

ACE Basin (ACE) National Estuarine Research Reserve Water Quality Metadata
January-December 2014 Report
Latest Update: 03/02/2016

I. Data Set and Research Descriptors

1) Principal investigator(s) and contact persons

Addresses:

SCDNR/Marine Resources Division
217 Fort Johnson Road
Charleston, SC 29422
(843) 953-9300 (843) 844-8822

ACE Basin NERR Field Station
15717 Bennett's Point Road
Green Pond, SC 29441

Contact Persons:

Dr. John Leffler, Research Coordinator

E-mail: lefflerj@dnr.sc.gov ; (843) 953-9303

Sandra Upchurch, Reserve Biologist

E-mail: upchurchs@dnr.sc.gov ; (843) 953-9223

Amanda C. Fornal, Reserve Biologist

E-mail: fornala@dnr.sc.gov ; (843) 953-9225

Meghan Miller, Reserve Technician

E-mail: millerm@dnr.sc.gov ; (843) 953-9225

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. Amanda Fornal and Chuck Tucker 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. Two tributaries, St. Pierre Creek and Fishing Creek, are in areas where boat traffic is light and development is sparse, and they are designated as "control" sites. In contrast, the two "treatment" 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.

The water quality monitoring program began on March 3, 1995 at Big Bay Creek and St. Pierre Creek; in October 2002, a monitoring station was established in Fishing Creek and in Mosquito Creek. 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 Saint Pierre station on 06/28/06 and transmits data to the NOAA GOES satellite, NESDIS ID #3b02f20a and at Fishing Creek station on 02/20/2013 NESDIS ID #3b04b1ce. (Where 3b02f20a and 3b04b1ce are the GOES ID for each particular station.). 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>.

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 150,000 acres of diverse estuarine wetlands providing preserved habitats for fish and wildlife.

Three monitoring stations are tributaries of the South Edisto River and one is in a tributary of both the S. Edisto and Ashepoo rivers, contributing to freshwater input to each site. The average tidal range at all stations is approximately 2.0 m (6.6 feet), with a maximum of 2.8 m (9.2 feet) and a minimum of 1.4 m (4.6 feet). The bottom habitat at each of the four sites consists of mud intermixed with dead shell hash. The descriptions of the sites are as follow:

Big Bay - GPS coordinates: 32.4941N and -80.3241W

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 2010, the mean depth at the station was 2.34 m (7.67 ft), and the mean salinity was 30.8 parts per thousand (ppt).

The Big Bay monitoring station is designated as a "treatment" site because it is subject to nonpoint source pollution and has a high density of development. The southern bank of the creek is bordered by residential and commercial development, with little setback from the bordering *Spartina* 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 is 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 are 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 is 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 is 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.

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

This monitoring station is in a tributary of Fishing Creek, approximately 1.79 km (1.11 mi) 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 protected 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 2010, the mean depth at the station was 1.77 m (5.81 ft), and the mean salinity was 9.4 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 Wildlife Management Area 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 managed wetlands. Water level in the managed wetland is regulated by rice trunks that control the flow of water between the impoundment and the South Edisto River.

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

This monitoring station is in Mosquito Creek proper (a tributary of both the South Edisto and Ashepoo rivers), approximately 2.51 km (1.56 mi) from the Ashepoo River and 12 km (7.46 mi) from the South Edisto River, and it is about 5 m (16.41 ft) from the southern bank of the creek. In 2010, the mean depth at the station was 3.71 m (12.17 ft), and the mean salinity was 18.2 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. Ten docks constructed of creosote, concrete and Wolmanized pilings; a public boat landing; a commercial seafood business with three commercial shrimp boats and a fueling area are located about 0.8 km (0.5 mi) downstream of the monitoring station. The major source 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 - GPS coordinates: 32.5233N and -80.3568W

This monitoring station is in a small tributary of St. Pierre Creek, approximately 0.25 km (0.16 mi) from the mouth of the creek, and it is about 5 m (16.41 ft) from the northern bank of the creek. The tributary flows through the southern portion of Bailey Island, and 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, live oaks, and palmettos dominate the upland areas. In 2010, the mean depth at the station was 2.00 m (8.69 ft), and the mean salinity was 29.7 parts per thousand (ppt).

The St. Pierre 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 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.

