

Jacques Cousteau (JAC) NERR Water Quality Metadata
(formerly known as Mullica River (MUL) NERR)
January 2002-December 2002
Latest Update: July 7, 2023

I. Data Set & 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 were also uploaded as .csv files until August. Graphs are automatically created from the .dat files using the EcoWatch software. The graphs are evaluated for suspect data, which appear as sudden spikes, flat lines, or other anomalies. Pre-deployment and post-retrieval readings are identified by depth and salinity values near zero. First and last readings are then compared with pre-deployment and post-retrieval readings taken with a YSI 600 unit. All irregular data observed from graphs are documented on tracking sheets. The appropriate files are then cut and pasted into an Excel macro created by the NERR Central Data Management Office (CDMO).

The CDMO cdmomac3.xls macro allows the user to automatically format column widths to the correct number of decimal places based on YSI sensor specifications. It also allows the user to QA/QC each data logger generated file for missing data points, fill all cells that do not contain data with periods, and find all data points that fall outside the range of what the data logger is designed to measure (outliers). The CDMO import.xls macro allows PC users with 30-minute data to automatically create a monthly Excel file from a two-week deployment and insert periods for missing data. In addition, in November 1999 a graphing capability was added to this macro allowing users to 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 storm events to determine potential causes for anomalies.

Missing data are denoted by periods (.) and documented in section 11 (Data Anomalies) of this document. Any erroneous data that are identified as being caused by probe failures, as determined upon examination of the data plots, are deleted and replaced with periods and noted in section 11. Symptoms of probe failure are extreme noise in the record, unrealistically high or negative data, and noisy or negative readings in standard solutions. Examples of many such failures are given in the CDMO Manual (Version 3). Sensor readings that greatly deviate from known values of standards after deployments are not necessarily believed to be the result of probe failure. These erroneous readings may be the result of fouling. If fouling is known to be the reason for these data, the data are removed from monthly files only and noted in section 11 (Data Anomalies) of this document. When all the macros are run and the data is checked and formatted properly, the monthly data files are saved as text files and then uploaded to the CDMO server. Sharon O'Donnell is responsible for data management and transferring data files to CDMO.

3) Research objectives:

The water quality of the Mullica River and Great Bay has traditionally been very 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 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, dissolved oxygen, pH, depth, and turbidity every 30 minutes. Presently, five instruments are located in the Jacques Cousteau Reserve. These monitoring sites extend from the fresh water/salt water interface at Lower Bank, approximately 25 kilometers up the Mullica River from the point where it joins Great Bay to the mouth of Great Bay, a distance of eight kilometers. Thus the

data loggers cover a total of 33 kilometers in this estuarine system. One new site and one previously monitored site (discontinued in August of 1999) were added to the SWMP in the JCNERR in the spring of 2002 and create a perpendicular transect to the Mullica River. The new site, Buoy 115 in Little Egg Harbor Bay, borders the Edwin B. Forsythe Refuge on Holgate (Long Beach Island). Please contact the reserve for Bouy 115 data, as this data is not included within this dataset. The restored monitoring site, Buoy 139, lies in the southwestern edge of Great Bay closest to Brigantine and Atlantic City.

At all five sites, YSI data loggers are deployed in the following manner. A 10 - 40 foot length of schedule 40 PVC pipe is used. Slots one inch wide and eight inches long are cut three inches above the bottom and encircled the pipe. Originally, a one half-inch bolt was placed below the pipe slots to keep the YSI from falling through the pipe. In May of 2002, this bolt was removed from Buoys 126 and 139, and was not installed at Buoy 115, allowing the data loggers to hang below the end of the PVC pipe. This effort was made to avoid monitoring water trapped inside the pipe by benthic invertebrates (i.e. a fouling community). A PVC cap is placed over the pipe with a slot for a locking mechanism to the pipe. A stretch-resistant polypropylene rope is attached to the cap with the other end fastened to the bail of the data logger for the retrieval of the YSI. Deployment structures that had the bottom bolts removed contained just enough rope to allow YSI's to hang six inches below the end of the PVC pipe.

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

Calibration standards required for pH and conductivity are purchased from Fisher Scientific supply. A two point calibration is used for pH, the first being pH 7 followed by pH 4. The lower pH standard is used because of the more acetic properties of the Mullica River. A standard of 20,000 us/cm is used to calibrate for conductivity. The membrane on the oxygen probe is changed when anomalous data is recorded, and almost every deployment during the summer months. The membrane is stretched over the face of the probe and is burned in by allowing the data logger to run in an unattended sampling mode sampling every 30 minutes for at least six hours. Dissolved oxygen is calibrated using a calibration cup filled with about 1/4 inch tap water, which creates a 100% water-saturated air environment for the sensor when the data logger is placed in the cup. The sensors are allowed to equilibrate in the cup before DO (% saturation) is calibrated. DO calibrations are performed immediately before deployment. Data loggers are allowed to sample inside the calibration cup at least one hour following retrieval to assure the membrane functioned properly during deployment. The standard for calibrating turbidity is purchased from a supply house and diluted to give a reading of 100 NTU (National Turbidity Units). Turbidity wipers are replaced after every deployment. Used conductivity and pH standards are stored for rinsing probes and performing post-

deployment calibrations prior to cleaning loggers. Great care is taken to clean the data loggers, and because of the large number of YSI's at the Rutgers facility, these standards are used for calibration twice, then as rinse solution at least twice before being discarded. Servicing an instrument generally takes about two hours for each data logger plus the time involved with retrieval and deployment.

5) Site location and character:

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

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. The 2002 averages for this site are 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 estuary as well as surface flow from Mullica River account for the majority of freshwater coming into the system at this site, followed by input from rainwater from the marsh surface and above.

2) Chestnut Neck (NE) - 39° 32.872' N, 74° 27.676' W - located 12 kilometers up the Mullica River from the mouth of the river. The river begins at a line drawn between Graveling Point and Oysterbed Point on the northwestern side of Great Bay. The Mullica River at this location is quite wide, about 250 meters. The data logger is attached to the dock of a small marina along the southern shore of the river adjacent to the main channel. This location has never been dredged. The average depth at this location is 1.6 meters with a tidal range of from 0.5 to 2.5 meters. The depth in the middle of the Mullica River at this location is about six meters. The pH averages 7.3 for the year with a range of from 6.6 to 7.9. The average salinity here is 18.6 ppt with a range of 2.7 to 27.5 ppt. The site is characterized by having tidal currents of less than one knot, during both ebb and flood tide, and has a sandy bottom. Freshwater input is primarily from groundwater and watershed runoff.

