

Chesapeake Bay Virginia (CBV) NERR Water Quality Metadata
January - December 2004
Latest update: August 12, 2020

I. Data Set and Research Descriptors

1. Principal investigators and contact persons

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Additional monitoring program support in addition to above stated:
Eric Wooden (Stewardship Coordinator), Scott Lerberg (Graduate Research Assistant), Betty Berry-Niekirk (Marine Scientist), Britt Anderson (Marine Scientist), Sarah Davies (NERRS Graduate Research Fellow), Frank Parker (NERR Graduate Research Fellow), Jim Goins (Field Manager), Eduardo Miles (Marine Scientist), Steve Snyder (Laboratory Specialist), and Terri Keffert (Laboratory Technician).

2. Entry verification

Deployment data are uploaded from the YSI data logger to a Personal Computer (IBM compatible). Data plots are produced and examined and erroneous data are detected using the PC6000 or EcoWatch software from YSI. Notes are made of any unusual data during that deployment. Files are exported from EcoWatch in a comma-delimited format (.CSV) and opened in Microsoft Excel for pre-processing with the EQWin format macro that was developed by the CDMO to reformat the header columns, insert station codes, insert a corrected time column and allow the technician to remove any pre- and post-deployment data from the file. Where deployment overlap occurs between files, the data produced by the newly calibrated sonde is accepted as being the most accurate. The pre-processed file is then ready to be copied into the EQWin water.eqi file where the data are QA/QC checked and archived in a database. EQWin queries, reports and graphs are used to discover data set outliers (values which fall outside the range that the instrument is designed to measure) and large changes in the data. EQWin is also used to generate statistics, view graphs, create customized queries and reports of the data, cross query the water, weather and nutrient data and finally export the data to the CDMO. Joy Austin has been responsible for data management since 1/2002.

3. Research objectives

Goodwin Islands (GI) component:

The Goodwin Islands represent marsh islands surrounded by intertidal flats, submerged aquatic vegetation (SAV) beds, oyster reefs, and shallow open estuarine waters. Because minimal human activities occur within upland portions, the Goodwin Islands are suitable as a reference or control site for non-point source water quality issues. Furthermore, due to extensive wetlands, intertidal, and submerged habitats, the Goodwin Islands are used extensively for SAV, material flux, fisheries science and trophic interaction research activities.

Claybank (CB) component:

The Claybank site represents a shallow (<2m) littoral area approximately 300-400 meters in width and located within the mesohaline portion of the York River estuary. Prior to 1972, this area supported submersed aquatic vegetation (SAV) but current conditions are not conducive to SAV survival. This site is used extensively to study sediment dynamics and environmental stress on SAV.

Taskinas Creek (TC) component:

The Taskinas Creek watershed is representative of an inner coastal plain, rural watershed within the southern Chesapeake Bay system. This watershed is dominated by forested and agricultural land uses with an increasing urban land use component. The drainage basin is suited for investigating hydrologic and non-point source water quality issues associated with changing land use patterns.

Sweet Hall Marsh (SH) component:

Sweet Hall Marsh is the most downriver extensive tidal freshwater marsh located in the Pamunkey River, one of two major tributaries of the York River. Research activities are currently addressing the impacts of salinity intrusion due to relative sea level rise. In addition, Sweet Hall Marsh has been used extensively to study general ecology and material flux within tidal freshwater marshes.

4. Research methods

The following research methods apply for all stations.

A YSI 6600 EDS unvented datalogger was used to measure specific conductivity, pH, depth, percent dissolved oxygen saturation, temperature, and turbidity at 15-minute intervals throughout the 2004 deployment year (see Section 6 for deployment intervals). Salinity and dissolved oxygen concentration are calculated parameters. Water depth data for 2004 have been post-corrected for atmospheric pressure changes that occurred between time of calibration and field retrieval. CBNERRVA maintains atmospheric pressure sensors at Gloucester Point, Taskinas Creek and Sweet Hall Marsh. Atmospheric pressure information is collected at 15-minute intervals. Calibration pressure information was provided by measurements made within the laboratory at Gloucester Point, VA. At approximately one to two-week intervals, the datalogger was returned to the lab for downloading, cleaning, membrane replacement and recalibration. Maintenance intervals vary from year to year and site-to-site depending on the amount of biofouling and expected battery life. In general, YSI dataloggers were deployed for two-week intervals

from the beginning of December to the end of April and one-week intervals from the beginning of May to the end of November. A second YSI datalogger was deployed following retrieval of the original YSI datalogger in order to maintain a continuous record.

