Jacques Cousteau (JAC) NERR Water Quality Metadata
1 January 2017 – 31 December 2017
Latest Update: 30 October 2018

I. Data set and Research Descriptors

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2) Entry verification

Deployment data are uploaded from the YSI data logger to a Personal Computer (IBM compatible). Files are exported from EcoWatch in a comma separated file (CSV) or KOR Software in an Excel File (.XLS) and uploaded to the CDMO where they undergo automated primary QAQC; automated depth/level corrections for changes in barometric pressure (cDepth or cLevel parameters); and become part of the CDMO's online provisional database. All pre- and post-deployment data are removed from the file prior to upload. During primary QAQC, data are flagged if they are missing or out of sensor range. The edited file is then returned to the Reserve for secondary QAQC where it is opened in Microsoft Excel and processed using the CDMO's NERRQAQC Excel macro. The macro inserts station codes, creates metadata worksheets for flagged data and summary statistics, and graphs the data for review. It allows the user to apply QAQC flags and codes to the data, remove any overlapping deployment data, append files, and export the resulting data file for upload to the CDMO. Upload after secondary QAQC results in ingestion into the database as provisional plus data, recalculation of cDepth or cLevel parameters, and finally tertiary QAQC by the CDMO and assimilation into the

CDMO's authoritative online database. Where deployment overlap occurs between files, the data produced by the newly calibrated sonde is generally accepted as being the most accurate. For more information on QAQC flags and codes, see Sections 11 and 12. Data management is handled by the JCNERR's SWMP Technician, Gregg P. Sakowicz.

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, three 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 datasondes. Because of the close proximity of the lower station (site name: B6) 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. Datasondes 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

YSI datasondes (a.k.a. "dataloggers") are programmed to record temperature, specific conductance, salinity, dissolved oxygen, depth, pH, and turbidity every 15 minutes. Two types/series of datasondes were utilized at the JCNERR in 2016; what are referred to as 6-series (represented by 6600EDS and V2-4 sondes) and EXO sondes. Presently, four SWMP monitoring stations are established in the Mullica River/Great Bay Reserve. These monitoring sites extend from the fresh water/salt water interface at Lower Bank, approximately 25 kilometers up the Mullica River from the point where it joins Great Bay to the mouth of Great Bay, a distance of eight kilometers. Thus the datasondes cover a total of 33 kilometers in this estuarine system.

Calibration standards required for pH were purchased from Y.S.I. (p/n 003822 (pH 7) and 003823(pH 10)). A two-point calibration was employed for pH, the first being pH 7 followed by pH 10. Calibration of the pH probe was performed via immersion in the standard and using the calibration feature of the EcoWatch (for 6-series sondes) or KOR (for EXO sondes) software and accepting the set-point after stable readings were obtained.

Calibration standards required for conductivity were purchased from Y.S.I.. A standard of 10 mS/cm (p/n 060911) was used to calibrate for conductivity. Calibration of the conductivity probe was performed via immersion in the standard and using the calibration feature of the EcoWatch or KOR software and accepting the set-point after stable readings were obtained.

Dissolved oxygen was calibrated via immersion in a bucket of oxygen-saturated tap water and utilizing the dissolved oxygen calibration function of the datasonde(s). Oxygenation of the water was accomplished via aeration with an aquarium pump and air-stone for a minimum of 2 hours to saturate tap water prior to calibration. Y.S.I. 6-series sondes equipped with ROX optical D.O. probes were utilized at jacb6wq (B6) during the early period of 2017 (before changing over to EXO sondes), and model number 599100-01 dissolved oxygen probes were utilized on EXO sondes at the other stations the entirety of 2017. Calibration of the dissolved oxygen probe was performed via immersion in the aerated water and using the calibration feature of the EcoWatch or Kor software and accepting the set-point after stable readings were obtained.

Calibration of the turbidity probe was performed with a 0 NTU (Nephelometric Turbidity Units) solution (de-ionized water) and a 124/126 NTU standard (supplied by YSI, inc., p/n 607300). Calibration of the Turbidity probe was performed via immersion in each standard and using the calibration feature of the EcoWatch (for 6-series sondes) or KOR (for EXO sondes) software and accepting the set-point after stable readings were obtained.

Used conductivity and pH standards were stored for rinsing probes and performing post-deployment calibration-checks after retrieval and prior to cleaning loggers. Great care was taken to clean the datasondes before calibration, and each used standard was used once as a post-calibration solution and once as a rinse solution before being discarded (unless contamination or dilution was observed or suspected).

Datasondes were deployed by inserting them in PVC pipes that are affixed to a permanent structure (i.e. two US Coast Guard channel markers (jacb6wq and jacb9wq), one commercial dock (jacnewq), and one bridge (jacbawq). The bottoms of the pipes were situated between approximately 0.5 and 1m above the sediment (the variability is the result of currents and shoaling leading to variability of the relative level of sediment below the sonde tubes). A line was used to lower and recover the datasondes within the pipes. A cross-pin (stainless steel or titanium bolt) was inserted across the bottom of the pipe and served as an end-stop for the datasonde during its descent, assuring a maximum fixed depth and retaining the datasonde if the line parted. Two-inch vent holes were

drilled every 6 inches of the pipe and four two- by ten-inch-wide slots were cut in the bottom of the pipe to allow for circulation of water in the pipe and 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 section of 4" copper pipe, vented as described above, was coupled to the lower end of some pipes, serving as an additional antifouling measure. A locking cap provided security.

In 2017, two methods of deployment and data collection were employed. The first being a stand-alone deployment during which a datasonde autonomously collected data on 15-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 at stations jacb9wq, jacnewq, and jacbawq. The second method employed was the pairing of datasondes with telemetry equipment that received data from the datasondes and broadcast it to the GOES satellite for receipt by the NOAA Hydrometeorological Automated Data System (HADS) as well as an independent array at the NERRS CDMO. These data were also recorded independently every 15 minutes in Eastern Standard Time (EST) by the datasondes for redundancy and to continue with the pre-existing NERRS SOP. Such telemetry was employed at jacb6wq. For more detail concerning these telemetered datasonde stations, see below:

The 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) data sets reflecting fifteen minute data sampling intervals. Upon receipt by the CDMO, the data undergoes the same automated primary QAQC process detailed in Section 2 above. The "real-time" telemetry data become part of the provisional dataset until undergoing secondary and tertiary QAQC and assimilation in the CDMO's authoritative online database. Provisional and authoritative data are available at http://cdmo.baruch.sc.edu.

