

ACE Basin (ACE) National Estuarine Research Reserve Water Quality Metadata
January-December 2013 Report
Latest Update: 11/29/2021

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 with Windows 7 or newer operating system. Files are exported from EcoWatch in a comma-delimited format (.CDF), EcoWatch Lite in a comma separated file (CSV) or KOR Software in a comma separated file (CSV) 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. Amanda Fornal, Meghan Miller, and Saundra Upchurch were responsible for these tasks.

3) Research objectives

Long-term water quality monitoring in the ACE Basin provides a unique opportunity to increase understanding of how various environmental factors influence estuarine processes. The Reserve research staff has elected to compare water quality conditions in shallow creeks along a salinity gradient and at different levels of development. Based on discussions with local Coastal Zone Management (CZM) personnel and ACE Basin NERR staff knowledge of land use within the Reserve, the South Edisto River drainage basin was selected because it is well suited for studying contrasting hydrographic conditions and land use patterns.

The water quality monitoring program began on March 3, 1995 in two tributaries of the South Edisto River, Big Bay Creek and St. Pierre Creek; in October 2002, a monitoring station was established in Fishing Creek and in

Mosquito Creek, tributaries of the North Edisto River and of both the South Edisto and Ashepoo rivers, respectively. St. Pierre Creek and Fishing Creek are in areas where boat traffic is light and development is sparse, and the monitoring sites in these creeks are designated as "control" sites. In contrast, the two "treatment" monitoring sites are in Big Bay Creek and Mosquito Creek where boat traffic is moderate to heavy and residential and commercial development is medium to dense.

The four sites also are located along the salinity gradient in the South Edisto River watershed: Big Bay Creek and St. Pierre Creek are in the polyhaline zone (18-30 ppt), Mosquito Creek is in the mesohaline zone (5-18 ppt), and Fishing Creek is in the oligohaline zone. See *Section 5 - Site Location and Character* for detailed descriptions of the sites.

Initially, YSI electronic data loggers were deployed to monitor the water temperature, specific conductance, dissolved oxygen, water level, and pH conditions, approximately 0.5 meters above the creek bottom, at 15-minute intervals; on August 11, 1995, the sampling interval was changed to 30 minutes, and turbidity monitoring was added to the program on April 11, 1996. On December 12, 2007, the sampling interval was changed to 15 minutes.

4) Research methods

One data logger is deployed at each permanent monitoring station (Big Bay, St. Pierre, Fishing Creek, and Mosquito Creek). The data logger is attached to a deployment mount at each station to ensure that the sensor is positioned approximately 0.5 m from the creek bottom during a deployment. At each monitoring station, the deployment mount consists of a PVC pipe that is attached vertically to a stable structure. To facilitate water flow across the sensors, approximately two-inch diameter holes are drilled into the PVC pipes.

A Sutron Sat-Link2 transmitter was installed at the St. Pierre station on 06/28/2006 and transmits data to the NOAA GOES satellite, NESDIS ID #3b02f20a. The St. Pierre 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>.

To minimize fouling (i.e. settlement of barnacles and sponges) of data loggers, new sensors and sensor guards are wrapped in nonconductive copper tape. A plastic mesh is wrapped around the sensor guard to keep out large animals (i.e. crabs, fish); the mesh is coated with anti-fouling paint. In addition, fouling organisms are removed from the PVC deployment mounts during monthly inspections.

The YSI data loggers are deployed for one to two weeks during the summer months, and the sampling period is extended up to one month during the cooler months. A data logger is retrieved and replaced with a newly calibrated data logger prior to a 15-minute reading to prevent interruption of data collection. Swap data are collected by taking readings at the same time with the retrieved and newly deployed data logger to determine how much drift occurred during the previous deployment. A secondary field reading is taken from time to time with in-situ measurements to serve as a secondary check. After deploying the calibrated data logger, a water sample is collected from same depth as the sensor to measure several water quality parameters (water temperature, salinity, pH, dissolved oxygen [mg/l]). Water temperature, salinity, and pH are measured directly with a thermometer, refractometer, and hand-held pH meter, respectively, dissolved oxygen, expressed at mg/l, is determined with a field Winkler titration kit. Water depth and meteorological conditions (i.e. precipitation and wind speed and direction) also are recorded. The in-situ measurements are used to determine if the sensor readings drifted significantly during deployment and to evaluate anomalous oxygen readings (<28%).

When the data loggers are retrieved, they are taken to the laboratory for cleaning, post-deployment calibration checks and servicing, in accordance with guidelines set by YSI Operating and Service Manual. Upon returning to the laboratory, the data are downloaded, and the dataset is reviewed to determine if any equipment

malfunctions occurred during deployment that need immediate attention. Post-deployment calibration checks of all the parameters except turbidity are done before cleaning the data loggers. Turbidity checks are performed after cleaning the data loggers to prevent contamination of the standard. Sensors are immersed in the appropriate standard solutions (i.e. pH) and readings are recorded. A DO membrane integrity test also is conducted to determine if the membrane was damaged during deployment.

A series of diagnostic values, including dissolved oxygen charge, dissolved oxygen gain, and pH millivolt value at pH 7 and at pH 10, are recorded during calibration and post-deployment calibration checks of data loggers. These diagnostic values are strong indicators of the individual sensor performance, and they are used to determine the accuracy of the data.

Before the data loggers are deployed dissolved oxygen (DO) membranes are changed and allowed to stretch for 24 hours, and the voltage of the batteries are checked. Next, the pH, conductivity, and turbidity sensors are calibrated, using the following standards: pH 7 and 10, 50 mS/cm potassium chloride solution, and 0 and 123 NTU solutions, respectively. The water level sensor is zeroed in air, and the barometric pressure in the laboratory is recorded. Before leaving the laboratory the following day, the DO sensor is calibrated in air-saturated water at the barometric pressure reading within the lab in mmHg. In addition to the procedures outlined in the CDMO manual, we conduct a DO membrane integrity test prior to deployment to determine if the membrane was installed properly or was damaged during calibration.

5) Site location and character

ACE Basin National Estuarine Research Reserve is one of the largest undeveloped estuaries on the East Coast. The study area encompasses the Ashepoo, Combahee and South Edisto River basins, which empty into St. Helena Sound. The NERR consists of approximately 60,702 ha (150,000 acres) of diverse estuarine wetlands providing preserved habitats for fish and wildlife.

The South Edisto River has a drainage area of approximately 394,176 ha (974,030 ac), encompassing the area between Four Holes Swamp and St. Helena Sound. The river receives considerable input of freshwater (average annual streamflow is 74 m³/s, 2613.29 ft³/sec)). The official saltwater-freshwater demarcation line on the river lies at river mile 20 (32.19 km); however, during periods of very low flow, the saltwater interface can intrude to river mile 32 (51.5 km), which is approximately 12 river miles (19.31 km) from the inland boundary of the reserve. Salt marshes of smooth cordgrass (*Spartina alterniflora*) dominate the wetlands in the polyhaline and mesohaline, while waterfowl impoundments are the dominant land cover in the oligohaline and limnetic waters.

The average tidal range in the South Edisto River is approximately 2.0 m (6.6 ft), with a maximum of 2.8 m (9.2 ft) and a minimum of 1.4 m (4.6 ft). The bottom habitat at all stations consists of mud which is intermixed with dead shell hash at the saltwater sites.

Station Code	SWMP Status	Station Name	Location	Active Dates	Reason Decommissioned	Notes
acebbwq	P	Big Bay	32.4941 N -80.3241 W	03/01/1995 00:00 - current	NA	NA
acefcwq	P	Fishing Creek	32.63593 N -80.36556 W	10/01/2002 00:00 - current	NA	NA
acemcwq	P	Mosquito Creek	32.5558 N -80.4380 W	10/01/2002 00:00 - current	NA	NA
acespwq	P	St. Pierre	32.52800 N -80.36144 W	03/01/1995 00:00 - current	NA	NA
acercwq	P	Rock Creek	32.54850 N -80.50361 W	03/01/1996 00:00 - 05/01/1996 00:00	see Rock Creek description	NA

Primary Monitoring Stations

Three of the four primary stations (Edisto Island, Fishing Creek, and St. Pierre Creek) are in tributaries of the South Edisto River and one station (Mosquito Creek) is in a tributary of both the South Edisto and Ashepoo rivers. The descriptions of the sites are as follow:

Big Bay (BB) - GPS coordinates: 32.4941 N and -80.3241 W

This monitoring station is in Big Bay Creek proper, approximately 2 km (1.24 mi) from the mouth of the creek and is located about 5 m (16.41 ft) from the southern bank of the creek. In 2013, the mean depth at the station was 2.74 m (8.99 ft), and the mean salinity was 29.3 parts per thousand (ppt).