Field verification samples for pH, dissolved oxygen, salinity, and temperature were taken during the deployment/retrieval procedure. PH was measured in the lab with a Orion pH meter model 370 and the field pH was measured with a YSI 600 XLM sonde. Dissolved oxygen was determined by Winkler titration and in the field with a LaMotte kit. Temperature and salinity were determined in the field by using the YSI 600 XLM sonde and YSI 85 instrument. All YSI procedures are in accordance with the YSI operating manual methods, Sections 3 and 7. Standards for pH were purchased from Fisher. Standards for specific conductivity and Turbidity were purchased from YSI. Data are reviewed and edited according to the YSI Data Review and Editing Protocol in Appendix C of the CDMO manual version 5.1.

Goodwin Islands (GI) component:

The Chesapeake Bay Virginia NERR maintains a long-term water quality monitoring station at Goodwin Islands. This station is located on the southeastern side of the main island in a shallow embayment, approximately 400 meters from shore. The station was established in 1997 and consisted of a stable structure composed of a 4 inch PVC pipe housed within a galvanized steel tower. The lower portion of the PVC pipe was milled to allow for water circulation within the pipe and around the datalogger sensors. The datalogger was suspended so that the sensors are maintained 0.5 m from the bottom substrate. On July 22, 2004 (12:15 EST), the station was moved approximately 25 meters southwest of the previous station in order to address sand shoaling and station maintenance issues. Other than the datalogger being suspended 0.25 m above the bottom substrate, the construction design of the new station is identical to the previous station. The new station results in sensors being maintained at a similar depth below the water surface as compared to the previous station.

Clay Bank (CB) component:

The Chesapeake Bay Virginia NERR maintains a long-term water quality monitoring station at Clay Bank. The station is located within a shallow (<2m) littoral area approximately 300-400 meters wide. A stable structure that consists of a 6-inch PVC pipe attached to a piling, was built in January 2001. The lower portion of the PVC pipe was milled to allow for water circulation within the pipe and around the datalogger sensors. The datalogger is suspended so that sensors are located 0.25 m from the bottom substrate. On June 17, 2004 (13:15 EST) the station was moved approximately 100 meters offshore of the previous station in order to address sand shoaling and station maintenance issues. The new structure is composed of a 4 inch PVC pipe, with the lower portion milled to allow for uninhibited water circulation, housed within a galvanized steel tower. The datalogger is suspended 0.31 m above the bottom substrate. The new station results in sensors being maintained 9 cm deeper as compared to the previous station.

Taskinas Creek (TC) component:

The Chesapeake Bay Virginia NERR maintains a long-term water quality monitoring station at Taskinas Creek. The station is located near the mouth of Taskinas Creek where the tidal marsh creek converges with the York River estuary. A simple deployment, consisting of a suspended wire attached to an overhanging tree, was established in September 1995. The datalogger was suspended at a fixed depth approximately 0.5 m above the creek-bed. In September 1997, the deployment was modified so that the datalogger remained secure and stable at all times within a 4-inch PVC housing attached to a piling system. The lower portion of the PVC pipe was milled to allow for water circulation within the pipe and around the datalogger sensors. The datalogger was suspended so that the sensors are maintained 0.5 m above the bottom substrate.

Sweet Hall Marsh (SH) component:

The Chesapeake Bay Virginia NERR maintains a long-term water quality station at Sweet Hall Marsh. This station, established in 2000, is located adjacent to a low-use boathouse where a 6-inch PVC pipe is attached to an adjacent pier piling. The datalogger was suspended so that the sensors remained 0.7 m from the bottom substrate. In contrast to above stations, the Sweet Hall Marsh station is maintained on a two-week deployment interval throughout the year.