3) Lower Bank (BA) - 39° 35.618' N, 74° 33.091' W - located 13 kilometers upriver of the Chestnut Neck location. The Mullica River at this site is about two hundred meters wide. The data logger is attached to a bridge going over the Mullica River and is located in the center of the river. The northern bank of the river is sparsely developed with single-family houses and has a steep bank about five meters high. The southern shore has an extensive marsh and freshwater 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. The average depth is 1.6 meters with a tidal range of 0.6 to 2.5 meters. pH ranges from 4.0 to 7.4. The salinity averages 4.6 ppt with a range of from 0.0 to 18.6 ppt. 2001 temperatures ranged from 0.0 to 31.1 degrees Celsius. Freshwater input is primarily from groundwater and watershed runoff.

4) Buoy 139 (B9) - 39° 29.883'N, 74° 22.873' W 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 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. 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 estuary as well as surface flow from Mullica River account for the majority of freshwater coming into the system at this site, followed by input from rainwater from the marsh surface and above.

6) Data collection period:

Buoy 126

Began		Ended	
02/04/01	1400	03/07/02	1300
03/07/02	1330	03/21/02	1000
03/21/02	1030	04/02/02	0200
04/11/02	1500	04/25/02	1000
04/25/02	1230	05/08/02	0930
05/08/02	1030	05/23/02	1000
05/23/02	1100	06/11/02	1500
06/11/02	1530	06/26/02	0900
06/26/02	1000	07/19/02	1300
07/19/02	1330	08/08/02	1000
08/08/02	1100	08/22/02	1000
08/22/02	1030	09/05/02	1200
09/05/02	1230	09/18/02	0830
09/18/02	0900	10/04/02	1330
10/04/02	1400	10/22/02	0930
10/21/02	2300	10/31/02	1100
10/31/02	1100	11/13/02	1030
11/13/02	1100	11/27/02	1300
11/27/02	1400	12/18/02	1030
12/18/02	1100	01/09/02	1430

Buoy 139

Began		Ended	
05/13/02	1430	06/04/02	0930
06/04/02	1030	06/19/02	1000
06/19/02	1030	07/09/02	1230
07/09/02	1300	07/24/02	1300
07/24/02	1330	08/08/02	1000
08/21/01	1100	08/26/02	0930
08/26/02	1200	09/13/20	0830
09/13/02	0930	09/25/02	0930

09/25/02	1100	10/18/02	1130
10/18/02	1400	11/05/02	1030
11/05/02	1200	11/20/02	1330
11/20/02	1400	12/04/02	1500
12/04/02	1530	12/13/02	1030
12/13/02	1130	03/19/03	*

*Freezing of the Bay precluded access to this site.

Lower Bank

Began		Ended	
03/14/02	0930	04/01/02	1500
04/01/02	1530	04/15/02	1330
04/15/02	1400	04/25/02	1430
04/25/02	1600	05/07/02	1000
05/07/02	1030	05/21/02	1300
05/21/02	1400	06/03/02	1500
06/03/02	1530	06/19/02	1000
06/19/02	1100	07/02/02	1130
07/02/02	1200	07/16/02	1100
07/16/02	1200	07/30/02	1100
07/30/02	1130	08/13/02	1200
08/13/02	1230	08/23/02	1330
08/23/02	1430	09/09/02	1130
09/09/02	1200	09/23/02	1200
09/23/02	1200	10/24/02	1330
10/24/02	1400	11/06/02	1430
11/06/02	1500	11/21/02	1100
11/21/02	1200	12/04/02	1100
12/04/02	1200	12/19/02	1030

Chestnut Neck

Began		Ended	
01/17/02	1530	01/31/01	1030
02/28/02	1600	03/14/02	0830
03/14/02	1600	04/03/02	0900
04/03/02	1030	04/18/02	1200
04/19/02	0830	05/07/02	1130
06/13/02	1000	06/27/02	0830
06/27/02	1500	07/10/02	1200
07/11/02	1230	07/25/02	0900
07/25/02	1330	08/07/02	1100
08/08/02	0900	08/22/02	0830
08/22/02	1630	09/05/02	0830
09/12/02	0900	09/26/02	0900
09/26/02	1600	10/10/02	1000
10/10/02	1600	10/24/02	0930
10/24/02	1700	11/07/02	0930
11/07/02	1400	11/21/02	0900
11/21/02	1600	12/12/02	0900
12/12/02	1500	01/02/03	1000

7) Distribution

According to the Ocean and Coastal Resource Management Data Dissemination Policy for the NERRS System-wide Monitoring Program, NOAA/ERD retains the right to analyze, synthesize and publish summaries of the NERRS System-wide Monitoring

Program data. The PI retains the right to be fully credited for having collected and processed the data. Following academic courtesy standards, the PI and NERR site where the data were collected will be contacted and fully acknowledged in any subsequent publications in which any part of the data are used. Manuscripts resulting from the NOAA/OCRM supported research that are produced for publication in open literature, including refereed scientific journals, will acknowledge that the research was conducted under an award from the Estuarine Reserves Division, Office of Ocean and Coastal Resource Management, National Ocean Service, National Oceanic and Atmospheric Administration. The data set enclosed within this package/transmission is only as good as the quality assurance and quality control procedures outlined by the enclosed metadata reporting statement. The user bears all responsibility for its subsequent use/misuse in any further analyses or comparisons. The Federal government does not assume liability to the Recipient or third persons, nor will the Federal government reimburse or indemnify the Recipient for its liability due to any losses resulting in any way from the use of this data.

NERR water quality data and metadata can be obtained from the Research Coordinator at the individual NERR site (please see section 1. Principal investigators and contact persons), from the Data Manager at the Centralized Data Management Office (please see personnel directory under general information link on CDMO homepage) and online at the CDMO homepage <http://cdmo.baruch.sc.edu>. Data are available in text tab-delimited format, Microsoft Excel spreadsheet format and comma-delimited format.

