North Carolina (NOC) NERR Water Quality Metadata
January 1.2011 – December 31, 2011
Latest Update: September 21, 2021

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-delimited format (.CDF) 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. All QA/QC by the Reserve are performed by Heather Wells and Byron Toothman.

3) Research objectives

Four long-term water quality monitoring stations have been established within the estuaries bordering Masonboro and Zeke's Islands of North Carolina's National Estuarine Research Reserve. Instruments are

deployed vertically at all sites except East Cribbings, which was anchored to the bottom for the majority of 2012. The East Cribbings site was converted to a vertical deployment structure on December 4, 2012. Measurements are taken at 15-minute intervals for approximately two to four week periods continuously throughout the year. Parameters measured include Depth, Temperature, Salinity, Specific Conductivity, pH, Dissolved Oxygen, and Turbidity. The goal is to assess short-term variability and long-term changes (i.e., localized impacts of seasonal storm events, inter-annual differences from rainfall, magnitude of climatic influence from El Nino/La Nina events, etc.) in estuarine water parameters within relatively pristine sites.

4) Research methods

The Estuarine Water Quality Monitoring Program began on March 2, 1992 at the Research Creek site of the Masonboro Island component. A second Masonboro Island site, Loosin Creek, was added on February 26, 2002. Data collection started on May 19, 1994 at the Zeke's Island component (East Cribbings site) and an additional site, Zeke's Basin, was added March 1, 2002. The procedures described below were instituted in June 1995 and thus do not cover data recorded previously.

Two data loggers are assigned to each of the four permanent monitoring stations and are generally not interchanged among sites unless malfunctions occur. Before each YSI 6600EDS is deployed, calibration and maintenance is performed following the manufacturer's instructions. Calibration standards are required for pH, turbidity and salinity; all other parameter calibrations are performed as described in the manual. Buffer solutions for a two-point pH calibration (pH 7 and 10) are purchased pre-made from a scientific supply house. The conductivity and turbidity standards are obtained from YSI. The optical dissolved oxygen probes (ROX) require membrane changes yearly unless scratches or malfunctions occur prior to that time. All sites have been monitored using ROX dissolved oxygen probes since 2009, prior to that time rapid pulse dissolved oxygen probes were used. The rapid pulse membranes were replaced prior to each deployment and allowed to equilibrate prior to calibration.

Data sondes are wrapped in a wet, white towel and placed in a cooler for transport to the site. Monitoring stations are accessed using a small boat equipped with an outboard motor. During deployment the weather conditions and tide stage are recorded in the field observation log. The water quality instrument is placed inside a locked PVC tube that is attached to a piling if vertical deployment, and a steel cage if anchored horizontally approximately (15cm off the bottom). Every 15 minutes measurements are taken for Temperature, Specific Conductance, Salinity, Dissolved oxygen saturation, Dissolved oxygen concentration, Depth, pH, and Turbidity. All data are recorded in Eastern Standard Time. Vertical deployment structures were utilized at Research Creek beginning in 2008-2009, at Loosin Creek in 2009, and at Zeke's Basin in August 2010.

At the end of the sample period the water quality instrument is exchanged with a freshly calibrated instrument and transported back to the laboratory wrapped in a wet, white towel. The weather and water quality measurements are again noted in the field observation log. The calibration drift and the effect of biofouling on the water quality instrument are documented by post-calibration protocols. The water quality data are then uploaded, and sent to CDMO for primary QAQC, and the instrument is cleaned and calibrated as noted previously.

A Sutron Sat-Link2 transmitter was installed at the Research Creek station on August 7, 2006, and at the Zeke's Basin station on November 3, 2008. Both transmit data to the NOAA GOES satellite, NESDIS ID #3B032698. 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.

5) Site location and character

The components of North Carolina's National Estuarine Research Reserve (from north to south) are: Currituck Banks, Rachel Carson, Masonboro Island, and Zeke's Island. They are located along the southeast Atlantic coast of the United States. Currently, only data from Masonboro Island and Zeke's Island components are transferred to the CDMO. The four monitoring sites are:

A. Research Creek, Masonboro Island
The first Masonboro Island site (formerly called Masonboro Island (MS)) is 0.72 km north east from the mouth of Whiskey Creek, and east of the Intracoastal Waterway (ICW), in a small navigable channel called Research Creek at 34°09'21.7" latitude and 77° 50'59.9" longitude. The site typically has a salinity range of 20-35 ppt and a tidal range that averages around 1.2 meters. The sole source of freshwater is rain and salinity values as little as 10 ppt have been recorded during periods of heavy rain. The creek bottom is characterized by sand and detritus based sediment with areas of soft mud with a depth ranging from 0.2 to 2.6 m. Spartina spp. marsh and dunes surround the site, which is relatively unimpacted by manmade perturbations and it is not accessible to road traffic. The site experiences minimal boat traffic.

B. Loosin Creek, Masonboro Island
The second Masonboro Island site (added in 2002) is 1.2 km east of the ICW, and 2.5 km south west of Masonboro Inlet, in a small navigable channel called Loosin Creek at 34° 10'20.0" latitude and 77° 49'58.1" longitude. The site generally has a salinity range of 22-35 ppt and a tidal range that averages 1.2 meters. The sole source of freshwater is rain and salinity values as little as 15 ppt have been recorded during periods of heavy rain. The creek bottom is characterized by sand and detritus based sediment with areas of soft mud with a depth ranging from 0.1 to 2.5 m. Spartina spp. marsh and dunes surround the site, which is relatively unimpacted by manmade perturbations and it is not accessible to road traffic. The site experiences minimal boat traffic.

C. East Cribbings, Zeke's Island
The first Zeke's Island site (formerly called Zeke's Island (ZI)) is located 1.8 km south of Federal Point boat launch in a tidal basin estuary at 33° 56'23.5" latitude and 77° 56'28.1" longitude. This site receives minimal freshwater input from leakage of the Cape Fear River through the 5.6 km rock jetty that separates the two bodies of water. The site typically has a salinity range of 15-33 ppt, although values as little as 10 ppt have been recorded. Tidal range averages 1.2 meters. Depth varies, but usually can be found to range from 0.5 to 2.7 meters. Bottom type substratum consists of large rocks ("the cribbings") with sand and detritus based sediment. There are no pollutants from land. Marsh and dunes surround the site. It is not accessible to road traffic but experiences minimal boat traffic.