5. Site location and character

(a) Goodwin Islands (Lat 37.21739; Long 76.3954)

The Goodwin Islands component of CBNERRVA is located on the southern side of the mouth of the York River. The station is located approximately 400 meters from shore, with an average water depth on the order of 1m. Goodwin Islands are a 315 ha (777 acre) archipelago of salt-marsh islands surrounded by inter-tidal flats and extensive beds of submerged aquatic vegetation (121 ha; 300 acres) dominated by eelgrass (*Zostera marina*) and Widgeon grass (*Ruppia maritima*). Water circulation patterns around the island are influenced by York River discharge and wind patterns of the Chesapeake Bay. Tides at the Goodwin Islands are semi-diurnal and display an average range of 0.7 m (range: 0.4 - 1.1 m). Seasonal water quality conditions described here are from 1998 through 2003 (Spring: March-May; Summer: June-August; Fall: September-November; Winter: December-February). Mean seasonal water temperature ranged between 13.7-15.6 for spring, 25.7-27.2 for summer, 18.0-19.2 for fall, and 4.7-8.2 °C in winter. Mean seasonal salinity ranged between 13.9-23.0 for spring, 17.3-23.0 for summer, 20.4-24.0 for fall, and 18.4-23.3 ppt in winter. The data logger probes are located 0.5 m above the sandy substrate bottom. Potential activities that could impact the site included, light recreational and commercial boating activity.

(b) Claybank (Lat 37.34855; Long 76.61123)

The Claybank station is located within a shallow (<2m) littoral area approximately 300-400 meters wide along the mesohaline portion of the York River estuary. The site is approximately 26 km upriver from the

mouth of the estuary. The shoreline consists of a narrow fringe of salt marsh with some areas armored with bulkhead or stone. Tidal range is on the order of 0.85 meters. This station is located along the north shoreline of the estuary in an area that historically (prior to 1972) supported submersed aquatic vegetation. The sampling station is influenced by a secondary turbidity maximum that moves back and forth in a region of about 20-40 km from the mouth of the York River estuary. Substrate within the region varies from fine sediments to sand. The site is exposed to strong winds from the northwest and re-suspension of sediment during storm events can be high. There is no fresh water input at this site. Seasonal water quality conditions described here are from 2001 through 2003 (Spring: March-May; Summer: June-August; Fall: September-November; Winter: December-February). Mean seasonal water temperature ranged between 14.0-16.2 for spring, 26.1-27.7 for summer, 17.5-19.4 for fall, and 4.9-8.0 °C in winter. Mean seasonal salinity ranged between 15.7-20.3 for spring, 16.5-21.3 for summer, 13.2-21.6 for fall, and 14.3-20.0 ppt in winter.

(c) Taskinas Creek (Lat 37.41497; Long 76.71441)

Taskinas Creek Reserve, component of CBNERRVA, encompasses 397 ha (980 acres) and is located within the boundaries of York River State Park near the town of Croaker, Virginia. The small sub-estuary of the York River is located on the southern side of the river, approximately 37 km up river from the mouth of the York River. The Taskinas Creek watershed is representative of an inner coastal plain, rural watershed within the southern Chesapeake Bay system. The watershed is dominated by forested and agricultural land uses with an increasing residential land use component. The non-tidal portion of Taskinas Creek contains feeder streams that drain oak-hickory forests, maple-gum-ash swamps and freshwater marshes. Freshwater mixed wetlands are found in the upstream reaches of Taskinas Creek. The creek is roughly 2 meters deep and 20 meters wide towards the lower end of the creek where substrate is dominated by fine sediment. Mean tide range is 0.85 m. Seasonal water quality conditions described here are from 1998 through 2003 (Spring: March-May; Summer: June-August; Fall: September-November; Winter: December-February). Mean seasonal water temperature ranged between 15.2-19.0 for spring, 26.8-28.2 for summer, 17.6-18.3 for fall, and 3.9-9.0 °C in winter. Mean seasonal salinity ranged between 4.0-14.0 for spring, 7.0-18.2 for summer, 6.9-17.0 for fall, and 8.4-15.3 ppt in winter. Potential activities that could impact the site include residential development, selective hardwood logging, and light recreational boating activity. Wildlife populations have been shown to influence microbiological water quality within the watershed.