The 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. Telemetry was, however, not active at Chestnut Neck for this reporting period due to ongoing rebuilding of infrastructure destroyed by Superstorm Sandy. The transmissions are scheduled hourly and contain four (4) data sets reflecting fifteen minute data sampling intervals. Upon receipt by the CDMO, the data undergoes the same automated primary QAQC process detailed in Section 2 above. The "real-time" telemetry data become part of the provisional dataset until undergoing secondary and tertiary QAQC and assimilation in the CDMO's authoritative online database. Provisional and authoritative data are available at 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 28 days datasondes were retrieved from the PVC pipe. Deployment periods were occasionally extended because of weather-related restrictions of access. A YSI 600 datasonde

attached to a hand-held YSI 650-MDS display 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 datasonde was then deployed to replace the datasonde being recovered. The recovered datasonde was brought back to the laboratory for downloading, post-deployment calibration checking, cleaning, and re-calibration. For some retrievals (due to spare datasondes being out for repairs or a desire to keep the same datasonde at the same SWMP site for consistency), the datasonde was not replaced but rather brought back to the field station, cleaned and recalibrated as described above, and re-deployed or replaced later that day or the following day.

Upon retrieval, datasondes were wrapped in a white towel and placed in a towel or short section of PVC pipe for transport back to the laboratory. Datasondes 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 datasonde 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 standard operating procedures and either re-calibrated for the next deployment or capped for storage for later calibration and deployment.

Datasondes were programmed to start recording data (ranging from one sample period to a few hours) before they were deployed in the field and allowed to run in either a wet, enclosed environment or an aerated water-filled bucket, so these deployment files often contained “tail ends” of non-deployment 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 in-situ 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. There were four active sampling stations in 2017. All four locations can be characterized by having little macroalgae (few to no established beds in the immediate locale; seasonal and structurally-dependent fouling-type communities (macroalga, barnacles, shellfish, etc.) fast moving tidal currents, and tidal ranges of approximately 1m (although this can vary significantly depending on moon state, storm events, and coastal wind conditions (e.g.- “blow out tides” associated with strong offshore winds). All sites are in a relatively undisturbed area with minimal impact from development or pollution.

1) Buoy 126 (B6) - 39deg 30'28.44"N, 74 deg 20'18.67"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 datasonde at this location is attached to Intracoastal Waterway Channel Marker 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 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. Monitoring at this station began on 08/06/1996. In 2017, the reported temperature at this station ranged from -1.6°C to 29.3°C, with an average of 13.7°C. The reported salinity at this station ranged from 20.1psu to 33.3psu, with an average of 29.3psu. It is important to note that fouling may have occasionally depressed some salinity readings and are "flagged" as such in the dataset, so the aforementioned average and range may not be accurate. The maximum tidal range (including storm surge and drought-level data), as recorded by the datasonde, was 2.22m.

2) Buoy 139 (B9) – 39deg 29'52.59"N, 74deg 22'52.07"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 datasonde at this location is attached to Intracoastal Waterway Channel Marker 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. 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. Monitoring at this station began on 08/02/1996. In 2017, the reported temperature at this station ranged from -1.5°C to 30.2°C, with an average of 14.9°C. The reported salinity at this station ranged from 20.4psu to 32.7psu, with an average of 27.9psu. It is important to note that fouling may have occasionally depressed some salinity readings and are "flagged" as such in the dataset, so the aforementioned average and range may not be accurate. The maximum tidal range (including storm surge and drought-level data), as recorded by the datasonde, was 2.10m.

*= these coordinates are a correction to the location reported in past years' metadata reports; the coordinates (39deg 29'24.65"N, 74 deg 22'53.83"W) of the #141 channel marker were attributed to this (#139) channel marker.

3) Chestnut Neck (NE) - 39deg 32'52.37"N, 74deg 27'38.77"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 datasonde 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 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. Monitoring at this station began on 08/01/1996. In 2017, the reported temperature at this station ranged from -1.2°C to 30.3°C, with an average of 15.4°C. The reported salinity at this station ranged from 3.3psu to 29.4psu, with an average of 16.0psu. It is important to note that fouling may have occasionally depressed some salinity readings and are "flagged" as such in the dataset, so the aforementioned average and range may not be accurate. The maximum tidal range (including storm surge and drought-level data), as recorded by the datasonde, was 2.47m.

4) Lower Bank (BA) - 39deg 35'37.18"N, 74 deg 33'05.44"W- located 13 kilometers upriver of the Chestnut Neck location. The Mullica River at this site is about two hundred meters wide. The datasonde is located at the center of a bridge spanning the Mullica River. The northern bank of the river is sparsely developed with single-family houses and has a steep bank about five meters high. The southern shore has an extensive marsh and fresh water wetland area about three kilometers wide. This site can be characterized by having fast tidal currents, just over one knot, deep water, and fine mixed organic mud and sandy sediment. Freshwater input is primarily from groundwater and watershed runoff. Monitoring at this station began on 10/10/1996. In 2017, the reported temperature at this station ranged from -0.6°C to 32.9°C, with an average of 15.3°C. The reported salinity at this station ranged from 0.1psu to 21.9psu, with an average of 3.5psu. It is important to note that fouling may have occasionally depressed some salinity readings and are "flagged" as such in the dataset, so the aforementioned average and range may not be accurate. The maximum tidal range (including storm surge and drought-level data), as recorded by the datasonde, was 2.14m.