6) Data collection period

Big Bay

BEGAN	ENDED	SONDE
12/18/2013 – 13:00	01/15/2014 – 12:30	EXO2
01/15/2014 – 12:45	02/20/2014 – 14:30	EXO2
02/20/2014 – 14:45	03/13/2014 – 09:45	EXO2
03/13/2014 – 10:00	04/02/2014 – 13:30	EXO2
04/02/2014 – 13:45	04/24/2014 – 10:00	EXO2
04/24/2014 – 10:15	05/16/2014 – 11:45	EXO2
05/16/2014 – 12:00	05/28/2014 – 10:00	EXO2
05/28/2014 – 10:15	06/11/2014 – 10:30	EXO2
06/11/2014 – 10:45	06/26/2014 – 11:15	EXO2
06/26/2014 – 11:30	07/09/2014 – 09:15	EXO2
07/09/2014 – 09:30	07/23/2014 – 10:15	EXO2
07/23/2014 – 10:30	08/13/2014 – 14:30	EXO2
08/13/2014 – 14:45	08/27/2014 – 15:30	EXO2
08/27/2014 – 15:45	09/10/2014 – 12:00	EXO2
09/10/2014 – 12:15	09/24/2014 – 10:15	EXO2
10/08/2014 – 11:15	11/05/2014 – 15:30	EXO2
11/05/2014 – 15:45	12/03/2014 – 14:45	EXO2
12/03/2014 – 15:00	01/07/2015 – 16:45	EXO2

Fishing Creek

BEGAN	ENDED	SONDE
12/18/2013 – 14:15	01/15/2014 – 12:30	6600 EDS
01/15/2014 – 12:45	02/20/2014 – 15:15	6600 EDS
02/20/2014 – 15:30	03/13/2014 – 10:15	6600 EDS
03/13/2014 – 10:30	04/02/2014 – 13:45	6600 EDS
04/02/2014 – 14:00	04/24/2014 – 11:15	6600 EDS
04/24/2014 – 11:30	05/16/2014 – 12:45	6600 EDS
05/16/2014 – 13:00	05/28/2014 – 11:15	6600 EDS
05/28/2014 – 11:30	06/11/2014 – 10:30	6600 EDS
06/11/2014 – 11:00	06/26/2014 – 10:00	6600 EDS
06/26/2014 – 10:15	07/09/2014 – 10:15	6600 EDS
07/09/2014 – 10:30	08/27/2014 – 12:00	6600 EDS
08/27/2014 – 12:15	09/10/2014 – 12:30	6600 EDS
09/10/2014 – 12:45	09/24/2014 – 11:45	6600 EDS
09/25/2014 – 12:45	10/08/2014 – 11:30	6600 EDS
10/08/2014 – 11:45	11/05/2014 – 12:15	6600 EDS
11/05/2014 – 12:30	12/09/2014 – 13:00	6600 EDS
12/09/2014 – 13:15	01/07/2015 – 13:45	6600 EDS

Mosquito Creek

BEGAN	ENDED	SONDE
12/18/2013 – 15:15	01/15/2014 – 11:00	6600 EDS
01/15/2014 – 11:15	02/20/2014 – 16:00	6600 EDS
02/20/2014 – 16:15	03/13/2014 – 11:30	6600 EDS
03/13/2014 – 11:45	04/02/2014 – 15:00	6600 EDS
04/02/2014 – 15:15	04/24/2014 – 13:00	6600 EDS
04/24/2014 – 13:15	05/16/2014 – 13:30	6600 EDS
05/16/2014 – 13:45	05/28/2014 – 13:15	6600 EDS
05/28/2014 – 13:30	06/11/2014 – 12:15	6600 EDS
06/11/2014 – 12:30	06/26/2014 – 13:00	6600 EDS
06/26/2014 – 13:15	07/23/2014 – 13:45	6600 EDS
07/23/2014 – 14:15	08/27/2014 – 09:45	6600 EDS
08/27/2014 – 10:00	09/10/2014 – 14:00	6600 EDS
09/10/2014 – 14:15	09/24/2014 – 13:15	6600 EDS

	09/24/2014 – 13:30	10/08/2014 – 12:45	6600 EDS
	10/08/2014 – 13:00	11/05/2014 – 13:00	6600 EDS
	11/05/2014 – 13:30	12/03/2014 – 11:30	6600 EDS
	12/03/2014 – 11:45	01/07/2015 – 15:00	6600 EDS
<u>St. Pierre</u>			
	BEGAN	ENDED	SONDE
	12/18/2013 – 12:00	01/15/2014 – 11:30	6600 EDS
	01/15/2014 – 11:45	02/20/2014 – 14:30	6600 EDS
	02/20/2014 – 14:45	03/13/2014 – 09:30	6600 EDS
	03/13/2014 – 09:45	04/02/2014 – 13:00	6600 EDS
	04/02/2014 – 13:15	04/24/2014 – 10:30	6600 EDS
	04/24/2014 – 10:45	05/16/2014 – 12:00	6600 EDS
	05/16/2014 – 12:15	05/28/2014 – 10:45	6600 EDS
	05/28/2014 – 11:00	06/11/2014 – 09:45	6600 EDS
	06/11/2014 – 10:00	06/26/2014 – 10:45	6600 EDS
	06/26/2014 – 11:00	07/09/2014 – 09:30	6600 EDS
	07/09/2014 – 09:45	07/23/2014 – 11:30	6600 EDS
	07/23/2014 – 11:45	08/13/2014 – 11:30	6600 EDS
	08/13/2014 – 11:45	08/27/2014 – 11:15	6600 EDS
	08/27/2014 – 11:30	09/10/2014 – 11:45	6600 EDS
	09/10/2014 – 12:00	09/24/2014 – 11:00	6600 EDS
	09/24/2014 – 11:15	10/08/2014 – 10:45	6600 EDS
	10/08/2014 – 11:00	11/05/2014 – 10:30	6600 EDS
	11/05/2014 – 10:45	12/03/2014 – 09:45	6600 EDS
	12/03/2014 – 10:00	12/16/2014 – 20:15	6600 EDS

