurred during a period of otherwise low turbidity and do not appear to be associated with any events that would lead to short periods of elevated turbidity:
02/02/06 10:00
02/05/06 01:30

A low pH value was recorded on during the B9041806 deployment at 5/23/2006 7:00. While suspect, no cause could be identified or discredited, so it was therefore not deleted.

All pH values from the B9052506 deployment should be considered suspect; the pH probe only accepted a one-point calibration (pH=7) before deployment. The values recorded appear within reason for the B9 station and were not deleted, but all pH values 05/25/06 11:30 - 06/08/06 09:30 must be considered suspect.

DO data appeared to degrade during the B9052506 deployment and mis-matched with the successive deployment. All DO data 05/25/06 11:30 - 06/08/06 09:30 should be considered suspect but were not deleted.

There was a slight mismatch in pH between the B9052506 deployment and the next. Therefore all pH data 05/25/06 11:30:00 - 06/08/06 09:30:00 should be considered suspect but were not deleted.

A film of calcareous growth covered the glass surface of the pH probe at some point during the B9060806 deployment, and the probe post-calibrated poorly. All pH data 06/08/06 10:00 - 07/12/06 09:30 should be considered suspect.

All turbidity data from the B9060806 deployment (06/08/06 10:00 - 07/12/06 09:30), especially from the latter half of the deployment (approximately 06/24/06 - 07/12/06 09:30:00) should be considered suspect. Considerable fouling by algae and tunicates was observed during retrieval of the datalogger and may have been the cause of high and "spiky" turbidity values recorded during the end of this deployment, but lots of rain and turbid waters were also observed during this approximate time period, so natural causes for high turbidity cannot be ruled out. Therefore, the turbidity data in question were retained but are considered suspect.

Some elevated turbidity values were recorded during the B9071206 deployment between 07/25/06 and 07/27/06. It is unclear if this was and actual event or something obscuring the optics of the turbidity probe. These values should be considered suspect but were not deleted.

Additionally, some individual turbidity "spikes" were recorded during the B9071206 deployment at 08/11/06 13:00, 08/11/06 21:30, and 08/13/06 12:00. It is unclear if this was an actual event or something obscuring the optics of the turbidity probe. These values should be considered suspect but were not deleted.

The DO probe post-calibrated approximately low for the B9081806 deployment. Therefore, DO data 08/18/06 15:30 – 09/27/06 13:00 should be considered suspect, but were not deleted.

There were some turbidity spikes, probably due to fouling, that occurred towards the end of the B9081806 deployment. All turbidity data between approximately 09/26/06 and 09/27/06 13:00 should be considered suspect but were not deleted.

There were some turbidity spikes, probably due to fouling, that occurred towards the end of the B9092706 deployment. (after roughly 11/16/06). All turbidity data between approximately 11/16/06 and 11/27/06 14:00 should be considered suspect but were not deleted.

pH values appear to have been elevated during the B9112706 deployment as evident by a pH mis-match between this and the previous deployment (B9092706). It is believed that this might have been caused by stray voltage from a malfunctioning Sutron telemetry unit. Therefore all pH values 11/27/06 14:30 – 12/31/06 23:45 should be considered suspect but not deleted.

NE

The DO probe used during the NE122805 deployment failed post-calibration. All DO data 12/28/05 16:00 - 01/11/06 08:30 should be considered suspect but were not deleted.

Some turbidity values from the NE011106 deployment are quite negative, and post-calibration turbidity values were a bit negative. Contamination of the 0NTU standard is suspected. Therefore, all turbidity data from this deployment (01/11/06 14:30 – 01/25/06 09:00) should be considered suspect but were not deleted.

A few large turbidity “spikes” were recorded during the NE012506 deployment at 01/27/06 07:00, 02/10/06 23:30, and 02/11/06 07:30. These should be considered suspect but were not deleted.

The 02/03/06 17:00 turbidity reading is suspect since it is negative.

There was a single large turbidity “spike” during the NE022506 deployment at 03/07/06 13:00. Considered suspect but not deleted.

There were two notable turbidity “spikes” during the NE031106 deployment at 03/14/06 12:00 and 03/20/06 09:00. Considered suspect but not deleted.

There was a single large turbidity “spike” during the NE032506 deployment at 03/25/06 23:30. Considered suspect but not deleted.

There was a single large turbidity “spike” during the NE040506 deployment at 04/21/06 01:30. Considered suspect but not deleted.

A period of extremely elevated DO values were recorded during the NE040506 deployment between 04/15/06 17:00 and 04/18/06 12:00. It could not be determined if this was a real or artificial event, so these data are considered suspect but were not deleted.

A single large turbidity spike was recorded during the NE042206 deployment at 05/07/06 16:00. Considered suspect but not deleted.

Low DO values were recorded during the NE050906 deployment at 05/09/06 16:00 and 05/09/06 20:00. Considered suspect, but not deleted.

Two large turbidity spikes were recorded during the NE060506 deployment at 06/05/06 15:00 and 06/07/06 21:30. Considered suspect, but not deleted.

Specific Conductivity post-calibrated a bit high for the NE060506 deployment. Therefore, all data 06/05/06 15:00 - 06/10/06 08:30 should be considered suspect but were not deleted.