D. Zeke's Basin, Zeke's Island
The second Zeke's Island site (added in 2002) is located 0.8 km south east of the Federal Point boat launch in a tidal basin estuary at 33° 57'17.0" latitude and 77° 56'6.0" longitude. This site receives minimal freshwater input from leakage of the Cape Fear River through the 5.6 km rock jetty that separates the two bodies of water The site has a characteristic salinity range of 12-30 ppt, but values below 10 ppt have been observed and are often associated with periods of heavy rainfall. Tidal range averages 1.2 meters. Depth varies, but typically it can be found to range from 0.1 to 1.8 meters. Bottom type substratum consists of sand and detritus based sediment with a layer of soft sulfuric mud. Marsh and dunes surround the site. It is not accessible to road traffic but experiences minimal boat traffic.

6) Data collection period

East Cribbings
Deployment date time Retrieval date time

12/13/2011	13:15	01/10/2012	11:45
01/10/2012	12:00	02/13/2012	13:45
02/03/2012	14:00	03/12/2012	11:00
03/12/2012	11:15	04/10/2012	12:45
04/10/2012	13:00	05/07/2012	10:45
05/07/2012	11:00	06/04/2012	10:45
06/04/2012	11:00	06/19/2012	10:30
06/19/2012	10:45	07/11/2012	15:45
07/11/2012	16:00	08/02/2012	11:00
08/02/2012	11:15	08/20/2012	12:45
08/20/2012	13:00	09/19/2012	12:30
09/19/2012	12:45	10/16/2012	11:00
10/16/2012	11:15	11/19/2012	13:30
11/19/2012	13:45	12/17/2012	13:30
12/17/2012	13:45	01/16/2013	13:15

Loosin Creek

Deployment date	time	Retrieval date	time
12/13/2011	12:00	01/10/2012	10:15
01/10/2012	10:30	02/14/2012	13:00
02/14/2012	13:15	03/13/2012	11:00
03/13/2012	11:15	04/10/2012	11:15
04/10/2012	11:45	05/08/2012	10:45
05/08/2012	11:00	06/13/2012	09:00
06/05/2012	09:15	06/19/2012	09:15
06/19/2012	09:30	07/11/2012	14:00
07/11/2012	14:15	08/02/2012	09:15
08/02/2012	09:30	08/20/2012	10:45
08/20/2012	11:00	09/19/2012	11:30
09/19/2012	11:45	10/17/2012	13:45
10/17/2011	14:15	11/20/2012	12:45
11/20/2012	13:00	12/17/2012	12:30
12/17/2012	12:45	01/10/2013	11:00

Research Creek

Deployment date	time	Retrieval date	time
12/13/2011	11:30	01/10/2012	09:45
01/10/2012	10:00	02/14/2012	10:30
02/14/2012	12:45	03/13/2012	10:45
03/13/2012	11:00	04/10/2012	11:00
04/10/2012	11:15	05/08/2012	11:00
05/08/2012	11:15	06/05/2012	08:15
06/05/2012	08:45	06/19/2012	08:45
06/19/2012	09:00	07/11/2012	14:30
07/11/2012	14:45	08/02/2012	09:00
08/02/2012	09:15	08/20/2012	11:15
08/20/2012	11:30	09/19/2012	10:00
09/19/2012	10:30	10/17/2012	13:15
10/17/2012	13:30	11/20/2012	11:45
11/20/2012	12:00	12/17/2012	1200
12/17/2012	12:15	01/16/2013	01:00

Zeke's Basin

Deployment date	time	Retrieval date	Time
12/13/2011	14:00	01/10/2011	12:00
01/10/2012	12:15	02/06/2012	10:30
02/06/2012	10:45	03/14/2012	13:30
03/14/2012	13:45	04/10/2012	13:00
04/10/2012	13:15	05/07/2012	11:00
05/07/2012	11:15	06/04/2012	11:00
06/04/2012	11:15	06/19/2012	11:00
06/19/2012	11:15	07/11/2012	16:00
07/11/2012	16:15	08/02/2012	11:15
08/02/2012	11:30	08/20/2012	13:00
08/20/2012	13:15	09/19/2012	12:45
09/19/2012	13:00	10/16/2012	11:15
10/16/2012	11:30	11/19/2012	13:00
11/19/2012	13:015	12/17/2012	13:45
12/17/2012	14:00	01/16/2013	13:30

7) Distribution

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

NERR water quality data and metadata can be obtained from the Research Coordinator at the individual NERR site (please see Principal Investigators and Contact Persons), from the Data Manager at the Centralized Data Management Office (please see personnel directory under the general information link on the CDMO home page) and online at the CDMO home page http://cdmo.baruch.sc.edu/. Data are available in text tab-delimited format.

8) Associated researchers and projects

As part of the SWMP core monitoring program, the North Carolina Reserve also collects weather data from a meteorological station located at the Research Creek monitoring site and water chemistry/nutrient data from all 4 of the water quality monitoring sites. These data may be correlated with the water quality data.

Additional research projects are ongoing and continually changing. Check with the Research Coordinator or other contact person for an updated list of research.

II. Physical Structure Descriptors

9) Sensor specifications – Include the parameter description, units, sensor type, model #, range of measurement, accuracy and resolution for each sensor for all measuring devices (6600, 6600 EDS, 6600 EDS V2, 6600 V2, or EXO). ***Specify if all of your sondes are the same model and have the same configuration. If not, detail how many of each model you have, what different sensor configurations you use, and where the different models/configurations are deployed.*** See the following example, ***update for your sondes/sensors***, and include the disclaimers below.