8) Associated researchers and projects:

During 2002, weekly ichthyoplankton sampling at Little Sheepshead Creek Bridge (LSCB) continued as part of the long-term sampling conducted by Rutgers University in the JCNERR. Presence and abundance of larval fishes are determined with a plankton net (1 m, 1 mm mesh) deployed during night flood tides from abridge near Little Egg Inlet (New Jersey) in the Great Bay/Little Egg harbor portion of the NERR. Killi- trapping conducted in the Rutgers boat basin, and system-wide otter trawling also continued in 2001 as part of long-term sampling within the Reserve.

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

Amanda McGuirk, one of the NERR Graduate Research Fellows, has been working with the JCNERR's Research Coordinator, Dr. Michael Kennish, on nutrient analysis of Great Bay and the Mullica River. Her study utilizes an ISCO sampler and spot sampling techniques documented in the NERR Standard Operating Procedure for SWMP.

Graduate Research Fellow Gregg Sakowicz is completing work on his thesis: Essential habitat for marsh fishes: Behavioral ecology of larval and juvenile *Fundulus heteroclitus* and *Cyprinodon variegatus*.

Other projects that have begun in the year 2002 in the JCNERR include a biofouling project conducted by the Research Coordinator, looking at fouling organisms that settle in the vicinity of Buoy 126 and the YSI data logger. Several biofouling panels constructed of aluminum plates were secured in the sediment. One set of panels was retrieved per month from June through the end of October and were processed for species content after the samples were preserved. In addition to the biofouling, the RC also began a study looking at

the species composition of the benthos near SWMP water quality sites. Samples were obtained with a manually operated Van Veen grab sampler and stored in 1 quart Nalgene jars for future analysis. The RC and Research technician also completed a technical report summarizing water quality from SWMP sites 1999 - 2000. The report is slated to be available in three sources; a technical report of the Rutgers University Institute of Marine and Coastal Sciences, a publication in the Spring 2003 New Jersey Academy of Natural Sciences (Kennish, M. J. and S. O'Donnell. 2002. Water quality monitoring in the Jacques Cousteau National Estuarine Research Reserve System. Bulletin of the New Jersey Academy of Science 47(2):1-13.), and as the second in a continuing series of publications and reports for the National Estuarine Research Reserve, established by the Science Coordinator of the NOAA Estuarine Reserves Division, Maurice Crawford.

II. Physical Structure Descriptors

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

YSI 6000/6600 datalogger

Variable	Range of Measurements	Resolution	Accuracy
Date	1-12, 1-31, 00-99 (Mo,Day,Yr)	1 mo, 1 day, 1 yr	NA
Time	0-24, 0-60, 0-60 (Hr,Min,Sec)	1 hr, 1 min, 1 s	NA
Temp	-5 to 45 (c)	0.01 C	+/-0.15C
Sp COND	0-100 (mS/cm)	0.01mS/cm	+/-0.5% Of
reading + 0.001mS/Cm			
Salinity	0-70 Parts per thousand (ppt)	0.01 ppt	+/- 1% of
Reading or 0.1 ppt, (whichever is greater)			
DO	0-200 (% air saturation)	0.1% @air sat	+/-2% @air
Saturation			
DO	200-500 (% air saturation	0.1% @ air sat	+/- 6% @
Saturation			
DO	0-20 (mg/l)	0.01 mg/l	+/- 0.2mg/l
DO	20-50 (mg/l)	0.01 mg/l	+/- 0.6mg/l
Depth (shallow)	0-9.1 (m)	0.001m	+/- 0.018m
PH	2-14 units	0.01 units	+/- 0.2units
Turb	0-1000 NTU	0.1 NTU	+/- 5% of
Reading or 2 NTU (whichever is greater)			

Data columns are separated by tabs. Each file contains a two line column header at the top of the page which identifies measurements and units for each column.

10) Coded variable indicator and variable code definitions:

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

11) Data anomalies:

BUOY 126

January B60102

No data collected, winter calibration tests

February B60202

2/1 0000 - 2/4 1330 no datalogger in water yet
2/4 1400-2/28 2330 no DO, pH or turbidity data due to suspected fouling of deployment structure

March B60302

3/7 1230 salinity drops to 26.57, salinity and spec. conductivity deleted
3/1 000-3/31 2330 no DO, pH or turbidity data due to suspected fouling of deployment structure
3/10 1900 high tide very low at 2.25 m when compared to rest of month
3/20 000 - 3/24 2330 salinity sporadically drops from 32.16 to 26.83

April B60402

4/1 000 - 4/2 200 data logged 52 seconds late, DO warm-up
4/2 0230 - 04/11 1430 data missing, datalogger down for service
4/11 1501 data logged 60 seconds late, misprogrammed DO warm-up time
4/25 1231 - 5/8 901 data logged 60 seconds late, misprogrammed DO warm-up time
4/25 1030 - 1200 data missing, data logger down for service
4/1 000-4/30 2330 no DO, pH or turbidity data due to suspected fouling of deployment structure
4/23 1230 - 4/25 1000 salinity not as tidally variable as previous readings

May B60502

4/25 1231 - 5/8 931 clock off by 60 seconds
5/8 1031 - 5/23 1001 clock off by 60 seconds
5/23 110040 - 6/11 150040 clock off by 40 seconds
5/8 1000 no data, logger down for service
5/23 1030 no data, logger down for service
5/21 1030 - 1500 no data, logger removed for filming for exhibit
5/1 000-5/9 2330 no DO, pH or turbidity data due to suspected fouling of deployment structure
5/12 930 - 5/15 2230 turbidity data deleted, most values >1000 NTU. Calibration value started at 5.2 NTU in 0 solution.
5/11 130 negative turbidity value of -1 NTU deleted
5/11 600 turbidity spike of 280 NTU, data retained
5/11 730 turbidity spike of 110 NTU, data retained
5/19 500, 730 turbidity spikes of 1498 and 1509 NTU's deleted
5/21 1530-5/23 1000 DO, pH, and turbidity data deleted, fouling of YSI reflected in data
5/23 1100-5/31 2330 DO, pH, and turbidity data deleted, fouling of YSI reflected in data
5/8 1030 depth increases with new deployment as a result of removing bolt from deployment structure bottom