Turbidity values steadily increased during the NE061906 deployment, likely due to fouling by tunicates and algae. All turbidity data 06/19/06 14:30 - 07/05/06 08:00 can be considered suspect but were not deleted.

DO values steadily degraded during the NE070506 deployment, possibly due to fouling. Therefore all DO data 07/05/06 13:30 - 07/19/06 09:00 can be considered suspect but not deleted.

A few negative turbidity values were recorded during the NE070506 deployment but all were within the +/-2.0 NTU acceptable error of the turbidity probe. These turbidity data, occurring between 07/06/06 and 07/15/06, can be considered suspect but were not deleted.

A few negative turbidity values were recorded during the NE071906 deployment but all were within the +/-2.0 NTU acceptable error of the turbidity probe. These turbidity data, occurring between 07/19/06 15:30 and 08/02/06 12:00, can be considered suspect but were not deleted.

DO values recorded at the end of the NE080206 deployment were a bit low when compared to the field data, but the DO probe post-calibrated well. Do data 08/02/06 12:30 - 08/22/06 09:00 may be considered suspect but were not deleted.

Some negative turbidity values were recorded during the NE080206 deployment (08/02/06 12:30 - 08/22/06 09:00), some within the acceptable +/-2.0 NTU range, and some below that range. While the turbidity probe post-calibrated a bit lower than the acceptable range (at -2.1 NTU's), these data are considered suspect, but not deleted.

There were a number of spiky turbidity values recorded during the NE082206 deployment between 09/05/06 and 09/17/06. These could not be attributed to any particular cause (fouling was light), so they are considered suspect but were not deleted.

Very low DO values were recorded during the NE091906 deployment on 09/26/06 15:15. It is not known what cause this, so these values are considered suspect but were not deleted.

A minor depth mis-match between successive deployments was evident at 09/26/06 15:15. It is not known what cause this, so the depth values from the NE091906 deployment between 09/19/06 12:30 and 09/28/06 14:00 are considered suspect but were not deleted.

A Sutron telemetry unit was installed at the NE station on 09/28/06. Upon review of all 2006 data at this reserve and others, it was discovered that many pH readings, obtained with YSI data sondes connected to these telemetry units, appeared elevated as compared to previous years' data at the same stations, and appeared to lose the patterns typically associated with tidal patterns. Therefore, all pH data obtained at NE from 09/28/06 15:30 (approximate time) to 12/31/06 23:45 should be considered suspect but were not deleted.

A single large turbidity spike was recorded during the NE092806 deployment at 10/04/06 01:30 and is considered suspect but was not deleted

A few negative turbidity values were recorded during the NE102406 deployment, but all were within the +/-2.0 NTU acceptable error of the turbidity probe. Therefore, all turbidity data 10/24/06 12:15 - 11/29/06 11:45 can be considered suspect but were not deleted.

A single large turbidity spike was recorded during the NE102406 deployment at 11/18/06 12:15 and is considered suspect but was not deleted.

A mismatch in successive DO values was recorded at 12/13/06 17:00. Because no cause could be identified, DO data from the NE112906 deployment 11/29/06 16:00 and 12/22/06 09:45 are considered suspect but were not deleted.

A few negative turbidity values were recorded during the NE112906 deployment but all were within the +/-2.0 NTU acceptable error of the turbidity probe. These turbidity data, occurring between 11/30/06 and 12/22/06, can be considered suspect but were not deleted.

BA

All turbidity values from the BA122805 deployment 12/28/05 14:00 - 01/11/06 12:30 appear spiky, possibly due to a problem with the turbidity probe. These are considered suspect but were not deleted.

Post-calibration DO values for the BA122805 deployment were quite low, but the values recorded during the deployment appear appropriate. DO data 12/28/05 14:00 - 01/11/06 12:30 may be considered suspect but were not deleted.

Depth data from the BA012506 deployment were lesser than the previous and successive deployments. It appears that this may have been caused by the datalogger "hanging up" during deployment. All depth data 01/25/06 12:00 – 02/08/06 12:00 should be considered suspect but were not deleted. Likewise, all other data collected during this period should be considered

suspect as they were recorded inside the pipe at an inappropriate location in the vertical water column.

Turbidity values for the BA 1/25/06 12:00 – 2/8/06 12:00 (BA012506) deployment are suspect. There are numerous small negative values (as low as -10) during this period, indicating the possibility of a small calibration error.

All turbidity values from the BA020806 deployment 02/08/06 13:00 – 02/27/06 11:30 are considered suspect because during the calibration of the turbidity probe, errors were reported, BUT the values during the deployment appear well within reason and the probe calibrated without issue on later deployments. The cause of this issue is yet to be resolved.

DO post-calibration and DO charge were low post-retrieval for the BA022706 deployment. DO values (both DO% and DO Conc) 02/27/06 12:00 – 03/29/06 11:00 are considered suspect but were not deleted.

The following turbidity "spikes" were observed in the data from the BA022706 deployment and are considered suspect but were not deleted:

03/21/06 09:30
03/25/06 12:00

Turbidity "spikes" at 04/21/06 11:00, 04/21/06 20:00, and 04/25/06 04:00 during the BA041206 deployment are considered suspect but were not deleted.

DO values (DO% and DO mg/L) appeared to drop throughout the BA041206 deployment and were a bit lower than the field data collected at the time of retrieval, but the DO probe post-calibrated fine. It is not clear what caused this, so DO data 04/12/06 10:00 – 04/26/06 14:30 are considered suspect but were not deleted.