NOC NERR deployed only 6600EDS data sondes with ROX DO probes in identical configurations throughout 2012

YSI 6600EDS data sonde:
Parameter: Non-vented Level EDS-S
Units: meters
Sensor Type: Stainless steel strain gauge
Range: 0 to 10ft
Accuracy: +/- 0.06 ft (0.018 m)
Resolution: 0.001 ft (0.001 m)

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
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 (0-10m)
Units: meters
Sensor Type: Stainless steel strain guage
Range 0-30ft
Accuracy: +/- 0.06 ft (0.018m)
Resolution: 0.001 ft (0.001m)

Parameter: pH – bulb probe or EDS flat glass 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

Dissolved Oxygen Qualifier (Rapid Pulse / Clark type sensor):
The reliability of dissolved oxygen (DO) data collected with the rapid pulse / Clark type sensor after 96 hours post-deployment for non-EDS (Extended Deployment System) data sondes may be problematic due to fouling which forms on the DO probe membrane during some deployments (Wenner et al. 2001). Some Reserves utilize the YSI 6600 EDS data sondes, which increase DO accuracy and longevity by reducing the environmental effects of fouling. Optical DO probes have further improved data reliability. The user is therefore advised to consult the metadata for sensor type information and to exercise caution when utilizing rapid pulse / Clark type sensor DO data beyond the initial 96-hour time period. Potential drift is not always problematic for some uses of the data, i.e. periodicity analysis. It should also be noted that the amount of fouling is very site specific and that not all data are affected. If there are concerns about fouling impacts on DO data beyond any information documented in the metadata and/or QAQC flags/codes, please contact the Research Coordinator at the specific NERR site regarding site and seasonal variation in fouling of the DO sensor.

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 1.03 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.

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:
Research Creek	RC	nocrcwq

Loosin Creek	LC	noclcwq
East Cribbings	EC	nocecwq
Zeke's Basin	ZB	noczbwq

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

East Cribbings

Deployment Date m/d/y	depth (meters)	DO 1 (100% sat)	DO 2 (100% sat)	Sp Cond (50 mS/cm)	pH (7)	pH (10)	BP (mmHg)	turb (0 NTU)
01/10/2012	0.029	98.5	98.5	50.44	6.97	9.89	762.0	-0.5
02/03/2012	0.114	99.6	99.7	49.55	7.02	10.03	769.6	0.5
03/12/2012	0.080	100.4	100.3	50.09	6.90	9.95	765.8	-0.1
04/10/2012	-0.005	98.8	98.9	50.53	6.79	9.10	759.0	-0.8
05/07/2012	-0.087	99.2	99.3	51.67	6.95	9.91	752.3	0.1
06/04/2012	0.062	99.7	99.6	52.84	6.95	9.87	765.0	0.3
06/19/2012	0.023	99.8	99.8	48.68	6.94	9.70	761.2	-0.4
07/11/2012	-0.008	99.1	99.1	48.58	6.95	9.86	759.7	0.8
08/02/2012	0.031	99.2	99.2	50.62	7.38	10.09	762.0	1.9
08/20/2012	0.076	100.4	100.4	48.20	6.93	9.87	767.3	-2.4
09/19/2012	0.053	100.2	100.3	50.78	7.08	10.05	759.7	0.0
10/16/2012	0.033	100.3	100.4	52.11	6.93	9.90	762.0	0.2
11/19/2012	0.017	100.1	99.9	49.83	6.92	9.98	760.5	1.0
12/17/2012	0.154	100.8	100.7	50.98	7.05	10.03	770.4	-1.8

Loosin Creek

Deployment Date m/d/y	depth (meters)	DO 1 (100% sat)	DO 2 (100% sat)	Sp Cond (50 mS/cm)	pH (7)	pH (10)	BP (mmHg)	turb (0 NTU)
01/10/2012	0.062	100.8	100.8	49.86	6.97	9.90	764.3	1.3

02/14/2012	0.096	100.4	100.4	50.31	6.89	9.92	767.3	-0.1
03/13/2012	0.077	101.4	101.3	49.59	6.96	9.88	765.8	0.7
04/10/2012	-0.043	99.2	99.2	50.85	6.96	9.78	756.9	-0.2
05/08/2012	-0.016	99.8	99.9	30.18	7.10	9.85	759.0	24.3
06/05/2012	0.072	100.7	100.9	49.97	6.78	9.95	765.0	0.0
06/19/2012	0.000	101.0	101.0	49.74	6.70	9.54	764.3	0.9
07/11/2012	-0.002	100.3	100.1	50.97	6.95	9.84	759.7	0.7
08/02/2012	0.027	100.6	100.4	49.65	7.00	10.00	762.0	0.2
08/20/2012	0.072	98.9	98.9	48.55	6.85	9.41	767.3	0.0
09/19/2012	0.039	100.0	99.9	48.75	7.36	9.87	757.7	-0.1
10/17/2011	0.012	99.8	99.7	49.24	6.79	9.67	760.5	0.1
11/20/2012	0.008	101.3	101.3	50.74	7.09	10.08	760.5	1.3
12/17/2012	771.9	100.0	99.8	50.68	7.24	10.18	0.1	0.0

Research Creek

Deployment Date	depth	DO 1	DO 2	Sp Cond	pH	pH	BP	turb
m/d/y	(meters)	(100% sat)	(100% sat)	(50 mS/cm)	(7)	(10)	(mmHg)	(0 NTU)
01/10/2012	0.052	100.7	100.6	49.80	6.96	9.87	764.3	0.2
02/14/2012	0.093	100.1	100.1	49.59	6.91	9.88	767.3	1.2
03/13/2012	0.078	100.5	100.6	50.20	6.97	9.86	765.8	0.1
04/10/2012	-0.054	97.5	97.6	50.03	6.88	9.84	756.9	-1.2
05/08/2012	-0.110	99.1	99.2	32.10	7.01	8.13	759.0	1.1
06/05/2012	0.063	101.5	101.3	50.66	6.93	10.01	765.0	1.1
06/19/2012	0.038	99.2	99.1	50.82	6.84	9.78	764.3	-0.2
07/11/2012	-0.010	100.6	100.4	51.28	6.91	9.78	759.7	0.1
08/02/2012	0.035	100.7	100.6	47.82	6.83	9.41	762.0	1506.5
08/20/2012	0.065	100.1	99.9	44.68	6.81	9.41	717.8	-.01
09/19/2012	0.033	99.6	99.5	46.24	7.12	9.62	757.7	0.2
10/17/2012	0.014	100.0	99.0	48.89	6.98	9.97	760.5	0.8
11/20/2012	-0.002	102.6	102.6	50.37	7.00	9.01	760.5	0.2
12/17/2012	0.153	100.5	100.4	51.69	6.72	9.67	770.4	1.3