This monitoring station was in Big Bay Creek proper, approximately 2 km (1.24 mi) from the mouth of the creek and was located about 5 m (16.41 ft) from the southern bank of the creek. It was a "treatment" site because it was subject to nonpoint source pollution and was surrounded by moderate level of development. The southern bank of the Big Bay Creek near this station was bordered by residential and commercial development, with little setback from the bordering *Spartina alterniflora* marsh. For instance, there are over forty private docks, two commercial seafood docks and a marina with 75 slips, three paved boat ramps, and two fueling areas along the southern bank. Docks and bulkheads are constructed of concrete, or creosote, CCA-treated or Wolmanized material. Boat traffic was heavy, especially during the warmer months, and the creek is closed to shellfish harvesting because of the surrounding human activities. The major sources of nonpoint source pollution were surface runoff from lawns, golf courses, and paved ramps that contain fertilizers, pesticides, herbicides and PAHs. All of the high ground along the southern bank was developed (i.e., residential homes, condominiums and restaurants); and maritime plant communities have been replaced by golf courses, lawns and ornamental gardens. Small patches of a few maritime species (i.e. live oak (*Quercus virginiana*), cabbage palmetto (*Sabal palmetto*), and Southern red cedar (*Juniperus silicicola*)) are found along the roads. In contrast, the northern bank was bordered by a wide expanse of *Spartina alterniflora* marsh, and no high ground is present. American oyster (*Crassostrea virginica*) forms a reef along the creek banks, especially the northern side, and on intertidal mud flats within the creek. The site was moved to Edisto Island due to the dock upon which it was located was owned by a private individual that was not maintaining the structure. Water quality data was collected at both stations for 8 months and the overall results were very similar.

Fishing Creek (FC) – GPS coordinates: 32.6358 N and -80.3655 W

This monitoring station is in a tributary of Fishing Creek, approximately 2 km (1.08 nautical miles) from the mouth of the creek and is located approximately 5 m (16.41 ft) from the northern bank of the creek. The tributary flows through the eastern half of Jehossee Island, a Wildlife Management Area (WMA) protected by the USFWS, and Fishing Creek forms the northeast border of the island. The station is surrounded by extensive *Spartina cynosuroides* marsh and vast mud flats. The upland area is characterized by slash pine, live oak, and cabbage palmetto. In 2013, the mean depth at the station was 2.49 m (8.17 ft), and the mean salinity was 7.8 parts per thousand (ppt).

Fishing Creek monitoring station is designated as a "control" site because there is no development in the immediate area, and boat traffic is relatively light in the creek. The WMA contains impoundments (formerly rice fields) that are managed as wildlife habitat for endangered fauna and migratory waterfowl. No pesticides or herbicides are applied to the wetlands. Water level in the wetland is regulated by rice trunks that control the flow of water between the impoundment and the South Edisto River.

Mosquito Creek (MC) – GPS coordinates: 32.5558 N and -80.4380 W

This monitoring station is in Mosquito Creek (a tributary of both the South Edisto and Ashepoo rivers), approximately 2.51 km (1.36 nautical miles) from the Ashepoo River and 12 km (6.48 nautical miles) from the South Edisto River, and it is approximately 5 m (16.41 ft) from the southern bank of the creek. In 2013, the mean depth at the station was 3.70 m (12.14 ft), and the mean salinity was 14.3 parts per thousand (ppt).

Mosquito Creek station is designated as a "treatment" site because of the land use practices in the surrounding area. Agriculture fields and impounded wetlands are found upstream of the monitoring station. Approximately fifteen docks constructed of creosote, concrete, Wolmanized or CCA treated wood; a public boat landing; a commercial seafood business with commercial shrimp boats and a fueling dock are located approximately 1.00 km (0.54 nautical miles) downstream of the monitoring station. The major contributor of nonpoint source pollution to the monitoring station is surface runoff from the impoundments and agricultural lands that contain high levels of nutrients and, at times, herbicides and pesticides. Impoundment trunks open and drain into the creek increasing the nutrient load and possibly introducing herbicides and pesticides. Vegetation in the area includes salt marsh

dominated by *Spartina alterniflora* and *Juncus roemerianus*. Upland fringe areas consist of cabbage palmetto, live oaks and pine trees.

St. Pierre Creek (SP) - GPS coordinates: 32.52800 N and -80.36144 W

This monitoring station is in a small tributary of St. Pierre Creek, approximately 0.25 km (0.13 nautical miles) from the mouth of the creek, and it is approximately 5 m (16.41 ft) from the northern bank of the creek. The tributary flows through the southern portion of Bailey Island, and the creek forms the eastern border of the island. The monitoring station is surrounded by a wide expanse of *Spartina alterniflora* marsh. Extensive mud flats and oyster reefs fringe the banks. Maritime forest communities comprised of species such as wax myrtles (*Morella cerifera*), live oaks (*Quercus virginiana*), and palmettos dominate the upland areas. In 2013, the mean depth at the station was 2.24 m (7.35 ft), and the mean salinity was 27.4 parts per thousand (ppt).

The St. Pierre Creek station is designated as a “control” site because development in the immediate area was sparse when the station was established on March 3, 1995, and the tributary is subject to relatively light boat traffic. In 1996, the 695-acre island was sold, and the owners partnered with The Nature Conservancy to design a conservation-based development. Four hundred and three acres in the center of Bailey Island were set aside as a nature preserve that is managed by The Nature Conservancy, and the number of residential lots on the remaining 292 acres is limited to 67. Access to the island is limited to one bridge and all roads on the island are single lane and made of crushed seashells. In addition, a conservation manual was developed for the property owners that provide specific lot designs and construction guidelines as well as landscaping guidelines to protect the maritime and estuarine habitats.

Inactive Monitoring Stations

Rock Creek is an inactive station, and the description of the site is as follows:

The Rock Creek site was located near an impoundment on North Hutchinson Island. The site was surrounded by *Spartina alterniflora* marsh, and the upland areas were dominated by maritime forest with wax myrtles, live oaks, and palmettos. An impoundment (a managed wildlife habitat) bordered the *Spartina alterniflora* marsh near the site, and the outlet canal for the impoundment was about one meter away from the site. There was no development and very little boat traffic in this portion of the Reserve. The site was discontinued due to the loss of the deployment mount and data logger in July 1995.

6) Data collection period

Big Bay

BEGAN	ENDED	SONDE
12/12/2012 – 12:15	01/09/2013 – 10:45	6600 EDS
01/09/2013 – 11:00	02/06/2013 – 09:30	6600 EDS
02/06/2013 – 09:45	03/13/2013 – 12:00	6600 EDS
03/13/2013 – 12:15	04/10/2013 – 11:15	6600 EDS
04/10/2013 – 11:30	04/24/2013 – 11:30	6600 EDS
04/24/2013 – 11:45	05/08/2013 – 10:45	6600 EDS
05/08/2013 – 11:00	05/22/2013 – 11:00	6600 EDS
05/22/2013 – 11:15	06/05/2013 – 11:45	6600 EDS
06/05/2013 – 12:00	06/18/2013 – 11:00	6600 EDS
06/18/2013 – 11:15	07/10/2013 – 11:45	6600 EDS
07/10/2013 – 12:00	07/24/2013 – 10:15	EXO2
07/24/2013 – 10:30	08/07/2013 – 12:15	6600 EDS
08/07/2013 – 12:30	08/22/2013 – 10:30	EXO2
08/22/2013 – 10:45	09/04/2013 – 10:45	6600 EDS
09/04/2013 – 11:00	09/18/2013 – 10:15	6600 EDS
09/18/2013 – 10:30	10/16/2013 – 10:30	6600 EDS
10/16/2013 – 10:45	11/20/2013 – 11:45	EXO2

11/20/2013 – 12:00	12/18/2013 – 12:45	6600 EDS
12/18/2013 – 13:00	01/15/2014 – 12:30	EXO2

Fishing Creek

BEGAN	ENDED	SONDE
12/12/2012 – 13:00	01/09/2013 – 11:45	6600 EDS
01/09/2013 – 12:00	02/06/2013 – 10:15	6600 EDS
02/06/2013 – 10:30	03/13/2013 – 13:00	6600 EDS
03/13/2013 – 13:15	04/10/2013 – 12:15	6600 EDS
04/10/2013 – 12:30	04/24/2013 – 13:15	6600 EDS
04/24/2013 – 13:30	05/08/2013 – 11:45	6600 EDS
05/08/2013 – 12:00	05/22/2013 – 10:00	6600 EDS
05/22/2013 – 10:15	06/05/2013 – 13:00	6600 EDS
06/05/2013 – 13:15	06/18/2013 – 09:30	6600 EDS
06/18/2013 – 09:45	07/10/2013 – 13:00	6600 EDS
07/10/2013 – 13:15	07/24/2013 – 11:15	6600 EDS
07/24/2013 – 11:30	08/07/2013 – 13:00	6600 EDS
08/07/2013 – 13:15	08/22/2013 – 11:30	6600 EDS
08/22/2013 – 11:45	09/04/2013 – 11:45	6600 EDS
09/04/2013 – 12:00	09/18/2013 – 11:00	6600 EDS
09/18/2013 – 11:15	10/16/2013 – 11:15	6600 EDS
10/16/2013 – 11:30	11/20/2013 – 14:30	6600 EDS
11/20/2013 – 14:45	12/18/2013 – 14:00	6600 EDS
12/18/2013 – 14:15	01/15/2014 – 12:30	6600 EDS