There are numerous turbidity values recorded during the BA050906 deployment between 05/09/06 11:00 and 05/23/06 11:00 that are negative, and some exceed the +/-2.0 acceptable error. The probe also post calibrated a bit below this tolerance. These data in question should be considered suspect but were not deleted.

A single turbidity "spike" during the BA050906 deployment at 05/12/06 01:30 should be considered suspect but was not deleted.

Turbidity "spikes" were recorded during the BA052306 deployment at 05/26/06 12:30:00, 05/28/06 11:30:00, 05/28/06 14:00:00, 05/30/06 16:00:00, and 05/31/06 05:00:00. These values should be considered suspect but were not deleted.

Turbidity "spikes" were recorded during the BA060106 deployment at 06/08/06 15:00:00 06/11/06 17:00:00. These values should be considered suspect but were not deleted.

Turbidity “spikes” were recorded during the BA061606 deployment at 06/24/06 05:00:00, 06/24/06 20:00:00, 06/24/06 22:00:00, 06/25/06 05:30:00, 07/01/06 04:30:00, 07/03/06 03:00:00, 07/03/06 17:30:00, 07/08/06 15:00:00. These values should be considered suspect but were not deleted.

There are many negative turbidity values recorded during the BA071906 deployment between 07/19/06 15:30 and 08/17/06 10:30. Post-calibration turbidity values were also low, suggesting these negative turbidity values were the result of poor calibration. These negative turbidity values should be considered suspect but were not deleted.

A single large turbidity “spike” was recorded during the BA081706 deployment at 09/03/06 09:30. This should be considered suspect but was not deleted.

DO readings dropped notably throughout the second half of the BA081706 deployment. Post-calibration readings of the DO probe were acceptable. There was considerable rainfall during the second half of this deployment. There was fouling and sediment accumulation in the PVC pipe and data sonde guard. The DO data from the BA081706 deployment (08/17/06 14:30 – 09/21/06 08:00), particularly the second half (approximately 08/29/06 – 09/21/06 08:00), should be considered suspect, but because the specific cause of this drop in DO was not identified, the data were retained in the dataset.

A single large turbidity “spike” was recorded during the BA092106 at 10/02/06 10:00. This should be considered suspect but was not deleted.

Turbidity values for the BA 12/21/06 13:30 – 1/19/07 06:00 (BA122106) deployment are suspect. There are numerous small negative values (as low as -10) during this period, indicating the possibility of a small calibration error.

12) Deleted Data

B6

Deleted DO values (DO % and DO Conc) at 04/29/06 15:30 (from the B6032906 deployment) because they were extremely (and presumably artificially) elevated (289.8 and 25.56 respectively).

A period of very high turbidity values were recorded during the B6050406 deployment. Upon retrieval, it was observed that mud/sediment had collected in the bottom of the probe guard. Because turbidity values later returned to reasonable levels, it is believed that this mud collected in the probe guard enough to artificially elevate the turbidity values, and was later washed out enough that the turbidty probe was able to collect reasonable (and presumably accurate) values. Therefore, turbidity values from 05/28/06 14:00:00 to 06/04/06 12:00:00 were deleted.

There were two samples reported for 06/22/06 (approximately) 10:30 during the B6062206 deployment. It appears that the Sutron telemetry unit forced a second sample at 10:38:24. All data matched with this timestamp were deleted.

The DO values recorded during the B6112006 deployment steadily decreased throughout the deployment, possibly due to immersion of the datalogger in accumulating sediment in the sonde guard. Post cal readings for the deployment were unacceptable at 56% and 58%. All DO data 11/21/06 14:30 – 12/31/06 23:45 were deleted.

B9

Water seepage into the Temperature/Conductivity probe port during the B9011006 deployment led to some very high (obviously erroneous) Temperature and Conductivity values. This error appears to have cascaded through the rest of the dataset, so all data from the following dates and times were deleted according to CDMO/YSI SOP's:
01/11/06 13:00 - 15:30, 21:30, 22:00
01/28/06 08:30, 09:00, 10:30 – 11:30, 13:30 – 22:00, 23:00, 23:30
01/29/06 00:00 – 03:00
01/29/06 04:00 – 02/01/06 15:30

Turbidity values from 05/09/06 15:00 - 05/24/06 10:30 were deleted because the turbidity probe backed out of the bulkhead during the B9041806 deployment due to vibrations caused by the loose PVC pipe (a strap preventing the pipe from swinging laterally either failed or was removed by vandals), flooding the port and deactivating the turbidity probe.

Dissolved Oxygen (both DO% and DO concentration) values were deleted for 05/22/06 19:30 - 05/24/06 10:30:00 due to a damaged DO membrane during the B9041806 deployment.

A pH value of 0 was recorded on 05/22/06 19:30 during the B9041806 deployment. This value was deleted.

A number of anomalous salinity and conductivity values were recorded during the B9041806 deployment on 05/22/06 at 19:30 22:30, 23:00, and 23:30, and 05/23/06 at 02:00 and 07:00. These data (both conductivity and salinity) were deleted. As per SWMP SOP's, when the conductivity probe fails or records erroneous data, DO concentration and depth were also deleted. Anomalous pH values were also deleted for these date/times.