June B60602

5/23 1100:40 - 6/11 1500:40 clock off by 40 seconds, DO warm up
6/11 1630:52 - 6/26 900:52 clock off by 52 seconds, DO warm up
6/26 1001 - 7/19 1301 clock off by 1 minute, DO warm up
6/1 000 - 6/11 1500 DO, pH, and turbidity data deleted, fouling of YSI reflected in data
6/26 930 data missing, YSI down for service
6/11 2100 - 6/25 2200 intermittent negative turbidity values, likely small calibration errors(-1, -2, and -3 NTU)
6/21 1200 - 1630 YSI temporarily out of water for a demonstration, data removed
6/24 1000 turbidity spike of 379 NTU removed for averaging (most values much lower)

6/6 1130, 1430, and 6/7 1830 depths vary from extreme highs to extreme lows over short period (2.31m to 4.05m)

6/5 500 - 6/9 1900 salinity gradually drops to 24.6 then recovers

July B60702

6/26 1001 - 7/19 1301 clock off by 1 minute, DO warm up

7/19 1256:57 - 7/31 2326:57 clock off by 3 minutes 3 seconds (add to time)

7/19 1700, 1730 turbidity of -0.1 NTU deleted

7/1 000 - 7/19 1330 intermittent negative turbidity values corrected by adding 3 NTU to all

7/24 630 - 7/27 300 salinity values high at low tide (>31.39 ppt). All previous readings <31 ppt at low tide.

7/11 1000-1530 DO values quickly rise and remain higher than previous values (39%-105%)

7/19 1430 - 7/31 2330 pH deleted, readings high, post-cal read 7.72 (in 7.0) and 4.82 (in 4.0)

7/20 130-7/31 2330 DO deleted, readings drop below 50%, then rise >200%, failed post-cal.

7/24 2030 temperature dips to 15.9 after being 27.6 on 7/23

August B60802

7/19 13:26:57 - 8/8 9:56:57 clock off by 3 minutes 3 seconds (add to time)

7/31 23:56:57 this time used as first reading for 8/1 000

8/8 1101 - 8/22 1001 clock off by 1 minute

8/22 1031 - 9/5 1201 clock off by 1 minute

8/8 1030 no data, logger down for service

8/5 930 turbidity spike, 1403 NTU deleted

8/5 1630 turbidity spike, 1385 NTU deleted

8/5 1700 turbidity spike, 187 NTU deleted

8/16 930-1430 salinity dips low to 28.5 ppt, prior readings >30 ppt

8/21 2100 - 8/22 1000 salinity and spec. conductivity deleted, drops at end of deployment as if fouled

8/28 500 - 8/31 2330 salinity readings drop suddenly, matches events in November

8/1 000 - 8/8 1000 DO deleted, readings drop below 50%, then rise >200%, failed post-cal.

8/20 730-1300 DO 39%-120% in 5 hours, following data appears fine

8/1 000 - 8/8 1000 pH deleted, readings high and post-cal read 7.72 (in 7.0) and 4.82 (in 4.0)

8/8 1100 - 8/31 2330 turbidity deleted, malfunctioning 6136 probe

8/4 1400 turbidity spike, 300 NTU, data retained

8/7 1600 turbidity spike, 729 NTU deleted

8/20 730-1300 DO ranged between 39%-120% in 5.5hrs mid-deployment

September B60902

9/1 000 - 9/30 2330 no turbidity, all deployments had malfunctioning 6136 probes

9/1 000 - 9/4 300 salinity noisy

9/23 1700 - 9/28 500 salinity not very tidally variable

9/5 1230 - 9/18 830 DO deleted, noisy data and 121% DO at post-calibration

October B61002

Dissolved Oxygen not as variable starting in October, may be result of lack of fouling

10/1 001 - 10/4 1331 clock off by 1 minute

10/22 1131 - 10/31 1031 clock off by 1 minute

10/31 1100:52-2330:52 clock off by 52 seconds

10/1 000 - 10/31 2330 no turbidity, all deployments had malfunctioning 6136 probes

10/4 1400 - 10/30 1130 deleted all parameters, depth values indicate logger stuck in top of PVC housing over two deployments. DO, pH, and salinity affected most.

10/30 1200 depth values return to normal, indicating logger sank down to bottom of pipe

10/30 1200 - 10/31 2330 pH deleted, values elevated for this deployment, postcal values 7.22 and 4.31 (too high)

November B61102

10/31 1100:52 - 11/13 1000:52 time off by 52 seconds, DO warm up

11/13 1101 - 11/27 1301 time off by 1 minute, DO warm up

11/27 1401 - 12/18 1031 time off by 1 minute, DO warm up

11/13 1030 no data, down for service

11/27 1330 no data, down for service

11/13 1100 - 11/27 1300 and 11/27 1400 - 11/30 2330 no turbidity probe installed-recalled by YSI.

11/1 000 - 11/13 1000 pH deleted, values elevated for this deployment, postcal values 7.22 and 4.31 (too high)

11/27 1400 pH slightly higher with new deployment 7.9 to 8.1

December B61202

12/1 000 - 12/18 1031 clock off by 1 minute

12/25 2000-2030 no data, suspect internal logger error

12/18 1100 DO changes with new deployment, lower and noisier

12/24 030 DO spike of 131.9%

12/18 1100 pH increases with deployment from 8.1 to 8.2, visible on yearly graphs.

No turbidity data entire month. No turbidity probe installed-recalled by YSI.

BOUY 139

No turbidity data reported for this site for 2002 because of faulty 6136 turbidity probes installed or missing on the data loggers deployed at this site

January - April 2002

No data collected

Site not operational until 5/13, Rutgers diver needed to remove fouling prior to first deployment

May B90502

No turbidity, see **

5/1 0000 - 5/13 1400 no data, site not operational

5/25 1130 DO values decrease from 96.3% to 63.8% and stay low for the rest of the deployment. Next deployment is also low until 6/6 1530.

June B90602

No turbidity, see **

6/4 1030 - 6/6 1400 DO, pH, and depth irregular. Perhaps data logger was stuck inside tube and fell into place two days later. Depth usually 1.76 to 3 meters, at the time of data collection depth was 1.09 to 1.94 meters. All data suspect.