Mosquito Creek

BEGAN	ENDED	SONDE
12/12/2012 – 14:00	01/09/2013 – 12:30	6600 EDS
01/09/2013 – 12:45	02/06/2013 – 11:15	6600 EDS
02/06/2013 – 11:30	03/13/2013 – 14:00	6600 EDS
03/13/2013 – 14:15	04/10/2013 – 13:15	6600 EDS
04/10/2013 – 13:30	04/24/2013 – 15:00	6600 EDS
04/24/2013 – 15:15	05/08/2013 – 12:30	6600 EDS
05/08/2013 – 12:45	05/22/2013 – 09:15	6600 EDS
05/22/2013 – 09:30	06/05/2013 – 13:45	6600 EDS
06/05/2013 – 14:00	06/18/2013 – 12:00	6600 EDS
06/18/2013 – 12:15	07/10/2013 – 14:00	6600 EDS
07/10/2013 – 14:15	07/24/2013 – 12:00	EXO2
07/24/2013 – 12:15	08/07/2013 – 14:00	6600 EDS
08/07/2013 – 14:15	08/22/2013 – 13:30	EXO2
08/22/2013 – 13:45	09/04/2013 – 13:00	6600 EDS
09/04/2013 – 13:15	09/18/2013 – 12:15	EXO2
09/18/2013 – 12:30	10/16/2013 – 12:15	6600 EDS
10/16/2013 – 12:30	11/20/2013 – 12:30	6600 EDS
11/20/2013 – 12:45	12/18/2013 – 15:00	6600 EDS
12/18/2013 – 15:15	01/15/2014 – 11:00	6600 EDS

St. Pierre

BEGAN	ENDED	SONDE
12/12/2012 – 11:45	01/09/2013 – 10:15	6600 EDS
01/09/2013 – 10:30	02/06/2013 – 08:30	6600 EDS
02/06/2013 – 08:45	03/11/2013 – 11:15	6600 EDS
03/11/2013 – 11:30	04/10/2013 – 10:45	6600 EDS

04/10/2013 – 11:00	04/24/2013 – 10:00	6600 EDS
04/24/2013 – 10:15	05/08/2013 – 10:15	6600 EDS
05/08/2013 – 10:30	05/22/2013 – 10:45	6600 EDS
05/22/2013 – 11:00	06/05/2013 – 11:00	6600 EDS
06/05/2013 – 11:15	06/18/2013 – 10:15	6600 EDS
06/18/2013 – 10:30	07/10/2013 – 11:00	6600 EDS
07/10/2013 – 11:15	07/24/2013 – 09:30	6600 EDS
07/24/2013 – 09:45	08/07/2013 – 11:30	6600 EDS
08/07/2013 – 11:45	08/22/2013 – 11:00	6600 EDS
08/22/2013 – 11:15	09/04/2013 – 11:00	6600 EDS
09/04/2013 – 11:15	09/18/2013 – 09:30	6600 EDS
09/18/2013 – 09:45	10/16/2013 – 09:45	6600 EDS
10/16/2013 – 10:00	11/20/2013 – 11:00	6600EDS
11/20/2013 – 11:15	12/18/2013 – 11:45	6600EDS
12/18/2013 – 12:00	01/15/2014 – 11:30	6600EDS

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 2021.

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

Dr. Charles Wenner of SCDNR/Marine Resources Research Institute received funding through the National Marine Fisheries Service in January of 2001 to continue an ongoing survey of red drum (*Sciaenops ocellatus*) in the South Edisto and Combahee River basins, by electrofishing in tidal freshwater and low salinity brackish water. Although red drum is the target species, all species are identified, measured and weighed.

As part of the System-wide Monitoring Program (SWMP), nutrient and weather data are gathered at the ACE NERR in conjunction with water quality data obtained by YSI 6600-EDS or YSI EXO2 data loggers. Diel nutrient samples are gathered once per month at the St. Pierre water quality monitoring station, and grab samples are obtained at each of the four sites once per month. The concentrations of the following parameters are measured and recorded for the nutrient monitoring program: ammonium (NH₄), nitrite + nitrate (NO₂ + NO₃), ortho-phosphate (PO₄), and chlorophyll-A (Chl-a). Real-time weather data are gathered 24/7 and is transmitted to the Centralized Data Management Office (CDMO). Historic water quality, nutrient, and weather data can be

obtained at <http://cdmo.baruch.sc.edu>. Information about other studies conducted in the ACE Basin may be obtained from the Research Coordinator.

II. Physical Structure Descriptors

9) Sensor specifications

In 2013, ACE NERR deployed mainly 6600 EDS/V2 data sondes at the four sites (Big Bay [BB], Fishing Creek [FC], Mosquito Creek [MC], and St. Pierre [SP]). EXO2 data sondes were deployed four times at BB site (July 10, August 7, October 16 and December 18 deployments) and two times at the MC site (July 10 and August 7 deployments). All 6600 and EXO2 data sondes were configured the same, except with respect to the type of DO sensor: Rapid-pulse DO sensors were installed on the 6600 sondes and the optical DO sensors on the EXO2 sondes.

YSI 6600EDS/V2 data sonde:

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

Units: percent air saturation (%)

Sensor Type: Rapid Pulse - Clark type, polarographic

Model#: 6562

Range: 0 to 500% air saturation

Accuracy: 0-200% air saturation: +/- 2% of the reading or 2% air saturation, whichever is greater; 200 to 500% air saturation: +/- 6% of the reading

Resolution: 0.1% air saturation

Parameter: Dissolved Oxygen mg/L (Calculated from % air saturation, temperature, and salinity)

Units: milligrams/Liter (mg/L)

Sensor Type: Rapid Pulse - Clark type, polarographic

Model#: 6562

Range: 0 to 50 mg/L

Accuracy: 0 to 20 mg/L: +/- 2% of the reading or 0.2 mg/L, whichever is greater
20 to 50 mg/L: +/- 6% of the reading

Resolution: 0.01 mg/L

Parameter: Depth (non-vented level – medium)

Units: meters (m)

Sensor Type: 6600 integrated stainless steel strain gauge

Model#: 6600 EDS/V2

Range: 0 to 61 m

Accuracy: +/- 0.12 m

Resolution: 0.001 m

Parameter: pH – bulb probe

Units: pH units

Sensor Type: Glass combination electrode

Model#: 6561

Range: 0 to 14 units

Accuracy: +/- 0.2 units

Resolution: 0.01 units

Parameter: Turbidity

Units: nephelometric turbidity units (NTU)

Sensor Type: Optical, 90 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 EXO2 Sonde:

Parameter: Temperature

Units: Celsius (°C)

Sensor Type: Thermistor

Model#: 599870-01

Range: -5 to 50 °C

Accuracy: -5 to 35 °C: +/- 0.01 °C, 35 to 50 °C: +/- .005 °C

Resolution: 0.01 °C

Parameter: Conductivity

Units: milli-Siemens per cm (mS/cm)

Sensor Type: 4-electrode nickel cell with autoranging

Model#: 599870-01

Range: 0 to 200 mS/cm

Accuracy: 0 to 100 mS/cm: +/- 0.5% of reading or 0.001 mS/cm, whichever is greater

100 to 200 mS/cm: +/- 1% of reading

Resolution: 0.001 mS/cm to 0.1 mS/cm (range dependent)

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 or 0.1 ppt, whichever is greater

Resolution: 0.01 psu

Parameter: Dissolved Oxygen % saturation

Sensor Type: Optical, luminescence lifetime w/ mechanical cleaning

Model#: 599100-01; 599110 sensor cap

Range: 0 to 500% air saturation

Accuracy: 0 to 200% air saturation: $\pm 1\%$ of the reading or 1% air saturation, whichever is greater; 200 to 500% air saturation: $\pm 5\%$ of the 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, luminescence lifetime w/ mechanical cleaning

Model#: 599100-01; 599110 sensor cap

Range: 0 to 50 mg/L

Accuracy: 0 to 20 mg/L: ± 0.1 mg/L or 1% of the reading, whichever is greater

20 to 50 mg/L: $\pm 5\%$ of the reading

Resolution: 0.01 mg/L

Parameter: Depth (non-vented level – medium)

Units: meters (m)

Sensor Type: EXO2 integrated stainless steel strain gauge

Model#: 59950x-02 (EXO2 – medium)

Range: 0 to 100 m

Accuracy: $\pm 0.04\%$ FS (± 0.04 m)

Resolution: 0.001 m

Parameter: pH (unguarded)

Units: pH units

Sensor Type: Glass combination electrode

Model#: 599702 (wiped); 599795-02 module

Range: 0 to 14 units

Accuracy: ± 0.01 units within $\pm 10^\circ$ of calibration temperature, ± 0.02 units for entire temperature range

Resolution: 0.01 units

Parameter: Turbidity

Units: nephelometric turbidity units (NTU), converted from 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 $\pm 2\%$ of reading (whichever is greater); 1000 to 4000 FNU $\pm 5\%$ of reading

Resolution: 0 to 999 FNU: 0.01 FNU, 1000 to 4000 FNU: 0.1 FNU

Parameter: pH (unguarded)

Units: pH units

Sensor Type: Glass combination electrode

Model#: 599702 (wiped); 599795-02 module

Range: 0 to 14 units

Accuracy: ± 0.01 units within $\pm 10^\circ$ of calibration temperature, ± 0.02 units for entire temperature range

Resolution: 0.01 units

Parameter: Turbidity

Units: nephelometric turbidity units (NTU), converted from 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 $\pm 2\%$ of reading (whichever is greater); 1000 to 4000 FNU $\pm 5\%$ of reading

Resolution: 0 to 999 FNU: 0.01 FNU, 1000 to 4000 FNU: 0.1 FNU

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 they 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: $((1013-BP)*0.0102)+\text{Depth/Level} = \text{cDepth/cLevel}$.