Zeke's Basin

Deployment Date	depth	DO 1	DO 2	Sp Cond	pH	pH	BP	turb
m/d/y	(meters)	(100%sat)	(100% sat)	(50mS/cm)	(7)	(10)	(mmHg)	(0 NTU)
01/10/2012	0.080	101.4	101.1	49.67	6.85	9.60	765.8	-0.9
02/06/2012	0.072	100.2	100.2	49.57	6.98	9.85	765.8	-0.4
03/14/2012	0.117	101.2	101.4	49.88	7.02	9.79	765.8	-0.1
04/10/2012	-0.027	99.8	99.8	50.65	7.05	9.81	759.7	-1.1
05/07/2012	-0.087	99.2	99.3	47.86	7.74	10.00	752.3	-3.0
06/04/2012	0.063	101.5	101.3	49.66	7.03	10.09	765.0	-0.3
06/19/2012	0.062	100.3	100.5	51.85	7.04	10.02	764.3	-1.5
07/11/2012	-0.008	99.4	99.5	50.24	7.09	10.04	759.7	-0.4
08/02/2012	*	*	*	*	*	*	*	*
08/20/2012	0.085	99.0	99.0	43.20	6.94	9.77	767.3	-2.3
09/19/2012	0.074	98.8	98.2	50.22	6.96	9.58	759.7	0.0
10/16/2012	0.046	101.5	101.5	14.50	7.08	9.98	762.0	-0.2

11/19/2012	-0.005	102.3	102.4	49.86	6.77	9.77	760.5	-0.1
12/17/2012	0.156	100.9	100.9	50.94	6.95	9.88	770.4	0.0

*Post calibration info not saved properly following the 08/02/12 deployment

14) Other remarks/notes

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. Any NANs in the dataset stand for "not a number" and are the result of low power, disconnected wires, or out of range readings. If additional information on missing data is needed, contact the Research Coordinator at the reserve submitting the data.

Storm Events
September 2012, over 3 inches of rain fell in the first 8 days of this month, with the majority ~2 inches on September 5. There was a noticeable drop in salinity/conductivity around and after this time.

Hurricanes and Tropical Storms that affected stations:
Tropical Storm Alberto – May 18th – 22nd Wind, light rain, small storm surge.
Hurricane Sandy – October 28th Small storm surge, wind, light rain.

November 17-19, 2012. A strong thunderstorm brought torrential rains and strong winds.

For all data
Disjunct data areas resulting from new deployments were flagged as <1> (CND).

Temperature affected measurements (SpCond/Salinity, pH) were rejected anytime the temperature sensor was affected by out of water events (pronounced change in temp values during extreme low tide readings).

Data affected by low tide were coded (CLT). Lower salinity and SpCond was addressed with <1> (CLT) due to the probability of fresher surface waters being measured as the water level decreased. Salinities approching zero or less were addressed as <-3> [GOW] (CLT) and affected data were also rejected accordingly.

All depth data corresponding to rejected or suspect SpCond/Salinity data (due to low tide) was also rejected <-3> [SOW] (CLT) or flagged as suspect <1>[SOW](CLT). Depth sensor is located above CT sensor and will be exposed when SpCond approaches 0.0. It is possible that some probes are still in the water during out of water events. The vertical orientation of the sondes means that shorter probes (pH, C/T) will be affected before longer probes (DO, turbidity).

All negative depth flagged and rejected <-3> [SOW] (CLT) unless affected by barometric pressure and coded as suspect <1>[SNV](CAP).

Fluctuations in SpCond/Salinity values around and following 11/19/12 may be a result of heavy rains in the area on 11/17-11/18/12.

Dissolved oxygen concentrations <3mg/L was coded <0> (CDA) along with corresponding values for DO% during hypoxic events.

Increased turbidity readings occurred throughout many deployments with unknown causes and were coded as such:

<-3> [STS] (CSM) = rejected turbidity spike >1000
<1> [STS] (CSM) = Suspect turbidity spike <1000

Small negative turbidity values <-2 NTU were flagged as suspect, <1> (CAF).

East Cribbings

General

This site is within a shallow lagoonal system and the sonde is subject to out of water events, especially at spring low tides. Deployment structure was switched to vertical deployment on 12/04/12.

Battery failure and no data collected 11/14 – 11/19/12.

Out of water events are described in Depth section.

Depth

Out of water events occurred and resulted in rejected or suspect data in the following deployments: 03/12/12, 06/19/12, 09/19/12 and 11/19/12.

09/19/12 deployment, the location of the sonde may have shifted slightly, resulting in disjunct depth readings. The East Cribbing deployment structure was set up using a buoy and cinder block. Shifts in the cinder block on the bottom may cause changes in depth. When this occurred the depth data is marked 1 GSM CWD and other parameters are marked 0 GSM CWD. EC is well-mixed so unless otherwise noted other parameters do not appear to be impacted.

11/19/12 deployment, out of water events began during low tides on 11/25/12. Data was flagged as suspect or rejected during these events. These continued until the sonde was moved to a vertical deployment structure on 12/04/12 at 13:15.

Sonde was deployed from a vertical piling beginning 12/04/12. Previous data was impacted by the potentially mobile deployment structure. Prior to the installation, the instrument could be moved by the tide and experienced frequent out of water events though it was anchored.

SpCond/Salinity

Immediately prior to and following out of water events, low SpCond/Salinity values are often observed. These values are outliers from the norm but may be measuring a fresh water lens as the probes are approaching the surface. These values were retained but flagged as suspect. This occurred mid-March, mid June through July and late November/early December of 2012.

SpCond/salinity data from 2/12 10:30 through 2/13 13:45 are considered suspect, the probe was heavily fouled with algae on the sonde and probes.