Station Code	SWMP Status	Station Name	Location	Active Dates	Reason Decommissioned	Notes
B6	P	jacb6wq	39.50790, -74.33850	Aug 1996 - Present	NA	NA
B9	P	jacb9wq	39.49794, -74.38113	Aug 1996 - Dec 1998; May 2002- Present	NA	NA
NE	P	Jacnewq	39.54790, -74.46080	Aug 1996 - Present	NA	NA
BA	P	Jacbawq	39.59370, -74.55150	Oct 1996 - Present	NA	NA

6) Data Collection Period

Data collection at the JCNERR is often performed on a seasonal (rather than year-round) basis due to ice-over conditions in local waters and the damages associated with ice formation and movement. Typically, the target date for redeployment after the winter is mid-March, but is often earlier if conditions permit or later if winter conditions linger

and/or stations are significantly damaged post-thaw. Datasondes are pulled and stations deactivated when ice-over conditions are anticipated (typically in early- or mid-December) in an attempt to avoid damage and/or loss of equipment due to the destructive nature of ice movements.

Site	Filename	Deploy Date	Time	Retrieve Date	Time
B6					
	jacb6wq121916	12/19/2016	14:30	01/18/2017	11:00
	jacb6wq011817	01/18/2017	11:15	02/22/2017	14:15
	jacb6wq022217	02/22/2017	14:30	03/30/2017	10:30
	jacb6wq033017	03/30/2017	11:00	05/10/2017	11:30
	jacb6wq051017	05/10/2017	11:45	05/11/2017	11:00
	jacb6wq051117	05/11/2017	12:00	05/31/2017	12:00
	jacb6wq060817	06/08/2017	15:15	06/21/2017	19:00
	jacb6wq062617	06/26/2017	13:30	07/10/2017	12:00
	jacb6wq071017	07/20/2017	12:15	08/08/2017	13:15
	jacb6wq080817	08/08/2017	13:30	09/07/2017	11:30
	jacb6wq090717	09/07/2017	12:00	10/05/2017	10:30
	jacb6wq100517	10/05/2017	11:00	11/01/2017	12:30
	jacb6wq110117	11/01/2017	12:45	11/02/2017	13:45
	jacb6wq110217	11/02/2017	14:30	11/27/2017	15:00
	jacb6wq112717	11/27/2017	15:15	12/18/2017	11:15
	jacb6wq121817	12/18/2017	11:45	01/11/2018	16:15
B9					
	jacb9wq122016	12/20/2016	12:15	01/19/2017	11:45
	jacb9wq011917	01/19/2017	12:00	02/21/2017	14:30
	jacb9wq022117	02/21/2017	14:45	03/29/2017	12:15
	jacb9wq032917	03/29/2017	12:30	05/08/2017	10:15
	jacb9wq050817	05/08/2017	10:30	06/06/2017	14:15
	jacb9wq060617	06/06/2017	14:45	07/10/2017	12:30
	jacb9wq071017	07/10/2017	12:45	08/09/2017	10:15
	jacb9wq080917	08/09/2017	10:45	09/06/2017	12:45
	jacb9wq090617	09/06/2017	13:15	10/03/2017	10:00
	jacb9wq100317	10/03/2017	10:15	11/02/2017	15:30
	jacb9wq110217	11/02/2017	15:45	11/29/2017	12:15
	jacb9wq112917	11/29/2017	12:30	12/18/2017	11:30
	jacb9wq121817	12/18/2017	11:45	LOST TO ICE	
NE					
	jacnewq123116	12/31/2016	14:45	01/27/2017	10:00
	jacnewq012717	01/27/2017	10:30	02/27/2017	10:45
	jacnewq022717	02/27/2017	11:00	03/21/2017	12:00
	jacnewq042417	04/24/2017	15:30	05/23/2017	15:15

jacnewq052317	05/23/2017	15:30	06/13/2017	16:00
jacnewq061317	06/13/2017	16:15	07/14/2017	12:45
jacnewq071417	07/14/2017	13:00	08/14/2017	08:45
jacnewq081417	08/14/2017	09:00	09/11/2017	15:00
jacnewq091117	09/11/2017	15:15	10/12/2017	12:45
jacnewq101217	10/12/2017	13:00	11/09/2017	09:15
jacnawq110917	11/09/2017	09:30	12/07/2017	12:00
jacnewq120717	12/07/2017	12:15	01/02/2018	11:45

BA

jacbawq123116	12/31/2016	14:00	01/26/2016	16:15
jacbawq012617	01/26/2017	16:30	02/23/2017	17:15
jacbawq022317	02/23/2017	17:30	03/30/2017	17:00
jacbawq033017	03/30/2017	17:15	05/04/2017	14:45
jacbawq050417	05/04/2017	15:00	06/02/2017	13:45
jacbawq060217	06/02/2017	14:00	06/29/2017	16:30
jacbawq062917	06/29/2017	16:45	07/27/2017	10:45
jacbawq072717	07/27/2017	11:00	08/25/2017	10:45
jacbawq082517	08/25/2017	11:00	09/21/2017	11:45
jacbawq092117	09/21/2017	12:00	10/16/2017	13:15
jacbawq101617	10/16/2017	13:45	11/09/2017	09:45
jacbawq110917	11/09/2017	10:15	12/07/2017	14:15
jacbawq120717	12/07/2017	14:45	01/02/2018	12:15

7) Distribution

NOAA retains the right to analyze, synthesize and publish summaries of the NERRS System-wide Monitoring Program data. The NERRS retains the right to be fully credited for having collected and process the data. Following academic courtesy standards, the NERR site where the data were collected should be contacted and fully acknowledged in any subsequent publications in which any part of the data are used. 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.

Requested citation format:
NOAA National Estuarine Research Reserve System (NERRS). System-wide Monitoring Program. Data accessed from the NOAA NERRS Centralized Data Management Office website: http://www.nerrsdata.org/; accessed 12 October 2012.

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 www.nerrsdata.org. Data are available in comma delimited format.

