

I. Data Set and Research Descriptors

1) Principal investigator(s) and contact persons

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2) Entry verification

Deployment data are uploaded from the YSI data logger to a Personal Computer (IBM compatible). Files are exported from EcoWatch in a comma-delimited format (CDF), EcoWatch Lite in a comma separated file (CSV) or KOR Software in an Excel File (.XLS) and uploaded to the CDMO where they undergo automated primary QAQC; automated depth/level corrections for changes in barometric pressure (cDepth or cLevel parameters); and become part of the CDMO's online provisional database. All pre- and post-deployment data are removed from the file prior to upload. During primary QAQC, data are flagged if they are missing or out of sensor range. The edited file is then returned to the Reserve for secondary QAQC where it is opened in Microsoft Excel and processed using the CDMO's NERRQAQC Excel macro. The macro inserts station codes, creates metadata worksheets for flagged data and summary statistics, and graphs the data for review. It allows the user to apply QAQC flags and codes to the data, remove any overlapping deployment data, and append files. After secondary QAQC, files are uploaded and are ingested into the CDMO database as provisional plus data, and cDepth or cLevel parameters are re-calculated. A tertiary QAQC is done on the yearly files by the CDMO and then files are assimilated 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. Nicole King, Saundra Upchurch, and Denise Sanger 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. 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 two major objectives of the ACE Basin monitoring program are to: 1) compare water quality conditions in shallow creeks along a salinity gradient and at different levels of development in the South Edisto River watershed and 2) track changes to the saltwater demarcation line in the South Edisto River as a result of prolonged drought, extraction of river water, and sea level rise.

The program began on March 3, 1995 in two tributaries of the South Edisto River, Big Bay Creek and St. Pierre Creek; in October 2002, monitoring stations were established in Fishing Creek and Mosquito Creek, tributaries

of the South Edisto River. In 2014, two sites were established in the South Edisto River proper at Jehossee Island and Grove Plantation.

Four primary monitoring stations (Edisto Island [replacement for Big Bay], Fishing Creek, Mosquito Creek and St. Pierre Creek) are used to study contrasting land use patterns in the reserve. The two “treatment” sites are Edisto Island and Mosquito Creek, where boat traffic is moderate to heavy and residential and commercial development is moderate. St. Pierre Creek and Fishing Creek, where boat traffic is light and development is sparse, are designated as “control” sites. The four sites are located along a salinity gradient ranging from the polyhaline (Edisto Island & St. Pierre Creek) to mesohaline (Mosquito Creek) to oligohaline (Fishing Creek). See *Section 5 - Site Location and Character* for detailed descriptions of the sites.

The secondary stations at Jehossee Island and Grove Plantation are used to track changes in the saltwater demarcation line. These two stations extend our coverage of the salinity gradient in the South Edisto River. The Jehossee Island station is in the mesohaline zone, and the Grove Plantation station is in the oligohaline to freshwater zone, approximately 0.16 km (0.1 nautical miles) downstream of the legal saltwater demarcation line. See *Section 5 - Site Location and Character* for detailed descriptions of the sites.

YSI electronic data loggers are deployed to monitor the water temperature, specific conductance, dissolved oxygen, water level, pH and turbidity conditions, approximately 0.5 meters (1.64 ft) from the creek bottom. Turbidity monitoring was added to the program on April 11, 1996. Initially the loggers measured the parameters at fifteen-minute intervals; on August 11, 1995, the sampling interval was changed to 30 minutes; and on December 12, 2007, the sampling interval was changed back to 15 minutes.

4) Research methods

A single YSI sonde is attached to a deployment mount at each monitoring station in order to ensure that the sensors are positioned approximately 0.5 m (1.64 ft) from the creek bottom during a deployment. 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. In 2017-2018, additional holes were drilled into the new or refurbished tubes before they were swapped with existing tube on deployment mount. In 2019, the tubes were also painted with a copper-based antifouling paint on the bottom 1 m. (See Section 14 for more details on the history of deployment mounts at the monitoring stations.)

From 1995 to 2013, YSI 6600 series sondes were deployed at all monitoring stations. In 2019, YSI 6600 sondes were only deployed at Grove Plantation (replaced with EXO2 in December) and Jehossee Island; YSI EXO2 were deployed at the other four stations (Edisto Island, Fishing Creek, Mosquito Creek, and St. Pierre). We started to migrate to EXO2 sondes in 2014 when Edisto Island station came on online; Fishing Creek site was switched to an EXO2 sonde in 2016, St. Pierre Creek station in 2017, Mosquito Creek station in 2018, and Grove Plantation station in December 2019.

ACE Basin Reserve also has switched from rapid pulse DO sensors to optical DO (ODO) sensors, and in 2018, ODO sensors were installed at all monitoring stations. ODO sensors were always installed at the Edisto Island monitoring station. The other stations were switched to ODO sensors during the following years: Fishing Creek station in 2016; Grove Plantation, Mosquito Creek, and St. Pierre stations in 2017; and Jehossee Island station in 2018.

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; in 2017, the Sat-Link2 was replaced with a Storm3 transmitter. A Sutron Sat-Link2 transmitter was installed at the Fishing Creek station from 02/20/2013 to 08/31/2015 and transmitted to the NOAA GOES satellite, NESDIS ID #3B04B1CE. On June 8, 2018, Fishing Creek Sutron Sat-Link2 transmitter was installed at the Grove Plantation station and began transmitting data on 06/15/2016 to the NOAA GOES satellite, NESDIS ID #3B04B1CE; on 12/10/2019, the Sat-Link2 was replaced with a Storm3 transmitter in December 2019. Transmissions from all stations 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 QA/QC and assimilation in the CDMO's authoritative online database. Provisional and authoritative data are available at <http://cdmo.baruch.sc.edu>.

Before the data loggers are deployed, the sondes are calibrated and programmed in accordance with guidelines set by CDMO and ACE Basin Reserve. The water depth sensor is zeroed in air by applying a depth offset during calibration that is calculated using the barometric pressure measured with a YSI handheld. The ROX DO sensors on the YSI 6600 and EXO2 sondes are calibrated by the air saturated water method, and the barometric pressure (mmHg) reading is measured with a YSI handheld. In prior years, the rapid pulse DO sensors on the YSI 6600 sondes were calibrated by the water saturated air method, and a DO membrane integrity test was performed on rapid pulse sensors to determine if the membrane was installed properly or was damaged during calibration. The pH sensor is calibrated by the two-point method (pH 7 and 10), and the turbidity sensor by the two-point method (0 standard and 124/126 NTU standard). In addition, a series of diagnostic values, including dissolved oxygen charge (rapid pulse only), dissolved oxygen gain, and pH millivolt value at pH 7 and at pH 10, and pH slope also are recorded during calibration process.

To minimize fouling (i.e. settlement of barnacles and sponges) of data loggers, sensors are wrapped in nonconductive copper tape. The inside of the PVC tube is brushed after every deployment to remove fouling organisms. The PVC tube is replaced with new or refurbished tube approximately once per year. Starting in 2019, the portions of the tubes that are always submerged were painted with copper-based anti-fouling paint (approximately 1 m from the bottom of the tube), and the fouling organisms growing on the outside of the tubes were scrapped off as needed. In 2019, we stopped wrapping a plastic mesh around the sensor guard.

The data loggers are deployed for one to two weeks during the summer months (April – September), and the sampling period is extended up to one month during the cooler months (October – March). 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. In-situ readings (water temperature, specific conductivity, salinity, and dissolved oxygen [% air sat and mg/L]) are measured with a hand-held YSI unit during the last 15-minute reading of the deployment to determine how much drift in the readings occurred during the deployment. Ambient conditions (i.e., precipitation and wind speed and direction) also are recorded.

When the data loggers are retrieved, they are taken to the laboratory for cleaning, post-deployment checks and servicing, in accordance with guidelines set by CDMO and ACE Basin Reserve. Post-deployment checks of all the parameters are done before cleaning the sensors. Prior to April of 2019, sonde and sensors were cleaned before turbidity post-deployment checks. Wiper brushes and pads (ROX ODO only) are left on for the dissolved oxygen post-deployment check but removed prior to checking the remaining parameters. A clean wiper pad is installed on the 6600 turbidity sensor before the post-deployment checks. With the rapid pulse sensor, a DO membrane integrity test also is performed to determine if the membrane was damaged during deployment. A series of diagnostic values, including dissolved oxygen charge (rapid pulse only), and pH millivolt value at pH 7 and at pH 10, and pH slope are recorded during post-deployment 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.

The data are downloaded, and the dataset is reviewed to determine if any equipment malfunctions occurred during deployment that need immediate attention.

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 euhaline, polyhaline, and mesohaline, while waterfowl impoundments are the dominant land cover in the oligohaline and fresh 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
acceiwq	P	Edisto Island	32.5040 N -80.3247 W	01/01/2015 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
acegpwq	S	Grove Plantation	32.6637 N -80.4130 W	01/01/2015 00:00 - current	NA	NA
acejiwq	S	Jehossee Island	32.6209 N -80.3965 W	01/01/2015 00:00 - current	NA	NA
acechwq	S	Charleston Harbor	32.7573 N -79.8589 W	01/01/2018 00:00 - 08/30/2018	see Charleston Harbor description below	Data only avail. from ACE
acebbwq	P	Big Bay	32.4941 N -80.3241 W	03/01/1995 00:00 - 12/31/2014 00:00	see Big Bay description below	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:

Edisto Island (EI) – GPS coordinates: 32.5040 N and -80.3247 W

On January 1, 2015, Edisto Island water quality station replaced the Big Bay station as a primary station. The Edisto Island station is approximately 1.27 km (0.68 nautical miles) upstream of the previous site (Big Bay) and is located on a dock at the Edisto Beach State Park. Water quality data were collected at both stations for 8 months and the overall results were very similar. Edisto Island station is also designated as a "treatment" site because of its proximity to developed areas. In 2019, the mean depth at the station was 2.63 m (8.7 ft), and the mean salinity was 29.50 practical salinity units (psu).

The eastern bank of the Big Bay creek, at the new station is bordered by *Spartina alterniflora* and *Salicornia virginica*. The high ground is dominated by maritime forest, characterized by live oak (*Quercus virginiana*), slash pine (*Pinus taeda*); and cabbage palmetto (*Sabal palmetto*). A marsh island with no high ground borders the western bank while American oyster (*Crassostrea virginica*) forms a reef along both creek banks. Boat traffic is heavy, especially during the warmer months, and the creek is closed to shellfish harvesting because of the surrounding human activities. Nonpoint sources of pollution, including fertilizers, pesticides, herbicides and PAHs, to the monitoring station are surface runoff from lawns, golf courses, and paved ramps. Docks and bulkheads are constructed of concrete or wood treated with creosote, CCA-treated, or Wolmanized process.

Fishing Creek (FC) – GPS coordinates: 32.63593 N and -80.36556 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 2019, the mean depth at the station was 2.44 m (8.0 ft), and the mean salinity was 9.7 psu.

The 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 2019, the mean depth at the station was 4.04 m (13.3 ft), and the mean salinity was 16.1 psu.

The 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 2019, the mean depth at the station was 1.95 m (6.5 ft), and the mean salinity was 28.7 psu.