BA

Deleted all DO data (DO% and DO mg/L) for the BA012506 deployment (01/25/06 12:00 – 02/08/06 12:00). The DO membrane was found to have been punctured, possibly during deployment.

NE

All pH data were deleted for the 8/22/2006 deployment. It appears that the bulb was broken prior to deployment when the sonde guard was affixed. 8/22/2006 12:30 – 9/19/2006 12:30

13) Missing Data

B6

Missing all data for 01/17/06 11:30; both dataloggers appear to have been out of the water at this time during the swap.

Missing all data 03/28/06 12:00 – 03/29/06 11:30. Because one of the JCNERR's dataloggers was at YSI for maintenance, the datalogger was taken back to the station for download, re-calibration and re-deployment. This resulted in a short period of missed data collection.

Missing all data 05/03/06 10:30 – 05/04/06 10:30. The "spare" datalogger was not available (in for repairs), so the same datalogger was retrieved and redeployed the next day.

Missing all turbidity data for the B6061506 deployment (06/15/06 10:00 – 06/20/06 10:00); a YSI600XLS-M unit, which is not equipped with a turbidity probe, was used in substitution for the YSI6600EDS datalogger.

Missing all data for 06/22/06 09:30; the datalogger was out of the water being reprogrammed to interface with the telemetry unit during this period.

Missing all data from 07/19/06 09:30; both dataloggers were out of the water at this time.

B9

Missing all data 04/10/06 10:30 – 04/18/06 11:30. The PVC pipe was damaged during the B9021606 deployment, so the datalogger was removed not immediately replaced. Weather events delayed the repair/replacement until 04/18/06.

Missing all data 05/23/06 at 07:30 for unknown reason.

All data for 05/24/06 11:00 – 05/25/06 11:00. Because two of the JCNERR's dataloggers were at YSI for repairs, an older YSI6000 unit had to be rehabilitated, calibrated, and deployed for the B9052506 deployment.

All parameters 08/18/06 13:30 – 08/18/06 15:00 are missing; due to dataloggers being at YSI for repairs and upgrades, datalogger #13 had to be recovered and recalibrated for a successive deployment.

NE

Missing all data 01/11/06 09:00 – 01/11/06 14:00. Both dataloggers were out of the water during this period.

Missing all data 01/25/06 09:30 – 01/25/06 13:30. Both dataloggers were out of the water during this period.

Missing all data 02/11/06 13:00 – 02/11/06 15:00. Both dataloggers were out of the water during this period.

Missing all data 02/25/06 13:00 – 02/25/06 16:00. Both dataloggers were out of the water during this period.

Missing all data 03/11/06 12:30 – 03/11/06 15:00. Both dataloggers were out of the water during this period.

Missing all data 03/25/06 12:30 – 03/25/06 14:30. Both dataloggers were out of the water during this period.

Missing all data 04/05/06 08:30 – 04/04/06 12:00. Both dataloggers were out of the water during this period.

Missing all data 04/22/06 11:00 – 04/22/06 13:30. Both dataloggers were out of the water during this period.

Missing all data 05/09/06 10:30 – 05/09/06 15:00. Both dataloggers were out of the water during this period.

Missing all data 05/23/06 10:30 – 05/23/06 13:30. Both dataloggers were out of the water during this period.

Missing all data 06/05/06 12:30 – 06/05/06 14:30. Both dataloggers were out of the water during this period.

Missing all data 06/19/06 09:00 – 06/19/06 14:00. Both dataloggers were out of the water during this period.

Missing all data 07/05/06 08:30 – 07/05/06 13:00. Both dataloggers were out of the water during this period.

Missing all data 07/19/06 09:30 – 07/19/06 15:00. Both dataloggers were out of the water during this period.

Missing all data 08/22/06 09:30 – 08/22/06 12:00. Both dataloggers were out of the water during this period.

Missing all data 10/24/06 08:30 – 10/24/06 12:00. Both dataloggers were out of the water during this period.

Missing all data 11/29/06 12:00 – 11/29/06 15:45. Both dataloggers were out of the water during this period.

Missing all data 12/22/06 10:00 – 12/22/06 12:45. Both dataloggers were out of the water during this period.

BA

Missing all data 01/11/06 13:00 – 01/11/06 13:30; Both dataloggers were out of the water during this swap.

Missing all data 02/08/06 12:30. Both dataloggers were out of the water during this swap.

Missing all data from 04/12/06 09:30; both dataloggers were out of the water during retrieval/deployment

Missing all data from 04/26/06 15:00 - 05/09/06 10:30:00. The batteries rapidly lost voltage during the BA041206 deployment and the datalogger stopped functioning sometime after the 04/26/06 14:30:00 sampling period.

Missing all data 07/19/06 09:00 – 07/19/06 15:00. Both dataloggers were out of the water during this swap.

Missing all data 08/17/06 11:00 – 08/17/06 14:00. Both dataloggers were out of the water during this swap.

Missing all data 09/21/06 08:30 – 09/21/06 13:00. Both dataloggers were out of the water during this swap.

Missing all data 10/12/06 09:00- 10/12/06 13:00. Both dataloggers were out of the water during this swap.

Missing all data 11/22/06 11:30 – 11/22/06 15:30. Both dataloggers were out of the water during this swap.