8) Associated Researchers and Projects

As per the requisites of the national SWMP program, the JCNERR performs nutrient sampling and meteorological monitoring correlated with the water-quality data addressed in this report. Data can be accessed by visiting www.nerrsdata.org

During 2017, 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 (1m, 1mm 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 conducts annual trawl survey at numerous sites from offshore of Little Egg Inlet to the freshwater interface up the Mullica River. SWMP data are regularly 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 2017 as part of long-term sampling within the Reserve.

Dr. Mark Sullivan's class at Stockton University has extensively utilized the JCNERR's SWMP dataset, including WQ data, in their curriculum.

Dr. Paul Jivoff of Rider University conducts regular surveys of local crab populations and utilizes the SWMP dataset.

Over-wintering populations of seals near the B6 site were observed/studied over the winter of 2015-2016 and 2016-2017 as a joint Rutgers University/Stockton College program; SWMP data from B6 are utilized in these observations/study.

Dr. Ken Able at the Rutgers University Marine Field station utilized SWMP data in the following technical report: Able, K.W., M. J. Shaw, S. M. VanMorter and M. C. Sullivan. 2017. Interactions between Alewife and American eel in the Mullica Valley. RUMFS Technical Report.

II. Physical Structure Descriptors

9) Sensor Specifications

JC NERR utilized three datasonde types during this reporting period: YSI non-vented V2-4 datasondes were utilized at the Buoy 126 (jacb6wq) station. Exo2 sondes were

used exclusively at the Buoy 139 (jacb9wq), Chestnut Neck (jacnewq), and Lower Bank (jacbawq) stations in 2017.

YSI 6600EDS and V2-4 sondes:

Parameter: Temperature
Units: Celsius (C)
Sensor Type: Thermistor
Model#: 6560
Range: -5 to 50 C
Accuracy: +/- 0.15
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 dependant)

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

Parameter: Dissolved Oxygen % saturation
Sensor Type: Optical probe w/ mechanical cleaning
Model#: 6150 ROX
Range: 0 to 500% air saturation
Accuracy: 0-200% air saturation: +/- 1% of the reading or 1% air saturation, whichever is greater 200-500% air saturation: +/- 15% or reading
Resolution: 0.1% air saturation

Parameter: Dissolved Oxygen mg/L (Calculated from % air saturation, temperature, and salinity)
Units: milligrams/Liter (mg/L)
Sensor Type: Optical probe w/ mechanical cleaning
Model#: 6150 ROX
Range: 0 to 50 mg/L
Accuracy: 0-20 mg/L: +/-0.1 mg/l or 1% of the reading, whichever is greater
20 to 50 mg/L: +/- 15% 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: pH – bulb probe
Units: pH units
Sensor Type: Glass combination electrode
Model#: 6561 or 6561FG
Range: 0 to 14 units
Accuracy: +/- 0.2 units
Resolution: 0.01 units

Parameter: Turbidity
Units: nephelometric turbidity units (NTU)
Sensor Type: Optical, 90 degree scatter, with mechanical cleaning
Model#: 6136
Range: 0 to 1000 NTU
Accuracy: +/- 2% of reading or 0.3 NTU (whichever is greater)
Resolution: 0.1 NTU

YSI EXO Sonde:

Parameter: Temperature
Units: Celsius (C)
Sensor Type: Thermistor
Model#: 599870-01
Range: -5 to 50 C
Accuracy: -5 to 35: +/- 0.01, 35 to 50: +/- .005
Resolution: 0.01 C

Parameter: Conductivity
Units: milli-Siemens per cm (mS/cm)
Sensor Type: 4-electrode cell with autoranging
Model#: 599870-01
Range: 0 to 200 mS/cm
Accuracy: 0 to 100: +/- 0.5% of reading or 0.001 mS/cm; 100 to 200: +/- 1% of reading
Resolution: 0.001 mS/cm to 0.1 mS/cm (range dependant)

Parameter: Salinity
Units: practical salinity units (psu)/parts per thousand (ppt)
Sensor Type: Calculated from conductivity and temperature

Range: 0 to 70 psu
Accuracy: +/- 1.0% of reading pr 0.1 ppt, whichever is greater
Resolution: 0.01 psu

Parameter: Temperature
Units: Celsius (C)
Sensor Type: Wiped probe; Thermistor
Model#: 599827
Range: -5 to 50 C
Accuracy: ±0.2 C
Resolution: 0.001 C

Parameter: Conductivity
Units: milli-Siemens per cm (mS/cm)
Sensor Type: Wiped probe; 4-electrode cell with autoranging
Model#: 599827
Range: 0 to 100 mS/cm
Accuracy: ±1% of the reading or 0.002 mS/cm, whichever is greater
Resolution: 0.0001 to 0.01 mS/cm (range dependent)

Parameter: Salinity
Units: practical salinity units (psu)/parts per thousand (ppt)
Model#: 599827
Sensor Type: Wiped probe; Calculated from conductivity and temperature
Range: 0 to 70 ppt
Accuracy: ±2% of the reading or 0.2 ppt, whichever is greater
Resolution: 0.01 psu

Parameter: Dissolved Oxygen % saturation
Sensor Type: Optical probe w/ mechanical cleaning
Model#: 599100-01
Range: 0 to 500% air saturation
Accuracy: 0-200% air saturation: +/- 1% of the reading or 1% air saturation, whichever is greater 200-500% air saturation: +/- 5% or reading
Resolution: 0.1% air saturation

Parameter: Dissolved Oxygen mg/L (Calculated from % air saturation, temperature, and salinity)
Units: milligrams/Liter (mg/L)
Sensor Type: Optical probe w/ mechanical cleaning
Model#: 599100-01
Range: 0 to 50 mg/L
Accuracy: 0-20 mg/L: +/-0.1 mg/l or 1% of the reading, whichever is greater
20 to 50 mg/L: +/- 5% 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 33 ft (10 m)
Accuracy: +/- 0.013 ft (0.04 m)
Resolution: 0.001 ft (0.001 m)