(d) Sweet Hall Marsh (Lat 37.57138; Long 76.88424)

Sweet Hall Marsh is the most downriver extensive tidal freshwater marsh located in the Pamunkey River, one of two major tributaries of the York River. The marsh is located approximately 77 km upriver from the mouth of the York River estuary. The reserve is 353 ha (871 acres) in area and includes 331 ha (818 acres) of emergent fresh-water marsh, 14 ha (35 acres) of permanently flooded broad-leaved forested wetlands and

approximately 4 ha (9 acres) of scrub-shrub. The marsh community is classified as freshwater mixed. Mean tidal range at Sweet Hall Marsh is on the order of 0.9 m. The Pamunkey River, which surrounds Sweet Hall Marsh, can reach depths up to 15 meters. Substrate within the littoral zone and channel is dominated by fine sediment. Seasonal water quality conditions described here are from 2002 through 2003 (Spring: March-May; Summer: June-August; Fall: September-November; Winter: December-February). Mean seasonal water temperature ranged between 14.7-16.7 for spring, 26.7-27.9 for summer, 19.1 (both years) for fall, and 4.7-6.3 °C in winter. Mean seasonal salinity ranged between 0.1-3.4 for spring, 0.1-8.4 for summer, 0.4-8.4 for fall, and 0.3-3.2 ppt in winter. Potential activities that could impact the site include minor municipal point source discharges above and below river of Sweet Hall Marsh, a major industrial discharge site (pulp mill) in the town of West Point and significant groundwater withdrawal near the confluence of the Pamunkey and York Rivers.

6. Data collection period

Sampling at Claybank (CB), Goodwin Islands (GI), Sweet Hall Marsh (SH), and Taskinas Creek (TC) began January 2004. Sampling was continuous through December 2004. Occasional time skips occurred at all sites due to low batteries, water leakage into the battery compartment, and for no apparent reason.

Claybank (CB)

Deployment Date/Time (MM/DD/YY) (HH:MM:SS)	Retrieval Date/Time (MM/DD/YY) (HH:MM:SS)
12/18/03 10:15:00	01/07/04 11:30:00
01/07/04 11:45:00	01/22/04 11:45:00
01/22/04 12:00:00	02/04/04 12:15:00
02/04/04 12:30:00	02/17/04 12:15:00
02/17/04 12:30:00	03/04/04 12:15:00
03/04/04 12:30:00	03/15/04 15:45:00
03/15/04 16:00:00	03/31/04 10:45:00
03/31/04 11:00:00	04/14/04 10:45:00
04/14/04 11:00:00	04/30/04 09:00:00
04/30/04 09:15:00	05/05/04 12:45:00
05/05/04 13:00:00	05/13/04 07:15:00
05/13/04 07:30:00	05/18/04 08:30:00
05/18/04 08:45:00	05/27/04 08:45:00
05/27/04 09:00:00	06/02/04 09:45:00
06/02/04 10:00:00	06/10/04 09:15:00
06/10/04 09:30:00	06/17/04 09:30:00
06/17/04 09:45:00	06/24/04 12:30:00
06/24/04 12:45:00	06/30/04 08:30:00
06/30/04 08:45:00	07/07/04 10:00:00
07/07/04 10:15:00	07/13/04 11:00:00
07/13/04 11:15:00	07/21/04 10:00:00
07/21/04 10:15:00	07/28/04 10:30:00
07/28/04 10:45:00	08/03/04 10:30:00
08/03/04 10:45:00	08/10/04 13:00:00
08/10/04 13:15:00	08/18/04 11:00:00
08/18/04 11:15:00	08/23/04 08:00:00
08/23/04 08:15:00	08/31/04 10:45:00

08/31/04	11:00:00
09/07/04	10:45:00
09/14/04	11:45:00
09/20/04	12:45:00
09/28/04	10:30:00
10/04/04	11:45:00
10/19/04	09:15:00
10/28/04	09:45:00
11/11/04	11:45:00
11/30/04	12:30:00
12/16/04	13:30:00