7) Distribution

NOAA retains the right to analyze, synthesize and publish summaries of the NERRS System-wide Monitoring Program data. The NERRS retains the right to be fully credited for having collected and process the data. Following academic courtesy standards, the NERR site where the data were collected should be contacted and fully acknowledged in any subsequent publications in which any part of the data are used. The data set enclosed within this package/transmission is only as good as the quality assurance and quality control procedures outlined by the enclosed metadata reporting statement. The user bears all responsibility for its subsequent use/misuse in any further analyses or comparisons. The Federal government does not assume liability to the Recipient or third persons, nor will the Federal government reimburse or indemnify the Recipient for its liability due to any losses resulting in any way from the use of this data.

Requested citation format:

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

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

YSI 6600EDS data sonde:

Parameter: Temperature
Units: Celsius (C)
Sensor Type: Thermistor
Model#: 6560
Range: -5 to 50 °C
Accuracy: +/- 0.15 °C
Resolution: 0.01 °C

Parameter: Conductivity
Units: milli-Siemens per cm (mS/cm)
Sensor Type: 4-electrode cell with autoranging
Model#: 6560
Range: 0 to 100 mS/cm
Accuracy: +/- 0.5% of reading + 0.001 mS/cm
Resolution: 0.001 mS/cm to 0.1 mS/cm (range dependent)

Parameter: Salinity
Units: parts per thousand (ppt)
Sensor Type: Calculated from conductivity and temperature
Range: 0 to 70 ppt
Accuracy: +/- 1.0% of reading 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: 0-20 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: 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: Depth (non-vented level, medium)

Units: meters (m)

Sensor Type: 6600-EDS integrated stainless steel strain gauge

Model#: 6600EDS – medium

Range: 0 to 61 m

Accuracy: +/- 0.12 m

Resolution: 0.001 m

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 data 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: +/- 0.05 °C

Resolution: 0.001 °C

Parameter: Conductivity

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

Sensor Type: 4-electrode nickel cell

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

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

Resolution: 0.0001 mS/cm to 0.01 mS/cm (range dependent)

Parameter: Salinity

Units: parts per thousand (ppt)

Sensor Type: Calculated from conductivity and temperature

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

Parameter: Dissolved Oxygen % saturation
Units: percent air saturation (%)
Sensor Type: Optical, luminescence lifetime
Model#: 599100-01; 599110 sensor cap
Range: 0 to 500% air saturation
Accuracy: 0-200% air saturation: +/- 1% of the reading or 1% air saturation, whichever is greater; 200 to 500% air saturation: +/- 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
Model#: 599100-01; 599110 sensor cap
Range: 0 to 50 mg/L
Accuracy: 0-20 mg/L: +/- 1% of reading or 0.1 mg/L; 20-50 mg/L: +/- 5% of reading
Resolution: 0.01 mg/L

Parameter: pH (unguarded)
Units: pH units
Sensor Type: Glass combination electrode
Model#: 599702; 599795-02 module
Range: 0 to 14 units
Accuracy: +/- 0.1 units within +/- 10°C of calibration temperature; +/- 0.2 units for entire temp range
Resolution: 0.01 units

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: +/- 0.04% FS (+/- 0.04 m)
Resolution: 0.001 m

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: 0-999 FNU: 0.3 FNU or +/- 2% of reading whichever is greater; 1000-4000 FNU: +/- 5% of reading
Resolution: 0-999 FNU: 0.01 FNU; 1000-4000 FNU: 0.1 FNU

Dissolved Oxygen Qualifier:

The reliability of the dissolved oxygen (DO) data after 96 hours post-deployment for non-EDS (Extended Deployment System) or data sondes may be problematic due to fouling which forms on the DO probe membrane during some deployments (Wenner et al. 2001, 2002). Many reserves have upgraded to YSI 6600 EDS or EXO2 data sondes, which increase DO accuracy and longevity by reducing the environmental effects of fouling. The user is therefore advised to consult the metadata and to exercise caution when utilizing non-EDS or EXO2 DO data beyond the initial 96-hour time period. However, this potential drift is not always

problematic for some uses of the data, ie. periodicity analysis. It should be noted that the amount of fouling is site specific and that not all data are affected. The Research Coordinator at the specific NERR site should be contacted concerning the reliability of the DO data because of the site and seasonal variation in the fouling of the DO sensor. All data sondes used at ACE NERR in 2013 were either YSI 6600 EDS or YSI EXO2 models.