Parameter: pH
Units: pH units
Sensor Type: Glass combination electrode
Model#: 599701(guarded) or 599702(wiped)
Range: 0 to 14 units
Accuracy: +/- 0.01 units within +/- 10° of calibration temperature, +/- 0.02 units for entire temperature range
Resolution: 0.01 units

Parameter: Turbidity
Units: formazin nephelometric units (FNU)
Sensor Type: Optical, 90 degree scatter
Model#: 599101-01
Range: 0 to 4000 FNU
Accuracy: 0 to 999 FNU: 0.3 FNU or +/-2% of reading (whichever is greater); 1000 to 4000 FNU +/-5% of reading
Resolution: 0 to 999 FNU: 0.01 FNU, 1000 to 4000 FNU: 0.1 FNU

Depth Qualifier:
The NERR System-Wide Monitoring Program utilizes YSI data sondes that can be equipped with either vented or non-vented depth/level sensors. 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 1.02 cm for every 1 millibar change in atmospheric pressure, and is eliminated for vented 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 can be corrected.

In 2010, the CDMO began automatically correcting depth/level data for changes in barometric pressure as measured by the Reserve's associated meteorological station

during data ingestion. These corrected depth/level data are reported as cDepth and cLevel, and are assigned QAQC flags and codes based on QAQC protocols. Please see sections 11 and 12 for QAQC flag and code definitions.

NOTE: older depth data cannot be corrected without verifying that the depth offset was in place and whether a vented or non-vented depth sensor was in use. No SWMP data prior to 2006 can be corrected using this method. The following equation is used for corrected depth/level data provided by the CDMO beginning in 2010: ((1013-BP)*0.0102)+Depth/Level = cDepth/cLevel.

Salinity Units Qualifier:

In 2013, EXO sondes were approved for SWMP use and began to be utilized by Reserves. While the 6600 series sondes report salinity in parts per thousand (ppt) units, the EXO sondes report practical salinity units (psu). These units are essentially the same and for SWMP purposes are understood to be equivalent, however psu is considered the more appropriate designation. Moving forward the NERR System will assign psu salinity units for all data regardless of sonde type.

Turbidity Qualifier:

In 2013, EXO sondes were approved for SWMP use and began to be utilized by Reserves. While the 6600 series sondes report turbidity in nephelometric turbidity units (NTU), the EXO sondes use formazin nephelometric units (FNU). These units are essentially the same but indicate a difference in sensor methodology, for SWMP purposes they will be considered equivalent. Moving forward, the NERR System will use FNU/NTU as the designated units for all turbidity data regardless of sonde type. If turbidity units and sensor methodology are of concern, please see the Sensor Specifications portion of the 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 = three-letter abbreviation for the Jacques Cousteau National Estuarine Research Reserve

wq = water quality data

example 1: jacb6wq030917= this demonstrates the naming convention for deployment files. This denotes a deployment at the Jacques Cousteau National Estuarine Research Reserve's (jac) Buoy 126 (b6) water quality (wq) station starting on 03/09/2017.

example 2: jacb6wq2017= water quality dataset from the JCNERR's Buoy 126 station for the year 2017

11) QAQC flag definitions

QAQC flags provide documentation of the data and are applied to individual data points by insertion into the parameter's associated flag column (header preceded by an F_). During primary automated QAQC (performed by the CDMO), -5, -4, and -2 flags are applied automatically to indicate data that is missing and above or below sensor range. All remaining data are then flagged 0, passing initial QAQC checks. During secondary and tertiary QAQC 1, -3, and 5 flags may be used to note data as suspect, rejected due to QAQC, or corrected.

-5 Outside High Sensor Range
-4 Outside Low Sensor Range
-3 Data Rejected due to QAQC
-2 Missing Data
-1 Optional SWMP Supported Parameter
0 Data Passed Initial QAQC Checks
1 Suspect Data
2 Open - reserved for later flag
3 Calculated data: non-vented depth/level sensor correction for changes in barometric pressure
4 Historical Data: Pre-Auto QAQC
5 Corrected Data

12) QAQC code definitions

QAQC codes are used in conjunction with QAQC flags to provide further documentation of the data and are also applied by insertion into the associated flag column. There are three (3) different code categories, general, sensor, and comment. General errors document general problems with the deployment or YSI datasonde, sensor errors are sensor specific, and comment codes are used to further document conditions or a problem with the data. Only one general or sensor error and one comment code can be applied to a particular data point, but some comment codes (marked with an * below) can be applied to the entire record in the F_Record column.

General Errors

GIC No instrument deployed due to ice
GIM Instrument malfunction
GIT Instrument recording error; recovered telemetry data
GMC No instrument deployed due to maintenance/calibration

GNF Deployment tube clogged / no flow
GOW Out of water event
GPF Power failure / low battery
GQR Data rejected due to QA/QC checks
GSM See metadata

Corrected Depth/Level Data Codes

GCC Calculated with data that were corrected during QA/QC
GCM Calculated value could not be determined due to missing data
GCR Calculated value could not be determined due to rejected data
GCS Calculated value suspect due to questionable data
GCU Calculated value could not be determined due to unavailable data

Sensor Errors

SBO Blocked optic
SCF Conductivity sensor failure
SCS Chlorophyll spike
SDF Depth port frozen
SDG Suspect due to sensor diagnostics
SDO DO suspect
SDP DO membrane puncture
SIC Incorrect calibration / contaminated standard
SNV Negative value
SOW Sensor out of water
SPC Post calibration out of range
SQR Data rejected due to QAQC checks
SSD Sensor drift
SSM Sensor malfunction
SSR Sensor removed / not deployed
STF Catastrophic temperature sensor failure
STS Turbidity spike
SWM Wiper malfunction / loss

Comments

CAB* Algal bloom
CAF Acceptable calibration/accuracy error of sensor
CAP Depth sensor in water, affected by atmospheric pressure
CBF Biofouling
CCU Cause unknown
CDA* DO hypoxia (<3 mg/L)
CDB* Disturbed bottom
CDF Data appear to fit conditions
CFK* Fish kill
CIP* Surface ice present at sample station
CLT* Low tide
CMC* In field maintenance/cleaning