Salinity Units Qualifier:

In 2013, EXO2 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 EXO2 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, EXO2 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 EXO2 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.

Chlorophyll Fluorescence Disclaimer:

YSI chlorophyll sensors (6025 or 599102-01) are designed to serve as a proxy for chlorophyll concentrations in the field for monitoring applications and complement traditional lab extraction methods; therefore, there are accuracy limitations associated with the data that are detailed in the YSI manual including interference from other fluorescent species, differences in calibration method, and effects of cell structure, particle size, organism type, temperature, and light on sensor measurements.

10) Coded variable definitions

Sampling Station:	Sampling site code:	Station Code:
St. Pierre	SP	acespwq
Big Bay	BB	acebbwq
Fishing Creek	FC	acefcwq
Mosquito Creek	MC	acemcwq

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

Probe Identification:

Standards for Calibration:

Turbidity 6136/599101-01 Probe

YSI 6073G Turbidity Standard
126 NTU

pH 6561/599702; 599795-02 Probe

RICCA CHEMICAL COMPANY LLC.
Buffer 7.00 and 10.00

Sp. Cond. 6560/599870-01 Probe

YSI 3169 Conductivity Calibrator 50 mS/cm +/- 1%

Big Bay

Post-Deployment Checks								
Deployment Date (m/d/y)	SpCond (ms/cm)	DO 1 (100% sat)	DO 2 (100% sat)	pH (7)	pH (10)	Turb (NTU)	Turb (NTU)	Depth (m)
12/12/2012	49.88	94	94.1	7.06	10.02	0.1	126.4	0.122
01/09/2013	50.55	101.7	101.7	7.07	10.02	0.2	127	0.007
02/06/2013	44.09	90	89.3	7.13	10.16	0.6	126.9	0.049
03/13/2013	50.5	101.7	101.3	7.13	10.14	0.4	127.9	-0.027
04/10/2013	50.4	101.6	101.6	7.09	10.06	0	126.5	0.034
04/24/2013	50.2	101	102.3	7.05	10.06	0.3	126.2	0.046
05/08/2013	50.66	96.6	94.6	7.11	10.05	0.1	125	-0.024
05/22/2013	49.85	101.1	98.3	7.05	10.05	0.1	126	-0.008
06/05/2013	50.01	99	99.2	7.12	10.04	0	126.9	-0.022
06/18/2013	50.28	103.5	103.5	7.19	9.53	0	125.8	-0.016
07/10/2013	49.84	97.7	97.7	7.18	10.16	-0.1	123	-0.062
07/24/2013	51.28	96.4	96.4	7.4	9.5	0.2	120.3	-0.015
08/07/2013	50.15	99.3	99.8	7.15	10.12	0.2	122.9	-0.002
08/22/2013	50.63	105.5	100.1	7.11	10.09	0	123.7	0.008
09/04/2013	50.67	100.8	100.8	7.09	10.14	0.7	125.1	0.025
09/18/2013	50.1	104.4	104	7.19	10.14	0.1	123.4	0.013
10/16/2013	50.05	100.5	100.4	7.07	10.05	1.1	123.1	1.488
11/20/2013	51.23	103.3	102.3	7.21	10.17	-0.4	124.1	0.129
12/18/2013	50.7	99.7	99.7	7.13	10.08	0.2	123	0.131

Fishing Creek

Post-Deployment Checks								
Deployment Date (m/d/y)	SpCond (ms/cm)	DO 1 (100% sat)	DO 2 (100% sat)	pH (7)	pH (10)	Turb (NTU)	Turb (NTU)	Depth (m)
12/12/2012	49.15	102.8	102.8	7.09	10.05	0	127.5	0.12
01/09/2013	50.45	98.6	98.5	7.2	10.14	-0.1	127.8	0.025
02/06/2013	51.01	109	103.7	7.19	10.24	0.4	126.5	0.049
03/13/2013	50.56	107.2	106.8	7.12	10.14	-0.2	128	-0.013
04/10/2013	50.32	101.7	101.9	7.12	10.11	0	127.7	0.038
04/24/2013	49.91	100.7	101.7	7.09	10.11	0.1	127.7	0.029
05/08/2013	51.03	101.6	101.2	7.17	10.15	0.2	125	-0.017
05/22/2013	49.44	101.1	101.1	6.99	10.01	0.1	125.3	-0.004
06/05/2013	50.63	100.8	100.8	7.07	10.04	0.1	126.3	-0.04
06/18/2013	49.91	106.1	107	7.02	10.01	0.3	125.7	-0.018
07/10/2013	50.33	99.2	99.1	7.01	10	0.4	124.3	-0.067
07/24/2013	49.98	103.5	103.4	7.02	9.99	-0.1	120.2	-0.006
08/07/2013	49.58	101.5	101.6	7.02	10.02	0.7	126.1	-0.013
08/22/2013	49.78	101.8	101.9	7.05	10.04	0	124.1	0.011
09/04/2013	50.08	101.2	101.2	7.07	10.13	0.6	125.7	0.015
09/18/2013	50.36	100.3	100.2	7.22	10.19	0.1	123	0.018
10/16/2013	51.1	95.1	95.3	7.01	10.01	1.5	125.4	0.129
11/20/2013	50.4	111.9	111.9	7.15	10.08	-0.3	124.2	0.124
12/18/2013	50.1	98	98	7.12	10.22	0.2	126.7	-0.003

Mosquito Creek

Post-Deployment Checks								
Deployment Date (m/d/y)	SpCond (ms/cm)	DO 1 (100% sat)	DO 2 (100% sat)	pH (7)	pH (10)	Turb (NTU)	Turb (NTU)	Depth (m)
12/12/2012	49.86	97.9	97.9	7.04	10.03	0.2	126.9	0.131
01/09/2013	50.23	103.1	103	7.11	10.05	0.5	129.4	0.025
02/06/2013	50.31	107.4	109	7.19	10.17	2.6	129.2	0.055
03/13/2013	50.29	102.8	103	7.06	10.1	0.2	128	-0.005
04/10/2013	50.15	103	102.7	7.16	10.13	0.6	127.6	0.04
04/24/2013	50.42	101.8	101.7	7.02	10.02	-0.2	127.2	0.043
05/08/2013	49.75	101.5	101.3	7.17	10.13	0.1	125	-0.019
05/22/2013	49.95	111	107.2	7.05	10.05	0	125.8	-0.012
06/05/2013	50.54	98.9	99.1	7.02	9.97	0	126.3	-0.03
06/18/2013	50.3	106.2	106.2	7.12	10.11	-14.3	61.6	-0.013
07/10/2013	49.28	99.2	99.8	7.14	10.13	0.1	123.1	-0.049
07/24/2013	50.41	104	104	7.19	10.18	0.1	120.7	-0.005
08/07/2013	50.21	99.4	99.4	7.06	10.04	0.4	123	0.002
08/22/2013	50.25	108.1	107.8	7.07	10.03	0	124	0.023
09/04/2013	840	101.1	101.2	7.13	10.15	0.1	123.1	0.04
09/18/2013	35.86	111.5	111.4	7.22	10.17	0.3	122.3	0.006
10/16/2013	50.4	101	101.4	7.29	9.69	0.5	126.6	0.154
11/20/2013	50.28	104.7	105.6	7.25	10.23	-0.5	124.2	0.135
12/18/2013	50.48	100.7	100.5	7.26	10.21	0.3	125.5	0.003

St. Pierre

Post-Deployment Checks								
Deployment Date (m/d/y)	SpCond (ms/cm)	DO 1 (100% sat)	DO 2 (100% sat)	pH (7)	pH (10)	Turb (NTU)	Turb (NTU)	Depth (m)
12/12/2012	49.26	84.7	84.8	7.12	10.12	0.2	127.6	0.131
01/09/2013	50.24	103	103.2	7.14	10.09	0.2	127.8	-0.017
02/06/2013	50.06	76.6	76.8	7.11	10.14	0.2	127	-0.064
03/11/2013	50	102.3	102.4	7.22	10.19	0.2	127.7	-0.182
04/10/2013	49.77	101.7	101.8	7.21	10.21	0	127.3	0.037
04/24/2013	49.78	100.8	101.5	7.16	10.21	0.3	126.7	-0.003
05/08/2013	50.7	90.7	90.6	7.21	10.19	0	125.3	-0.016
05/22/2013	50.15	101.4	101.3	7.15	10.16	0.3	126.1	-0.044
06/05/2013	50.5	99.6	99.9	7.11	10.09	0.2	126	-0.055
06/18/2013	49.89	100.4	100.4	7.15	10.11	0.3	125.3	-0.017
07/10/2013	49.82	98.1	98.8	7.16	10.18	0.4	125.2	-0.061
07/24/2013	50.63	103	103.2	7.18	10.15	0	120.3	-0.017
08/07/2013	48.49	99.2	99.2	7.12	10.12	0.8	125.4	-0.002
08/22/2013	50.44	102	102	7.2	10.13	0	124.3	-0.003
09/04/2013	47.27	93.8	93.7	7.13	10.17	0.3	124.8	0.032
09/18/2013	49.9	101.5	100.9	7.09	10.04	0.3	123.1	-0.007
10/16/2013	50.93	84	84	7.04	10.07	1.6	124.1	0.118
11/20/2013	51.46	100	101.4	7.37	10.33	-0.2	124.7	0.042
12/18/2013	50.4	99.1	99.1	7	9.98	0.4	125.3	0.016

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.