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 (281.26 ha) 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 (118.17 ha) is limited to 67 (27.11 ha). 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.

Secondary Monitoring Stations

Both secondary stations (Grove Plantation and Jehossee Island) are in the South Edisto River proper. The descriptions of the sites are as follow:

Grove Plantation (GP) – GPS coordinates: 32.6637 N and -80.4130 W

This monitoring station is in the South Edisto River located at the Grove Plantation unit of the ACE Basin National Wildlife Refuge, which is owned and managed by the US Fish and Wildlife Service (USFWS). The station is

approximately 18 m (59 ft) from the eastern bank of the Edisto River. The station is surrounded by tidal freshwater fringe marsh and managed wetlands (aka “waterfowl impoundments”). The upland area is dominated by pine-mixed hardwood forest that is characterized by several species of oaks and pines. During years of normal rainfall, the salinity at this station generally is below 1 psu, but it will increase if rainfall is low. In 2019, the average depth at the station was 3.38 m (11.1 ft), and the mean salinity was 1.2 psu.

Jehossee Island (JI) – GPS coordinates: 32.6209 N and -80.3965 W

This monitoring station is in the South Edisto River. It is located at the Jehossee Island unit of the ACE Basin National Wildlife Refuge, which is owned and managed by the USFWS. The station is surrounded by *Spartina cynosuroides* fringe marsh and managed wetlands (aka “waterfowl impoundments”). The upland area is dominated by inland maritime forest that is characterized by slash pine, live oak, and cabbage palmetto. During years of normal rainfall, the salinity at this station generally is between 5 and 10 psu, and it will increase if rainfall is low. In 2019, the average depth at the station was 4.77 m (15.8 ft), and the mean salinity was 11.3 psu.

Inactive Monitoring Stations

Big Bay, Charleston Harbor, and Rock Creek are inactive stations, and the descriptions of the sites are as follow:

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

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 were collected at both stations for 8 months and the overall results were very similar.

Charleston Harbor (CH) - GPS coordinates: 32.7573 N and -79.8589 W

The Charleston Harbor station was about 85 meters from Fort Moultrie on Sullivans Island to the east, and about 0.8 km north from the mouth of Charleston Harbor Estuary. Fort Moultrie is a National Monument and part of the Fort Sumter National Park. The station was surrounded by water on three sides, and by beach to the east. The Charleston Harbor data and metadata are only available by contacting the reserve directly. Data were collected from 11/29/2017 to 08/30/2018. The site was destroyed on 08/30/2019.

Rock Creek (RC) - GPS coordinates: 32.54850 N and -80.50361 W

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

The end times below marked with an asterisk (*) coincide with the last actual reading in that deployment so the times will not be in consecutive order with the following deployment begin time. The gap between the end time of one

deployment and the begin time of the next deployment is attributed to either missing or rejected data due to in field maintenance, battery failure, collector error, or sonde was lost. **Note:** see Section 14 for more information about the stations.

Edisto Island

BEGAN	ENDED	SONDE
12/03/2018 - 10:45	01/03/2019 - 13:15	EXO2
01/03/2019 - 13:30	02/04/2019 - 12:45	EXO2
02/04/2019 - 13:00	03/04/2019 - 10:45	EXO2
03/04/2019 - 11:00	04/01/2019 - 12:00	EXO2
04/01/2019 - 12:15	04/19/2019 - 07:30	EXO2
04/19/2019 - 07:45	05/01/2019 - 11:45	EXO2
05/01/2019 - 12:00	05/15/2019 - 11:45	EXO2
05/15/2019 - 12:00	05/28/2019 - 10:15*	EXO2
05/28/2019 - 10:45	06/13/2019 - 10:15	EXO2
06/13/2019 - 10:30	06/26/2019 - 10:15	EXO2
06/26/2019 - 10:30	07/10/2019 - 08:15	EXO2
07/10/2019 - 08:30	07/24/2019 - 10:00	EXO2
07/24/2019 - 10:15	08/07/2019 - 10:30	EXO2
08/07/2019 - 10:45	08/12/2019 - 10:30	EXO2
08/12/2019 - 10:45	08/27/2019 - 10:00	EXO2
08/27/2019 - 10:15	09/12/2019 - 08:15	EXO2
09/12/2019 - 08:30	09/23/2019 - 10:15	EXO2
09/23/2019 - 10:30	10/08/2019 - 08:45	EXO2
10/08/2019 - 09:00	11/06/2019 - 09:45	EXO2
11/06/2019 - 10:00	12/10/2019 - 12:00	EXO2
12/10/2019 - 12:15	01/06/2020 - 11:45	EXO2

Fishing Creek

BEGAN	ENDED	SONDE
12/03/2018 - 11:30	01/03/2019 - 12:00	EXO2
01/03/2019 - 12:15	02/04/2019 - 15:30	EXO2
02/04/2019 - 15:45	03/04/2019 - 12:15	EXO2
03/04/2019 - 12:30	03/28/2019 - 08:00*	EXO2
03/28/2019 - 09:30	04/17/2019 - 12:00	EXO2
04/17/2019 - 12:15	05/01/2019 - 11:15	EXO2
05/01/2019 - 11:30	05/15/2019 - 09:45	EXO2
05/15/2019 - 10:00	05/29/2019 - 10:00	EXO2
05/29/2019 - 10:15	06/13/2019 - 10:45	EXO2
06/13/2019 - 11:00	06/26/2019 - 10:00	EXO2
06/26/2019 - 10:15	07/11/2019 - 08:45	EXO2
07/11/2019 - 09:00	07/24/2019 - 08:00	EXO2
07/24/2019 - 08:15	08/07/2019 - 09:45	EXO2
08/07/2019 - 10:00	08/12/2019 - 10:45	EXO2
08/12/2019 - 11:00	08/28/2019 - 10:15	EXO2
08/28/2019 - 10:30	09/10/2019 - 10:45	EXO2
09/10/2019 - 11:00	09/24/2019 - 10:45	EXO2
09/24/2019 - 11:00	10/08/2019 - 09:45	EXO2
10/08/2019 - 10:00	11/07/2019 - 10:00	EXO2
11/07/2019 - 10:15	12/09/2019 - 12:00	EXO2
12/09/2019 - 12:15	01/06/2020 - 10:45	EXO2

Grove Plantation

BEGAN	ENDED	SONDE
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12/03/2018 - 12:00	01/03/2019 - 12:45	6600 EDS/V2
01/03/2019 - 13:00	02/04/2019 - 15:00	6600 EDS/V2
02/04/2019 - 15:15	03/04/2019 - 12:45	6600 EDS/V2
03/04/2019 - 13:00	03/28/2019 - 09:45*	6600 EDS/V2
03/28/2019 - 10:45	04/17/2019 - 11:15	6600 EDS/V2
04/17/2019 - 11:30	05/01/2019 - 11:45	6600 EDS/V2
05/01/2019 - 12:00	05/15/2019 - 10:15	6600 EDS/V2
05/15/2019 - 10:30	05/29/2019 - 10:30	6600 EDS/V2
05/29/2019 - 10:45	06/13/2019 - 11:30	6600 EDS/V2
06/13/2019 - 11:45	06/26/2019 - 10:30	6600 EDS/V2
06/26/2019 - 10:45	07/11/2019 - 09:15	6600 EDS/V2
07/11/2019 - 09:30	07/24/2019 - 08:30	6600 EDS/V2
07/24/2019 - 08:45	08/07/2019 - 10:15	6600 EDS/V2
08/07/2019 - 10:30	08/12/2019 - 11:15	6600 EDS/V2
08/12/2019 - 11:30	08/28/2019 - 10:45	6600 EDS/V2
08/28/2019 - 11:00	09/10/2019 - 11:30	6600 EDS/V2
09/10/2019 - 11:45	09/24/2019 - 11:15	6600 EDS/V2
09/24/2019 - 11:30	10/08/2019 - 10:15	6600 EDS/V2
10/08/2018 - 10:30	11/07/2019 - 10:30	6600 EDS/V2
11/07/2019 - 10:45	12/09/2019 - 12:45	6600 EDS/V2
12/09/2019 - 13:00	12/17/2019 - 12:45	EXO2
12/17/2019 - 13:00	01/06/2020 - 11:30	EXO2

Jehossee Island

BEGAN	ENDED	SONDE
12/03/2018 - 11:00	01/03/2019 - 11:15	6600 EDS/V2
01/03/2019 - 11:30	02/04/2019 - 14:30	6600 EDS/V2
02/04/2019 - 14:45	03/04/2019 - 11:45	6600 EDS/V2
03/04/2019 - 12:00	04/01/2019 - 10:45	6600 EDS/V2
04/01/2019 - 11:00	04/17/2019 - 10:30	6600 EDS/V2
04/17/2019 - 10:45	04/29/2019 - 09:30*	6600 EDS/V2
04/29/2019 - 11:00	05/15/2019 - 09:15	6600 EDS/V2
05/15/2019 - 09:30	05/29/2019 - 09:30	6600 EDS/V2
05/29/2019 - 09:45	06/13/2019 - 09:45	6600 EDS/V2
06/13/2019 - 10:00	06/26/2019 - 09:30	6600 EDS/V2
06/26/2019 - 09:45	07/11/2019 - 08:15	6600 EDS/V2
07/11/2019 - 08:30	07/24/2019 - 07:30	6600 EDS/V2
07/24/2019 - 07:45	08/07/2019 - 07:15	6600 EDS/V2
08/07/2019 - 07:30	08/12/2019 - 10:15	6600 EDS/V2
08/12/2019 - 10:30	08/28/2019 - 09:45	6600 EDS/V2
08/28/2019 - 10:00	09/10/2019 - 10:15	6600 EDS/V2
09/10/2019 - 10:30	09/24/2019 - 10:15	6600 EDS/V2
09/24/2019 - 10:30	10/08/2019 - 09:15	6600 EDS/V2
10/08/2019 - 09:30	11/07/2019 - 09:15	6600 EDS/V2
11/07/2019 - 09:30	12/09/2019 - 11:15	6600 EDS/V2
12/09/2019 - 11:30	12/19/2019 - 01:30*	6600 EDS/V2

Mosquito Creek

BEGAN	ENDED	SONDE
12/03/2018 - 10:15	01/03/2018 - 10:30	EXO2

01/03/2019 - 10:45	02/04/2019 - 13:45	EXO2
02/04/2019 - 14:00	03/04/2019 - 10:45	EXO2
03/04/2019 - 11:00	04/01/2019 - 09:45	EXO2
04/01/2019 - 10:00	04/17/2019 - 09:30*	EXO2
05/01/2019 - 10:15	05/13/2019 - 08:45*	EXO2
05/13/2019 - 10:15	05/29/2019 - 08:45	EXO2
05/29/2019 - 09:00	06/13/2019 - 09:00	EXO2
06/13/2019 - 09:15	06/26/2019 - 08:45	EXO2
06/26/2019 - 09:00	07/11/2019 - 07:30	EXO2
07/11/2019 - 07:45	07/24/2019 - 06:45	EXO2
07/24/2019 - 07:00	08/07/2019 - 08:00	EXO2
08/07/2019 - 08:15	08/12/2019 - 09:30	EXO2
08/12/2019 - 09:45	08/28/2019 - 09:00	EXO2
08/28/2019 - 09:15	09/10/2019 - 09:30	EXO2
09/10/2019 - 09:45	09/24/2019 - 09:30	EXO2
09/24/2019 - 09:45	10/08/2019 - 08:30	EXO2
10/08/2019 - 08:45	11/07/2019 - 08:15	EXO2
11/07/2019 - 08:30	12/09/2019 - 10:15	EXO2
12/09/2019 - 10:30	01/06/2020 - 09:00	EXO2