CMD* Mud in probe guard
CND New deployment begins
CRE* Significant rain event
CSM* See metadata
CTS Turbidity spike
CVT* Possible vandalism/tampering
CWD* Data collected at wrong depth
CWE* Significant weather event

13) Post-deployment information

Deployment filename Datasonde ID#, Dissolved Oxygen #1 depth measured/expected offset, Specific Conductivity, pH7, pH10, Turbidity0

Deployment Name	Sonde Name	DO 100%	Depth m (measured/ expected)	SpCond 10mS/cm3	pH (7)	pH (10)	Turb 0NTU
jacb6wq011817	V2B	101.5	-0.017/-0.022	9.986	7.09	10.12	0.8
jacb6wq022217	Loaner	101.0	0.015/-0.013	9.961	7.05	10.03	0.4
jacb6wq033017	V2B	111.6	0.021/-0.011	9.761	7.04	9.81	-0.6
jacb6wq051017	Nice Guy Eddie	101.5	-0.067/-0.064	10.0748	7.1	10.12	1.03
jacb6wq060817	Mr. Orange	104.5	0.015/0.013	9.928	7.15	10.13	0.81
jacb6wq071017	Mr. Pink	99.1	0.083/0.08	10.0528	7.09	10.13	1.77
jacb6wq080817	Mr. Brown	99.1	0.057/0.054	10.0074	7.17	10.19	0.97
jacb6wq090717	Boss Joe	100.5	0.053/0.048	10.0307	7.09	10.06	2.75
jacb6wq100517	Mr. Blonde	100.0	0.077/0.083	10.1501	7.13	10.07	1.71
jacb6wq110117	Mr. Blue	101.8	0.088/0.093	9.9766	6.98	10.1	0.0
jacb6wq110217	Nice Guy Eddie	98.9	0.051/0.053	10.0677	7.08	10.09	0.04
jacb6wq112717	Boss Joe	99.5	0.005/0.005	10.0645	7.17	10.14	1.46
jacb6wq121817	Mr. Blonde	102.5	0.133/0.139	10.0433	7.11	10.13	0.40
jacb9wq011917	Mr. Blue	101.9	0.119/0.137	9.9288	7.07	10.09	2.54
jacb9wq022117	Mr. Blonde	100.5	0.044/0.037	10.0364	7.17	10.1	0.63
jacb9wq032917	Boss Joe	97.8	0.029/-0.003	10.0488	7.12	10.13	0.92
jacb9wq050817	Mr. Orange	96.6	0.0050/0.01	10.1086	7.12	10.16	1.69
jacb9wq060617	Mr. Brown	98.6	0.011/0.017	9.9543	7.24	10.20	1.17
jacb9wq071017	Mr. White	100.1	0.08/0.081	10.0355	7.09	10.13	1.66
jacb9wq080917	Mr. Blue	98.5	0.049/0.055	9.9722	7.05	10.08	0.33
jacb9wq090617	Mr. Pink	101.5	0.209/0.208	10.0045	7.09	10.13	0.79
jacb9wq100317	Mr. Brown	99.9	0.082/0.083	10.047	7.03	9.97	2.1
jacb9wq110217	Mr. Blue	101.8	0.088/0.093	9.9766	6.98	10.1	1.53
jacb9wq112917	Nice Guy Eddie	101.1	-0.0020/0.004	10.0661	6.97	9.91	1.12
jacb9wq121817	Mr. Brown	NO DATA AVAILABLE; SONDE LOST TO ICE					
jacnewq012717	Boss Joe	102.9	0.175/0.177	10.0444	7.09	10.1	1.94
jacnewq022717	Nice Guy Eddie	102.8	0.101/0.072	9.9463	7.03	10.01	1.28
jacnewq042417	Mr. Pink	97.8	-0.087/-0.088	10.0033	7.16	10.22	1.15
jacnewq052317	Mr. Blonde	103.6	0.025/0.03	10.0066	7.14	10.18	0.04
jacnewq061317	Nice Guy Eddie	99.4	-0.0020/0.008	10.0588	7.09	10.1	0.2
jacnewq071417	Boss Joe	100.0	0.0030/0.01	9.9863	7.12	10.08	0.68
jacnewq081417	Mr. Blonde	100.3	0.013/0.014	10.531	7.14	10.21	1.13
jacnewq091117	Nice Guy Eddie	101.8	0.112/0.99	10.013	7.12	10.15	1.34
jacnewq101217	Mr. White	100.9	0.042/0.046	10.0205	7.26	10.29	1.31

jacnewq110917	Mr. Blonde	100.9	0.035/0.037	10.594	7.14	10.11	0.70
jacnewq120717	Mr. Blue	100.7	0.138/0.138	10.0383	7.06	10.14	4.35
jacbawq012617	Nice Guy Eddie	100.2	0.0070/0.008	9.9887	7.07	10.07	1.12
jacbawq022317	Mr. Blue	100.7	-0.036/-0.033	9.9617	7.07	10.1	-0.08
jacbawq033017	Nice Guy Eddie	99.5	-0.113/-0.131	10.0088	7.07	10.09	1.32
jacbawq050417	Mr. Brown	100.1	-0.081/-0.077	9.9981	6.83	9.82	0.74
jacbawq060217	Mr. Pink	95.5	0.033/0.045	10.045	7.05	10.03	1.01
jacbawq062917	Mr. Blonde	110.1	-0.043/-0.045	10.0409	7.13	10.08	26.57
jacbawq072717	Nice Guy Eddie	100.6	0.032/0.048	9.9948	7.18	10.24	0.95
jacbawq082517	Mr. White	100.3	0.0060/0.003	10.0084	7.13	10.15	0.9
jacbawq092117	Mr. Blue	99.0	-0.02/0.024	10.0565	7.14	10.08	1.41
jacbawq101617	Boss Joe	101.5	0.03/0.046	9.9914	7.17	10.2	1.9
jacbawq110917	Mr. Brown	100.8	0.023/0.037	10.0234	7.01	9.99	1.25
jacbawq120717	Mr. White	104.2	0.137/0.138	10.016	7.19	10.28	5.21

14) Other Remarks/Notes

This section details comments concerning data in the data set that are not adequately described by the coding convention or require additional comment/qualification.