Missing all data 12/21/06 09:30 – 12/21/06 13:00. Both dataloggers were out of the water during this swap.

14) Post-deployment information

The following are the end-of-deployment post-calibration readings in standard solutions prior to cleaning.

Deployment, #, DO%(1), DO%(2), Depth displayed/expected offset, SpCond, pH7, pH10, pH4, Turbidity0, Turbidity123

B6120105,13,84.0%,86.0%,-0.066/NR,10.00,7.17,10.14,NR,0.1,122.9
B6011706,14,106.9%,107.0%,-0.084/NR,9.92,7.16,10.01,NR,3.0,116.5
B6022106,11,107.1%,106.9%,0.058/0.067,10.08,7.15,10.11,4.08,1.2,118.3
B6032906,11,108.4%,108.1%,-0.057/-0.068,8.96,6.84,9.96,4.13,-2.2,126.1
B6050406,13,105.4%,105.6%,-0.026/-0.027,8.15,7.08,10.02,4.38,NR(PM),NR(PM)
B6061506,600XLS-M,97.1%,NR,-0.032/NR,10.16,7.10,10.78,3.87,N/A,N/A
B6062006,11,N/A,N/A,N/A,N/A,N/A,N/A,N/A,N/A,N/A
B6062206,11,N/A,N/A,N/A,N/A,N/A,N/A,N/A,N/A,N/A
B6062606,11,100.7%,100.8%,0.009/0.016,9.64,7.20,10.32,4.25,0.5,122.7
B6071906,14,96.5%,96.3%,0.046/0.029,9.99,7.23,10.01,3.98,-2.1,122.1
B6080706,14,99.7%,99.9%,-0.083/-0.031,1.07,6.97,9.83,4.87,0.5,126.4
B6092006,11,122.5%,123.5%,0.132/0.163,7.38,7.52,10.68,4.46,-5.1,98.9
B6112006,13,58.0%,56.8%,0.072/0.059,9.73,7.20,10.22,4.21,0.2,122.8

B9111405,14,74.1%,81.1%,-0.061/NR,10.13,7.03,10.01,NR,0.8,127.8
B9011006,11,101.4%,101.4%,0.008/NR,10.03,6.97,10.01,NR,2.3,128.5
B9021606,13,119.8%,116.9%,0.075/0.094,10.17,7.20,10.30,4.25,0.4,124.3
B9041806,13,NR(PM),NR(PM),NR(PM),NR(PM),NR(PM),NR(PM),NR(PM),NR(PM),NR(PM)
B9052506,8 (YSI6000 unit),93.3%,93.4%,-0.083/-0.072,10.05,7.13,9.96,NR,NR,NR
B9060806,14,99.8%,100.0%,0.008/0.019,9.39,8.15,8.14,7.87,0.0,123.0
B9071206,13,104.4%,103.9%,0.062/0.060,10.08,7.00,10.03,4.30,-2.8,75.6
B9081806,13,89.7%,89.7%,0.040/0.070,9.58,7.12,10.13,4.10,0.9,120.0
B9092706,14,93.9%,93.9%,0.078/0.076,10.81,6.72,9.72,3.77,0.8,118.0
B9112706,11,106.2%,106.1%,0.144/0.155,9.98,6.62,9.73,3.69,-0.8,123.5

NE122805,12,92.3%,98.9%,0.002/0.000,21.02,7.24,NR,NR,0.0,128.2
NE011106,12,103.8%,97.8%,-0.002/0.000,19.98,6.83,10.13,NR,-4.2,122.9
NE012506,12,108.2%,100.4%,0.010/0.000,19.82,7.11,10.23,NR,-0.5,128.0
NE021106,12,98.1%,99.3%,-0.010/0.000,10.58,7.03,10.09,4.06,-0.1,123.8
NE022506,12,97.8%,100.0%,0.128/0.000,10.02,6.98,10.04,4.03,0.0,124.2
NE031106,12,99.8%,100.0%,0.001/0.000,9.91,6.98,9.99,3.98,1.3,117.3
NE032506,12,101.0%,99.9%,0.071/0.000,10.01,6.98,10.03,4.03,-2.8,123.0
NE040506,12,120.7%,100.0%,0.000/0.000,9.78,6.98,10.06,4.13,1.2,121.6
NE042206,12,103.0%,100.2%,0.000/0.000,9.71,7.01,10.02,3.97,2.8,119.3
NE050906,12,104.2%,100.0%,0.003/0.000,10.11,7.10,10.30,4.00,1.0,117.9
NE052306,12,100.3%,100.0%,0.000/0.000,9.98,6.93,10.02,4.10,-1.8,119.3
NE060506,12,91.3%,100.3%,0.000/0.000,12.02,7.03,10.06,3.94,-1.2,129.8
NE061906,12,99.3%,100.3%,0.000/0.000,9.82,6.93,9.89,4.02,0.3,118.3