St. Pierre

BEGAN	ENDED	SONDE
12/03/2018 - 09:15	01/03/2019 - 09:30	EXO2
01/03/2019 - 09:45	02/04/2019 - 12:45	EXO2
02/04/2019 - 13:00	03/04/2019 - 10:00	EXO2
03/04/2019 - 10:15	04/01/2019 - 08:45	EXO2
04/01/2019 - 09:00	04/17/2019 - 08:30	EXO2
04/17/2019 - 08:45	05/01/2019 - 08:45	EXO2
05/01/2019 - 09:00	05/15/2019 - 08:15	EXO2
05/15/2019 - 08:30	05/28/2019 - 08:00*	EXO2
05/28/2019 - 09:30	06/13/2019 - 08:00	EXO2
06/13/2019 - 08:15	06/26/2019 - 08:00	EXO2
06/26/2019 - 08:15	07/10/2019 - 07:00	EXO2
07/10/2019 - 07:15	07/24/2019 - 06:00	EXO2
07/24/2019 - 06:15	08/07/2019 - 08:45	EXO2
08/07/2019 - 09:00	08/12/2019 - 08:30	EXO2
08/12/2019 - 08:45	09/10/2019 - 08:30	EXO2
09/10/2019 - 08:45	09/24/2019 - 08:30	EXO2
09/24/2019 - 08:45	10/08/2019 - 07:30	EXO2
10/08/2019 - 07:45	11/06/2019 - 09:00	EXO2
11/06/2019 - 09:15	12/09/2019 - 09:00	EXO2
12/09/2019 - 09:15	01/06/2020 - 08:15	EXO2

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 processed 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 2020.

NERR water quality data and metadata can be obtained from the Research Coordinator at the individual NERR site (please see Principal Investigators and Contact Persons), from the Data Manager at the Centralized Data Management Office (please see personnel directory under the general information link on the CDMO home page) and online at the CDMO home page www.nerrsdata.org. Data are available in comma delimited format.

8) Associated researchers and projects

As 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 and meteorological data obtained by a Campbell Scientific CR1000 data logger. 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 ACE NERR Research Coordinator.

II. Physical Structure Descriptors

9) Sensor specifications

ACE NERR deployed EXO2 data sondes and 6600 EDS/V2 data sondes in 2019: 6600 sondes at GP and JI monitoring stations, and EXO2 sondes at EI, FC, MC, and SP; Charleston Harbor station was not operational in 2019. GP was switched to EXO2 in December of 2019. The EXO2 data sondes were configured the same, and the 6600 data sondes were configured the same. Optical DO sensors were installed at all monitoring stations.

YSI 6600EDS 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: 0-20 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: Dissolved Oxygen % saturation

Units: percent air saturation (%)

Sensor Type: Optical probe w/ mechanical cleaning

Model#: 6150 ROX

Range: 0 to 500% air saturation

Accuracy: 0-200% air saturation: +/- 1% of the reading or 1% air saturation, whichever is greater 200-500% air

saturation: +/- 15% or reading

Resolution: 0.1% air saturation

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

Units: milligrams/Liter (mg/L)

Sensor Type: Optical probe w/ mechanical cleaning

Model#: 6150 ROX

Range: 0 to 50 mg/L

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

20 to 50 mg/L: +/- 15% of the reading

Resolution: 0.01 mg/L

Parameter: Non-vented Level - Shallow (Depth)

Units: feet or meters (ft or m)

Sensor Type: Stainless steel strain gauge

Range: 0 to 30 ft (9.1 m)

Accuracy: +/- 0.06 ft (0.018 m)

Resolution: 0.001 ft (0.001 m)

Parameter: pH – bulb probe

Units: pH units

Sensor Type: Glass combination electrode

Model#: 6561 or 6561FG

Range: 0 to 14 units

Accuracy: +/- 0.2 units

Resolution: 0.01 units

Parameter: Turbidity

Units: nephelometric turbidity units (NTU)

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

YSI EXO Sonde:

Parameter: Temperature
Units: Celsius (C)
Sensor Type: CT2 probe, Thermistor
Model#: 599870
Range: -5 to 50 C
Accuracy: -5 to 35: +/- 0.01, 35 to 50: +/- .005
Resolution: 0.01 C

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

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

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

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

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

20 to 50 mg/L: +/- 5% of the reading
Resolution: 0.01 mg/L

Parameter: Non-vented Level - Shallow (Depth)
Units: feet or meters (ft or m)
Sensor Type: Stainless steel strain gauge
Range: 0 to 33 ft (10 m)
Accuracy: +/- 0.013 ft (0.004 m)
Resolution: 0.001 ft (0.001 m)

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

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

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 1.02 cm for every 1 millibar change in atmospheric pressure and is eliminated for vented sensors because they are vented to the atmosphere throughout the deployment time interval.

Beginning in 2006, NERR SWMP standard calibration protocol calls for all non-vented depth sensors to read 0 meters at a (local) barometric pressure of 1013.25 mb (760 mm/hg). To achieve this, each site calibrates their depth sensor with a depth offset number, which is calculated using the actual atmospheric pressure at the time of calibration and the equation provided in the SWMP calibration sheet or digital calibration log. This offset procedure standardizes

each depth calibration for the entire NERR System. If accurate atmospheric pressure data are available, non-vented sensor depth measurements at any NERR can be corrected.

In 2010, the CDMO began automatically correcting depth/level data for changes in barometric pressure as measured by the Reserve's associated meteorological station during data ingestion. These corrected depth/level data are reported as cDepth and cLevel and are assigned QAQC flags and codes based on QAQC protocols. Please see sections 11 and 12 for QAQC flag and code definitions.

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

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

Salinity Units Qualifier:

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

Turbidity Qualifier:

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

10) Coded variable definitions

Sampling station:	Sampling site code:	Station code:
Edisto Island	EI	aceeiwq
Fishing Creek	FC	acefcwq
Grove Plantation	GP	acegpwq
Jehossee Island	JI	acejiwq
Mosquito Creek	MC	acemcwq
St. Pierre Creek	SP	acespwq

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 are 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	<i>Open - reserved for later flag</i>

- 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

Edisto Island

Deployment Date (m/d/y)	Post-Deployment Checks							
	SpCond (ms/cm)	DO 1 (100% sat)	DO 2 (100% sat)	Depth (m)	pH (7)	pH (10)	Turb (NTU)	Turb (NTU)
12/03/2018	50.12	100.1	102.3	0.143	7.15	10.16	0.10	115.12
01/03/2019	48.75	101.9	103.4	0.082	7.11	10.15	0.11	130.69
02/04/2019	50.04	101.1	103.3	0.138	7.09	10.15	-0.26	124.34
03/04/2019	48.72	99.8	99.8	0.174	7.11	10.13	0.29	124.07
04/01/2019	50.01	96.8	96.8	-0.059	7.09	10.12	-0.11	124.81
04/19/2019	49.13	101.2	101.2	0.022	7.11	10.08	0.37	123.08
05/01/2019	49.76	98.5	98.5	0.042	7.10	10.14	0.08	123.19
05/15/2019	49.99	99.7	99.7	0.012	7.03	10.03	0.09	125.21
05/28/2019	49.70	98.8	98.8	0.049	7.10	10.10	0.64	125.22
06/13/2019	49.49	99.5	99.5	0.079	7.05	10.09	0.29	133.66
06/26/2019	50.05	99.4	99.4	0.054	7.14	10.13	0.03	124.66
07/10/2019	49.90	98.6	98.6	0.003	7.07	10.08	0.64	124.04
07/24/2019	49.87	99.1	99.1	-0.008	7.07	10.10	0.37	124.96
08/07/2019	49.44	100.3	100.3	-0.102	7.03	10.00	-0.10	125.82
08/12/2019	49.60	100.6	100.6	0.034	6.83	6.83	0.80	127.60
08/28/2019	49.64	100.4	100.4	0.024	7.10	10.08	0.24	125.05
09/12/2019	50.00	100.9	100.9	0.055	7.12	10.11	0.13	124.45
09/23/2019	50.03	97.4	97.4	0.076	7.08	10.13	0.08	125.67
10/08/2019	49.97	100.2	100.2	0.059	7.14	10.18	-0.30	131.05
11/06/2019	50.13	99.9	99.9	0.160	7.02	10.03	-0.03	137.27
12/10/2019	50.03	101.5	101.5	0.170	7.07	10.01	-0.02	127.05

Fishing Creek

Deployment Date (m/d/y)	Post-Deployment Checks							
	SpCond (ms/cm)	DO 1 (100% sat)	DO 2 (100% sat)	Depth (m)	pH (7)	pH (10)	Turb (NTU)	Turb (NTU)
12/03/2018	50.93	99.6	101.5	0.113	7.12	10.15	0.35	116.50
01/03/2019	49.28	100.6	102.0	0.067	7.13	10.15	-0.09	130.64
02/04/2019	49.76	100.7	102.5	0.251	7.16	10.15	0.33	125.81
03/04/2019	49.38	100.5	100.5	0.110	7.62	10.59	-0.06	123.06
03/28/2019	49.44	98.8	98.8	0.074	7.09	10.10	0.46	124.13
04/17/2019	49.21	101.0	101.0	0.018	7.13	10.08	0.01	123.94
05/01/2019	49.31	98.4	98.4	0.076	7.11	10.13	0.39	122.80
05/15/2019	49.52	97.6	97.6	0.013	7.11	10.10	0.57	125.38
05/29/2019	49.68	99.4	99.4	0.059	7.00	10.01	0.23	127.44
06/13/2019	49.65	99.5	99.5	0.077	7.10	10.12	0.33	122.12
06/26/2019	50.19	99.0	99.0	0.072	7.08	10.11	0.63	123.97
07/11/2019	49.66	98.8	98.8	0.069	7.11	10.10	0.89	124.07
07/24/2019	49.43	99.3	99.3	-0.028	7.11	10.13	0.54	125.24
08/07/2019	49.88	101.5	101.5	0.004	7.06	10.07	0.20	125.96
08/12/2019	49.55	97.7	97.7	-0.003	7.13	10.13	0.18	127.10
08/28/2019	49.80	99.9	99.9	0.062	7.09	10.11	0.33	134.34
09/10/2019	49.40	99.2	99.2	0.014	7.11	10.12	0.90	124.90
09/24/2019	50.16	97.7	97.7	0.092	7.07	10.11	0.14	126.16
10/08/2019	49.89	97.2	97.2	0.032	7.05	10.08	0.26	128.29
11/07/2019	49.95	100.2	100.2	0.107	7.13	10.12	0.63	125.73
12/09/2019	50.56	100.7	100.7	0.149	7.17	10.09	0.54	135.88