ACE NERR Water Quality Site Histories

Big Bay:

1995 - Big Bay water quality station was installed in **March** (Coordinates: 32.4941 N and -80.3241 W).
2001 - Big Bay site replaced in **October** due to old age and excessive biofouling of oysters (Coordinates changed: 32 29 38.72125 N 80 19 21.69864 W very accurate).
2003 - Big Bay site moved to a new location in **July** after embankment collapsed near data logger, causing sedimentation issues and poor data (Coordinates: 32.4941 N and 80.3241 W).
2005 - Big Bay site modified in **December**.
2009 - Big Bay site mount replaced in **January** (about 0.3 meters deeper).
2012 - Big Bay site PVC tube replaced on **June 1**.
2013 - Big Bay site PVC tube replaced in **August 20** - Fasteners used to attach tube to the piling.

Fishing Creek:

2002 - Fishing Creek site installed in **October** (Coordinates: 32.63593 N and -80.36556 W).
2009 - Fishing Creek site PVC tube replaced in **May** (Approximately 0.2 meters deeper).
2009 - Fishing Creek site destroyed in **October**.
2010 - Fishing Creek sign post mount was replaced in **January** with a 40-ft, 8-in diameter pressure-treated piling.
2012 - Fishing Creek site PVC tube replaced on **May 31** - Fasteners used to attach tube to the piling.
2013 - Fishing Creek site PVC tube replaced on **August 19** - Fasteners used to attach tube to the piling.

Mosquito Creek:

2002 - Mosquito Creek site installed in **October** (Coordinates: 32.5558 N and -80.4380 W).
2007 - Mosquito Creek mount installed 0.5 meters away from old mount in **August**. This is a deeper location.
2008 - Mosquito Creek site mount attached to original mount after new mount broke in **October** (about 0.2 meters shallower).
2008 - Mosquito Creek site mount was destroyed and repaired in **December** (about 0.2 meters shallower).
2009 - Mosquito Creek site mount moved due to demolition of old bridge and construction of new one at same location in **August** (about 0.2 meters deeper).
2012 - Mosquito Creek site PVC tube was leaning during **May 2** and **May 16** deployments.
2012 - Mosquito Creek site PVC tube replaced on **May 31** - Fasteners used to attach tube to the bridge.
2013 - Mosquito Creek site PVC tube replaced in **August 20** - Fasteners used to attach tube to the piling.

St. Pierre Creek:

1995 - St. Pierre water quality station was installed in **October** (Coordinates: 32.52800 N and -80.36144 W).
1997 - St. Pierre site moved away from bank in **February, March, and other times** due to sedimentation issues and biofouling readings.
2000 - St Pierre site moved to other side of channel and station modified in **April** (Coordinates changed: 32.5279 N -80.3615W).
2001 - St. Pierre station replaced in **September**.
2006 - St. Pierre station PVC replaced in **April**.
2006 - St Pierre sign post mount was replaced in **May** - with a 40-ft, 8-in diameter pressure-treated piling.
2006 - Sutron Sat-Link2 transmitter installed in **June** to transmit real-time data.
2009 - St. Pierre site PVC tube replaced in **June** (about 0.06 meters deeper).
2012 - St. Pierre site PVC tube replaced on **June 1** - Fasteners used to attach tube to the piling.
2013 - St. Pierre site PVC tube replaced on **August 20** - Fasteners used to attach tube to the piling.

Rock Creek:

1996 - Rock Creek water quality station was installed in **March** (Coordinates: 32.54850 N and -80.50361 W).
1996 - Rock Creek water quality station was vandalized in **July** and never replaced.

Blanket Statements: All Stations

Effect of Freshwater Input on Water Quality

Water quality at the SWMP sites are influenced by the river water level and streamflow rate in the South Edisto River at the USGS gauging station at Givhans Ferry. We observe a negative correlation between salinity and the river stage - significant salinity decreases when river crests above flood level (+10 feet) and salinity increases when the river level falls below 5 feet. The same negative correlation is observed between streamflow and salinity, regardless of the river stage - decreases in salinity when streamflow is above 15,000 ft³/sec and increases when streamflow is below 5,000 ft³/sec.

Effect of Significant Rain Events on Water Quality

Water quality at the SWMP sites are influenced by significant rain events during low tides. We observe dips in salinity and dissolved oxygen levels and spikes in turbidity during slack low tide at the sites.

Sonde Exchange In-Situ Readings

In-situ readings were collected by taking readings at the same time with the retrieved and newly deployed data logger attached to the same rope about 1 meter below the surface. The newly deployed sonde was then deployed within the PVC tube to begin taking readings. Around the end of August of 2012, a 600LS sonde was used for in-situ readings. The 600LS was positioned next to the PVC tube to collect a reading at the same time as the retrieved sonde and the newly deployed sonde.

Dissolved Oxygen Hypoxia Coding

Dissolved oxygen percent and mg/L readings are coded <0> (CDA) when a hypoxic event is recorded as (≤ 3 mg/L).

Turbidity Spike Coding

For YSI 6000 series sondes, turbidity values between 300 and 1000 NTU are coded <1> [STS]. These spikes are typically observed during low tides, max flood tides, and/or rain events.

Turbidity readings above 1000 NTU for YSI 6000 series sondes are rejected and are coded <-3> [STS]. These values are above the sensor specifications.

Turbidity Negative Readings Coding

Negative turbidity values are rejected and are coded <-3> [SNV]. These values are below the sensor specifications.

Wiper Brush Malfunctioning Coding

Wiper brush used to clean sensors during deployment was lost during some deployments. All post calibration checks were in the acceptable range. Values are flagged as <1> [SWM] or <-3> [SWM]. Any other data concerns that occurred during the deployment are listed under the appropriate parameter heading.

Significant Weather Events

The significant weather event data listed in the table below is from the National Hurricane Center administered by the National Oceanic and Atmospheric Administration (NOAA). All events listed are ones that have impacted the South Carolina Coast beginning in 2012. As the National Hurricane Center updates their information concerning the events this table will be updated to reflect that information.

Significant Weather Event	Date Started	Date Ended	Max Wind Speed
			NA

Data Editing/Flagging Notes: Organized by Station, Parameter, and Code

Big Bay

All Parameters Blanket Statement for Big Bay

All data collected from 11/26/2013 - 00:00 to 11/26/2013 - 01:15 during the November 20th deployment (11/20/2013 - 12:00 to 12/18/2013 - 12:45) were rejected due to erratic temperature values. Specific conductivity, salinity, DO % and DO mg/L values also were erratic during this time. Depth, pH and turbidity were within the range typically observed at this site. The cause for the erratic values is unknown but thought to be attributed to a sensor malfunction. The F-record is flagged {CSM}. The values are flagged as <-3> [SSM] (CSM) for temperature and <-3> [GQR] (CSM).

Rejected Data (<-3>)

Missing Data (Flag <-2>)

Suspect Data (Flag <1>)

The first record of the November 20th deployment (11/20/2013 - 12:00 to 12/18/2013 - 12:45) for all parameters were marked suspect due to a temperature dip. It is unknown the cause for this dip in value but thought to be attributed to acclimation of the sensor. All other parameters were within the range typically observed at this site. The values are flagged as <1> [GSM] (CND).

Passed Initial QAQC Checks <0>

Temperature

Rejected Data (Flag <-3>)

Missing Data (Flag <-2>)

Suspect Data (Flag <1>)

The data collected during the following deployments were suspect due to sensor malfunction. The temperature values were lower (0.5° Celsius) than those recorded by the other sonde assigned to this site. Based on QAQC evaluation, the lower values were not correct. The difference did not appear to affect the other parameters. The values are flagged as <1> [SSM] (CSM).

03/13/2013 - 12:15	to	04/10/2013 - 11:15	04/24/2013 - 11:45	to	05/08/2013 - 10:45
05/22/2013 - 11:15	to	06/05/2013 - 11:45	06/18/2013 - 11:15	to	07/10/2013 - 11:45
08/22/2013 - 10:45	to	09/04/2013 - 10:45	09/18/2013 - 10:30	to	10/16/2016 - 10:30
11/20/2013 - 12:15	to	12/18/2013 - 12:45			

Passed Initial QAQC Checks <0>

Specific Conductivity/Salinity

Rejected Data (Flag <-3>)

The data collected from 11/02/2013 - 09:45 to 11/20/2013 - 11:45 during the October 16th deployment (10/16/2013 - 10:45 to 11/20/2013 - 11:45) were rejected due to a sensor malfunction. The post-deployment check of 50.05 mS/cm was within the acceptable range of 47 - 53 mS/cm. The unusual fluctuations in the readings indicated a problem with the sensor. The values are flagged as <-3> [SSM] (CSM).