NE070506,12,102.1%,100.3%,0.000/0.000,9.98,6.97,9.98,3.76,0.4,118.3
NE071906,12,117.1%,101.2%,0.001/0.000,10.00,6.60,9.80,3.78,-3.4,117.8
NE080206,11,99.3%,100.3%,0.112/0.124,10.00,6.98,9.98,4.23,-2.1,138.2
NE082206,11,108.3%,108.0%,0.026/-0.083,9.94,5.24,5.14,5.07,2.4,122.8
NE091906,5,N/A,N/A,N/A,N/A,N/A,N/A,N/A,N/A,N/A
NE092806,5,103.2%,100.0%,0.230/0.001,9.98,6.98,9.92,4.02,0.2,123.0
NE102406,5,106.1%,101.4%,-0.002/0.000,9.38,6.89,9.95,4.06,-0.4,125.0
NE112906,5,98.9%,99.0%,-0.002/0.000,9.83,7.06,10.23,4.11,-2.5,122.2
NE122806,5,101.4%,99.3%,0.000/0.000,10.26,7.15,10.06,3.90,0.3,129.7

BA122805,X,67.2%,99.0%,0.004/0.000,19.88,7.10,10.23,NR,2.3,129.0
BA011106,5,103.8%,100.0%,0.000/0.000,19.98,7.02,10.18,NR,0.0,129.4
BA012506,X,82.9%,100.0%,0.003/0.000,19.95,7.18,9.89,NR,2.7,128.0
BA020806,5,98.9%,100.3%,-0.005/0.000,10.08,6.92,10.08,4.01,-1.4,130.8
BA022706,14,87.1%,100.0%,0.000/0.017,10.10,7.18,10.08,3.98,-1.8,120.8
BA032906,5,110.0%,100.0%,0.000/0.000,10.01,7.05,10.01,4.03,-2.3,122.8
BA041206,14,110.0%,100.4%,0.000/NR,10.01,7.02,10.12,4.00,-1.0,122.0
BA050906,5,103.2%,100.3%,0.000/0.000,10.01,7.00,10.04,4.20,-3.4,124.0
BA052306,14,102.1%,99.3%,0.059/0.059,9.96,6.97,9.87,4.38,3.0,122.4
BA060106,5,106.7%,100.6%,0.000/0.000,9.40,6.85,10.02,4.04,-1.2,118.9
BA061906,X,101.3%,99.3%,0.030/0.000,9.90,6.94,9.98,4.03,3.2,119.0
BA071906,X,101.3%,100.2%,0.040/0.000,9.68,6.82,9.83,4.20,-4.0,123.0
BA081706,X,99.7%,100.1%,0.000/0.000,9.92,6.98,9.97,4.16,-0.6,128.0
BA092106,X,100.3%,99.2%,-0.270/0.000,9.89,6.96,10.20,4.41,3.2,118.0
BA101206,X,83.0%,101.0%,0.419/0.000,9.80,6.84,10.10,4.30,1.3,109.0
BA112206,X,109.7%,99.8%,0.228/0.000,10.17,6.90,10.35,4.32,-0.2,121.6
BA122106,X,98.1%,100.0%,-0.043/0.000,10.20,7.29,10.18,4.21,0.2,128.2

Deployment= deployment file name
#= datalogger ID number
D.O.% (1)= first datalogger output in a 100% Dissolved Oxygen-saturated environment
D.O.% (2)= second datalogger output in a 100% Dissolved Oxygen-saturated environment
Depth displayed/expected offset = depth in meters (m) displayed by the datalogger when in a depth=0.000m environment. The offset reflects expected depth value, adjusted for local atmospheric pressure (applicable only to non-vented dataloggers (#8, 11, 13, 14, and the 600XLS-M unit); vented dataloggers (#X, 5, and 12) have an expected offset = 0.000)
SpCond= datalogger output in a 10 OR 20 milliSiemens per centimeter cubed conductivity standard solution
pH7= datalogger output in a pH7 standard solution
pH10= datalogger output in a pH10 standard solution
pH4= datalogger output in a pH4 standard solution
Turb0= datalogger output in a 0 NTU turbidity standard (e.g.- Deionized water)
Turb123= datalogger output in either a 100 or 123 NTU turbidity standard

NR= Value not recoded for unspecified reason(s)

NR(PM)- No sample taken due to malfunction of the probe.
NST= No sample taken. This could be for a number of reasons: the appropriate calibration solution may not have been available, the standard had not yet been phased in or had been phased out, or recording of the particular parameter had not yet been adopted as SOP.
N/A= Not Applicable. See metadata.

The following are field data recorded with a YSI600XL sonde paired with a YSI650MDS display ("handheld") unit immediately before deployment and immediately after retrieving the YSI6600/YSI6600EDS unit (and prior to the deployment of its replacement). The 600XL sonde was lowered to approximately the same depth as the recovered sonde, preferably inside the PVC housing itself when practical.

Deployment, DataType, Temp, SpCond, Sal, DO%, DOConc, Other(pH)