Grove Plantation

Deployment Date (m/d/y)	Post-Deployment Checks							
	SpCond (ms/cm)	DO 1 (100% sat)	DO 2 (100% sat)	Depth (m)	pH (7)	pH (10)	Turb (NTU)	Turb (NTU)
12/03/2018	49.81	99.9	101.6	0.095	7.01	10.15	0.5	118.3
01/03/2019	49.74	99.7	100.9	0.058	7.09	10.11	0.1	130.4
02/04/2019	49.86	100.1	101.9	0.112	7.02	10.03	0.7	124.4
03/04/2019	49.41	101.4	101.4	0.112	7.04	10.06	0.3	125.5
03/28/2019	49.81	101.5	101.5	0.053	6.87	9.90	0.0	125.3
04/17/2019	49.48	105.6	105.6	0.030	7.06	10.08	0.3	125.8
05/01/2019	49.42	99.1	99.1	0.066	7.03	10.06	0.5	125.1
05/15/2019	49.44	99.3	99.3	0.026	7.02	10.03	0.7	123.7
05/29/2019	49.22	98.6	98.6	0.101	7.07	10.09	0.3	125.4
06/13/2019	49.38	100.3	100.3	0.096	7.02	10.02	0.6	127.9
06/26/2019	49.82	98.2	98.2	0.071	6.98	10.02	0.5	127.6
07/11/2019	49.69	99.4	99.4	0.075	7.01	10.03	0.6	126.8
07/24/2019	49.23	97.9	97.9	0.008	7.00	10.03	0.4	127.2
08/07/2019	49.95	99.7	99.7	0.004	6.97	9.99	0.7	127.8
08/12/2019	48.85	97.5	97.5	0.039	6.99	10.00	0.4	129.8
08/28/2019	49.89	100.8	100.8	0.123	6.95	9.95	0.3	134.9
09/10/2019	48.72	98.6	98.6	0.004	6.98	9.99	0.6	126.4
09/24/2019	45.13	98.8	98.8	0.094	7.07	10.11	0.8	127.5
10/08/2019	48.48	96.7	96.7	0.069	6.94	9.84	0.6	131.3
11/07/2019	50.21	100.0	100.0	0.145	7.03	10.01	0.3	127.7
12/09/2019	50.02	101.9	101.0	0.047	7.09	10.07	-0.21	126.86
12/17/2019	50.25	101.9	101.9	0.176	7.21	10.15	0.12	126.89

Jehossee Island

Deployment Date (m/d/y)	Post-Deployment Checks							
	SpCond (ms/cm)	DO 1 (100% sat)	DO 2 (100% sat)	Depth (m)	pH (7)	pH (10)	Turb (NTU)	Turb (NTU)
12/03/2018	49.89	99.7	101.4	0.108	7.09	10.10	0.1	120.7
01/03/2019	55.13	99.3	101.1	0.061	7.15	10.18	0.3	128.3
02/04/2019	49.93	99.6	102.0	0.128	7.48	9.42	0.3	126.6
03/04/2019	49.44	100.4	100.4	0.162	7.26	10.55	0.8	125.7
04/01/2019	49.45	99.7	99.7	0.039	7.14	10.19	0.8	126.7
04/17/2019	49.42	103.6	103.6	0.108	7.05	10.08	0.2	134.0
04/29/2019	49.41	97.7	97.7	0.061	7.26	10.28	0.8	125.8
05/15/2019	49.21	98.4	98.4	0.007	7.00	10.01	0.3	125.6
05/29/2019	45.74	99.0	99.0	0.096	7.10	10.12	0.6	126.3
06/13/2019	49.50	100.7	100.7	0.099	7.10	10.10	0.5	128.5
06/26/2019	48.45	97.3	97.3	0.061	7.08	10.14	-0.7	127.1
07/11/2019	45.31	97.8	97.8	0.073	7.15	10.01	-0.1	126.5
07/24/2019	49.09	98.1	98.1	0.003	7.08	10.14	0.9	126.8
08/07/2019	31.56	99.8	99.8	-0.016	7.17	10.17	0.7	135.7
08/12/2019	44.56	97.8	97.8	0.030	7.07	9.97	0.0	132.5
08/28/2019	49.42	100.3	100.3	0.112	7.05	10.12	0.0	134.3
09/10/2019	49.43	98.9	98.9	-0.009	7.34	9.96	0.7	128.1
09/24/2019	53.08	97.8	97.8	0.094	6.87	10.73	0.5	127.9
10/08/2019	48.78	101.5	101.5	0.105	7.04	9.98	0.6	131.1
11/07/2019	84.33	99.2	99.2	0.128	6.92	9.90	0.1	128.0
12/09/2019	50.26	100.8	100.8	0.228	7.13	10.03	0.0	130.5

Mosquito Creek

Deployment Date (m/d/y)	Post-Deployment Checks							
	SpCond (ms/cm)	DO 1 (100% sat)	DO 2 (100% sat)	Depth (m)	pH (7)	pH (10)	Turb (NTU)	Turb (NTU)
12/03/2018	49.93	99.5	101.4	0.134	7.13	10.16	0.15	116.04
01/03/2019	49.72	100.4	101.1	0.061	7.10	10.11	-0.17	131.38
02/04/2019	50.10	100.3	102.4	0.156	7.14	10.20	0.30	124.18
03/04/2019	49.56	100.6	100.6	0.147	7.08	10.10	0.02	124.40
04/01/2019	49.97	96.5	96.5	0.060	7.07	10.09	0.15	124.37
04/17/2019	ND	ND	ND	ND	ND	ND	ND	ND
05/01/2019	49.87	99.2	99.2	0.021	7.12	10.14	0.13	123.53
05/13/2019	49.54	75.1	75.1	0.033	7.10	10.11	0.36	125.52
05/29/2019	49.76	99.3	99.3	0.074	7.11	10.11	0.36	126.0
06/13/2019	50.18	99.5	99.5	0.076	7.10	10.10	0.06	125.35
06/26/2019	50.17	98.3	98.3	0.068	7.06	10.07	0.30	126.12
07/11/2019	50.25	98.9	98.9	0.056	7.06	10.07	0.01	124.57
07/24/2019	50.02	98.9	98.9	-0.014	7.10	10.12	0.39	125.81
08/07/2019	49.69	100.2	100.2	-0.016	7.05	10.05	0.46	125.33
08/12/2019	49.89	98.1	98.1	-0.012	7.11	10.12	0.02	127.30
08/28/2019	49.69	99.0	99.0	0.116	7.10	10.11	-0.15	127.81
09/10/2019	50.05	98.9	98.9	-0.76	7.05	10.08	0.07	122.10
09/24/2019	50.37	98.3	98.3	0.078	7.10	10.13	-0.11	125.90
10/08/2019	49.79	97.5	97.5	0.061	7.14	10.18	-0.11	128.96
11/07/2019	50.01	100.5	100.5	0.151	7.10	10.10	-0.17	123.69
12/09/2019	50.20	101.4	101.4	0.125	7.08	10.05	0.61	128.36

St. Pierre

Deployment Date (m/d/y)	Post-Deployment Checks							
	SpCond (ms/cm)	DO 1 (100% sat)	DO 2 (100% sat)	Depth (m)	pH (7)	pH (10)	Turb (NTU)	Turb (NTU)
12/03/2018	50.06	99.7	101.5	0.143	7.15	10.13	0.14	112.33
01/03/2019	49.81	100.4	101.0	0.060	7.14	10.15	-0.11	122.94
02/04/2019	50.11	101.3	102.8	0.159	7.68	10.57	0.13	124.49
03/04/2019	49.64	100.4	100.4	0.146	7.13	10.17	-0.21	123.39
04/01/2019	49.78	99.6	99.6	0.070	7.14	10.16	0.32	125.86
04/17/2019	49.70	101.3	101.3	0.011	7.03	10.02	0.21	123.41
05/01/2019	49.64	99.1	99.1	0.065	7.05	10.07	0.43	122.85
05/15/2019	49.99	100.4	100.4	0.023	7.00	9.99	0.01	121.91
05/28/2019	49.63	99.5	99.5	0.069	7.15	10.14	0.28	125.60
06/13/2019	50.03	100.3	100.3	0.153	7.07	10.10	0.15	125.31
06/26/2019	50.18	100.3	100.3	0.069	7.04	10.05	-0.07	124.72
07/10/2019	50.14	100.3	100.3	0.059	6.99	10.02	0.26	124.54
07/24/2019	50.07	99.1	99.1	-0.013	7.08	10.09	0.10	124.52
08/07/2019	49.74	101.7	101.7	0.010	7.05	10.07	0.44	126.04
08/12/2019	48.88	100.3	100.3	0.107	7.13	10.13	0.42	131.75
09/10/2019	49.96	99.2	99.2	-0.052	7.08	10.14	0.54	127.52
09/24/2019	49.92	98.7	98.7	0.080	7.01	10.07	0.36	126.58
10/08/2019	49.89	102.0	102.0	0.064	7.15	10.18	0.46	129.39
11/06/2019	50.16	100.0	100.0	0.152	7.09	10.08	0.16	118.85
12/09/2019	50.08	102.5	102.5	0.165	7.10	10.05	0.05	127.40

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

Primary Sites

Edisto Island:

2014 - Water quality station was installed in **May** - Fasteners used to attach tube to the dock.

2015 - Site officially went online on **January 1**. (Coordinates: 32.5040 N and -80.3247 W)

2017 - PVC tube swapped with new tube with more holes along the length of tube on **December 1**.

2019 - PVC tube swapped with new tube with antifouling paint near bottom and the bottom strut was replaced on **February 28**.

Fishing Creek:

2002 - Fishing Creek site installed in **October** (Coordinates: 32.63593 N and -80.36556 W).

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

2015 - Sutron Sat-Link2 telemetry equipment removed on **August 31**.

2016 - Fishing Creek site 6600 sondes were replaced with EXO2 sondes on **December 14**.

2017 - PVC tube swapped with new tube with more holes along the length of tube on **December 11**.

2019 - PVC tube swapped with new tube with antifouling paint near bottom on **March 28**.

Mosquito Creek:

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

2007 - Deployment mount installed 0.5 meters away from old mount in **August**. This is a deeper location.

2009 - 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.
 2016 - PVC tube was replaced, and a new mounting structure was installed on **May 17**.
 2017 - Rapid Pulse DO sensors on YSI 6600 sondes were replaced with Optical DO sensors on **July 5**.
 2018 - PVC tube swapped with new tube with more holes along the length of tube on **February 27**.
 2018 - YSI 6600 sonde was replaced with EXO2 sonde on **November 5**.
 2019 - PVC tube swapped with new tube with antifouling paint near bottom on **May 13**.