6/4 1000 no data, data logger down for service

6/19 1030 pH continues steep fall from previous deployment, indicating a real weather event

July B90702

No turbidity, see **

7/1 000 - 7/9 1230 salinity data noisy for deployment

7/9 1300 - 7/24 1301 clock off by 1 minute

7/9 1300-7/24 1300 DO data deleted for whole deployment, fouling on probe reflected in data

7/9 1300 depth lower than previous deployment, low values <1.5m

7/9 1300 salinity data less erratic than previous deployment

7/24 1330 - 8/8 1000 clock off by 1 minute

7/24 1330 - 7/31 2330 DO deleted, fouling on membrane reflected in data

7/24 1330 pH lower with new deployment, appears to be weather event

7/24 1600 - 7/29 700 temperature drops noticeably

August B90802

No turbidity, see **

7/24 1331 - 8/8 1001 clock off by 1 minute

8/1 000 - 8/8 1000 DO data deleted for whole deployment, fouling on probe reflected in data

8/8 1030 - 8/21 1030 data missing, no tracking sheet, no files, reason unclear

8/21 1100:52 - 8/26 930:52 clock off by 52 seconds, logger retrieved early

8/21 1100 - 8/26 930 pH deleted, all deployment values too high in yearly comparison

8/21 1100 - 8/26 930 DO deleted for entire deployment, noisy readings outside of expected values

8/26 1201 - 9/13 831 clock off by 1 minute

8/26 1000 - 8/26 1130 no data, down for service

September B90902

No turbidity, see **

8/26 1201 - 9/13 831 clock off by 1 minute

9/13 900 no data, down for service

9/13 930 DO values higher than previous deployment and continue to increase to end of deployment

9/13 930 pH slightly higher with new deployment

9/25 1101 - 10/18 1131 time off by 1 minute

9/25 1100 - 9/30 2330 DO deleted because of consistently falling, erratic readings

9/25 1000, 1030 no data, down for service

9/26 730 - 9/28 030 salinity values not as tidally affected as previous values

October B91002

No turbidity, see **

9/25 1101 - 10/18 1131 time off by 1 minute

9/25 1101 - 10/18 1131 time off by 1 minute

10/1 000 - 10/18 1130 DO deleted because of consistently falling, erratic readings

10/18 1401 - 11/5 1031 time off by 1 minute

10/18 1200 - 1330 no data, logger down for service

10/18 1400 - 10/31 2330 pH deleted, drops too far below norm

10/18 1400 - 10/19 230 DO falls to 67.3% soon after deployment then jumps back to 97.9%

November B91102

No turbidity, see **

10/18 1400 - 11/5 1030 time off by 1 minute

11/1 000 - 11/5 1030 pH deleted, drops too far below norm

11/5 1200 - 11/20 1330 time off by 1 minute
11/5 1100, 1130 no data, downtime for maintenance
11/12 1000 DO dips to 80.5% suddenly, then back to 98.3% in 5.5 hrs
11/20 1400:52 - 12/4 1500:52 clock off by 52 seconds
11/20 1400 DO changes with new deployment from 93.1% to 106.5%
11/20 1400 - 11/30 2330 pH deleted for entire deployment, values abnormally high
11/01 0000 - 11/5 1030 DO drops towards end of deployment. Values seem consistent and correspond with a drop in water temperature, possibly due to phytoplankton activity. Data retained.

December B91202

No turbidity, see **

11/20 1400:52 - 12/4 1500:52 clock off by 52 seconds
12/1 000 - 12/4 1500 pH deleted for entire deployment, values abnormally high
12/4 1530 - 12/13 1030 pH deleted for entire deployment

LOWER BANK

No turbidity data reported for this site for 2002 because of faulty 6136 turbidity probes installed on the data loggers deployed at Lower Bank

January BA0102

No data collected

February BA0202

No data collected

March BA0302

None to report

April BA0402

3/14 930 - 4/1 1500 clock off by 40 seconds for the entire deployment
4/1 1530 - 4/15 1330 clock off by 40 seconds for the entire deployment
4/4 200 turbidity spike of 280 NTU deleted
4/15 1400 - 4/25 1430 clock off by 40 seconds for the entire deployment
4/25 1600 clock off by 40 seconds for the entire deployment
4/25 1500, 1530 no data, logger down for service
4/25 1600 - 4/30 2330 DO oscillates between 98% and 53% for majority of deployment, including a few instances of sudden decreases in DO

May BA0502

4/25 1600 - 5/7 1000 clock off by 40 seconds for the entire deployment
5/7 1030 - 5/21 1300 clock off by 40 seconds for the entire deployment
5/21 1401 - 6/3 1501 clock off by 60 seconds for the entire deployment
5/21 1330 no data, logger down for service
5/1 000 - 5/7 1030 DO oscillates between 88% and 44% for whole deployment, including a few instances of sudden decreases in DO

June BA0602

6/3 153940 - 6/19 100940 clock off by 9 minutes 40 seconds for entire deployment
6/19 1030 no data, logger down for service
6/3 1530 - 6/19 1000 DO data deleted, values started at >200% and declined steadily. Failed hi-lo test upon retrieval and when 610YSI read 91%, logger read 290%
6/19 1101 - 7/2 1131 time off by 1 minute

July BA0702

6/19 1101 - 7/2 1131 time off by 1 minute
7/2 1200:52 - 7/16 1100:52 time off by 52 seconds
7/16 1201 - 7/30 1101 time off by 1 minute
7/30 1131 - 8/13 1201 time off by 1 minute
7/2 1200 - 7/16 1100 DO noisier than following deployment
7/16 1200 - 7/30 1100 pH slightly higher (0.1) with new deployment
7/16 1130 no data, logger down for service

August BA0802

7/30 1131 - 8/13 1201 time off by 1 minute
8/13 1229:58 - 8/23 1329:58 logging time off by 2 seconds
8/23 1431 - 9/9 1131 time off by 1 minute
8/23 1400 no data, down for service
8/23 1430 temperature and pH lower with new deployment, unusual for temperature
8/13 1230 - 8/23 1330 DO deleted, with new deployment changed from 86% to 5%

September BA0902

8/23 1431 - 9/9 1131 time off by 1 minute
9/9 1242:03 - 9/23 1212:03 time off by 12 minutes 3 seconds
9/23 1201 - 10/24 1331 time off by 1 minute