05/07/12 deployment, SpCond/Salinity was slightly outside of acceptable range in post calibration. Data appear to fit conditions but was flagged as suspect due to post cal values, flagged as <1> [SPC] (CDF).

06/04/12 deployment, SpCond/salinity. The probe calibrated and post calibrated within acceptable range with acceptable slope. It was noted on field data sheet that there was algae present on the deployment structure and mud within the guard. It may be that anoxic conditions affected data.

08/20/12 deployment, SpCond/Salinity was slightly outside of acceptable range in post calibration. Data appear to fit conditions but may have been slightly elevated for the entire deployment. Data was flagged as suspect <1> [SPC] (CSM).

10/16/12 deployment, SpCond/Salinity was slightly outside of acceptable range in post calibration. Data appear to fit conditions but was flagged as suspect <1> [SPC] (CSM).

Dissolved Oxygen

Dissolved oxygen data can be quite variable. These cycles often correlate with tidal fluctuation, and may be accentuated by presence of drift algae (*Gracilaria*).

Values above 100% saturation are not uncommon and values above 200% may occur during warmer months. These reflect conditions at the site, occurring at the same time as elevated pH values and data were retained (unless affected by out of water events, potentially driven by *Gracilaria* presence). Data was not flagged as suspect though some of the upper limits for percent saturation were surpassed. We will be working towards flagging these data in the future.

01/10/12 deployment, dissolved oxygen dropped to zero then negative values (beginning on 02/05/12). The negative data was rejected and it unknown is the cause of the malfunction was due to hypoxic conditions due to the presence of algae. The remaining data during this time was flagged as suspect since it is unclear if the probe was functioning properly. The dissolved oxygen post calibration value was within acceptable range.

Around 3/08/12, dissolved oxygen levels decreased through the remainder of the deployment. This data was flagged as suspect, though the probe passed post calibration with acceptable values.

05/07/12 deployment, dissolved oxygen values dropped below 3 mg/L periodically. The probe passed post calibration with acceptable ranges and data was retained.

06/04/12 deployment, SpCond/salinity. The probe calibrated and post calibrated within acceptable range with acceptable slope. It was noted on field data sheet that there was algae present on the deployment structure and mud within the guard. It may be that anoxic conditions affected data.

08/02/12 deployment, dissolved oxygen values may have been altered due to the loose turbidity wiper and algal presence. Turbidity and pH values were rejected from 08/13/23:45 through the end of the deployment. During this time, dissolved oxygen was elevated during rising and high tides and a bit decreased during falling/low tides. The variability seemed to increase during this time so dissolved oxygen values were flagged as suspect due to wiper malfunction and biofouling. This probe passed post calibration with acceptable values.

pH

01/10/12 deployment had elevated pH (>8.5). The probe passed post calibration and had acceptable slope. These may also correlate to elevated turbidity and potential presence of drift algae. Algae were documented as being present on the deployment structure at the time of sonde retrieval and some algae was caught in the wiper assembly.

4/10/12 deployment may have had a probe malfunction. Values began to drift lower around 4/26/12, correlating with a drop in SpCond/Salinity. Though this may not be the exact time that probe began to malfunction, pH data was marked as suspect from 4/25/12 through the end of deployment. This probe failed to pass the post calibration and was discarded following this deployment because it failed to calibrate properly following reconditioning procedures.

05/07/12 deployment, pH values were variable and decreased at the same time as dissolved oxygen decreases. Turbidity values were also elevated and rejected during this time. Values for pH were retained but may have been affected by silt or mud exposure mid deployment.

06/04/12 deployment, pH values were lower than the deployments before and after. The probe calibrated and post calibrated within acceptable range with acceptable slope. It was noted on field data sheet that there was algae present on the deployment structure and mud within the guard. It may be that anoxic conditions affected pH.

06/19/12 deployment, pH values were slightly outside of acceptable range for post calibration in the 10 standard. Slope was still acceptable and the data was flagged as suspect, appear to fit conditions for the site.

08/02/12 deployment, pH values were outside of acceptable range for pH 7 and slope during the post calibration. The entire deployment could be marked as suspect for this factor but there were additional factors to consider as well. pH may have been affected by a loose wiper on the turbidity probe as well. On 08/13/12 at 11:15, turbidity values increased and pH values increased. From this point through 08/14/12 0:00 values were flagged as suspect. From 08/14/12 through the end of the deployment pH values were rejected.

Disjunct pH data between 11/19/12 and 12/17/12 deployments. Both deployments had acceptable ranges for pH post calibration and slope values. Data was not flagged.

Turbidity

01/01/12 – 01/10/12 data was rejected due to turbidity probe failing post calibration.

01/10/12 deployment had large sections of turbidity data were considered suspect or rejected, potentially due to drift algae. When the sonde was retrieved from the field, drift algae (*Gracilaria*) was caught in the wiper assembly.

02/13/12 deployment also experienced elevated turbidity values. Macro algae was caught in the wiper assembly again upon sonde retrieval. Several turbidity values were flagged as suspect or rejected from 01/12 7:00 through 02/13 13:45.

05/07/12 deployment, turbidity spikes were flagged suspect intermittently during the first portion of the deployment. Extended periods of elevated turbidity were rejected or flagged as suspect from 05/13 – 05/18/12 and intermittently until 05/27/12. On 05/27/12, turbidity values dropped to zero then remained at -1 through the end of deployment. Cause of probe malfunction is unknown and the probe passed post calibration and functioned normally following deployment. Negative readings were rejected and low values immediately before were flagged as suspect.

06/04/12 deployment, turbidity readings were elevated for much of the deployment. Many values were rejected or flagged as suspect from 06/08/12 through the end of the deployment. There was algae and mud in both the sonde structure and guard that potentially impacted data. Additionally, the turbidity wiper was not parked correctly.

07/11/12 deployment, elevated turbidity values were flagged as suspect beginning 7/28/12. Values continued to increase and were rejected from 7/30/12 through the end of deployment. Upon retrieval, this sonde had crabs inside the guard and heavy algal and mud fouling.