St. Pierre Creek:

1995 - Water quality station was installed in **March**. (Coordinates: 32.52800 N and -80.36144 W).
 2000 - Site moved to other side of channel in **April** (Coordinates changed: 32.5279 N -80.3615 W).
 2006 - Sign post mount was replaced in **May** - with a 40-ft, 8-in diameter pressure-treated piling.
 2006 - Sutron Sat-Link2 transmitter was installed in **June**.
 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.
 2016 - PVC tube was re-positioned on piling on **July 18**.
 2016 - Yagi antenna was replaced with the top hat design on **September 12**.
 2016 - ISCO platforms were removed, and one was installed at different position on **November 4**.
 2017 - PVC tube was re-positioned on piling on **June 6** - sonde is now higher on piling.
 2017 - Rapid Pulse DO sensors on YSI 6600 sondes were replaced with Optical DO sensors on **July 5**.
 2017 - PVC tube swapped with new tube with more holes along the length of tube (see Section 3) on **June 6**.
 2017 - YSI 6600 sonde was replaced with an EXO2 sonde and switched to YSI Storm 3 telemetry system on **November 15**.
 2019 - PVC tube swapped with new tube with antifouling paint near bottom on **May 28**.

Secondary Sites

Grove Plantation - St. Helena Sound estuary:

2013 - A 40-ft, 8-in diameter treated pressure piling was installed on **November 8**.
 2014 - YSI sonde was deployed on **January 15**.
 2015 - Grove Plantation site officially went online on **January 1** (Coordinates: 32.6637N and -80.4130W)
 2016 - Grove Plantation telemetry system was installed in **June**.
 2016 - Grove Plantation site began transmitting real-time data on **June 15**.
 2017 - Rapid Pulse DO sensors on YSI 6600 sondes were replaced with Optical DO sensors on **December 4**.
 2017 - PVC tube swapped with new tube with more holes along the length of tube on **December 11**.
 2019 - PVC tube swapped with new tube with antifouling paint near bottom on **March 28**.
 2019 - YSI 6600 sonde was replaced with an EXO2 sonde on **December 9**.
 2019 - Switched to YSI Storm 3 telemetry system on **December 10**.

Jehossee Island - St. Helena Sound estuary:

2013 - Jehossee Island water quality station was installed on **August 19** - PVC tube attached to USFWS dock.
 2015 - Jehossee Island site officially went online on **January 1** (Coordinates: 32.6209 N and -80.3965 W).
 2018 - PVC tube swapped with new tube with more holes along the length of tube on **January 30**.
 2018 - Rapid Pulse DO sensors on YSI 6600 sondes were replaced with Optical DO sensors on **November**.
 2019 - PVC tube swapped with new tube with antifouling paint near bottom on **April 29**.

Inactive Stations

Big Bay:

1995 - Big Bay water quality station was installed in tributary of Big Bay Creek in **March** (Coordinates: 32 29.662N and -80 19.427W)
 2001- Big Bay station replaced in **October** due to old age and excessive biofouling of oysters (Coordinates: 32 29 38.72125N and -80 19 21.69864W)

2003 - Big Bay station moved to the creek proper in **July** after embankment collapsed near data logger (Coordinates: 32.4941N and -80.3241W)

2014 - Big Bay site officially went offline on **December 31**.

Charleston Harbor - Charleston Harbor Estuary:

2017 - Deployment mount was installed (PVC tube with holes along the length of the tube is mounted to a 40-ft, 8-in diameter treated pressure piling) in **October**.

2018 - Charleston Harbor site officially went online on **January 1** (Coordinates: 32.7573 N and -79.8589 W).

2018 - Telemetered transmission began on **January 4**.

2018 - Site was destroyed on **August 30**.

2019 – Data and metadata removed from CDMO. Only available directly from Reserve.

Rock Creek:

1996- Rock Creek water quality station was installed in **March** (Coordinates: 32.5404 N and -80.4821 W° [approximation because location was not measured while site was active])

1996 - Rock Creek water quality station went offline in **July**.

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, 3.05 meters) and salinity increases when the river level falls below 5 feet (1.52 meters). 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 (424.75 m³/sec) and increases when streamflow is below 5,000 ft³/sec (141.58 m³/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.

Wiper Brush Malfunctioning Coding

Wiper brush used to clean sensors during deployment fell off during a number of deployments. All post calibration checks were in the acceptable range. Values are flagged as <1> [SWM]. Any other data concerns that occurred during the deployment are listed under the appropriate parameter heading.

Missing Data Coding

Sonde was not at the correct depth in the deployment tube for last reading of the deployment. This is caused by sonde being pulled prematurely or deployed during the first reading. These values are considered post deployment values. Values are flagged as <-2>.

Dissolved Oxygen Hypoxia Coding

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

Turbidity Spike Coding

For YSI 6000 series sondes, turbidity values between 300 and 1000 NTU are coded <1> [STS]. For YSI EXO series sondes, turbidity values between 300 and 4000 NTU (FNU) 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 and above 4000 NTU (FNU) for YSI EXO series 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.

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) and/or local knowledge. All events listed are ones that have impacted the South Carolina Coast beginning in 2019. 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
Hurricane Dorian (AL052019)	August 28, 2019	September 6, 2019	NA

Hurricane Dorian:

Hurricane Dorian was a category 5 hurricane that moved along the southeastern Atlantic Coast with rainfall and storm surge along the SC coast as a category 1. The impact of Hurricane Dorian was observed at the Bennett's Point meteorological station in Green Pond, South Carolina during the following times:

Data collected at all sites from 09/04/2019 at 14:00 to 09/06/2019 at 04:45 are flagged for a significant weather event. All parameters were affected therefore the F_Record column is flagged as {CWE} {CSM}.

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

Edisto Island

All Parameters Blanket Statement for Edisto Island

The data collected from 03/25/2019 - 00:00 to 04/01/2019 - 12:00 during the March 4th deployment (03/04/2019 - 11:00 to 04/01/2019 - 12:00) were flagged due to biofouling. There was a significant number of bryophytes growing inside the sonde guard, on the conductivity sensor and on turbidity sensor. Other coding that occurred during the deployment are listed under the appropriate parameter heading or in a blanket statement. The F_Record column for these rows are flagged as {CSM}.

Rejected Data (Flag <-3>)

Missing Data (Flag <-2>)

The data from 09:15 to 11:30 on 02/28/2019 during the February 4th deployment (02/04/2019 - 13:00 to 03/04/2019 - 10:45) were missing due to infield maintenance. The old tube was replaced with a new tube and the bottom super strut on the deployment mount was replaced. The values are flagged as <-2> [GMC] (CSM). Note: anti-fouling paint was added to the bottom portion of the tube (see Research Methods section).

The data at 10:30 on 05/28/2019 were missing due to infield maintenance. It is believed that there was a buildup of tunicates inside the tube preventing the metal pipe and brush from reaching the bottom. With continued efforts the obstruction was cleared from the tube and the metal pipe was able to reach bottom with audio confirmation of the pipe hitting the metal stop pins. The sonde was then deployed once true bottom was confirmed. The value is flagged as <-2> [GMC] (CSM).

Suspect Data (Flag <1>)

The first readings after the new tube was installed (02/28/2019 - 11:45) during the February 4th deployment (02/04/2019 - 13:00 to 03/04/2019 - 10:45) 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 observed at this site at this time of year. The values are flagged as <1> [GSM] (CMC).

Passed Initial QAQC Checks (Flag <0>)

Temperature

Rejected Data (Flag <-3>)

Missing Data (Flag <-2>)

Suspect Data (Flag <1>)

Passed Initial QAQC Checks (Flag <0>)

Specific Conductivity/Salinity

Rejected Data (Flag <-3>)

The data collected on 09/19/2019 at 00:15 during the September 12th deployment (09/12/2019 - 08:30 to 09/23/2019 - 10:15) was rejected due to cause unknown. Although the post-deployment check was within the accepted range, the drop in specific conductivity (50.58 mS/cm - 29.39 mS/cm - 50.57 mS/cm) and salinity (33.1 psu - 18.1 psu - 33.1 psu) did not occur at or near a low tide or rain event. The reason for the decrease is not known, but we suspect it was a temporary malfunction of the sensor and or sonde. The data were rejected due to data being outside the range typically observed at this site. The value is flagged as <-3> [GSM] (CCU).

Missing Data (Flag <-2>)

Suspect Data (Flag <1>)

The data collected on 10/20/2019 at 15:30 during the October 8th deployment (10/08/2019 - 09:00 to 11/06/2019 - 09:45) was suspect due to cause unknown. The sudden drop in specific conductivity (48.62 mS/cm - 41.81 mS/cm - 48.33 mS/cm) and salinity (31.8 psu - 26.9 psu - 31.6 psu) did not occur at or near low tide or during a rain event. The values were not rejected because they were within the range typically observed at this site. It is unknown the reason for the drop. The value is flagged as <1> [GSM] (CCU).

Passed Initial QAQC Checks (Flag <0>)

The data collected from 08/11/2019 - 23:45 to 08/12/2019 - 04:00 during the August 7th deployment (08/07/2019 - 10:45 to 08/12/2019 - 10:30) were flagged due to a rain event. The decrease in specific conductivity/salinity was caused by rain events that occurred on a falling tide. No significant changes occurred in the other parameters. The post-deployment checks were within acceptable ranges. The values are flagged as <0> [GSM] (CRE).

DO Percent/mg/L

Rejected Data (Flag <-3>)

The mg/L datum collected on 09/19/2019 at 00:15 during the September 12th deployment (09/12/2019 - 08:30 to 09/23/2019 - 10:15) was rejected due conductivity sensor failure. The specific conductivity value used to calculate mg/L was rejected due to a sudden drop in value outside the range typically observed at this site. The cause for the sudden drop is unknown. The value is flagged as <-3> [SCF] (CSM).

Missing Data (Flag <-2>)

Suspect Data (Flag <1>)

Passed Initial QAQC Checks (Flag <0>)

Depth

Rejected Data (Flag <-3>)

The datum collected on 09/19/2019 at 00:15 during the September 12th deployment (09/12/2019 - 08:30 to 09/23/2019 - 10:15) was rejected due to conductivity sensor failure. The specific conductivity value used to calculate depth was rejected due to a sudden drop in value outside the range typically observed at this site. The cause for the sudden drop is unknown. The value is flagged as <-3> [SCF] (CSM).

Missing Data (Flag <-2>)

Suspect Data (Flag <1>)

Passed Initial QAQC Checks (Flag <0>)

pH

Rejected Data (Flag <-3>)

The data collected from 08/24/2019 - 02:45 to 08/27/2019 - 10:00 during the August 12th deployment (08/12/2019 - 10:45 to 08/27/2019 - 10:00) were rejected due to sensor malfunction. The pH values during this time period were below the level typical for this site, and there was no tidal fluctuation. The pH sensor was unresponsive during the post-deployment check reading 6.83 in the pH 7 and 10 solutions. A new pH tip was used for this deployment. It was thought that the pH tip was faulty because upon replacement values returned to normal in the pH 7 and pH 10 solutions. The values are flagged as <-3> [SSM] (CSM).

Missing Data (Flag <-2>)

Suspect Data (Flag <1>)

The data collected during the July 24th deployment (07/24/2019 - 10:15 to 08/07/2019 - 10:30) were suspect due to sensor diagnostics out of range. The post-deployment pH mV for pH 7 was -51.4, which is outside the accepted range of 0 +/- 50. The post-deployment checks were within the acceptable ranges. The values collected were within the range typically observed at this site. The pH tip was replaced for the next deployment (August 12th). The values are flagged as <1> [SDG] (CSM).