09/07/04	10:30:00
09/14/04	11:30:00
09/20/04	12:30:00
09/28/04	10:15:00
10/04/04	11:30:00
10/19/04	09:00:00
10/28/04	09:30:00
11/11/04	11:30:00
11/30/04	12:15:00
12/16/04	13:15:00
01/05/05	10:15:00

Goodwin Islands (GI)

Deployment	Date/Time
(MM/DD/YY)	(HH:MM:SS)

12/18/03	11:30:00
01/07/04	10:00:00
01/21/04	12:45:00
02/04/04	10:15:00
02/19/04	10:45:00
03/04/04	10:00:00
03/15/04	13:30:00
03/31/04	09:45:00
04/13/04	09:45:00
04/30/04	08:00:00
05/05/04	09:15:00
05/13/04	08:45:00
05/18/04	07:30:00
05/27/04	07:30:00
06/02/04	08:30:00
06/10/04	08:00:00
06/17/04	08:30:00
06/24/04	09:15:00
06/30/04	07:45:00
07/07/04	11:30:00
07/13/04	09:00:00
07/21/04	11:45:00
07/28/04	07:45:00
08/03/04	13:15:00
08/10/04	09:15:00
08/18/04	08:45:00
08/23/04	10:45:00
08/31/04	08:15:00
09/07/04	08:00:00
09/14/04	09:00:00
09/22/04	12:00:00
09/28/04	09:00:00
10/04/04	11:00:00
10/19/04	07:45:00
10/28/04	07:15:00
11/03/04	09:30:00
11/11/04	09:00:00
11/16/04	11:30:00
11/30/04	09:45:00

Retrieval	Date/Time
(MM/DD/YY)	(HH:MM:SS)

01/07/04	09:45:00
01/21/04	12:30:00
02/04/04	10:00:00
02/19/04	10:30:00
03/04/04	09:45:00
03/15/04	13:15:00
03/31/04	09:30:00
04/13/04	09:30:00
04/30/04	07:45:00
05/05/04	09:00:00
05/13/04	08:30:00
05/18/04	07:15:00
05/27/04	07:15:00
06/02/04	08:15:00
06/10/04	07:45:00
06/17/04	08:15:00
06/24/04	09:00:00
06/30/04	07:30:00
07/07/04	11:15:00
07/13/04	08:45:00
07/21/04	11:30:00
07/28/04	07:30:00
08/03/04	13:00:00
08/10/04	09:00:00
08/18/04	08:30:00
08/23/04	10:30:00
08/31/04	08:00:00
09/07/04	07:45:00
09/14/04	08:45:00
09/22/04	11:45:00
09/28/04	08:45:00
10/04/04	10:45:00
10/19/04	07:30:00
10/28/04	07:00:00
11/03/04	09:15:00
11/11/04	08:45:00
11/16/04	11:15:00
11/30/04	09:30:00
12/16/04	10:45:00

12/16/04 11:00:00

01/05/05 08:15:00

Sweet Hall Marsh (SH)

Deployment Date/Time
(MM/DD/YY) (HH:MM:SS)

12/17/03 13:45:00
01/07/04 16:45:00
01/21/04 16:15:00
02/04/04 15:15:00
02/16/04 16:30:00
03/04/04 14:30:00
03/17/04 15:30:00
03/30/04 14:00:00
04/12/04 11:45:00
04/27/04 14:45:00
05/11/04 09:15:00
05/25/04 13:00:00
06/08/04 13:45:00
06/22/04 14:00:00
07/08/04 14:45:00
07/19/04 12:45:00
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08/17/04 14:00:00
09/01/04 11:45:00
09/15/04 11:15:00
09/30/04 12:15:00
10/13/04 09:45:00
10/27/04 09:45:00
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Taskinas Creek (TC)

Deployment Date/Time
(MM/DD/YY) (HH:MM:SS)

12/17/03 12:15:00
01/07/04 13:45:00
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06/08/04 10:30:00
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06/22/04 10:30:00
06/28/04 14:45:00

Retrieval Date/Time
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01/07/04 13:30:00
01/21/04 14:30:00
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06/15/04 12:00:00
06/22/04 10:15:00
06/28/04 14:30:00
07/08/04 11:15:00