October BA1002

9/23 1201 - 10/24 1331 time off by 1 minute
10/24 1401 - 11/6 1431 time off by 1 minute
10/16 800-1930 pH remained elevated through 2 high tides (>7.12, see depth)
10/16 1700 salinity elevated, lowest value 11 ppt (see depth)
10/16 1430 low tide depth elevated, 1.916 m
10/12 2230 low tide depth elevated, 1.886 m
10/7 000 - 10/24 1330 DO deleted, deployed over 1 month and fouled last two weeks

November BA1102

10/24 1401 - 11/6 1431 time off by 1 minute
11/6 1501 - 11/21 1101 time off by 1 minute
11/21 1201 - 12/4 1101 time off by 1 minute
11/21 1130 no data, down for service
11/18 200 salinity drops to 0.1 pt and stays low for rest of month
11/17 230 depth elevated at low tide, 1.95 m
11/22 2200-11/23 700 tide/depth drops dramatically from 1.82 m to 0.72 m then slowly increases over next few days

December BA1202

11/21 1201 - 12/4 1101 time off by 1 minute
12/4 1131 - 12/19 1031 time off by 1 minute
12/19 1100-12/31 2300 no data, risk of winter icing
12/4 1130 no data, down for service
12/11 2330 pH elevated at low tide 5.9, other values <5.5
12/12 1100 salinity drops to 0.1 ppt and stays low for rest of deployment

CHESTNUT NECK

January NE0102

1/1 000 - 1/17 1500 no data, logger down for winter/ice

1/31 1100 - 2/28 1530 no data, logger down for winter, calibration tests
1/26 400 turbidity spike of 240 NTU removed

February NE0202

2/1 000 - 2/28 1530 no data, data logger down for winter & calibration tests
2/28 1600 - 2330 DO deleted, values too low in comparison to other deployments

March NE0302

3/14 900 - 1530 data logger down for service
3/1 000 - 3/14 830 DO deleted, values too low in comparison to other deployments
3/10 1030 - 3/11 400 turbidity jumps from ~8 NTU to 20+ NTU, stays high for rest of this deployment and following deployment
3/23 1400 turbidity spike, 103.2 NTU removed

April NE0402

4/19 2200 turbidity spike of 34 NTU kept in file
4/11 730, 1000 turbidity spikes of 58 and 46 NTU kept in file
4/3 930 - 1000 data logger down for service
4/18 1230 - 4/19 800 data logger down for service
4/27 1530 - 4/30 2330 temperature readings irregular up to 50 degrees Celsius. All parameters affected, data deleted and logger serviced by YSI
4/3 900 DO drops between deployments from 107% to 100%
4/11 900 turbidity spike of 95 NTU removed
4/19 1700 DO rises to 103% shortly after deployment (93.4%), unsure of cause
4/3 1030 - 4/18 1200 pH deleted, values considerably higher than surrounding data

May NE0502

5/1 0000 - 5/7 1130 temperature readings irregular up to 50 degrees Celsius. All parameters affected, data deleted and logger serviced by YSI
5/7 1200 - 5/31 2330 No data, logger sent back to YSI for repair

June NE0602

6/13 1000 - 6/27 830 time off by 40 seconds, DO warm-up
6/27 1500 - 7/10 1200 time off by 40 seconds, DO warm-up
6/1 000 - 6/13 930 no data, YSI in shop for servicing
6/27 900 - 6/27 1430 no data, down for service
6/24 100 - 6/27 830 DO values decline rapidly, 78% to 12% at end of deployment, suspect drift/fouling, data deleted

July NE0702

7/1 000 - 7/10 1200 time off by 40 seconds, DO warm up
7/11 1230 - 7/25 900 time off by 40 seconds, DO warm up
7/25 1330 - 7/30 2330 time off by 40 seconds, DO warm up
7/10 1230 - 7/11 1200 no data, down for service
7/25 930 - 1300 no data, down for service
7/2 2000 - 7/10 1200 DO deleted, noisy data from 71% to negative values
7/18 2030 - 7/25 0900 DO deleted, like the two deployments prior, DO falls at end of deployment from ~70% to 20% indicating fouling/drift
7/7 2000 turbidity spike, 256 NTU deleted for averaging
7/25 2330 - 7/26 530 small pH spike appears as values rise to 7.1

August NE0802

7/25 1330:40 - 8/7 1100:40 clock off by 40 seconds, DO warm up
8/8 900:40 - 8/22 830:40 clock off by 40 seconds, DO warm up
8/22 1630:40 - 9/5 830:40 clock off by 40 seconds, DO warm up
8/7 1130 - 8/8 830 no data, logger down for service

8/22 900 - 8/22 1600 no data, logger down for service
8/3 2030 - 8/7 1100 DO deleted, fouling affected probe
8/8 900 - 8/22 830 DO deleted, drops drastically in comparison to other deployments
8/22 1630-1730 first three DO readings anomalous, deleted (-50%, 407%, 79%)
8/8 900 pH higher than previous deployment, suspect drift in previous YSI
8/28 2000 - 8/31 2330 turbidity irregularly high, suspect error, data deleted

September NE0902

8/22 1630:40 - 9/5 830:40 clock off by 40 seconds, DO warm up
9/12 900:40 - 9/26 900:40 clock off by 40 seconds, DO warm up
9/26 1600:40 - 10/10 1000:40 clock off by 40 seconds, DO warm up
9/1 000 - 9/5 830 turbidity irregularly high, suspect error, data deleted
9/5 900 - 9/12 830 no data, YSI down for service
9/26 930 - 9/26 1530 no data, YSI down for service
9/1 2030 - 9/5 830 DO data deleted, values rapidly decline from 66% to 38%, indication fouling/drift.
9/26 1600 DO jumps from 69.7% to 82.2% with new deployment

October NE1002

10/10 1600:40 - 10/24 930:40 time off by 40 seconds, DO warm up
10/24 1700:40 - 11/7 930:40 time off by 40 seconds, DO warm up
10/10 1030 - 1530 no data, down for service
10/24 1000 - 1630 no data, down for service
10/16 930 - 1230 DO appears to spike on yearly file, but rise is gradual, data retained but suspect
10/24 1700 DO drops with new deployment from 94.1% - 90.4%
10/16 1430, 1500 depth didn't change much between high and low tides. Average depth 1.59m, but low here only 2.16m and high 2.32
10/24 1700 - 10/31 2330 intermittent negative turbidity values -0.1 to -4 NTU, suspect calibration error. Data corrected by adding 4 to all values
10/3 2100 - 10/4 2330 three consecutive peaks of pH 7.6 at each ebbing tide that day