B6120105,D,9.86,44.64,28.66,114.5,10.8,6.8
B6120105,R,5.11,47.11,30.02,95.9,10.0,7.2
B6011706,D,5.11,47.11,30.02,95.9,10.0,7.2
B6011706,R,3.07,44.70,28.06,99.6,11.1,7.9
B6022106,D,3.07,44.70,28.06,99.6,11.1,7.9
B6022106,R,7.67,45.70,29.28,105.7,10.4,8.1
B6032906,D,8.13,45.57,29.23,109.5,10.7,8.0
B6032906,R,13.26,44.80,28.96,104.1,9.4,8.1
B6050406,D,14.57,44.51,28.78,105.0,9.0,8.1
B6050406,R,18.47,45.87,29.80,90.1,7.1,7.8
B6061506,D,18.47,45.87,29.80,90.1,7.1,7.8
B6061506,R,23.42,42.34,27.30,92.9,6.8,7.9
B6062006,D,23.42,42.34,27.30,92.9,6.8,7.9
B6062006,R,N/A,N/A,N/A,N/A,N/A,N/A
B6062206,D,N/A,N/A,N/A,N/A,N/A,N/A
B6062206,R,N/A,N/A,N/A,N/A,N/A,N/A
B6062606,D,N/A,N/A,N/A,N/A,N/A,N/A
B6062606,R,26.10,44.27,28.57,88.7,6.1,7.7
B6071906,D,26.10,44.27,28.57,88.7,6.1,7.7
B6071906,R,26.58,46.79,30.35,90.5,6.1,7.9
B6080706,D,27.27,46.88,30.39,97.3,6.5,7.9
B6080706,R,22.25,35.61,22.61,101.5,7.8,7.8
B6092006,D,22.25,35.61,22.61,101.5,7.8,7.8
B6092006,R,NST-SM,NST-SM,NST-SM,NST-SM,NST-SM,NST-SM
B6112006,D,NST-SM,NST-SM,NST-SM,NST-SM,NST-SM,NST-SM
B6112006,R,8.14,39.55,24.91,99.6,10.0,7.9

B9111405,D,12.97,41.20,26.18,94.5,8.5,NR
B9111405,R,LS,LS,LS,LS,LS,LS
B9011006,D,LS,LS,LS,LS,LS,LS
B9011006,R,4.44,43.24,27.24,100.8,10.9,8.0
B9021606,D,4.44,43.24,27.24,100.8,10.9,8.0

B9021606,R,9.43,43.44,27.96,102.5,9.8,8.0
B9041806,D,14.07,44.97,29.10,104.3,9.0,8.0
B9041806,R,16.40,41.14,26.41,108.5,9.1,8.0
B9052506,D,17.18,41.24,26.47,110.3,9.0,8.1
B9052506,R,18.88,41.84,26.92,110.8,8.8,8.1
B9060806,D,18.88,41.84,26.92,110.8,8.8,8.1
B9060806,R,NHA,NHA,NHA,NHA,NHA,NHA
B9071206,D,NHA,NHA,NHA,NHA,NHA,NHA
B9071206,R,25.61,45.21,29.25,105.6,7.3,7.9
B9081806,D,24.61,47.22,30.70,103.3,7.2,7.9
B9081806,R,21.11,40.63,26.02,100.7,7.7,8.0
B9092706,D,21.11,40.63,26.02,100.7,7.7,8.0
B9092706,R,9.95,37.50,23.70,97.1,9.4,7.7
B9112706,D,9.95,37.50,23.70,97.1,9.4,7.7
B9112706,R,5.21,44.71,28.36,96.9,10.2,7.4

NE122805,D,3.35,17.90,10.39,89.1,11.1,NR
NE122805,R,5.07,22.93,13.68,100.3,11.6,NR
NE011106,D,5.41,11.21,6.33,97.7,11.9,NR
NE011106,R,5.23,16.23,9.42,96.9,11.6,NR
NE012506,D,5.39,7.03,3.71,122.8,19.0,NR
NE012506,R,3.91,26.48,14.21,138.2,16.3,NR
NE021106,D,4.02,16.96,9.83,98.9,12.1,NR
NE021106,R,3.04,20.52,12.03,106.6,13.2,NR
NE022506,D,3.31,20.54,12.05,107.8,13.8,NR
NE022506,R,8.17,16.75,9.81,115.4,12.8,NR
NE031106,D,8.03,19.47,11.54,114.1,12.5,NR
NE031106,R,7.04,27.64,15.89,97.4,10.3,NR
NE032506,D,7.24,25.89,16.52,NR,10.9,NR
NE032506,R,11.29,25.42,16.77,92.0,9.1,NR
NE040506,D,11.22,25.36,15.46,90.8,9.0,NR
NE040506,R,14.30,26.80,16.62,123.8,11.3,NR
NE042206,D,14.48,30.33,20.24,8.5,93.8,NR
NE042206,R,16.12,24.65,15.70,101.8,9.2,NR
NE050906,D,16.24,23.49,14.22,9.9,110.2,NR
NE050906,R,16.90,21.49,12.91,92.4,8.3,NR
NE052306,D,17.87,18.30,10.98,152.8,14.3,NR
NE052306,R,21.89,22.04,13.11,87.3,6.9,NR
NE060506,D,22.86,35.23,23.88,79.4,5.9,NR
NE060506,R,NR,NR,NR,NR,NR,NR
NE061906,D,23.72,31.22,19.04,102.3,7.5,NR
NE061906,R,26.48,23.42,13.92,74.7,5.6,NR
NE070506,D,26.53,26.08,16.42,81.2,5.9,NR
NE070506,R,28.31,24.34,14.71,22.4,1.7,NR
NE071906,D,28.21,32.40,20.13,85.7,5.7,NR
NE071906,R,29.62,27.49,16.40,61.3,4.4,NR