The data collected during the August 27th deployment (08/27/2019 - 10:15 to 09/12/2019 - 08:15) were suspect due to sensor diagnostics out of range. The post-deployment pH mV for pH 7 was -53.2, which is outside the accepted range of 0 +/- 50. The values collected were within the range typically observed at this site. The post-deployment checks were within the accepted ranges. The values are flagged as <1> [SDG] (CSM).

Passed Initial QAQC Checks (Flag <0>)

Turbidity

Rejected Data (Flag <-3>)

The data collected from 03/30/2019 - 00:00 to 04/01/2019 - 12:00 during the March 4th deployment (03/04/2019 - 11:00 to 04/01/2019 - 12:00) were rejected due to biofouling. There was a significant number of bryophytes growing inside the sonde guard, on the conductivity sensor, and on turbidity sensor. The turbidity increased, did not follow a normal pattern for this site, and readings dropped with the next deployment. The values are flagged as <-3> [GSM] (CBF).

The data collected from 05/10/2019 - 12:45 to 05/15/2019 - 11:45 during the May 1st deployment (05/01/2019 - 12:00 to 05/15/2019 - 11:45) were rejected due to biofouling. There were tunicates growing on the inside of the sonde guard. The sustained values above 100 are not typical for this site. The turbidity increased, did not follow a normal pattern for this site, and readings dropped with the next deployment. The post-deployment checks were within the acceptable ranges. The values are flagged as <-3> [GSM] (CBF).

The data collected from 05/24/2019 - 16:45 to 05/28/2019 - 10:15 during the May 15th deployment (05/15/2019 - 12:00 to 05/28/2019 - 10:15) were suspect due to biofouling. There were tunicates growing on the inside of the sonde guard. The turbidity increased but did follow the normal pattern for this site, and the readings dropped with the next deployment. The post-deployment checks were within the acceptable ranges. The values are flagged as <-3> [GSM] (CBF).

The data collected at the following times were rejected due to a turbidity spike. Although the values are within the sensor specifications, they were out of line with the surrounding data. There was a two order of magnitude difference between the 15-minute intervals which is not typical for this site. They did not occur near low tide or during rain events. The values are flagged as <-3> [STS] (CSM).

07/18/2019 - 11:15 (3906)

09/24/2019 - 17:30 (1660)

Missing Data (Flag <-2>)

Suspect Data (Flag <1>)

Passed Initial QAQC Checks (Flag <0>)

Fishing Creek

All Parameters Blanket Statement for Fishing Creek

Rejected Data (Flag <-3>)

Missing Data (Flag <-2>)

The data collected on 03/28/2019 from 08:15 to 09:15 were missing due to infield maintenance. The old tube was replaced with a new tube. The values are flagged as <-2> [GMC] (CSM). Note: anti-fouling paint was added to the bottom portion of the tube (see Scientific Methods section).

Suspect Data (Flag <1>)

Passed Initial QAQC Checks (Flag <0>)

Temperature

Rejected Data (Flag <-3>)

Missing Data (Flag <-2>)

Suspect Data (Flag <1>)

Passed Initial QAQC Checks (Flag <0>)

Specific Conductivity/Salinity

Rejected Data (Flag <-3>)

Missing Data (Flag <-2>)

Suspect Data (Flag <1>)

The Specific Conductivity/Salinity data collected at 01:00 on 10/27/2019 during the October 8th deployment (10/08/2019 - 10:00 to 11/07/2019 - 10:00) was suspect due to a sudden drop in specific conductivity and salinity. The sudden drop in specific conductivity (24.19 mS/cm - 15.52 mS/cm - 23.64 mS/cm) and salinity (14.7 psu - 9.1

psu - 14.3 psu) did not occur at or near low tide or during a rain event. The value was not rejected because they were within the range typically observed at this site. It is unknown the reason for the drop. The value is flagged as <1> [GSM] (CCU).

Passed Initial QAQC Checks (Flag <0>)

DO Percent/mg/L

Rejected Data (Flag <-3>)

Missing Data (Flag <-2>)

Suspect Data (Flag <1>)

Passed Initial QAQC Checks (Flag <0>)

Depth

Rejected Data (Flag <-3>)

Missing Data (Flag <-2>)

Suspect Data (Flag <1>)

Passed Initial QAQC Checks (Flag <0>)

pH

Rejected Data (Flag <-3>)

The data collected from 03/27/2019 - 0:00 to 03/28/2019 - 08:00 during the March 4th deployment (03/04/2019 - 12:30 to 03/28/2019 - 08:00) were rejected due to sensor out of range and increase in pH values which dropped at next deployment. The post-deployment checks of 7.62 and 10.59 are outside the acceptable ranges of 6.7-7.3 for pH 7 and 9.7-10.3 for pH 10. The sensor diagnostics of -85.7 and -254.9 are also outside the acceptable ranges of 0 +/- 50 for pH 7 and -180 +/- 50 for pH 10. The values collected were within the acceptable range for this site. The values are flagged as <-3> [SPC] (CSM).

Missing Data (Flag <-2>)

Suspect Data (Flag <1>)

The data collected from 03/04/2019 - 12:30 to 03/26/2019 - 23:45 during the March 4th deployment (03/04/2019 - 12:30 to 03/28/2019 - 08:00) were suspect due to sensor out of range. The post-deployment checks of 7.62 and 10.59 are outside the acceptable ranges of 6.7-7.3 for pH 7 and 9.7-10.3 for pH 10. The sensor diagnostics of -85.7 and -254.9 are also outside the acceptable ranges of 0 +/- 50 for pH 7 and -180 +/- 50 for pH 10. The values collected were within the acceptable range for this site. The values are flagged as <1> [SPC] (CSM).

Passed Initial QAQC Checks (Flag <0>)

Turbidity

Rejected Data (Flag <-3>)

The data collected during the following times were rejected due to turbidity spikes. Although the values are within the sensor specifications, they were out of line with the surrounding data. There was a two order of magnitude difference between the 15-minute intervals which is not typical for this site. They did not occur at low tide or during a rain event. The values are flagged as <-3> [STS] (CSM).

05/12/2019 - 07:45 (1203)

09/12/2019 - 00:15 (1255)

Missing Data (Flag <-2>)

Suspect Data (Flag <1>)

Passed Initial QAQC Checks (Flag <0>)

Grove Plantation

All Parameters Blanket Statement for Grove Plantation

Rejected Data (Flag <-3>)

Missing Data (Flag <-2>)

The data collected on 03/28/2019 from 10:00 to 10:30 were missing due to infield maintenance. The old tube was replaced with a new tube. The values are flagged as <-2> [GMC] (CSM). Note: anti-fouling paint was added to the bottom portion of the tube (see Scientific Methods section).

Suspect Data (Flag <1>)

Passed Initial QAQC Checks (Flag <0>)

Temperature

Rejected Data (Flag <-3>)

Missing Data (Flag <-2>)

Suspect Data (Flag <1>)

Passed Initial QAQC Checks (Flag <0>)

Specific Conductivity/Salinity

Rejected Data (Flag <-3>)

Missing Data (Flag <-2>)

Suspect Data (Flag <1>)

The data collected during the September 24th deployment (09/24/2019 - 11:30 to 10/08/2019 - 10:15) were suspect due to sensor being out of range. The post-deployment check of 45.13 mS/cm is outside the accepted range of 47 - 53 mS/cm. Heavy barnacles were found inside the conductivity conduit. Values returned to the accepted range following cleaning. The values collected were within the range typically observed at this site. The values are flagged as <1> [SPC] (CSM).

Passed Initial QAQC Checks (Flag <0>)

DO Percent/mg/L

Rejected Data (Flag <-3>)

Missing Data (Flag <-2>)

Suspect Data (Flag <1>)

Passed Initial QAQC Checks (Flag <0>)

Depth

Rejected Data (Flag <-3>)

Missing Data (Flag <-2>)

Suspect Data (Flag <1>)

Passed Initial QAQC Checks (Flag <0>)

pH

Rejected Data (Flag <-3>)

The first pH record of the following deployments was rejected due to a spike in pH. The cause for the spike in pH is unknown but thought to be attributed to acclimation of the probe. The post-deployment checks and sensor diagnostics were within the acceptable ranges. The values are flagged as <-3> [GSM] (CND).

03/04/2019 - 13:00

07/24/2019 - 08:45

11/07/2019 - 10:45

12/09/2019 - 13:00

12/17/2019 - 13:00

The values collected from 13:15 – 13:30 on 12/17/2019 during the December 17th deployment (12/17/2019 - 13:00 to 01/06/2020 - 11:30) were rejected due to a spike in pH. The sensor used was brand new out of the box. The cause for the spike by a new pH sensor is unknown but thought to be attributed to acclimation of the probe. The post-deployment checks and sensor diagnostics were within the acceptable ranges. The values are flagged as <-3> [GSM] (CCU).

Missing Data (Flag <-2>)

Suspect Data (Flag <1>)

The data collected from 01/01/2019 - 00:00 to 01/03/2019 - 12:45 during the December 3, 2018 deployment (12/03/2018 - 12:00 to 01/03/2019 - 12:45) were suspect because the pH sensor on this sonde was recording lower values than the sensor on the other sonde deployed at this site. The post-deployment checks were within the acceptable ranges. The cause for the lower values is unknown but thought to be attributed to the age of the sensor. The values are flagged as <1> [GSM] (CCU).

The data collected during the March 4th deployment (03/04/2019 - 13:00 to 03/28/2019 - 09:45) were suspect due to sensor diagnostics out of range. The post-deployment slope was 154.8 which is below the acceptable threshold of 155. The post-deployment checks were within the acceptable ranges. The values are flagged as <1> [SDG] (CSM).

Passed Initial QAQC Checks (Flag <0>)

Turbidity

Rejected Data (Flag <-3>)

Missing Data (Flag <-2>)

Suspect Data (Flag <1>)

Passed Initial QAQC Checks (Flag <0>)

Jehossee Island

All Parameters Blanket Statement for Jehossee Island

The data were collected at the wrong depth from 09:45 to 11:30 on 06/26/2019 during the June 26th deployment (06/26/2019 - 09:45 to 07/11/2019 - 08:15). The sonde was deployed at the wrong depth during this time period. At 11:45 the sonde reached the correct depth and stayed at the correct depth for the remainder of the deployment. The difference in depth was not considered significant because the S. Edisto River is a well-mixed system and the sonde was in the same thermocline, as indicated by the water temperature readings. The depth values are flagged as <1> (CWD), and the other parameters are flagged as <0> (CWD). Other errors that occurred during the deployment are listed under the appropriate parameter heading or in a blanket statement. The F_Record column of these rows are flagged as {CSM}.

The data collected at 11:15 on 12/09/2019 during the December 9th deployment (12/09/2019 11:30 to 01/06/2020 - 10:30) was suspect due to a depth reading that was 0.6 m difference. This is the last reading of the deployment and the reading may have been taken when the sonde was being retrieved. The other readings were not affected. The difference in depth was not considered significant because the S. Edisto River is a well-mixed system and the sonde was in the same thermocline, as indicated by the water temperature readings. The depth values are flagged as <1> (CWD), and the other parameters are flagged as <0> (CWD). Other errors that occurred during the deployment are listed under the appropriate parameter heading or in a blanket statement. The F_Record column of these rows are flagged as {CSM}.