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

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
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:

Turbidity 6136/599101-01 Probe

pH 6561/599702; 599795-02 Probe

Sp. Cond. 6560/599870-01 Probe

Standards for Calibration:

YSI 6073G Turbidity Standard

126 NTU

RICCA CHEMICAL COMPANY LLC.

Buffer 7.00 and 10.00

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

Big Bay

Deployment Date	SpCond	DO 1	DO 2	pH	pH	Turb	Turb	Depth
m/d/y	ms/cm	(100% sat)	(100% sat)	(7)	(10)	NTU	NTU	m
12/18/2013	50.68	101.1	101.1	7.02	9.98	-0.2	124.3	0.161
01/15/2014	50.60	99.8	99.7	7.08	10.01	-0.6	125.5	-0.085
02/20/2014	50.13	100.2	100.6	7.05	10.09	-0.02	124.56	0.017
03/13/2014	51.16	99.6	99.9	7.17	10.17	-0.1	122.1	-0.107
04/02/2014	49.8	100.5	100.8	7.06	10.18	-0.2	124.5	0.493
04/24/2014	49.95	99.9	99.9	7.09	10.06	0.0	124.2	-0.093
05/16/2014	50.06	100.7	100.8	7.04	10.01	0.2	123.6	0.147
05/28/2014	51.32	101.8	100.9	7.0	10.02	4.9	124.3	0.183
06/11/2014	50.03	100.3	100.2	7.03	10.08	-0.1	125.2	-0.039
06/26/2014	48.81	99.9	100.4	7.14	10.02	-5.0	119.0	0.013
07/09/2014	50.06	100.1	100.6	7.01	10.04	0.2	122.5	0.104
07/23/2014	54.46	100.7	100.7	7.08	10.14	-0.01	124.75	0.076
08/13/2014	50.21	99.8	99.8	7.13	10.05	0.072	122.4	-0.069
08/27/2014	49.27	100.5	100.5	7.25	9.75	0.25	120.5	0.03
09/10/2014	50.37	100.8	100.7	7.09	9.99	-0.5	116.5	0.127

09/24/2014	50.61	100.3	100.9	7.28	10.23	0.7	118.4	0.089
10/08/2014	50.25	100.6	100.7	6.98	10.18	-0.44	118.31	0.084
11/05/2014	49.74	101.3	101.6	8.0	10.55	1.67	105.5	0.231
12/03/2014	47.81	101.0	101.2	7.23	9.95	0.94	121.6	0.158

Fishing Creek

Deployment Date	SpCond	DO 1 (100% sat)	DO 2 (100% sat)	pH (7)	pH (10)	Turb NTU	Turb NTU	Depth m
m/d/y	ms/cm	sat	sat	(7)	(10)	NTU	NTU	m
12/18/2013	51.25	101.3	100.7	6.87	9.89	0.3	125.3	0.084
01/15/2014	50.59	98.9	99.8	6.98	9.9	0.2	123.0	-0.021
02/20/2014	50.71	90.2	100.4	6.53	10.25	0.0	132.5	10.36
03/13/2014	50.0	102.5	99.9	7.16	10.02	-0.2	126.6	-0.008
04/02/2014	50.26	104.6	100.8	7.08	10.03	-0.2	126.5	0.081
04/24/2014	50.23	104.0	99.7	6.96	10.04	-0.1	126.2	-0.043
05/16/2014	50.25	103.6	100.8	7.11	9.88	0.0	124.0	0.07
05/28/2014	49.3	102.5	100.7	7.17	10.04	4.3	122.0	0.063
06/11/2014	49.24	101.8	100.2	6.98	10.05	0.4	125.0	0.022
06/26/2014	49.64	101.0	100.4	7.08	9.88	-4.0	125.6	0.049
07/09/2014	50.08	98.1	100.6	6.99	10.06	0.1	124.6	0.053
07/23/2014	49.69	100.7	100.7	6.83	10.09	-0.5	125.8	0.072
08/13/2014	49.17	97.7	100.0	7.09	9.92	-0.5	125.4	0.021
08/27/2014	49.82	101.9	100.5	7.1	9.88	0.1	124.2	0.047
09/10/2014	49.94	107.8	100.7	7.07	9.92	0.0	121.7	0.069
09/24/2014	50.1	92.6	100.8	6.81	10.03	0.0	121.1	0.087
10/08/2014	49.44	90.3	100.8	7.01	10.13	-0.1	117.4	0.088
11/05/2014	50.75	100.1	101.4	6.88	9.88	1.2	110.1	0.15
12/09/2014	48.44	97.5	101.3	7.23	10.1	1.3	124.6	0.083