Missing Data (Flag <-2>)

Suspect Data (Flag <1>)

The data collected during the February 6 deployment (02/06/2013 - 09:45 to 03/13/2013 - 12:00) were suspect due to post calibration out of range. The post-deployment check of 44.09 mS/cm was outside of the acceptable range of 47 - 53 mS/cm. The data were not rejected because the readings were within the range typically observed at this site. The values are flagged as <1> [SPC] (CSM).

Passed Initial QAQC Checks <0>

DO Percent/mg/L

Rejected Data (Flag <-3>)

The data collected during the February 6 deployment (02/06/2013 - 09:45 to 03/13/2013 - 12:00) were rejected due to QAQC checks. The DO post-deployment check and the sensor diagnostics checks were acceptable. The data were rejected because the values were outside of the range typically observed at this site. There also was a 10% difference between the first DO (% air sat and mg/L) readings of this deployment and the last reading of the previous deployment. The values are flagged as <-3> [SQR] (CSM).

The DO mg/L data collected from 11/02/2013 - 09:45 to 11/20/2013 - 11:45 during the October 16th deployment (10/16/2013 - 10:45 to 11/20/2013 - 11:45) were rejected due to specific conductivity sensor malfunction. The specific conductivity values used to calculate DO mg/L were rejected due to unusual fluctuations in the readings. The values were within the acceptable range expected at this site. The values are flagged as <-3> [SCF] (CSM).

Missing Data (Flag <-2>)

Suspect Data (Flag <1>)

The data collected during the following deployments were suspect due to post-deployment sensor diagnostics out of range. The post-deployment DO charge was outside the acceptable range of 25 - 75, and the post calibration values were within the acceptable range of 90-110%. The values are flagged as <1> [SDG] (CSM).

05/22/2013 - 11:15 to 06/05/2013 - 11:45 (75.6)

08/22/2013 - 10:45 to 09/04/2013 - 10:45 (87.9)

The data collected during the September 18 deployment (09/18/2013 - 10:30 to 10/16/2013 - 10:30) were suspect due to sensor diagnostics. The pre-deployment DO charge of 77.8 and post-deployment DO charge of 80.3 were outside the acceptable range of 25 - 75, but the post-deployment check was acceptable. The data were not rejected because the values were within the range typically observed at this site. Also, the difference between the last reading of this deployment and the adjacent deployment reading were similar. The values are flagged as <1> [SDG] (CSM).

The data collected during the November 20 deployment (11/20/2013 - 12:00 to 12/18/2013 - 12:45) were suspect due to sensor diagnostics. The pre-deployment DO charge of 79.8 was outside the acceptable range of 25 - 75, but the post-deployment check and sensor diagnostics were acceptable. The data were not rejected due to the readings being within the range typically observed at this site, and the difference between the last reading of this deployment and the adjacent deployment reading were similar. The values are flagged as <1> [SDG] (CSM).

Passed Initial QAQC Checks <0>

Depth

Rejected Data (Flag <-3>)

The data collected from 8/12/2013 - 19:15 to 8/22/2013 - 10:30 during the August 7 deployment (08/07/2013 - 12:30 to 08/22/2013 - 10:30) were rejected due to biofouling. A worm was in the depth port when the sonde was retrieved, which caused lower than normal values and values that did not fluctuate normally during the tidal cycle indicating that the sensor was fouled. The values are flagged as <-3> [GSM] (CBF).

The data collected from 10/19/2013 - 14:15 to 11/20/2013 - 11:45 during the October 16 deployment (10/16/2013 - 10:45 to 11/20/2013 - 11:45) were rejected due to the post calibration out of range. The post-deployment check of 1.488 when the offset was 0.151 was not acceptable. There were also notes in the field log about mud in the

depth port which may have caused the depth readings to not fluctuate normally during the tidal cycle. The values are flagged as <-3> [SPC] (CSM).

Missing Data (Flag <-2>)

Suspect Data (Flag <1>)

The data collected from 10/16/2013 - 10:45 to 10/19/2013 - 14:00 during the October 16th deployment (10/16/2013 - 10:45 to 11/20/2013 - 11:45) were suspect due to post calibration out of range. The post-deployment check of 1.488 when the offset was 0.151 is not acceptable. The values collected were within the range typically observed at this site. Mud was found in the depth port, which could be the cause for the unacceptable post-deployment check. The values are flagged as <1> [SPC] (CSM).

Passed Initial QAQC Checks <0>

pH

Rejected Data (Flag <-3>)

The data collected from 12/16/2013 - 01:15 to 12/18/2013 - 12:45 during the November 20 deployment (11/20/2013 - 12:00 to 12/18/2013 - 12:45) were rejected to sensor drift. Post-deployment calibration checks were within the accepted ranges. The values during the last two days of the deployment started to drift upward, and the final reading of 8.1 was higher than the first reading of the next deployment (7.7). The reason for this upward trend in values is unknown. The values are flagged at <-3> [SSD] (CSM).

Missing Data (Flag <-2>)

Suspect Data (Flag <1>)

The data collected during the June 18 deployment (06/18/2013 - 11:15 to 07/10/2013 - 11:45) were suspect due to post calibration out of range. The post-deployment pH 10.00 check of 9.53 and pH slope of 131.8 are outside their acceptable ranges of 9.7 - 10.3 and ≥ 155 , respectively. Sea squirts were attached to the pH sensor when the sonde was retrieved. The readings were not rejected because the readings were within the range typically observed at this site. The values are flagged as <1> [SPC] (CSM).

The data collected during the July 24 deployment (07/24/2013 - 10:30 to 08/07/2013 - 12:15) were suspect due to post calibration out of range. The checks of 7.40 (pH 7.00), 9.50 (pH 10.00) and 118.2 for the pH slope are outside their accepted ranges of 6.7 - 7.3, 9.7 - 10.3 and ≥ 155 , respectively. Eggs were found on the pH sensor when the sonde was retrieved and may have contributed to the low pH slope reading. The readings were not rejected because the readings were within the range typically observed at this site. The values are flagged as <1> [SPC] (CSM).

Passed Initial QAQC Checks <0>

Turbidity

Rejected Data (Flag <-3>)

The data collected during the following time periods were rejected due biofouling. The post-deployment checks were within the acceptable range. The sustained elevated values above and near 100 are not typical for this site. The elevated values are thought to be caused by an accumulation of mud near the sensor. Values dropped with the deployment of a new sonde. The values are flagged as <-3> [GSM] (CBF).

01/06/2013 - 16:00 to 01/09/2013 - 10:45

04/29/2013 - 08:45 to 05/08/2013 - 10:45

Missing Data (Flag <-2>)

Suspect Data (Flag <1>)

The data collected from 04/06/2013 – 14:30 to 04/10/2013 – 11:15 during the March 13th deployment (03/13/2013 – 12:15 to 04/10/2013 – 11:15) were suspect due to biofouling. The presence of algae on the sensor caused the elevated readings. The values returned to normal with the deployment of a new sonde. The values are flagged as <1> [GSM] (CBF).

Passed Initial QAQC Checks <0>

Fishing Creek

All Parameters Blanket Statement for Fishing Creek

Rejected Data (Flag <-3>)

Missing Data (Flag <-2>)

Suspect Data (Flag <1>)

Passed Initial QAQC Checks <0>

Temperature

Rejected Data (Flag <-3>)

Missing Data (Flag <-2>)

Suspect Data (Flag <1>)

Passed Initial QAQC Checks <0>

Specific Conductivity/Salinity

Rejected Data (Flag <-3>)

Missing Data (Flag <-2>)

Suspect Data (Flag <1>)

Passed Initial QAQC Checks <0>

DO Percent/mg/L

Rejected Data (Flag <-3>)

Missing Data (Flag <-2>)

Suspect Data (Flag <1>)

The data collected during the March 13 deployment (03/13/2013 - 13:15 to 04/10/2013 - 12:15) were suspect due to sensor diagnostics. The pre/ post-deployment DO charge of 99.2 and 86.7, respectively, were outside the acceptable range of 25 - 75, but the post deployment check was acceptable. The data were not rejected due to the readings being within the range typically observed at this site, and there was no sensor drift. The values are flagged as <1> [SDG] (CSM).

The data collected from 05/08/2013 – 12:00 to 05/21/2013 – 03:45 during the May 8th deployment (05/08/2013 – 12:00 to 05/22/2013 – 10:00) were suspect due to sensor wiper malfunction. During the post-deployment check it

was noted that the wiper brush failed to park in the correct position affecting dissolved oxygen (% and mg/L), and turbidity. The values collected were within the range typically observed at this site. The values are flagged as <1> [SWM] (CSM).

The data collected during the following times were suspect due to sensor wiper malfunction. During the post-deployment check it was noted that the wiper brush failed to park in the correct position affecting dissolved oxygen (% and mg/L), pH and turbidity. The data collected were within the range typically observed at this site. The values are flagged as <1> [SWM] (CSM).