Rejected Data (Flag <-3>)

The intermittent data collected starting at 06:00 on 12/19/2019 during the December 9th deployment (12/09/2019 - 11:30 to 01/06/2020 - 10:30) were rejected due to low battery voltage. The values collected occurred after the initial power failure due to low battery voltage. The data collected were within the range typically observed at this site. The values are flagged as <-3> [GPF] (CSM).

Missing Data (Flag <-2>)

No data were collected on 01/18/2019 at 09:45 during the January 3rd deployment (01/03/2019 - 11:30 to 02/04/2019 - 14:30). It is unknown why this occurred. The values are flagged as <-2> [GSM] (CCU).

The data collected on 04/29/2019 from 09:45 to 10:45 were missing due to infield maintenance. The old tube was replaced with a new tube. The values are flagged as <-2> [GMC] (CSM). Note: Anti-fouling paint was added to the bottom portion of the tube (see Scientific Methods section).

The missing data during the December 9th deployment (12/09/2019 11:30 to 01/06/2020 - 10:30) were due to low battery voltage that started at 21:30 on 12/17/2019. The missing values are flagged as <-2> [GPF] (CSM).

Suspect Data (Flag <1>)

Passed Initial QAQC Checks (Flag <0>)

Temperature

Rejected Data (Flag <-3>)

Missing Data (Flag <-2>)

Suspect Data (Flag <1>)

Passed Initial QAQC Checks (Flag <0>)

Specific Conductivity/Salinity

Rejected Data (Flag <-3>)

The data collected during the August 7th deployment (08/07/2019 - 07:30 to 08/12/2019 - 10:15) were rejected due to sensor malfunction. The post-deployment check of 31.56 mS/cm is outside the accepted range of 47 - 53 mS/cm. During calibration the readings were very unstable and erratic, different sensors were tried as well as different sondes, but the values would not stabilize. The pre-deployment cell constant of 3.12 is outside the accepted range of 4.6 - 5.45. The values were outside the range typically observed at this site. The values are flagged as <-3> [SSM] (CSM).

Missing Data (Flag <-2>)

Suspect Data (Flag <1>)

The data collected during the January 3rd deployment (01/03/2019 - 11:30 to 02/04/2019 - 14:30) were suspect due to sensor being out of range. The post-deployment check of 55.13 mS/cm is outside the accepted range of 47-53 mS/cm. The sensor was out of range during pre-calibration but after cleaning the port the values were within the acceptable range. The sonde was sent out for evaluation and it was found that the conductivity port had high impedance leakage which required replacement of the bulkhead. The values collected were within the acceptable range for this site. The values are flagged as <1> [SPC] (CSM).

The data collected during the May 29th deployment (05/29/2019 - 09:45 to 06/13/2019 - 09:45) were suspect due to sensor being out of range. The post-deployment check of 45.74 mS/cm is outside the accepted range of 47 - 53 mS/cm. Barnacles and mud were found inside the conduits. The values collected were within the acceptable range for this site. The values are flagged as <1> [SPC] (CSM).

The data collected during the July 11th deployment (07/11/2019 - 08:30 to 07/24/2019 - 07:30) were suspect due to sensor being out of range. The post-deployment check of 45.31 mS/cm is outside the accepted range of 47 - 53 mS/cm. Barnacles were found inside the conduits, once the barnacles were removed the readings were within the acceptable range. The values collected were within the acceptable range for this site with the exception that the sonde did not record any readings between about 5.8 and 7.3 ppt. The values are flagged as <1> [SPC] (CSM).

The data collected during the August 12th deployment (08/12/2019 - 10:30 to 08/28/2019 - 09:45) were suspect due to sensor being out of range. The post-deployment check of 44.56 mS/cm is outside the accepted range of 47 - 53 mS/cm. Barnacles were found inside the conductivity conduit. Once barnacles were removed values returned to within the accepted range. The values collected were within the range typically observed at this site. The values are flagged as <1> [SPC] (CSM).

The data collected during the September 24th deployment (09/24/2019 - 10:30 to 10/08/2019 - 09:15) were suspect due to sensor being out of range. The post-deployment check of 53.08 mS/cm is outside the accepted range of 47 - 53 mS/cm. The values during the post-check were unstable. Barnacles were found inside the conductivity conduit. Values did not return to the accepted range following cleaning, and a crack was found in the base of the sensor. The values collected were within the range typically observed at this site. The values are flagged as <1> [SPC] (CSM).

The data collected during the November 7th deployment (11/07/2019 - 09:30 to 12/09/2019 - 11:15) were suspect due to sensor being out of range. The post-deployment check of 84.33 mS/cm is outside the accepted range of 47 - 53 mS/cm. Barnacles were found inside the conductivity conduit. Values did not return to the accepted range following cleaning. The sensor was placed on a different sonde and it read 48.25 mS/cm which is within the acceptable range. When placing the sensor back on the original sonde a crack was noticed in the sensor port allowing water intrusion. The cause for the out of range post-deployment check was the sonde and not the sensor. The values collected were within the range typically observed at this site with the exception that the sonde did not record any readings between about 8.7 and 10.7 ppt. The values are flagged as <1> [SPC] (CSM).

Passed Initial QAQC Checks (Flag <0>)

DO Percent/mg/L

Rejected Data (Flag <-3>)

Sporadically throughout the April 17th deployment (04/17/2019 - 10:45 to 04/29/2019 - 09:30) DO percent and mg/L were rejected due to 0.0 values recorded. This was the first deployment for the sonde and optical sensors since they came back from preventative maintenance where a new bulkhead was installed on the sonde. The cause for the 0.0 values recorded was water intrusion in the optical DO sensor port. Once water was removed and the port was cleaned and dried completely the problem ceased. The post-deployment check was within the acceptable range. All other values collected were within the acceptable range for this site. The 0.0 values are flagged as <-3> [SSM] (CSM).

The DO mg/L data collected during the August 7th deployment (08/07/2019 - 07:30 to 08/12/2019 - 10:15) were rejected due to conductivity sensor failure. The specific conductivity values used to calculate DO mg/L were rejected due to values outside the range typically observed at this site. However, the DO readings were within the range typically observed at this site. The values are flagged as <-3> [SCF] (CSM).

Missing Data (Flag <-2>)

Suspect Data (Flag <1>)

Passed Initial QAQC Checks (Flag <0>)

Depth

Rejected Data (Flag <-3>)

The data collected during the August 7th deployment (08/07/2019 - 07:30 to 08/12/2019 - 10:15) were rejected due to conductivity sensor failure. The specific conductivity values used to calculate depth were rejected due to values outside the range typically observed at this site. However, the depth readings were within the range typically observed at this site. The values are flagged as <-3> [SCF] (CSM).

Missing Data (Flag <-2>)

Suspect Data (Flag <1>)

Passed Initial QAQC Checks (Flag <0>)

pH

Rejected Data (Flag <-3>)

The data collected during the December 3, 2018 deployment (12/03/2018 - 11:00 to 01/03/2019 - 11:15) were rejected due to elevated pH values observed during QAQC checks. The pH values started increasing at 12:30 on 12/27/2018 and the new deployment dropped by 0.9. The values are flagged as <-3> [SQR] (CSM).

The data collected during the February 4th deployment (02/04/2019 - 14:45 to 03/04/2019 - 11:45) were rejected due to post deployment checks out of range. The pH 7 check of 7.48 and pH 10 of 9.42 were outside the acceptable range, the post deployment slope of 105 was also outside the acceptable range. The readings were not within the range observed at the site at the beginning of the deployment. The values are flagged as <-3> [SPC] (CSM).

The first value (04/01/2019 - 11:00) of the April 1st deployment (04/01/2019 - 11:00 to 04/17/2019 - 10:30) was rejected due to a spike in pH. The cause for the spike in pH is unknown but thought to be attributed to acclimation of the probe. The value is flagged as <-3> [GSM] (CND).

Missing Data (Flag <-2>)

Suspect Data (Flag <1>)

The data collected during the March 4th deployment (03/04/2019 - 12:00 to 04/01/2019 - 10:45) were suspect due to post-deployment check out of range. The pH 10 check of 10.55 is outside the acceptable range of 9.7-10.3. The pH 7 check was within the acceptable range. The values collected were within the acceptable range for this site. The values are flagged as <1> [SPC] (CSM).

The data collected during the September 10th deployment (09/10/2019 - 10:30 to 09/24/2019 - 10:15) were suspect due to sensor out of range. The post-deployment check for pH 7 was 7.34 which is outside the accepted range of 6.7 - 7.3. The pH slope of 139.4 is below the acceptable threshold of 155. There were barnacles growing on and around the pH bulb which may have caused the out of range values. The values are flagged as <1> [SPC] (CSM).

The data collected during the September 24th deployment (09/24/2019 - 10:30 to 10/08/2019 - 09:15) were suspect due to sensor out of range. The post-deployment check for pH 10 was 10.73 which is outside the accepted range of 9.7 - 10.3. The pH 7 check was within the acceptable range. The values collected were within the acceptable range for this site. The values are flagged as <1> [SPC] (CSM).

The data collected during the following deployments were suspect due to sensor diagnostics out of range. The pH mV slopes were below the acceptable threshold of 155. The values collected were within the range typically observed at this site. The post-deployment checks were within the accepted ranges. The values are flagged as <1> [SDG] (CSM).

08/12/2019 - 10:30 to 08/28/2019 - 09:45 (153.9)

10/08/2019 - 09:30 to 11/07/2019 - 09:15 (153.5)

12/09/2019 - 11:30 to 12/19/2019 - 01:30 (150.7) Note: low battery from 02:00 to 01/06/2019 - 10:30

Passed Initial QAQC Checks (Flag <0>)

Turbidity

Rejected Data (Flag <-3>)

Sporadically throughout the April 17th deployment (04/17/2019 - 10:45 to 04/29/2019 - 09:30) turbidity recorded negative values. This was the first deployment for the sonde and optical sensors since they came back from preventative maintenance where a new bulkhead was installed on the sonde. The cause for the negative values was water intrusion in the optical DO sensor port. Once the port was cleaned and dried completely the problem ceased. All other values collected were within the acceptable range for this site. The negative values are flagged as <-3> [SSM] (CSM).

The data collected from 05/25/2019 - 21:30 to 05/29/2019 - 09:30 during the May 15th deployment (05/15/2019 - 09:30 to 05/29/2019 - 09:30) were rejected due to biofouling. There was significant hydroid growth on the screen and inside the sonde guard which allowed sedimentation inside the sonde guard. The turbidity increased and did not follow the normal pattern for this site. The sustained values above 100 were not typical for this site. The values dropped with the deployment of the new sonde. The post-deployment checks were within the acceptable ranges. The values are flagged as <-3> [GSM] (CBF).

The data collected from 06/12/2019 - 00:30 to 06/13/2019 - 09:45 during the May 29th deployment (05/29/2019 - 09:45 to 06/13/2019 - 09:45) were rejected due to biofouling. The hydroid growth on and inside the sonde guard created a turbid environment that was not indicative to this site. The sustained values above 100 are not typical for this site. The values dropped with the deployment of the new sonde. The post-deployment checks were within the acceptable ranges. The values are flagged as <-3> [GSM] (CBF).