08/02/12 deployment, wiper was loose but still attached to turbidity probe upon sonde retrieval.. Values were elevated sporadically during beginning of deployment and flagged as suspect or rejected. Beginning 08/13/12 around 11:15 values remained elevated and from this point through the end of deployment were rejected. Dissolved oxygen and pH values were also flagged during this time.

08/20/12 deployment, turbidity values were low during the post calibration, outside of acceptable range. Values for the entire deployment may have been slightly higher than those reported. Data was

flagged as suspect <1> [SPC] (CSM) for the entire deployment, unless a turbidity spike, which was flagged as suspect or rejected.

10/16/12 deployment, elevated turbidity values were flagged as suspect intermittently initially, then continuously beginning 10/27/12. Values continued to increase and were rejected from 10/29/12 23:00 through 10/30/12 16:00. Additional values of elevated turbidity were flagged as suspect or rejected. Beginning 11/08/12, elvated values appeared with more frequency and data was rejected through the remainder of the deployment.

12/17/12 deployment, elevated turbidity values were flagged as suspect from 12/26 – 12/30/12. This sensor passed post calibration with acceptable values.

Loosin Creek

General

This site typically has low turbidity values, occasionally these values approach zero and fit conditions of the site. Negative one readings were retained and marked as (CAF), acceptable calibration/accuracy error of the sensor.

Missing data due to sonde swap: 04/10/12 11:30 and 10/17/12 14:00.

Out of water events are described in Depth section.

Depth

Out of water events occurred and resulted in rejected or suspect data in the following deployments: 01/10/12 (on 02/12/12 5:00) and 02/14/12 (on 03/09/12 13:45-15:30).

Due to the rejection of SpCond/Salinity, the depth and dissolved oxygen parameters were also rejected due to QAQC protocols for 06/03/12 - 06/05/12.

SpCond/Salinity

01/01/12 – 01/10/12 SpCond/Salinity probe was slightly outside of acceptable post calibration values. Data was flagged as suspect.

Over one inch of rain fell on January 11, 2012. This may have caused a slight dip in salinity following this event. Data was not flagged.

01/13/12 5:00 and 5:15 showed a dip in salinity during low tide. There may have been some stratification and sensors may be measuring a fresh water lens as approaching the surface. These values were retained but flagged as suspect, low tide. It appears that all sensors were still in the water. (Depth readings at this time were suspect due to changes in barometric pressure).

Rainfall in the area on May 14 and May 17, 2012 may have contributed to a dip in salinity occurring from May 17-19, 2012.

05/08/12 deployment, post calibration values were outside of acceptable range and the probes were heavily fouled. The wiper was not fully functional upon sonde retrieval. Fouling likely occurred following unusually heavy precipitation and records from 06/03/12 21:30 through the end of deployment were rejected. Due to the rejection of SpCond, the dissolved oxygen and depth parameters were also rejected due to QAQC protocols.

Rainfall occurred in the beginning of September (over 3 inches by Sept 8th), resulting in a noticeable drop in salinity/specific conductance. This data was retained and accurately represents the rainfall pulse. However, there was disjunct data between the end of this deployment and the next

deployment. Not sure where we will draw the line for potentially suspect data since the same pattern was present at RC. (no data currently flagged)

Dissolved Oxygen
January through June deployments had dissolved oxygen dips correlating with tidal cycles. These records were retained.

05/08/12 deployment had extensive biofouling (affecting data mid deployment). Though this probe passed post calibration within acceptable range, the membrane was scratched and replaced after deployment. Data was retained and seems to fit conditions for the site for the majority of the deployment. SpCond/Salinity data was rejected for 06/03-06/05/12, and QAQC procedures require the rejection of dissolved oxygen and depth parameters.

pH
03/13/12 deployment had pH values dips during high tide. These records were retained.

04/10/12 deployment, the first value recorded was a little low, the sensor may have still been equilibrating. pH value was flagged a <1> (CND).

05/08/12 deployment had disjunct values between deployments and this probe failed to pass post calibration. The wiper was not fully functional upon retrieval, and biofouling growth on the sonde may have adversely affected data. All data for this deployment was flagged as suspect though early portions of the deployment may have reflected conditions for the site.

06/19/12 deployment, probe failed post calibration with low values and slope was out of range.

08/02/12 deployment, readings seem elevated, post calibration okay and data retained.

08/20/12 deployment, probe failed post calibration and slope was low. Data was flagged as suspect and values were lower than average.

09/19/12 deployment, probe failed post calibration and slope was low. Data was flagged as suspect and but values seem to fit conditions for the site.

10/17/12 deployment, probe measured slightly low during post calibration in both standards and slope was just outside of acceptable range. pH values for the entire deployment were flagged as suspect.

Turbidity
01/01/12 – 01/10/12 deployment may have been calibrated using a contaminated standard. All turbidity values from this deployment were rejected.

05/08/12 deployment, wipers did not function properly upon sonde retrieval due to fouling. This probe did not pass post calibration within acceptable range. Values for turbidity began to look noisy and elevated around 5/20/12 and were marked as suspect due to probe failing post calibration and biofouling. Spikes during this time were rejected.

06/05/12 and 06/19/12 deployments, periods of elevated turbidity readings were flagged as suspect or rejected.

09/19/12 deployment, elevated turbidity values began on 9/23/12 sporadically and were flagged as suspect or rejected. Beginning 10/01/12 data remained elevated and frequently was outside the upper reporting limit of the sensor. All data from this point through the end of the deployment was rejected. There was algae present on the wiper impacting data throughout this time period.

10/18/12 and 11/20/12 deployment, elevated turbidity values were flagged as suspect or rejected.

Research Creek

General

Battery failures resulted in missing data: 03/12/12 – 03/13/12 and 11/05/12 – 11/20/12

Missing due to sonde swap: 06/05/12 8:30 and 09/19/12 10:15.

Out of water events are described in Depth section.

Depth

02/14/12, depth data was marked <1> [GSM] (CWD), with other parameters marked <0> [GSM] (CWD). We are unsure of what caused this change in depth but DO and pH were also impacted by whatever change occurred at the station.

02/24/12, short period of negative depth readings though probes appear to be in the water. Data was flagged as suspect, <1> [SNV] (CAP).