Mosquito Creek

Deployment Date	SpCond	DO 1 (100% sat)	DO 2 (100% sat)	pH (7)	pH (10)	Turb NTU	Turb NTU	Depth m
m/d/y	ms/cm	sat	sat	(7)	(10)	NTU	NTU	m
12/18/2013	49.97	93.5	100.9	6.96	9.95	0.3	124.5	0.112
01/15/2014	50.12	95.9	99.8	7.02	9.89	-0.5	125.7	-0.028
02/20/2014	49.72	86.4	100.6	6.97	10.0	0.8	130.5	0.067
03/13/2014	50.14	105.6	99.8	7.05	10.1	-0.2	126.1	-0.013
04/02/2014	50.16	104.9	100.8	7.0	10.05	-0.2	127.1	0.08
04/24/2014	50.16	95.1	99.8	7.03	10.04	0.0	125.7	-0.02
05/16/2014	50.53	119.9	100.8	7.07	9.93	0.0	124.6	0.072
05/28/2014	49.64	108.3	100.8	7.12	10.03	5.6	121.4	0.07
06/11/2014	49.23	98.1	100.2	7.02	10.02	0.3	124.8	0.021
06/26/2014	50.34	103.4	100.4	6.89	9.99	0.2	124.6	0.047
07/15/2014	50.27	103.3	100.6	7.0	10.02	0.1	125.0	0.058
07/23/2014	48.67	94.3	100.6	6.92	10.09	0.1	124.5	0.059
08/13/2014	49.15	92.7	100.0	7.0	9.93	0.0	127.3	-0.001
08/27/2014	50.2	105.2	100.4	6.94	9.88	-0.3	126.2	0.04
09/10/2014	50.62	111.1	100.7	7.16	9.92	-0.4	119.1	0.072

09/24/2014	50.41	120.0	100.3	6.92	9.98	0.0	125.8	0.033
10/09/2014	50.71	100.8	100.8	6.99	10.2	-0.1	120.7	0.081
11/05/2014	50.52	91.2	110.5	7.02	9.96	1.9	110.5	0.175
12/03/2014	51.13	101.4	101.4	6.58	9.9	0.0	102.0	0.096

St. Pierre

Deployment Date	SpCond	DO 1 (100% sat)	DO 2 (100% sat)	pH (7)	pH (10)	Turb NTU	Turb NTU	Depth m
m/d/y	ms/cm							
12/18/2013	50.15	105.3	100.6	7.76	9.86	4.1	125.3	0.328
01/15/2014	50.26	100.1	99.7	6.66	10.0	-0.4	125.4	-0.072
02/20/2014	49.42	98.7	100.6	6.92	10.01	0.0	126.2	0.075
03/13/2014	50.94	99.5	99.7	7.04	10.02	-0.2	126.0	-0.008
04/02/2014	50.75	105.2	100.7	6.96	10.09	-0.1	126.3	0.065
04/24/2014	49.82	101.0	99.8	7.07	10.04	0.0	126.3	-0.037
05/16/2014	50.47	107.6	100.9	6.97	10.0	0.0	126.0	0.093
05/28/2014	49.96	104.7	100.8	7.04	10.03	4.2	122.5	0.019
06/11/2014	49.67	98.4	100.2	6.97	10.01	0.5	124.2	0.022
06/26/2014	50.38	101.5	100.4	6.93	9.95	0.3	124.7	0.042
07/09/2014	50.01	106.5	100.5	7.03	10.05	0.3	124.7	0.051
07/23/2014	50.0	104.1	100.6	7.0	10.02	0.5	123.6	0.058
08/13/2014	50.43	99.8	100.3	7.02	10.0	-3.4	128.9	0.022
08/27/2014	49.46	83.9	100.4	7.01	9.84	-0.4	126.6	0.054
09/10/2014	50.74	104.6	100.7	7.02	9.88	0.0	120.9	0.077
09/24/2014	50.82	119.8	100.3	6.83	10.14	0.1	120.0	0.007
10/08/2014	50.24	94.6	100.8	6.91	10.16	0.0	118.8	0.079
11/05/2014	50.5	102.1	101.4	6.81	9.74	1.2	109.9	0.205
12/03/2014	50.38	103.1	101.3	7.03	9.77	-3.0	127.4	0.145

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 29.662N 80 19.427W)

2001- Big Bay station replaced in **October** due to old age and excessive biofouling of oysters (coordinates changed: 32 29 38.72125N 80 19 21.69864W very accurate)

2003- Big Bay station moved to new location in **July** after embankment collapsed near data logger, causing sedimentation issues and poor data.(coordinates: 32.4941N and 80.3241W)

2005- Big Bay station modified in **December**

2009- Big Bay site mount replaced in **January** (about 0.3 meters deeper).