The data collected from 07/04/2019 - 06:45 to 07/11/2019 - 08:15 during the June 26th deployment (06/26/2019 - 09:45 to 07/11/2019 - 08:15) were rejected due to biofouling. There was significant hydroid growth on the turbidity wiper brush which interfered with the turbidity readings. The sustained values near and above 100 are not typical for this site. The values dropped with the deployment of the new sonde. The post-deployment checks were within the acceptable ranges. The values are flagged as <-3> [GSM] (CBF).

The data collected from 08/02/2019 - 19:00 to 08/07/2019 - 07:15 during the July 24th deployment (07/24/2019 - 07:45 to 08/07/2019 - 07:15) were rejected due to biofouling. The presence of mud and hydroids on the external screen caused the sensor to lose tidal fluctuation and fluctuate erratically which is not typical for this site. The values dropped with the deployment of the new sonde. The post-deployment checks were within the acceptable ranges. The values are flagged as <-3> [GSM] (CBF).

The data collected from 08/27/2019 - 00:15 to 08/28/2019 - 09:45 during the August 12th deployment (08/12/2019 - 10:30 to 08/28/2019 - 09:45) were rejected due to biofouling. There was hydroid growth on the wiper brush which interfered with the turbidity readings. The sustained values near and above 100 are not typical for this site. The values dropped with the deployment of the new sonde. The post-deployment checks were within the acceptable ranges. The values are flagged as <-3> [GSM] (CBF).

Missing Data (Flag <-2>)

Suspect Data (Flag <1>)

The data collected from 05/15/2019 - 01:00 to 05/15/2019 - 09:15 during the April 29th deployment (04/29/2019 - 11:00 to 05/15/2019 - 09:15) were suspect due to biofouling. There was hydroid growth inside the sonde guard. The turbidity values increased and dropped with the next deployment. The turbidity values did follow the normal pattern for this site. The post-deployment checks were within the acceptable ranges. The values are flagged <1> [GSM] (CBF).

The data collected from 09/23/2019 - 22:15 to 09/24/2019 - 10:15 during the September 10th deployment (09/10/2019 - 10:30 to 09/24/2019 - 10:15) were suspect due to biofouling. There was hydroid growth on the wiper brush which interfered with turbidity readings. The sustained values near and above 100 are not typical for this site. The post-deployment checks were within the acceptable ranges. The values are flagged as <1> [GSM] (CBF).

Passed Initial QAQC Checks (Flag <0>)

Mosquito Creek

All Parameters Blanket Statement for Mosquito Creek

Rejected Data (Flag <-3>)

Missing Data (Flag <-2>)

The data collected during the April 17th deployment (04/17/2019 - 09:45 to 05/01/2019 - 10:00) were missing due to loss of sonde. During the sonde swap on May 1st the sonde was lost at sea and could not be recovered. The values are flagged as <-2> [GSM].

The data collected on 05/13/2019 from 09:00 to 10:00 were missing due to infield maintenance. The old tube was replaced with a new tube. The values are flagged as <-2> [GMC] (CSM). Note: Anti-fouling paint was added to the bottom portion of the tube (see Scientific Methods section).

Suspect Data (Flag <1>)

Passed Initial QAQC Checks (Flag <0>)

Temperature

Rejected Data (Flag <-3>)

Missing Data (Flag <-2>)

Suspect Data (Flag <1>)

Passed Initial QAQC Checks (Flag <0>)

Specific Conductivity/Salinity

Rejected Data (Flag <-3>)

Missing Data (Flag <-2>)

Suspect Data (Flag <1>)

Passed Initial QAQC Checks (Flag <0>)

DO Percent/mg/L

Rejected Data (Flag <-3>)

The data collected from 05/26/2019 - 16:30 to 05/29/2019 - 08:45 during the May 13th deployment (05/13/2019 - 10:15 to 05/29/2019 - 08:45) were rejected due to post-deployment check out of range. The steady decrease in values may be caused by the growth of the barnacle on the optic. There was a significant difference between the in-situ reading (72.7%) and the last reading (57.6%). The post-deployment check of 75.1% is outside the acceptable range of 90 - 110%. The values are flagged <-3> [SPC] (CSM).

Missing Data (Flag <-2>)

Suspect Data (Flag <1>)

The data collected from 05/13/2019 - 10:15 to 05/26/2019 - 16:15 during the May 13th deployment (05/13/2019 - 10:15 to 05/29/2019 - 08:45) were suspect due to post-deployment check out of range. The post-deployment check of 75.1% is outside the acceptable range of 90 - 110%. There was a barnacle growing on the optic of the sensor, once the barnacle was removed the readings were within the acceptable range. The values are flagged as <1> [SPC] (CSM).

Passed Initial QAQC Checks (Flag <0>)

Depth

Rejected Data (Flag <-3>)

The data collected 11/29/2019 - 13:30 during the November 7th deployment (11/07/2019 - 08:30 to 12/09/2019 - 10:15) was rejected. The depth changed dramatically for one record before returning to the previous reading. The other parameters do not appear to be affected. Therefore, the sonde may have malfunctioned for the depth reading. The values are flagged as <-3> [GSM] (CCU).

Missing Data (Flag <-2>)

Suspect Data (Flag <1>)

Passed Initial QAQC Checks (Flag <0>)

pH

Rejected Data (Flag <-3>)

Missing Data (Flag <-2>)

Suspect Data (Flag <1>)

The data collected during the July 24th deployment (07/24/2019 - 07:00 to 08/07/2019 - 08:00) were suspect due sensor diagnostics out of range. The post-deployment pH mV for pH 7 was -52.5, which is outside the accepted range of 0 +/- 50. The values collected were within the range typically observed at this site. The values are flagged as <1> [SDG] (CSM).

Passed Initial QAQC Checks (Flag <0>)

Turbidity

Rejected Data (Flag <-3>)

Missing Data (Flag <-2>)

Suspect Data (Flag <1>)

Passed Initial QAQC Checks (Flag <0>)

St. Pierre

All Parameters Blanket Statement for St. Pierre

The data collected during the following periods were flagged due to significant rain events. The decrease in salinity and elevated turbidity was caused by rain events that occurred during low tides. No significant changes occurred in dissolved oxygen or pH. The post-deployment checks were within acceptable ranges. The F_Record column is flagged as {CRE} {CSM}.

05/12/2019 - 16:45 - 20:45	06/04/2019 - 23:45 - 06/05/2019 - 03:30	06/06/2019 - 15:00 - 16:45
06/09/2019 - 17:00 - 19:30	06/12/2019 - 05:45 - 13:30	06/22/2019 - 17:15 - 19:00
07/05/2019 - 16:45 - 18:15	07/24/2019 - 03:15 - 04:45	08/03/2019 - 16:15 - 17:00
08/17/2019 - 11:30 - 13:45	08/18/2019 - 00:30 - 02:45	10/15/2019 - 12:45 - 15:00
10/16/2019 - 01:45 - 03:45	10/16/2019 - 13:15 - 15:30	10/19/2019 - 16:30 - 18:30
10/20/2019 - 03:45 - 06:15	11/17/2019 - 03:00 - 05:15	12/13/2019 - 12:45 - 16:00
12/17/2019 - 17:30 - 18:45	12/23/2019 - 09:00 - 12:45	

Rejected Data (Flag <-3>)

Missing Data (Flag <-2>)

The data collected on 05/28/2019 from 08:15 to 09:15 were missing due to infield maintenance. The old tube was replaced with a new tube. The values are flagged as <-2> [GMC] (CSM). Note: Anti-fouling paint was added to the bottom portion of the tube (see Scientific Methods section).

The data collected on 02/19/2019 at 09:45 and on 02/22/2019 at 02:45 during the February 4th deployment (02/04/2019 - 13:00 to 03/04/2019 - 10:00) and 12/21/2019 at 08:00 during the December 9th deployment (12/09/2019 - 09:15 to 01/06/2020 - 08:15) are missing due to cause unknown. The values are flagged as <-2> [GSM] (CCU).

Suspect Data (Flag <1>)

Passed Initial QAQC Checks (Flag <0>)

Temperature

Rejected Data (Flag <-3>)

Missing Data (Flag <-2>)

Suspect Data (Flag <1>)

Passed Initial QAQC Checks (Flag <0>)

Specific Conductivity/Salinity

Rejected Data (Flag <-3>)

Missing Data (Flag <-2>)

Suspect Data (Flag <1>)

The data collected at 12:15 on 10/29/2019 during the October 8th deployment (10/08/2019 - 07:45 to 11/06/2019 - 09:00) was suspect due to sudden drop in the reading. The cause for the sudden drop is unknown; it may have been a sensor malfunction. The value is flagged as <1> [GSM] (CCU).

Passed Initial QAQC Checks (Flag <0>)

DO Percent/mg/L

Rejected Data (Flag <-3>)

Missing Data (Flag <-2>)

Suspect Data (Flag <1>)

Passed Initial QAQC Checks (Flag <0>)

Depth

Rejected Data (Flag <-3>)

The following depth values collected were rejected due to sensor malfunction. During these times the depth recorded 0.00 meters. The times were not at or near low tide. The cause for the malfunction is thought to be attributed to high power draw from the central wiper. The values are flagged as <-3> [SSM] (CSM).

02/10/2019 - 04:30

02/10/2019 - 08:30

11/19/2019 - 10:45

11/20/2019 - 09:30

Missing Data (Flag <-2>)

Suspect Data (Flag <1>)

Passed Initial QAQC Checks (Flag <0>)

pH

Rejected Data (Flag <-3>)

Missing Data (Flag <-2>)

Suspect Data (Flag <1>)

The data collected during the February 4th deployment (02/04/2019 - 13:00 to 03/04/2019 - 10:00) were suspect due to post deployment checks out of range. The pH 7 check of 7.68 and pH 10 of 10.57 are outside the accepted ranges

of 6.7 - 7.3 and 9.7 - 10.3. The pH mV of -75.6 and -241.8 are outside the accepted ranges of 0 +/- 50 and -180 +/- 50, but the slope was within the acceptable range. The reading at 09:45 on 02/19/2019 and at 02:45 on 02/22/2019 were retrieved from the telemetered data. The readings were within the range observed at the site, and the values are flagged as <1> [SPC] (CSM).

The data collected during the August 7th deployment (08/07/2019 - 09:00 to 08/12/2019 - 08:30) were suspect due sensor diagnostics out of range. The post-deployment pH mV for pH 7 was -51.1 which is outside the accepted range of 0 +/- 50. The values collected were within the range typically observed at this site. The values are flagged as <1> [SDG] (CSM).

Passed Initial QAQC Checks (Flag <0>)

Turbidity

Rejected Data (Flag <-3>)

The data collected during the following times were rejected due to turbidity spikes. Although the values are within the sensor specifications, they were out of line with the surrounding data. There was a two order of magnitude difference between the 15-minute intervals which is not typical for this site. They did not occur at low tide or during a rain event. The values are flagged as <-3> [STS] (CSM).

10/01/2019 - 21:15 (1811)

11/03/2019 - 23:15 (1965)

Missing Data (Flag <-2>)

Suspect Data (Flag <1>)

Passed Initial QAQC Checks (Flag <0>)