07/11/12 – 07/22/12, depth was 0.4m higher in the tube during this time period. We are unsure of the cause of this issue. Depth data are marked <1> [GSM] (CWD) and other parameters are marked <0> [GSM] (CWD).

08/28/12 – 09/19/12, SpCond/Salinity was outside of acceptable range for post calibration and probes were heavily fouled upon sonde retrieval. Data QAQC procedures require that dissolved oxygen and depth are also flagged as suspect.

09/19/12 deployment, SpCond/Salinity was outside of acceptable range for post calibration and probes were heavily fouled upon sonde retrieval. Data QAQC procedures require that dissolved oxygen and depth are also flagged as suspect, beginning 09/28/12 through 10/17/12.

11/20/12 12:00, the first reading for the deployment indicates that the sonde had not reached bottom of deployment tube at time of reading. Data flagged as suspect.

SpCond/Salinity

Immediately prior and following out of water events, low SpCond/Salinity values are often observed. These values are outliers from the norm but may be measuring a fresh water lens as the probes are approaching the surface. These values were retained but flagged as suspect and occurred on 03/09/12.

02/15/12 8:00-8:30, 02/24-02/25/12 and 03/08/12 14:00 recorded dips in salinity during low tide. There may have been some stratification and sensors may be measuring a fresh water lens as approaching the surface. These values were retained but flagged as suspect, low tide. It appears that all sensors were still in the water.

During the 04/12/12 deployment, elevated values were observed. Since the post calibration was within acceptable range, data was not flagged.

05/08/12 deployment failed post calibration for SpCond/Salinity. This sonde was heavily fouled when retrieved from the field. There is more variation in the range of salinities reported beginning around 05/30/12. Data from this point through the end of the deployment was flagged as suspect.

During the 06/15/12 deployment, elevated values were observed. Since the post calibration was within acceptable range, data was not flagged.

08/02/12 and 08/20/12 deployments, SpCond/Salinity was outside of acceptable range for post calibration. It was slightly lower than surrounding deployments. The affected data was flagged as suspect.

08/28/12 – 09/19/12 flagged as suspect. SpCond/Salinity was outside of acceptable range for post calibration and probes were heavily fouled upon sonde retrieval.

09/19/12 deployment, SpCond/Salinity was outside of acceptable range for post calibration and probes were heavily fouled upon sonde retrieval. Data was flagged as suspect beginning 09/28/12 through 10/17/12.

10/17/12 deployment, SpCond/Salinity passed post cal but values seemed elevated prior to 10/29/12. The data for the entire deployment was flagged as suspect due to elevated values and the age of the probe. This area experienced approximately 2 inches of rain on Oct 27-28, 2012 which may have contributed to the decreased values recorded around 10/29/12.

12/17/12 deployment, SpCond/Salinity was just outside of acceptable range during post calibration. This was the same probe as the one from 10/17/12 deployment, and data was flagged as suspect.

Dissolved Oxygen
Dissolved oxygen dips occur often, correlated with tidal cycles. These records were retained.

02/24/12 - 02/25/12 Dissolved oxygen dipped during low tide, data was retained and flagged <0> (CLT).

08/10/12 - 8/20/12 Dissolved oxygen sensor began malfunctioning, perhaps related to turbidity probe malfunctions. Data was flagged as suspect <1> [SSM] (CDF) when values fit conditions for the site and was rejected <-3> [SSM] (CDF) as values periodically dropped to zero.

11/22/12 16:00 dissolved oxygen values dropped to zero for one reading then resumed values near 100% saturation. The zero reading was rejected due to a sensor malfunction the remainder of the deployment fit conditions for the site.

pH
02/24-02/25/12 pH dipped during low tide, data was retained and flagged <0> (CLT).

05/08/12 deployment, failed post calibration in pH 10 and slope was not within acceptable range. This sonde was heavily fouled upon retrieval, but there is no clear area to flag for drift. This deployment also was disjunct with the values from the previous deployment, so all records for pH in this deployment were flagged as suspect.

08/02/12 deployment, pH failed post calibration and slope was low. Data for the entire deployment was flagged as suspect.

08/20/12 deployment, pH failed post calibration and slope was outside of acceptable range. Data was flagged as suspect beginning 8/28/12 and rejected after 9/08/12. The probes were heavily fouled upon sonde retrieval.

09/19/12 deployment, pH failed post calibration and slope was outside of acceptable range. Data for the entire deployment was flagged as suspect.

11/20/12 deployment, pH failed post calibration in the 10 standard and slope was outside acceptable range. Data for the beginning of the deployment was flagged as suspect due to post calibration failure. Beginning 12/03/12 pH values began to drop and suspect flag was used with sensor drift comment. Data from 12/08/12 through the end of the deployment was rejected due to sensor drift.

12/17/12 deployment, pH failed post calibration with values lower than standards and the slope outside of acceptable range. Data was flagged as suspect for the entire deployment.

Turbidity
03/13/12 deployment, elevated values were flagged as suspect on 04/09/12, cause unknown.

08/10/12 – 08/20/12 turbidity probe malfunctioned with values above the upper limit of the sensor. This probe failed post calibration and data was rejected due to sensor malfunction. This malfunction may have also affected the dissolved oxygen sensor as it malfunctioned at the same time.

Zeke's Basin
General
This site is within a shallow lagoonal system and the sonde is subject to our of water events, especially at spring low tides.

Post calibration data for 08/02/12 deployment was not saved properly and consequently was lost. All data transitioned relatively seamlessly between deployments so post calibration was assumed to be adequate. Data was retained.

Battery failures: 01/28/12 – 02/06/12, 03/03/12 – 03/14/12,

Missing data: 09/12/2012 17:30 Cause unknown. Surrounding data appear to be good.

Out of water events are described in Depth section.

Depth

Out of water events occurred and resulted in rejected or suspect data in the following deployments: 04/10/12, 05/07/12, 06/04/12 and 06/19/12.

The depth sensor was affected by changes in barometric pressure. This resulted in negative depth readings while the sensors were still in the water. These values were flagged as suspect <1> [SNV] (CAP).