Data are missing due to equipment or associated specific probes not being deployed, equipment failure, time of maintenance or calibration of equipment, or repair/replacement of a sampling station platform. Occasionally, supplementary data are available from proximal non-SWMP stations. If additional information and/or missing data are needed, contact the Research Coordinator at the reserve submitting the data.

Occasionally negative turbidity values between -0001 and -0002 NTU's/FNU's are recorded. Because such values fall within the range of accuracy (+/-2 NTU/FNU) of the 6-series turbidity probes, these data are considered suspect but not rejected.

Occasionally negative turbidity values less than -0002NTU's/FNU's are recorded. Because such values fall outside the range of accuracy (+/-2 NTU/FNU) of the 6-series turbidity probes, these data were rejected and flagged with a <-3> <SNV> (negative value) designation in the dataset.

Note to users: When utilizing these data, it is always best to also review the SWMP Meteorological (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. Provisional MET data from the JCNERR's MET station (station code: jacncmet) are available at the CDMO website: http://nerrsdata.org/

All stations:

A strong coastal storm on October 29th brought wind, rain, and storm surge to the JCNERR; changes in trends are particularly evident in the datasets for all four SWMP WQ stations as well as the Nacote Creek meteorological dataset.

A combination of a particularly strong "Polar Vortex" and bombogenic extra-tropical storm event the final week of 2017 into the first week of 2018 resulted in a hard-freeze of JCNERR waters

Site-specific comments:

B6 (jacb6wq)

A change from YSI 6-series sondes to the YSI EXO2 sonde was made at this station beginning with the 05/10/2017 deployment.

Depth data is missing and marked -2 GIM from 11/1 12:45 to 11/2 13:45 at the beginning of a deployment. During this time there was an issue with the sonde. When the sonde was hooked up to telemetry, depth data completely dropped out. Data from the sonde was neither recorded nor telemetered.

Anomalous SpCond/salinity data occurred at the following dates/times. It is believed that this may be biological in nature (algae or animal) impacting data during these times. These values have been marked -3 SCF CSM.

06/10/2017 22:30 to 6/12 22:45
06/21/2017 16:15 to 17:45
06/26/2017 13:30 to 6/28 23:00
07/27/2017 04:45
07/28/2017 17:30
07/30/2017 06:15, 8:45
08/01/2017 07:30
08/05/2017 16:30
08/06/2017 04:45 – 5:00
08/16/2017 14:00
08/18/2017 17:30
08/19/2017 16:15, 17:00-30
08/20/2017 17:15 -45
08/21/2017 18:00, 19:30
08/23/2017 20:30

Because of differences in the ranges, accuracies, and resolutions of the two Temperature/Conductivity probes (CT2 (p/n 599871-01) and WCT (p/n 599827)), as well as the resistance of the sensors to fouling (the latter more so than the former), users of the data may wish to incorporate the following information (see Sensor Specification section) in their use and analysis of the data:

Deployment sensor type data range

jacb6wq051017	WCT	05/10/2017 11:45 - 05/11/2017 11:00
jacb6wq051117	WCT	05/11/2017 12:00 - 05/31/2017 12:00
jacb6wq060817	WCT	06/08/2017 15:15 - 06/21/2017 19:00
jacb6wq062617	WCT	06/26/2017 13:30 - 07/10/2017 12:00
jacb6wq071017	WCT	07/20/2017 12:15 - 08/08/2017 13:15
jacb6wq080817	WCT	08/08/2017 13:30 - 09/07/2017 11:30
jacb6wq090717	WCT	09/07/2017 12:00 - 10/05/2017 10:30
jacb6wq100517	WCT	10/05/2017 11:00 - 11/01/2017 12:30
jacb6wq110117	WCT	11/01/2017 12:45 - 11/02/2017 13:45
jacb6wq110217	WCT	11/02/2017 14:30 - 11/27/2017 15:00
jacb6wq112717	WCT	11/27/2017 15:15 - 12/18/2017 11:15
jacb6wq121817	WCT	12/18/2017 11:45 - 01/11/2018 16:15

B9 (jacb9wq)

Because of differences in the ranges, accuracies, and resolutions of the two Temperature/Conductivity probes (CT2 (p/n 599871-01) and WCT (p/n 599827)), as well as the resistance of the sensors to fouling (the latter more so than the former), users of the data may wish to incorporate the following information (see Sensor Specification section) in their use and analysis of the data:

Deployment	sensor type	data range
jacb9wq122016	CT2	12/20/2016 12:15 – 01/19/2017 11:45
jacb9wq011917	CT2	01/19/2017 12:00 - 02/21/2017 14:30
jacb9wq022117	WCT	02/21/2017 14:45 - 03/29/2017 12:15
jacb9wq032917	WCT	03/29/2017 12:30 - 05/08/2017 10:15
jacb9wq050817	WCT	05/08/2017 10:30 - 06/06/2017 14:15
jacb9wq060617	WCT	06/06/2017 14:45 - 07/10/2017 12:30
jacb9wq071017	WCT	07/10/2017 12:45 - 08/09/2017 10:15
jacb9wq080917	WCT	08/09/2017 10:45 - 09/06/2017 12:45
jacb9wq090617	WCT	09/06/2017 13:15 - 10/03/2017 10:00
jacb9wq100317	WCT	10/03/2017 10:15 - 11/02/2017 15:30
jacb9wq110217	WCT	11/02/2017 15:45 - 11/29/2017 12:15
jacb9wq112917	WCT	11/29/2017 12:30 - 12/18/2017 11:30
jacb9wq121817	WCT	N/A- lost to ice

The wiper fell off sometime during the jacb9wq022117 (02/21/2017 14:45 -03/29/2017 12:15) deployment; data quality may have been impacted.