NE080206,D,29.62,27.49,16.40,61.3,4.4,NR
NE080206,R,25.71,37.62,23.20,62.4,4.5,NR
NE082206,D,26.03,34.23,21.38,85.3,6.3,NR
NE082206,R,22.86,8.01,4.44,67.0,5.1,7.0
NE091906,D,22.86,8.01,4.44,67.0,5.1,7.0
NE091906,R,N/A,N/A,N/A,N/A,N/A,N/A
NE092806,D,N/A,N/A,N/A,N/A,N/A,N/A
NE092806,R,13.45,16.28,12.52,98.5,9.3,NR
NE102406,D,13.20,22.81,13.78,91.2,8.9,7.3
NE102406,R,9.23,8.43,4.51,96.3,10.7,6.8
NE112906,D,9.79,21.63,12.93,89.4,29.3,NR
NE112906,R,6.66,29.27,17.95,89.9,9.8,NR
NE122806,D,NR,NR,NR,NR,NR,NR
NE122806,R,0.73,29.01,17.29,97.3,12.4,NR

BA122805,D,4.79,0.15,0.07,89.9,11.5,NR
BA122805,R,5.62,0.92,0.40,88.1,11.0,NR
BA011106,D,5.62,0.92,0.40,88.1,11.0,NR
BA011106,R,3.67,0.08,0.03,92.4,11.6,NR
BA012506,D,3.67,0.08,0.03,92.4,11.6,NR
BA012506,R,4.51,0.14,0.07,77.4,10.2,NR
BA020806,D,4.63,0.08,0.04,95.5,12.3,NR
BA020806,R,1.74,5.00,2.64,105.6,14.4,NR
BA022706,D,1.74,5.00,2.64,105.6,14.4,NR
BA022706,R,8.32,13.71,7.91,102.8,11.5,NR
BA032906,D,8.32,13.71,7.91,102.8,11.5,NR
BA032906,R,12.71,2.89,3.09,104.8,10.8,NR
BA041206,D,12.71,10.89,5.22,104.8,10.8,NR
BA041206,R,16.61,3.49,1.84,85.5,8.2,NR
BA050906,D,16.61,0.78,0.64,78.9,7.3,NR
BA050906,R,17.03,0.83,0.41,91.5,8.8,NR
BA052306,D,17.03,0.83,0.41,91.5,8.8,NR
BA052306,R,25.63,1.80,0.91,75.4,6.1,NR
BA060106,D,25.63,1.80,0.91,75.4,6.1,NR
BA060106,R,25.43,2.61,1.32,77.1,6.9,NR
BA061906,D,25.93,9.12,5.10,92.8,7.3,NR
BA061906,R,29.17,3.23,1.52,69.3,5.0,NR
BA071906,D,30.17,8.93,4.75,73.2,5.3,NR
BA071906,R,25.72,5.01,2.67,71.9,5.6,NR
BA081706,D,27.17,16.52,9.34,93.2,7.1,NR
BA081706,R,19.81,0.42,0.20,95.0,8.7,NR
BA092106,D,19.83,0.13,0.07,75.6,6.8,NR
BA092106,R,16.98,0.68,0.35,83.0,7.9,NR
BA101206,D,17.89,10.34,5.89,74.6,6.9,NR
BA101206,R,9.33,1.40,0.71,91.7,10.5,5.7
BA112206,D,8.81,0.41,0.23,88.3,10.2,NR

BA112206,R,5.94,3.62,1.89,99.3,12.3,NR
BA122106,D,6.14,2.14,1.06,89.8,11.2,NR
BA122106,R,1.49,2.20,1.11,95.6,13.3,NR

Deployment= deployment file name
DataType= Deployment vs. Retrieval data, with D= deployment (data obtained just prior to deploying the datalogger) and R= retrieval (data obtained just after retrieving the datalogger)
Temp= Temperature in degrees Celsius
SpCond = Specific Conductivity in millisiemens per centimeter cubed (mS/cm^3)
Sal= Salinity in parts per thousand (ppt)
DO%= Dissolved Oxygen in percent saturation
DOConc= Dissolved Oxygen concentration in milligrams per Liter (mg/L)
Other(pH)= pH in standard pH units

NHA= No 600XL/650MDS Handheld unit Available to obtain field data
NST-SM= No Sample (field data) Taken due to Sonde (600XL) Malfunction
NST= No Sample Taken for unspecified reason(s)
NR= sample Not Recoded for unspecified reason(s)
LS= lost field sheet on which field data were recorded
N/A= Not Applicable. See metadata.

15) Other Remarks

On 10/01/2019 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.

There were a few instances at this NERR site where negative turbidity values between -0001 and -0002 NTU's were recorded. Some of these have been noted in Section 11 (Anomalous/Suspect Data). Because such values fall within the range of accuracy (+/-2 NTU) of the turbidity probes, these data were not deleted.

There were a few instances at this NERR site where turbidity values less than -0002 were recorded. Some of these have been noted in Section 11 (Anomalous/Suspect Data). Although these fall outside the turbidity probes' range of accuracy (+/-2 NTU), these data were retained for future consideration and possibly post-correction by users of the data. It is the users'

responsibility to consider these data and retain or omit them from analyses if deemed appropriate.

Note to users: When utilizing these data, it is always best to also review the SWMP Weather Station (MET) dataset from this reserve to provide weather conditions that may affect the SWMP Water Quality (WQ) data from this reserve. 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/) approximately June 2007.