Fishing Creek:

2002- Fishing Creek site installed in **October** (coordinates: 32.6358 N 80.3655W)

2009- Fishing Creek site mount replaced in **May** (about 0.2 meters deeper).

2009- Fishing Creek site destroyed in **October**.

2010- Fishing Creek site replaced with 40' pylon in **January**.

2013- Sutron Sat-Link2 transmitter installed in **March** at Fishing Creek to transmit real-time data

Mosquito Creek:

2002- Mosquito Creek site installed in **October** (coordinates: 32.5558 N 80.4380W)

2007- Mosquito Creek mount installed 0.5 meters away from old mount in **August**. 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)

Rock Creek:

1996- Rock Creek water quality station was installed in **March**. (coordinates: XXXXXXXXXXXXX)

1996- Rock Creek water quality station was vandalized in **July** and never replaced.

St. Pierre:

1995- St. Pierre water quality station was installed in **October**. (coordinates: 32 31.724N 81 21.573W)

1997- St. Pierre site moved away from bank in **February, March, and other times** due to sedimentation issues fouling readings

2000- St Pierre site moved to other side of channel and station modified in **April** (coordinates changed: 32 31 40.59518N 80 21 41.2548W very accurate)

2001- St. Pierre station replaced in **September**

2006- St. Pierre station PVC replaced in **April**.

2006- Sutron Sat-Link2 transmitter installed in **June** at St. Pierre to transmit real-time data

2009- St. Pierre site mount replaced in **June** (about 0.06 meters deeper).

Blanket Statement(s): All Stations

The Edisto and Salkehatchie River Basins have been the driest overall experiencing persistent low streamflow conditions over much of the past two to three months, reported Scott Harder, S.C. Department of Natural Resources (DNR) Hydrologist. This was the main driver for declaring an incipient drought for counties in these basins.

Sonde Exchange In-Situ Readings

Dissolved Oxygen Hypoxia Coding

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

Turbidity

Turbidity sensors for all sites provided unusually high values from the observed norm and have been marked as suspect data (Code: <1>). The cause of these irregular values above 300NTU is unknown (Code: STS). However, these values could be attributed to low tide, max flood tide, and/or rain events.

Turbidity sensors for all sites provided values over 1000 NTU. These values are outside the sensor specifications and the cause is unknown (Code: STS). Therefore, these anomalous data points have been marked as rejected (Code: <-3>).

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

Big Bay

All Parameters Blanket Statement for Big Bay

Rejected Data (Flag <-3>)

Data rejected from 2/20/2014 -7:45 through 2/20/2014 -14:30 due to equipment failure.

Missing Data (Flag <-2>)

Data are missing from 8/27/2014 10:45-8/27/2014 15:30 due to instrument failure.

Data are missing from 9/24/2014 10:30-10/08/2014 11:00 are missing due to an issue during calibration that caused no data to be collected.

Data are missing from 11/05/2014 10:45 – 11/05/2014 15:30 due to instrument failure.

Suspect Data (Flag <1>)

Data were marked suspect due to a turbidity readings over 300NTU. These values could be attributed to low tide, max flood tide, and/or rain events.

Data from 1/15 12:45 to 15:45 is marked 1 GSM CWD. The sonde appears to have for some reason gotten hung up in the tube during the sonde deployment, after 15:45 it returned to the normal depth.

Data from 9/10 12:15 to 19:15 is marked 1 GSM CWD. The sonde appears to have for some reason gotten hung up in the tube during the sonde deployment, after 15:45 it returned to the normal depth.

Temperature

Rejected Data (Flag <-3>)

None

Missing Data (Flag <-2>)

Data are missing from 8/27/2014 10:45-8/27/2014 15:30 due to instrument failure

Suspect Data (Flag <1>)

None

Specific Conductivity/Salinity

Rejected Data (Flag <-3>)

Data rejected from 1/30/2014 -13:15 through 2/20/2014 – 7:30 due to conductivity sensor failure.

For all of 2014, YSI was having difficulty with their specific conductivity probes; therefore, they were having us send the probes back due to reading high values and for altogether bad readings. So data during the following date/times should all be marked as <-3> SCF:

04/03/2014 @ 13:45 to 04/24/2014 @ 10:00

04/24/2014 @ 10:15 to 05/16/2014 @ 11:45

05/28/2014 @ 10:15 to 06/11/2014 @ 10:30

9/10/2014 @ 12:15 to 09/24/2014 @ 10:15

10/08/2014 @ 12:15 to 11/05/2014 @ 10:30

Missing Data (Flag <-2>)

Data are missing from 8/27/2014 10:45-8/27/2014 15:30 due to instrument failure

Suspect Data (Flag <1>)

Suspect data as <1> [SSD] Sensor drift from 9/14/14 at 12:45 to 9/18/14 at 07:00

DO Percent/mg/L

Rejected Data (Flag <-3>)

Missing Data (Flag <-2>)

Data are missing from 8/27/2014 10:45-8/27/2014 15:30 due to instrument failure

Suspect Data (Flag <1>)

See Big Bay blanket statement above.