Anomalous SpCond/salinity data occurred at the following dates/times. It is believed that this may be biological in nature (algae or animal) impacting data during these times. These values have been marked -3 SCF CSM.

03/28/2017 16:30

05/30/2017 19:00-15
06/04/2017 12:15
07/24/2017 07:00
08/01/2017 13:00

An ice-event in late 2017 resulted in the stranding and ultimate loss of the b9wq121817 deployment, affecting data from 12/18/2017 11:45 through 12/31/2017 23:45

NE (jacnewq)

Because of differences in the ranges, accuracies, and resolutions of the two Temperature/Conductivity probes (CT2 (p/n 599871-01) and WCT (p/n 599827)), as well as the resistance of the sensors to fouling (the latter more so than the former), users of the data may wish to incorporate the following information (see Sensor Specification section) in their use and analysis of the data:

Deployment	sensor type	data range
jacnewq123116	CT2	12/31/2016 14:45 - 01/27/2017 10:00
jacnewq012717	WCT	01/27/2017 10:30 - 02/27/2017 10:45
jacnewq022717	WCT	02/27/2017 11:00 - 03/21/2017 12:00
jacnewq042417	WCT	04/24/2017 15:30 - 05/23/2017 15:15
jacnewq052317	WCT	05/23/2017 15:30 - 06/13/2017 16:00
jacnewq061317	WCT	06/13/2017 16:15 - 07/14/2017 12:45
jacnewq071417	WCT	07/14/2017 13:00 - 08/14/2017 08:45
jacnewq081417	WCT	08/14/2017 09:00 - 09/11/2017 15:00
jacnewq091117	WCT	09/11/2017 15:15 - 10/12/2017 12:45
jacnewq101217	WCT	10/12/2017 13:00 - 11/09/2017 09:15
jacnawq110917	WCT	11/09/2017 09:30 - 12/07/2017 12:00
jacnewq120717	WCT	12/07/2017 12:15 - 01/02/2018 11:45

Data from 01/01/2017 00:00 to 09/01/2017 15:30 is marked 1 GSM CWD for depth and 0 GSM CWD for other parameters. It was discovered that the brass cross-piece failed when the sonde was pulled. It was replaced with a titanium bolt when the sonde was pulled up. When the brass cross-piece failed the sonde may have dropped and sat a bit past the end of the pipe. The site is well-mixed (good current velocity, a number of pilings to agitate and mix the flowing water, etc.) other parameters should not have been impacted by the change in depth.

A skilletfish was discovered in the sonde guard on 02/27/18; a number of elevated Specific Conductivity, Salinity, and Turbidity values that did not fit the trend occurred during the jacnewq012717 deployment and were rejected assuming this fish caused blockage of the sensors (as were the SpCond-associated parameters: DO concentration and depth).

The wiper fell off sometime during the jacnewq022717 (02/27/2017 11:00 - 03/21/2017 12:00) deployment; data quality may have been impacted.

Anomalous SpCond/salinity data occurred at the following dates/times. It is believed that this may be biological in nature (algae or animal) impacting data during these times. These values have been marked -3 SCF CSM.

03/07/2017 11:00
03/09/2017 17:30
03/09/2017 17:45
03/17/2017 19:00

There is a period of missing data from 03/21/2017 to 04/24/2017 when the datasonde was removed and the station deactivated while the owners of the dock on which the deployment pipe is affixed had to make repairs to the structure.

BA (jacbawq)

Because of differences in the ranges, accuracies, and resolutions of the two Temperature/Conductivity probes (CT2 (p/n 599871-01) and WCT (p/n 599827)), as well as the resistance of the sensors to fouling (the latter more so than the former), users of the data may wish to incorporate the following information (see Sensor Specification section) in their use and analysis of the data:

Deployment	sensor type	data range
jacbawq123116	CT2	12/31/2016 14:00 - 01/26/2016 16:15
jacbawq012617	WCT	01/26/2017 16:30 - 02/23/2017 17:15
jacbawq022317	CT2	02/23/2017 17:30 - 03/30/2017 17:00
jacbawq033017	WCT	03/30/2017 17:15 - 05/04/2017 14:45
jacbawq050417	WCT	05/04/2017 15:00 - 06/02/2017 13:45
jacbawq060217	WCT	06/02/2017 14:00 - 06/29/2017 16:30
jacbawq062917	WCT	06/29/2017 16:45 - 07/27/2017 10:45
jacbawq072717	WCT	07/27/2017 11:00 - 08/25/2017 10:45
jacbawq082517	WCT	08/25/2017 11:00 - 09/21/2017 11:45
jacbawq092117	WCT	09/21/2017 12:00 - 10/16/2017 13:15
jacbawq101617	WCT	10/16/2017 13:45 - 11/09/2017 09:45
jacbawq110917	WCT	11/09/2017 10:15 - 12/07/2017 14:15
jacbawq120717	WCT	12/07/2017 14:45 - 01/02/2018 12:15

There are a number of depressed oxygen and elevated turbidity values in the annual dataset that may be due to general boat traffic (boats pass very closely to the sensors through the channel under the bridge), the location and activities at a nearby marina (large vessels moored in a very small and shallow basin, a large live-aboard houseboat moored approximately 80 meters from the sensor), and generally turbid and muddy waters that would likely be flagged as suspect or rejected at other open-water stations, but retained at this one as they may very well be real values, albeit anthropogenic.

Additionally, this site is often impacted by runoff and river flow from coastal storms and rain events (which were quite frequent in 2017).

On 06/02/2017 the cross-piece at the bottom of the pipe failed during deployment. The line tethered the datasonde was tied-off to approximate the end the pipe. Upon later review, it appears that the sonde was set a bit shallower (e.g.- up the pipe) than it had been during the previous deployment(s). This discrepancy in depth was noted (flagged) for the remainder of the annual dataset. Other parameters should not be impacted by this difference in depth as it is a well-mixed site.