08/22/2013 – 11:45 to 09/04/2013 – 11:45

12/18/2013 – 14:15 to 12/31/2013 – 23:45

The data collected during the November 20 deployment (11/20/2013 - 14:45 to 12/18/2013 - 14:00) were suspect due to sensor out of range. The post-deployment check of 111.9 % was outside the acceptable range of 90 - 110%, but the sensor diagnostics were acceptable. The data were not rejected due to the readings being within the range typically observed at this site. The values are flagged as <1> [SPC] (CSM).

Passed Initial QAQC Checks <0>

Depth

Rejected Data (Flag <-3>)

Missing Data (Flag <-2>)

Suspect Data (Flag <1>)

Passed Initial QAQC Checks <0>

pH

Rejected Data (Flag <-3>)

The first pH record for the following deployments were rejected due to spikes in pH when the sonde was deployed. This is not typical; however, it is thought to be attributed to acclimation of the probe. The post deployment checks and sensor diagnostics were all within the acceptable ranges. The values are flagged as <-3> [GSM] (CND).

03/13/2013 - 13:15

04/10/2013 - 12:30

06/05/2013 - 13:15

07/24/2013 - 11:30

08/07/2013 - 13:15

Missing Data (Flag <-2>)

Suspect Data (Flag <1>)

The data collected during the December 18 deployment (12/18/2013- 14:15 to 01/15/2014 - 12:30) were suspect due to sensor diagnostics out of range. The pre-deployment pH slope of 151.2 was outside of the acceptable range of ≥ 155 , but the post-deployment pH checks were acceptable. The data were not rejected because the readings were within the range typically observed at the site. The values are flagged as <1> [SDG] (CSM).

Passed Initial QAQC Checks <0>

Turbidity

Rejected Data (Flag <-3>)

The data collected from 05/21/2013 – 04:00 to 05/22/2013 – 10:00 during the May 8th deployment (05/08/2013 – 12:00 to 05/22/2013 – 10:00) were rejected due to sensor wiper malfunction. During the post-deployment check it was noted that the wiper brush failed to park in the correct position affecting dissolved oxygen (% and mg/L), pH and turbidity. The sustained values near and above 100 were not typical for this site. The values are flagged as <-3> [SWM] (CSM).

The data collected during the following time periods were rejected due to biofouling. The post-deployment checks were within an acceptable range, and the wiper parked correctly (180° from the optics). However, the sustained values near and above 100 were not typical for this site and indicate biofouling. The values are flagged as <-3> [GSM] (CBF).

06/02/2013 - 02:00 to 06/05/2013 - 13:00

06/27/2013 - 03:00 to 07/10/2013 - 13:00

11/02/2013 - 00:30 to 11/20/2013 - 14:30

12/16/2013 - 06:30 to 12/18/2013 - 14:00

The data collected from 12/29/2013 – 03:00 to 12/31/2013 – 23:45 during the December 18th deployment (12/18/2013 – 14:15 to 01/15/2014 – 12:30) were rejected due to sensor wiper malfunction. During the post-deployment check it was noted that the wiper brush failed to park in the correct position affecting dissolved oxygen (% and mg/L), pH and turbidity. The sustained values near and above 100 were not typical for this site. The values are flagged as <-3> [SWM] (CSM).

Missing Data (Flag <-2>)

Suspect Data (Flag <1>)

The data collected from 04/05/2013 – 07:15 to 04/10/2013 – 12:15 during the March 13th deployment (03/13/2013 – 13:15 to 04/10/2013 – 12:15) were suspect due to biofouling. The presence of algae on the sensor caused the elevated readings. The values returned to normal with the deployment of a new sonde. The values are flagged as <1> [GSM] (CBF).

The data collected during the following times were suspect due to sensor wiper malfunction. During the post-deployment check, it was noted that the wiper brush failed to park in the correct position affecting dissolved oxygen (% and mg/L), pH and turbidity. The data collected were within the range typically observed at this site. The values are flagged as <1> [SWM] (CSM).

08/22/2013 – 11:45 to 09/04/2013 – 11:45

12/18/2013 – 14:15 to 12/29/2013 – 02:45

Passed Initial QAQC Checks <0>

Mosquito Creek

All Parameter Blanket Statement for Mosquito Creek

The data were collected at the wrong depth from 05/26/2013 – 16:45 to 06/05/2013 - 13:45. The post-deployment check for depth was within an acceptable range; however, the depth rose abruptly indicating the sonde was collecting at the wrong depth. The reason for the sonde moving up in the tube is currently unknown. However, this difference is not considered significant because the S. Edisto River and the creek are well-mixed systems and new tube was placed in the same thermocline. The site is well-mixed throughout the water column and the other parameters appeared to be within the range typically observed at the site; however, the deployment tube did not have holes in the area of the probes. The depth values are flagged as <1> (CWD), and the other parameters are flagged as <0> (CWD). The F_record is flagged {CSM}. Other data concerns that occurred during the deployment are listed under the appropriate parameter heading or in a blanket statement.

Rejected Data (Flag <-3>)

The data collected on 08/20/2013 from 13:30 to 13:45 during the August 7th deployment (08/07/2013 - 14:15 to 08/22/2013 - 13:30) was collected outside of the sonde tube due to equipment maintenance. The sonde was removed from the tube and out of the water while the old tube was replaced, and the sonde was re-deployed before the 14:00 reading. The values are flagged as <-3> [GMC] (CSM).

Missing Data (Flag <-2>)

Suspect Data (Flag <1>)

The first readings after the new tube was installed (08/20/2018 - 14:00) during the August 7th deployment (08/07/2013 - 14:15 to 08/20/2013 - 13:30) were suspect due to in-field maintenance/cleaning. The same sonde was deployed before and after the old tube was replaced with a new tube. The readings were within the range typically observed at this site. The values are flagged as <1> [GSM] (CMC).

Passed Initial QAQC Checks <0>

Temperature

Rejected Data (Flag <-3>)

Missing Data (Flag <-2>)

Suspect Data (Flag <1>)

Passed Initial QAQC Checks <0>

Specific Conductivity/Salinity

Rejected Data (Flag <-3>)

The data collected from 09/16/2013 - 02:30 to 09/18/2013 - 12:15 during the September 4th deployment (09/04/2013 - 13:15 to 09/18/2013 - 12:15) were rejected due to sensor malfunction. The post-deployment check of 840.0 mS/cm was outside the acceptable range of 47 - 53 mS/cm. The data were rejected because the readings were over 100 psu which is well outside the range typically observed at this site. The sensor was sent to YSI and then retired. The values are flagged as <-3> [SSM] (CSM).

Missing Data (Flag <-2>)

Suspect Data (Flag <1>)

The data collected from 09/04/2013 - 13:15 to 9/16/2013 - 02:15 during the September 4 deployment (09/04/2013 - 13:15 to 09/18/2013 - 12:15) were suspect due to sensor malfunction. The post-deployment check of 840.0 mS/cm was outside the acceptable range of 47 - 53 mS/cm. The values were within the range typically observed at the site. The sensor was sent to YSI and then retired. The values are flagged as <1> [SSM] (CSM).

The data collected during the September 18 deployment (09/18/2013 - 12:30 to 10/16/2013 - 12:15) were suspect due to sensor out of range. The post-deployment check of 35.86 mS/cm was outside the acceptable range of 47 - 53 mS/cm. The values were within the range typically observed at the site. The values are flagged as <1> [SPC] (CSM).

Passed Initial QAQC Checks <0>

DO Percent/mg/L

Rejected Data (Flag <-3>)

Dissolved oxygen data collected from 05/26/2013 - 16:45 to 06/05/2013 - 13:45 during the May 22 deployment (05/22/2013 - 09:30 to 06/05/2013 - 13:45) were rejected due to post calibration out of range. The post-deployment check of 111.0 % was outside the acceptable range of 90 - 110%. The values collected were outside the range typically observed at this site. The values are flagged as <-3> [SPC] (CSM).

Sporadically throughout the May 22 deployment (05/22/2013 - 09:30 to 06/05/2013 - 13:45) starting at 05/31/2013 - 20:00 DO mg/L and % recorded negative values. The cause for these negative values is unknown but thought to be attributed to the sonde floating up in the tube. The portion of the tube where the sonde was stuck did not have holes which allow water to flow around the sonde. It is believed that the sonde was recording a tubal effect caused by decreased flow. The values are flagged as <-3> [SNV] (CSM).

The DO mg/L data collected from 09/16/2013 - 02:30 to 09/18/2013 - 12:15 during the September 4th deployment (09/04/2013 - 13:15 to 09/16/2013 - 12:15) were rejected due to specific conductivity sensor malfunction. The specific conductivity values used to calculate DO mg/L were rejected due to readings over 100 psu which is well outside the accepted range for this site. The post-deployment check of 840 mS/cm was far outside the accepted range of 47 - 53 mS/cm. The DO mg/L values were within the range expected at this site. The values are flagged as <-3> [SCF] (CSM).