Depth

Rejected Data (Flag <-3>)

None

Missing Data (Flag <-2>)

Data are missing from 8/27/2014 10:45-8/27/2014 15:30 due to instrument failure____

Suspect Data (Flag <1>)

pH

Rejected Data (Flag <-3>)

None

Missing Data (Flag <-2>)

Data are missing from 8/27/2014 10:45-8/27/2014 15:30 due to instrument failure

Suspect Data (Flag <1>)

Data marked as suspect <1> [SSD] from: 8/27/14 at 15:45 to 9/10/14 at 12:15 due to sensor drift

Data marked as suspect <1> [GSM] from: 11/05/14 at 15:45 to 12/03/14 at 14:45 due to instrument malfunction.

Turbidity

Rejected Data (Flag <-3>)

None

Missing Data (Flag <-2>)

Data are missing from 8/27/2014 10:45-8/27/2014 15:30 due to instrument failure

Suspect Data (Flag <1>)

See Big Bay blanket statement above.

See "All Stations" blanket statement above.

Fishing Creek

All Parameters Blanket Statement for Fishing Creek

Suspect Data (Flag <1>)

Data were marked suspect due to turbidity readings over 300NTU. These values could be attributed to low tide, max flood tide, and/or rain events.

Temperature

Rejected Data (Flag <-3>)

None

Missing Data (Flag <-2>)

09/24/2014 at 12:00 to 09/25/2014 at 12:30

Suspect Data (Flag <1>)

None

Specific Conductivity/Salinity

Rejected Data (Flag <-3>)

None

Missing Data (Flag <-2>)

09/24/2014 at 12:00 to 09/25/2014 at 12:30

Suspect Data (Flag <1>)

Data marked as suspect <1> (CCU) from 7/15/14 at 14:45 to 7/19/14 at 06:45

DO Percent/mg/L

Rejected Data (Flag <-3>)

None

Missing Data (Flag <-2>)

09/24/2014 at 12:00 to 09/25/2014 at 12:30

Suspect Data (Flag <1>)

Data marked as suspect <1> [SDP] from 12/15/2014 01:15 to 01/07/2015 13:45 due to DO membrane puncture

Depth

Rejected Data (Flag <-3>)

None

Missing Data (Flag <-2>)

09/24/2014 at 12:00 to 09/25/2014 at 12:30

Suspect Data (Flag <1>)

None

pH

rejected Data (Flag <-3>)

None

Missing Data (Flag <-2>)

09/24/2014 at 12:00 to 09/25/2014 at 12:30

Suspect Data (Flag <1>)

Data marked as suspect due to mud. <1> [GSM] from 7/15/14 at 00:45 to 7/18/14 at 12:45

Turbidity

Rejected Data (Flag <-3>)

None

Missing Data (Flag <-2>)

09/24/2014 at 12:00 to 09/25/2014 at 12:30

.

Suspect Data (Flag <1>)

Various dates marked as suspect <1> [SSM]

Accumulation of sediment naturally occurs at this site. During these times there was significant mud caked on all the probes that caused the readings to be off. This occurred for most of 2014 but seemed to be flushed out by the 8/14 deployment.

01/01/2014 @ 00:00 to 01/15/2014 @ 12:30

01/15/2014 @ 12:45 to 02/20/2014 @ 15:15

04/16/2014 @ 00:45 to 04/24/2014 @ 11:15

05/01/2014 @ 21:15 to 05/16/2014 @ 12:45

05/31/2014 @ 3:00 to 06/11/2014 @ 10:30

06/11/2014 @ 11:00 to 06/26/2014 @ 10:00

06/29/2014 @ 16:45 to 07/09/2014 @ 10:15

07/09/2014 @ 10:30 to 07/23/2014 @ 12:15

09/08/2014 @ 12:00 to 09/24/2014 @ 11:45

Mosquito Creek

All Parameter Blanket Statement for Mosquito Creek

Suspect Data (Flag <1>)

Data were marked suspect due to turbidity readings over 300NTU. These values could be attributed to low tide, max flood tide, and/or rain events.

Rejected Data (Flag <-3>)

None

Temperature

Rejected Data (Flag <-3>)

None

Missing Data (Flag <-2>)

07/15/2014 at 10:30 and 07/23/2014 at 14:00

11/05/2014 at 13:15

Suspect Data (Flag <1>)

None

Specific Conductivity/SalinityRejected Data (Flag <-3>)

None

Missing Data (Flag <-2>)

07/15/2014 at 10:30 and 07/23/2014 at 14:00

Suspect Data (Flag <1>)

None

DO Percent/mg/LDeleted Data (Flag <-3>)

None

Missing Data (Flag <-2>)

07/15/2014 at 10:30 and 07/23/2014 at 14:00

Suspect Data (Flag <1>)

Marked as <1> [SDO] DO suspect from 7/12/14 at 22:45 to 7/23/14 at 14:00

Marked as <1> [SPC] (CSM) from 8/11 6:30 to 8/13 16:00, the post calibration value was 42% and there was a barnacle present on the membrane.