November NE1102

10/24 1700:40 - 12/12 930:40 clock off by 40 seconds for each of 3 deployments
11/21 1600 - 12/12 900 no turbidity data, probe in YSI shop for servicing
11/7 1000 - 11/7 1330 no data, logger down for service
11/21 930 - 1530 no data, logger down for service
11/16 1730 - 11/21 900 turbidity jumps from 8.3 to 103.2, then >1000 NTU's, data deleted
11/16 1400 salinity, specific conductivity, pH, and depth all highest values for month, may be linked to storm, full moon on 11/19
11/1 000 - 11/7 930 intermittent negative turbidity values -3.2 to -0.1, corrected by adding +3.2 NTU to all values
11/16 2000 - 11/17 1230 small increase in DO, data retained
11/22 1130 - 1300 pH small spikes of 7.7 appears dramatically on yearly graph

December NE1202

12/12 1500:40 - 1/2 1000:40 time off by 40 seconds
12/1 000 - 12/12 930 clock off by 40 seconds
12/1 000 - 12/12 900, 12/12 1500 - 12/31 2330 no turbidity data, probe in shop
12/12 930 - 1430 no data, logger down for service
12/25 1500 salinity, depth, and pH spikes may be result of high tide (1300) and winter storm

12) Missing data:

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

13) Post deployment information

Deployment ID	DO%	pH 7	pH 4	Depth	Turb.	SpCond	Battery	Logger
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BUOY 126

B6121802	53.9	7.02	4.01	-0.12	-	20.38	10.2	0
B6112702	105.8	7.13	4.18	0.073	-	20.04	11.3	14
B6111302	136.5	7.11	4.18	0.021	-	20.33	11.2	11
B6103102	100.7	7.22	4.31	0.039	-0.2	-	12.2	9
B6102202	101.2	6.99	3.97	-0.025	-	20.21	11.6	14
B6100402	113.6	6.88	4.58	0.099	10.7	19.73	10.6	0
B6091802	94.1	7	4.22	-0.012	61	20.26	12	-
B6090502	121.1	7.08	4.03	0.017	-1.2	19.99	12.4	14
B6082202	100.3	7.15	4.09	-0.018	83.7	19.83	12.4	13
B6080602	-	7.05	4.14	-0.131	-1.5	20.38	10.6	5
B6071902	-	7.72	4.82	0.09	0	20.11	8.8	-
B6062602	93	7.13	4.2	-0.114	-2.4	20.13	12	11
B6061102	101	7.03	3.97	0.012	-1.2	19.79	11	9
B6052302	34.9	7.08	4.11	-0.004	69	19.9	9.9	5
B6050702	106.9	7.05	4.05	-0.053	1.1	19.9	11.9	13
B6042502	98.8	6.96	3.99	0.03	-2.5	20.43	12.1	14
B6041102	92.1	7.07	4.05	0.121	0.8	20.32	12.3	13
B6032102	95.3	6.85	3.88	0.102	2.9	19.9	12.1	9
B6030702	98.5	7.01	3.98	-0.115	23.5	20.06	12.6	14
B6020402	73.6	7.1	3.94	-0.034	-2.8	20.2	12.2	9

LOWER BANK

BA120402	102.4	7.13	4.09	0.061	-0.4	20	11.5	13
BA112102	-	7.08	4.04	0	-	19.92	10.7	5
BA110602	102.5	6.83	3.9	0.159	0.2	20.33	11.8	13
BA100902	102.4	7.22	4.22	0.008	-	19.75	11.2	5
BA092302	102.6	7.21	4.4	0.117	3	19.2	12	13
BA090402	100.1	7.09	4.06	-0.012	1.1	20.53	11.1	7
BA082302	91.7	7.06	3.97	0.047	9.2	20.13	11	11
BA081302	-	7.37	4.82	-0.068	1.5	25.37	11.3	0
BA073002	90	7.08	5	0.082	26.8	19.87	9.9	14
BA071602	96.3	7.03	4.15	-0.118	-2.6	20.28	10.9	13
BA070202	102.2	6.88	3.92	-0.11	0.6	18.16	too low	9
BA061902	78.1	6.97	3.98	0.001	4.4	19.62	11.7	5
BA060302	73	6.96	3.92	0.112	22	20.32	11.1	0
BA052102	96.6	6.9	3.9	-0.03	5.3	19.9	12	14
BA050702	107.9	7.21	4.15	-0.003	1.6	20.07	10.6	5
BA042502	98.2	7.04	4.06	0	7.6	20.26	11.4	6
BA041502	92.6	7.03	4.07	-0.002	-8	20.11	10.8	5
BA040102	100.5	7.79	3.95	0.001	1.5	20.04	11.7	6
BA031302	107	6.98	4.05	0.002	22.6	21.96	11.3	5

CHESTNUT NECK

CN121202	102.9	7.28	4.34	0.002	-	20.29	10.7	6	
CN112102	105.4	7.12	4.35	0.001	-	20.23	10.8	6	
CN110702	102.7	6.88	4.07	0	94.2	19.65	11.2	6	
CN102402	100.8	6.93	3.92	0	-5.5	20.35	11.4	6	
CN101002	106.8	7.05	4.02	-0.001		3.8	20.51	11.7	6
CN092602	100.1	7.07	4.04	0.001	0	20.18	11.9	6	
CN091202	98.1	7.3	4.4	0.007	0.9	19.49	12.2	6	
CN090502	n/a		-	-	-	-	-		
CN082202	102.2	6.97	4.15	0	15.8	19.7	11.8	6	
CN080802	92.4	6.85	3.95	0.001	-0.3	19.47	6.7	6	
CN072502	95.5	6.83	4.07	0.003	0.6	19.79	10.3	6	
CN071102	89	6.66	3.91	0.001	0.1	19.71	10.6	6	
CN062702	67.7	6.83	4.16	-0.001		0.4	19.7	10.8	6
CN040102	n/a		-	-	-	-	-	12	
CN031402	n/a		-	-	-	-	-	11	
CN022802	98.8	7.03	3.96	-0.013		1	50.66	11.2	11
CN021402	131.2	7.15	4.12	-0.11	-0.9	49.71	11.4	11	
CN013102	108.5	7.1	-	0.135	3.1	-	11.5	12	
CN011702	101.4	6.92	-	0.001	0.2	-	-	12	
CN010302	98.6	7.17		-0.002		0.2	-	11.3	12
CN120601	103.1	6.95		-0.1	0	-	11.8	12	