SpCond/Salinity
Immediately prior and following out of water events, low SpCond/Salinity values are often observed. These values are outliers from the norm but may be measuring a fresh water lens as the probes are approaching the surface. These values were retained but flagged as suspect.

Sporadic temporary small dips in salinity at low tide are assumed to be lower salinity surface waters. Often these were associated with out of water events and may be coded as suspect, low tide <1> CLT or as suspect sensor out of water <1> [SOW] (CLT).

01/01/12 – 01/10/12 failed postcal. Conductivity was slightly elevated in the post calibration. Data appears to fit conditions for the site and was flagged as <1> [SPC] (CDF).

05/07/12 deployment, conductivity was slightly low in the post calibration. Data appears to fit conditions for the site and was flagged as <1> [SPC] (CDF). There was rain documented in the area

on May 14 and May 17, which may have contributed to the dips in SpCond/Salinity around May 18, 2012.

06/19/2012 deployment, SpCond/Salinity failed post calibration. Conductivity was slightly elevated in the post calibration. Data appears to fit conditions for the site and was flagged as <1> [SPC] (CDF).

10/27/2012 - 11/19/2012 SpCond/Salinity flagged as suspect. Post calibration failure due to Conductivity probe being fouled with mud and slow response time. Probe worked well once the sediment was removed.

Dissolved Oxygen

Especially during summer months, oxygen data can be quite variable. These cycles often correlate with tidal fluctuation and are likely driven by presence of drift algae (*Gracilaria*).

High values were recorded for dissolved oxygen, sometimes surpassing 200% saturation. These reflect conditions at the site, occurring at the same time as elevated pH values and data were retained (unless affected by out of water events, potentially driven by *Gracilaria* presence). Data was retained.

03/14/12 deployment begins to see very low dissolved oxygen concentration occurring at low tide. Data was retained as this pattern fits the summertime/warm water pattern for this site.

04/10/12 deployment, experienced dissolved oxygen dips towards the end of the deployment, correlating with tidal cycles. These records were retained.

05/07/12 , 06/04/12 and 06/19/12 deployments experienced dissolved oxygen dips, often correlated with the tidal cycles and pH fluctuations and were experienced at several other stations as well.

07/11/2012 18:45 - 07/21/2012 02:30 Flagged as suspect due to QAQC checks. Dissolved oxygen data are lower than expected for the conditions and jump between hypoxic and normal values erratically. Pre and post calibration data are acceptable. The cause may have been sediment around the end of the probe that was eventually cleared away by the wiper or a wave action. Some turbidity data also flagged similarly during this time for the same reason. During the same period, pH also dropped very low (6.7). It is possible that a thick raft of invasive *Gracilaria vermiculophylla* became wrapped round the deployment tube during this time and restricted water flow.

11/19/12 deployment, dissolved oxygen post calibration values were unacceptable and slope out of range. Data are congruent with pre and post deployment records and fit conditions for the site, flagged <1> [SPC] (CDF).

pH

01/01/12 – 01/10/12 data, pH post-cal unacceptable for standard 10, yet slope was acceptable. Data appear to fit conditions. Flagged suspect and coded <1> [SPC] (CDF).

01/10/12 deployment, pH post-cal unacceptable for standard 10 and slope was below acceptable range. Data was flagged as suspect and coded <1> [SPC] (CDF).

03/14/12 deployment, pH post cal value in standard pH10 was slightly outside of acceptable range. The data seem to fit conditions for the site and was retained but flagged as suspect <1> [SPC] (CDF), for the entire deployment.

04/10/12 deployment, pH post cal value in standard pH10 was slightly outside of acceptable range. The data seem to fit conditions for the site and was retained but flagged as suspect <1> [SPC] (CDF), for the entire deployment.

05/07/12 deployment, pH was elevated in the standard for pH7 during post calibration. Data appears to be slightly elevated for the entire deployment and was flagged as suspect, <1> [SPC] (CSM), for the deployment. The slope was also outside the acceptable range during post calibration.

06/19/12 deployment, pH post calibration values were within the acceptable range, but the slope value was low. Data was retained and flagged as <1> [SPC] (CSM).

08/02/12 deployment, post calibration not saved properly and data was lost. pH data was lower than adjacent deployments by pH=~0.3 and flagged as <1> [SPC] (CSM). The probe was reconditioned several times and repeatedly failed calibration.

08/20/12 deployment, post calibration outside acceptable range for pH 10. Data appeared to fit conditions and were flagged <1> [SPC] (CDF).

09/19/12 deployment, post calibration outside acceptable range for pH 10. Data appeared to fit conditions well and flagged <1> [SPC] (CDF).

11/19/12 deployment, pH postcal unacceptable and slope out of range. Data are congruent with pre and post deployment records and fir conditions for the site, flagged <1> [SPC] (CDF).

Turbidity

Periods of elevated turbidity values were crosschecked with weather data to determine if they were driven by weather. Turbidity at Zeke's Basin station is particularly sensitive to high or sustained winds due to winds during periods of low water and is a normal occurance.

04/10/12 deployment started with some elevated turbidity reading initially, then sporadically through the deployment. Elevated values were flagged as suspect or rejected.

05/17/12 deployment, had a post calibration for turbidity that was outside acceptable range. This may have been caused by a contaminated standard. Data from this deployment may reflect slightly lower values and was flagged as suspect, <1> [SPC] (CSM). Elevated values during this deployment were flagged as suspect or rejected.

06/19/12 deployment, turbidity was elevated beginning around 06/21/12. Turbidity values that were extremely high were rejected and most other records were flagged as suspect. The data remained noisy throughout the rest of the deployment. On 07/08/12, turbidity values reached zero and negative. These records were rejected due to sensor error. The reminder of the deployment was flagged as suspect or rejected due to possible sensor error or turbidity spikes.

07/14/12 18:15 - 07/25/2012 00:45 turbidity values were flagged as suspect due to QAQC checks, <1> [SQR] (CSM). Pre and post calibration data are acceptable. The cause may have been sediment around the end of the probe that was eventually cleared away by the wiper or a wave action. Some DO data also flagged during this time.

10/16/12 deployment, elevated turbidity values were flagged as suspect or rejected from 10/19-10/29/19.