Marked as <1> (CCU) suspect from 10/28/2014 at 00:30 to 11/01/2014 at 04:15 due to extreme drop in DO.

DepthRejected Data (Flag <-3>)

None

Missing Data (Flag <-2>)

07/15/2014 at 10:30 and 07/23/2014 at 14:00

Suspect Data (Flag <1>)

Depth data is marked 1 GSM CWD and other parameters 0 GSM CWD during the following dates/times because the PVC mount is higher in the water column due to one or more of the bandits securing the PVC being loose. This issue was corrected in February of 2016.

08/13/2014 @ 12:30 to 08/27/2014 @ 12:00

08/27/2014 @ 12:15 to 09/10/2014 @ 12:30

09/10/2014 @ 12:45 to 10/08/2014 @ 11:30

10/08/2014 @ 11:45 to 11/05/2014 @ 12:00

11/05/2014 @ 12:15 to 12/09/2014 @ 13:00

12/09/2014 @ 13:00 to 01/07/2015 @ 13:45

pHRejected Data (Flag <-3>)

None

Missing Data (Flag <-2>)

07/15/2014 at 10:30 and 07/23/2014 at 14:00

Suspect Data (Flag <1>)

None

Turbidity

Rejected Data (Flag <-3>)

See Mosquito Creek blanket statement.

Missing Data (Flag <-2>)

07/15/2014 at 10:30 and 07/23/2014 at 14:00

Suspect Data (Flag <1>)

See "All Stations" blanket statement above.

St. Pierre

All Parameter Blanket Statement for St. Pierre

Rejected Data (Flag <-3>)

Data are rejected due to values being outside of sensor range.

Suspect Data (Flag <1>)

Data were marked suspect due to a turbidity reading over 300NTU. These values could be attributed to low tide, max flood tide, and/or rain events.

Missing Data (Flag <-2>)

Data marked as missing from (10/26/2014 at 02:45 to 11/05/2014 at 10:30); (12/12/2014 at 02:30 to 12/13/2014 at 10:45); and (12/14/2014 at 00:15 to 12/16/2014 at 20:15) <-2> [GPF] due to power failure/low battery. Data missing from (12/16/2014 at 20:15 to (12/31/2014 00:00) due to batteries corroding during deployment.

Temperature

Rejected Data (Flag <-3>)

None

Missing Data (Flag <-2>)

None

Suspect Data (Flag <1>)

Data suspect as <1> [SSD] from 7/25/14 at 21:15 to 7/26/14 at 00:00

Specific Conductivity/Salinity

Rejected Data (Flag <-3>)

None

Missing Data (Flag <-2>)

None

Suspect Data (Flag <1>)

Data suspect <1> (CCU) cause unknown from: 7/26/14 at 00:30 to 7/26/14 at 16:38; 8/3/14 at 04:00 to 8/3/14 at 05:15; 9/8/14 at 11:15 to 9/8/14 at 13:30; 9/20/14 at 09:30 to 9/20/14 at 11:00; 9/29/14 at 16:15 to 9/29/14 at 19:00

DO Percent/mg/LDeleted Data (Flag <-3>)

None

Missing Data (Flag <-2>)

See St. Pierre blanket statement.

None

Suspect Data (Flag <1>)

None

DepthRejected Data (Flag <-3>)

None

Missing Data (Flag <-2>)

None

Suspect Data (Flag <1>)

Data during the 8/13 deployment took a few hours to settle in to the tube to the correct depth. Something preventing the sonde from lowering all the way at first, however this issue resolved on its own and depth matched up well with the next deployment.

Data during the 10/8 deployment took a few hours to settle in to the tube to the correct depth. Something preventing the sonde from lowering all the way at first, however this issue resolved on its own and depth matched up well with the next deployment.

pHRejected Data (Flag <-3>)

None

Missing Data (Flag <-2>)

None

Suspect Data (Flag <1>)

Data suspect from 9/24/14 at 11:15 to 10/08/14 at 10:45 due to slightly higher pH readings during deployment. Data marked suspect for deployment (1/15/2014 at 11:45 to 2/20/2014 at 14:30) and deployment (3/13/2014 at 09:45 to 4/02/2014 at 13:00) and deployment (11/05/2014 at 10:45 to 12/03/2014 at 09:45) due to high pH. Note this was the same sonde.

TurbidityDeleted Data (Flag <-3>)

See St. Pierre blanket statement.

Missing Data (Flag <-2>)

See St. Pierre blanket statement.

Suspect Data (Flag <1>)

See St. Pierre blanket statement.