BUOY 139

B9111802	100	7.18	3.88	-0.057		-	19.99	11.6	9
B9082102	109.5	7.19	4.17	0.091	1.5	19.91	11	9	
B9072302	78.7	6.88	3.84	0.042	2	20.1	11.8	11	
B9070802	n/a		-	-	-	-	-	14	
B9061802	99	6.95	4.02	-0.066		5.9	19.58	11.2	13
B9052902	100.3	6.98	4	-0.039		0.1	20.35	9.6	11
B9051302	86	7.08	4.05	0.068	0.8	19.78	11	9	
B9080602	96.9	7.19	4.11	0.131	2.8	20.21	7.8	13	
B9082602	65.7	6.95	3.81	0.069	9.8	19.98	11.4	5	
B9091002	105	7.04	3.8	0.155	2.1	20.52	10.2	0	
B9092402	-	7.02	4.02	-0.027		42.2	19.79	11.9	14
B9101802	96.8	6.94	3.91	0.014	-	19.78	11.3	11	
B9110402	108.7	7.09	4.06	-0.003		-	19.93	11.5	14
B9120402	103.2	7.17	4.06	-0.187		0.6	20.6	10.8	0

14) Other Remarks/notes

On 07/07/2023 this dataset was updated to include embedded QAQC flags for anomalous/suspect data. System-wide monitoring data beginning in 2007 were processed to allow for QAQC flags and codes to be embedded in the data files rather than detailed in the metadata alone (as in the anomalous/suspect, deleted, and missing data sections above). Prior to 2006, rejected data were deleted from the dataset so they are unavailable to be used at all, but suspect data were only noted in the metadata document. Suspect data flags <1> were embedded retroactively in order to allow suspect data to be easily identified and filtered from the dataset if desired for analysis and reporting purposes. No other flags or codes were embedded in the dataset and users should still refer to the detailed explanations above for more information.

In all cases of anomalous turbidity data (data kept in monthly files), negative

turbidity is the result of a calibration error. All data collected by defective 6136 turbidity probes has been completely removed.

In most cases when data logger is off by 40 or 60 seconds, it is a result of the DO warm up time. In cases where logger is off by 1 minute or more, it can be assumed that this is due to technician error when programming the time function of a data logger. The appointment of two new data logger technicians in the spring of 2002 made it difficult to rectify problems associated with DO warmup. Emphasis was placed on proper calibration and handling of water quality parameters.

Logging at Buoy 139 did not begin until May 13, 2002 after an approved Rutgers diver cleaned fouling from the inside and outside of the deployment pipe. At this time, Buoy 126 was also cleaned. Data collected at Buoy 126 prior to this is corrupt do to massive fouling, which prevented free circulation of water. Bolts secured at the bottom of the deployment pipes were removed from these sites during cleaning and were not replaced, in an attempt to allow loggers to hang beyond other fouling organisms growing on the pipes later in the season.

All excess rope used to deploy data loggers in the PVC housing was removed in order to allow the YSI's to hang at a constant depth 8 inches below the pipe. It is uncertain whether or not this method actually provided reliable depth data after viewing 2002 data. The JCNERR is considering reinstalling the bolts at these sites.

The water quality data are thoroughly scrutinized at the end of each year and graphs and tracking sheets are used to help indicate anomalous data. Something that worked well identifying problems at Lower Bank (at the end of the year), which was monitored with vented depth data loggers, was swapping out with the same two units rather than utilizing all nine of the 6000/6600 series loggers. When looking at graphs of the yearly data from this site, it became evident that the logger named #5 was fitted with a bad turbidity probe. The probe S/N 02A0818 was installed on 3/12/02. During it's first use on 4/15, the tracking sheets recorded that the turbidity wiper fell off. On 5/21 the technician recorded that there were some initial problems with the wiper not sweeping during calibration, and there was a shortage of 123 NTU standard for calibration. On 6/18 the technician recorded the same problem, and unrelated, there was still a shortage of 123 NTU standard. The shipment of turbidity standard was delayed. The #5 logger was then used at Buoy 115 on 7/8 because of a shortage of loggers in the system (several were in the YSI shop being repaired at that time). At this time, the wiper did not wipe during the deployment and the technician calibrating the logger accepted very high values for the zero solution.

The UNCAL operation, as prescribed by Mike Lizotte of YSI, was utilized after many turbidity calibrations when wipers were not spinning properly. This seemed to be a solution during calibration, but not necessarily during post-calibration. Mike Lizotte informed the technicians that air bubbles in solutions might have caused errors. At Buoy 115, fouling was the cause of the turbidity wiper not sweeping properly. All problems were investigated during the time they happened, for that particular deployment. Many of the other 6136 probes had similar problems, which could have indicated operator error, tainted standards, or greater need for precision during calibration. Coincidentally, two graduate students from the JCNERR began learning to calibrate and deploy data loggers at this time. After several months of investigating the cause of the problems with the 6136 turbidity probes within the JCNERR, the technicians were asked to return the probes to YSI due to a recall. The JCNERR sent back

five turbidity probes on 10/9/02.

The data recorded at Buoy 126 prior to May 9, 2002, indicates that there was some form of obstruction in the pipe that prevented proper water circulation. Dramatic swings in DO and pH values insinuate that water near the data logger could have been effected by respiration of organisms in between flooding and ebbing tides. Turbidity may have been also been affected. These parameters were deleted from monthly files beginning 1/1/02 000 until May 9. Salinity, depth, and temperature do not seem to be affected by the 'blockage.'

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

An additional version of the 2002 metadata is archived at the Rutgers University Marine Field Station in Tuckerton, NJ. This file, named "5 site metadata 2002" includes a fifth site named Buoy 115 in Little Egg Harbor Bay.

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