Missing Data (Flag <-2>)

Suspect Data (Flag <1>)

Dissolved oxygen data collected from 05/22/2013 - 09:30 to 05/26/2013 - 16:30 during the May 22 deployment (05/22/2013 - 09:30 to 06/05/2013 - 13:45) were suspect due to sensor out of range. The post-deployment check of 111.0 % was outside the acceptable range of 90 - 110%. The values were within the range typically observed at the site. The values are flagged as <1> [SPC] (CSM).

The data collected during the September 18 deployment (09/18/2013 - 12:30 to 10/16/2013 - 12:15) were suspect due to post calibration out of range. The post-deployment checks of 111.5 % and 111.4 % were outside the acceptable range of 90 - 110%. The values were within the range typically observed at the site. The values are flagged as <1> [SPC] (CSM).

Passed Initial QAQC Checks <0>

Depth

Rejected Data (Flag <-3>)

The depth data collected from 09/16/2013 - 02:30 to 09/18/2013 - 12:15 during the September 4th deployment (09/04/2013 - 13:15 to 09/16/2013 - 12:15) were rejected due to specific conductivity sensor malfunction. The specific conductivity values used to calculate depth were rejected due to readings over 100 psu, which were well outside the accepted range for this site. The values are flagged as <-3> [SCF] (CSM).

Missing Data (Flag <-2>)

Suspect Data (Flag <1>)

Passed Initial QAQC Checks <0>

pH

Rejected Data (Flag <-3>)

Missing Data (Flag <-2>)

Suspect Data (Flag <1>)

The data collected during the October 16 deployment (10/16/2013 - 12:30 to 11/20/2013 - 12:30) were suspect due to sensor diagnostics out of range. The post-deployment slope of 135.1 was outside the accepted range of ≥ 155 . The post-deployment check was acceptable. The values were within the range typically observed at the site. The values are flagged as <1> [SDG] (CSM).

Passed Initial QAQC Checks <0>

Turbidity

Rejected Data (Flag <-3>)

The data collected from 06/23/2013 - 21:15 to 07/10/2013 - 14:00 during the June 18 deployment (06/18/2013 - 12:15 to 07/10/2013 - 14:00) were rejected due a wiper malfunction. The post-deployment 0 NTU and 126 NTU checks of -14.3 and 61.6, respectively, were outside the acceptable ranges of -2 - 2 NTU and 100 - 140 NTU respectively. The turbidity wiper only spun one way, parked over the optics, and stopped randomly during the post-deployment check. The data were rejected due to the readings being outside the range typically observed at the site and many of the values were negative. The values are flagged as <-3> [SWM] (CSM), negative values are flagged as <-3> [SNV] (CSM).

Missing Data (Flag <-2>)

Suspect Data (Flag <1>)

The data collected during the February 6 deployment (02/06/2013 - 11:30 to 03/13/2013 - 14:00) were suspect due to post calibration out of range. The post-deployment 0 NTU check of 2.6 NTU was outside the acceptable range of -2 - 2 NTU. The values were within the range typically observed at the site. The values are flagged as <1> [SPC] (CSM).

The data collected from 06/18/2013 - 12:15 to 06/23/2013 - 21:00 during the June 18 deployment (06/18/2013 - 12:15 to 07/10/2013 - 14:00) were suspect due to wiper malfunction. The post-deployment 0 NTU and 126 NTU checks of -14.3 and 61.6, respectively, were outside the acceptable ranges of -2 - 2 NTU and 100 - 140 NTU respectively. The turbidity wiper only spun one way, parked over the optics, and stopped randomly during the post-deployment check. The values readings were within the range typically observed at the site. The values are flagged as <1> [SWM] (CSM).

Passed Initial QAQC Checks <0>

St. Pierre

All Parameter Blanket Statement for St. Pierre

Rejected Data (Flag <-3>)

Missing Data (Flag <-2>)

Suspect Data (Flag <1>)

Passed Initial QAQC Checks <0>

Temperature

Rejected Data (Flag <-3>)

Missing Data (Flag <-2>)

Suspect Data (Flag <1>)

The data collected during the following deployments were suspect due to sensor malfunction. The temperature values were lower (0.5° Celsius) than those recorded by the other sonde assigned to this site. Based on QAQC evaluation, the lower values were not correct. The difference did not appear to affect the other parameters. The values are flagged as <1> [SSM] (CSM).

02/06/2013 - 08:45 to 03/11/2013 - 11:15

05/08/2013 - 10:30 to 05/22/2013 - 10:45

07/10/2013 - 11:15 to 07/24/2013 - 09:30

09/04/2013 - 11:15 to 09/18/2013 - 09:30

04/10/2013 - 11:00 to 04/24/2013 - 10:00

06/05/2013 - 11:15 to 06/18/2013 - 10:15

08/07/2013 - 11:45 to 08/22/2013 - 11:00

Passed Initial QAQC Checks <0>

Specific Conductivity/Salinity

Rejected Data (Flag <-3>)

Missing Data (Flag <-2>)

Suspect Data (Flag <1>)

The data collected from 09/08/2013 – 22:15 to 09/18/2013 – 09:30 during the September 4th deployment (09/04/2013 – 11:15 to 09/18/2013 – 09:30) were suspect due to sensor drift. During the deployment the peak values drifted below the values that are typically observed at this site but were still within the range typically observed at this site. The post-deployment check of 47.27 mS/cm is on the low end of the accepted range of 47 - 53 mS/cm. The cause of the drift is unknown but thought to be attributed to biofouling. The values returned to normal with the deployment of a new sonde. The values are flagged as <1> [SSD] (CSM).

The data collected from 10/11/2013 – 00:00 to 10/16/2013 – 09:45 during the September 18th deployment (09/18/2013 – 09:45 to 10/16/2013 – 09:45) were suspect due to sensor drift. During the deployment the peak values drifted below the values that are typically observed at this site but were still within the range typically observed at this site. The cause for the drift is unknown but thought to be attributed to biofouling. The values returned to normal with the deployment of a new sonde. The values are flagged as <1> [SSD] (CSM).

Passed Initial QAQC Checks <0>

DO Percent/mg/L

Rejected Data (Flag <-3>)

The data collected during the following times were rejected due to post calibration out of range. The post-deployment checks were outside the acceptable range of 90 to 110%. The downward drift in the data was most likely caused by biofouling. The values are flagged as <-3> [SPC] (CSM).

01/01/2013 - 00:00 to 01/09/2013 - 10:15 (84.7%) 02/16/2013 - 18:00 to 03/11/2013 - 11:15 (76.7%)
11/02/2013 - 01:00 to 11/20/2013 - 11:00 (84.0%)

DO data collected from 05/15/2013 - 08:00 to 05/22/2013 - 10:45 during the May 8 deployment (05/08/2013 - 10:30 to 05/22/2013 - 10:45) were rejected due to QAQC checks. The post-deployment DO check of (90.7%) was near the lower limit of the acceptable range. The data were rejected because the downward drift in the readings indicate biofouling. The values are flagged as <-3> [GSM] (CBF).

Missing Data (Flag <-2>)

Suspect Data (Flag <1>)

The data collected during the following times were suspect due to post calibration out of range. The post-deployment checks were outside the accepted range of 90 - 110%. The values were within the range typically observed at the site. The values are flagged as <1> [SPC] (CSM).

02/06/2013 - 08:45 to 02/16/2013 - 17:45 (76.7%) 10/16/2013 - 10:00 to 11/02/2013 - 00:45 (84.0)

Passed Initial QAQC Checks <0>

Depth

Rejected Data (Flag <-3>)

Missing Data (Flag <-2>)

Suspect Data (Flag <1>)

Passed Initial QAQC Checks <0>

pH

Rejected Data (Flag <-3>)

The first pH record for the following deployments were rejected due to spikes in pH when the sonde was deployed. This is not typical; however, it is thought to be attributed to acclimation of the probe. The post deployment checks and sensor diagnostics were all within the acceptable ranges. The values are flagged as <-3> [GSM] (CND).

08/07/2013 - 14:15

09/04/2013 - 13:15

The data collected during the November 20 deployment (11/20/2013 - 11:15 to 12/18/2013 - 11:45) were rejected due to post calibration out of range. The post-deployment checks of 7.37 and 10.33 were outside the acceptable ranges of 6.7 - 7.3 and 9.7 - 10.3 respectively, but the post pH slope was acceptable. The data were rejected because readings were outside the range typically observed at the site and were higher than those of the previous and following deployments. The values are flagged as <-3> [SPC] (CSM).

Missing Data (Flag <-2>)

Suspect Data (Flag <1>)

Passed Initial QAQC Checks <0>

Turbidity

Rejected Data (Flag <-3>)

Missing Data (Flag <-2>)

Suspect Data (Flag <1>)

The data collected during the following deployments were suspect due to a wiper malfunction. The post-deployment checks were within acceptable ranges, but the wiper pad stopped touching the turbidity sensor optics during the deployment. The brush was still wiping the other sensors. The values were within the range typically observed at the site. The values are flagged as <1> [SWM] (CSM).

02/06/2013 - 08:45 to 03/11/2013 - 11:15

04/10/2013 - 11:00 to 04/24/2013 - 10:00

Passed Initial QAQC Checks <0>