07/08/04	11:30:00	07/14/04	09:30:00
07/14/04	09:45:00	07/19/04	09:45:00
07/19/04	10:00:00	07/27/04	11:15:00
07/27/04	11:30:00	08/04/04	12:30:00
08/04/04	12:45:00	08/11/04	12:30:00
08/11/04	12:45:00	08/17/04	09:30:00
08/17/04	09:45:00	08/25/04	09:30:00
08/25/04	09:45:00	09/01/04	09:15:00
09/01/04	09:30:00	09/09/04	12:00:00
09/09/04	12:15:00	09/15/04	12:30:00
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09/30/04	14:15:00	10/06/04	10:00:00
10/06/04	10:15:00	10/13/04	11:00:00
10/13/04	11:15:00	10/19/04	13:00:00
10/19/04	13:15:00	10/27/00	11:15:00
10/27/04	11:30:00	11/15/04	11:15:00
11/15/04	11:30:00	11/29/04	13:30:00
11/29/04	13:45:00	12/14/04	10:15:00
12/14/04	10:30:00	01/04/05	10:00:00

7. Distribution:

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

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

8. Associated researchers and projects:

Additional water quality monitoring programs within the York River system include:

a. USEPA Chesapeake Bay Mainstem and Tributary Monitoring Program. Since 1984, biweekly to monthly water quality sampling at a series of sites located along the mid-river channel has been conducted as part of the Chesapeake Bay Program (www.chesapeakebay.net). Station ID's: York River proper (WE4.2, LE4.3, LE4.2, LE4.1, RET4.3), the Pamunkey River (RET4.1, TF4.2) and Mattaponi River (RET4.2 and TF4.4).

b. VIMS Shoal Survey. Since 1984, biweekly to monthly water quality sampling at a series of sites located along the shoal areas of the lower York River estuary has been conducted by the Biological Sciences Department at the Virginia Institute of Marine Science. Station ID's include: Guinea Marsh, Goodwin Island, VIMS, Yorktown, Mumfort Islands, Catlett Islands and Clay Bank.

c. Alliance for the Chesapeake Bay Volunteer Monitoring Program. Physical and chemical (limited nutrients) data are collected by a volunteer network along the York River system (www.Acb-online.org). Station ID's include: Thorofare Creek, Wormley Creek, Blackwell Landing, Pamunkey Trail, Timberneck Creek, Yorktown Naval Weapons Station, Gloucester Point, West Point and Croaker Landing. Note: Some stations may be inactive.

d. VIMS Juvenile Abundance Monitoring Survey. As part of their Juvenile Abundance Monitoring Surveys, water quality and hydrographic data has been collected since 1968 along a series of sites in the York River estuary (includes the Mattaponi and Pamunkey River systems) by the Fisheries Science Department (www.fisheries.vims.edu/research.html) at the Virginia Institute of Marine Science. Surveys include the VIMS Trawl Survey, the Striped Bass Seine Survey and the Juvenile Shad/River Herring Pushnet Survey.

e. Virginia Department of Health. The Virginia Department of Health, Division of Shellfish Sanitation's (www.vdh.state.va.us/shellfish) Seawater Sampling Program collects microbial and general water quality and hydrographic data along a series of sites in the York River estuary (includes lower portions of the Mattaponi and Pamunkey River systems).

f. USEPA Chesapeake Bay Shallow Water Monitoring Program. Since May 2003, CBNERRVA has maintained additional continuous water monitoring stations within the York River estuary system. Measurements for this program include: temperature, specific conductivity, dissolved oxygen, pH, turbidity, insitu fluorescence, and depth. Stations are located at Gloucester Point and Yorktown (on the York River proper), Muddy Point and Walkerton (Mattaponi River), and White House (Pamunkey River). This additional surface water quality mapping program, which monitors the above stated paramaters, occurs on a monthly basis in the York River estuary.

II. Physical Structure Descriptors

9) Sensor specifications

YSI 6600EDS data logger

Parameter: Temperature
Units: Celsius (C)
Sensor Type: Thermistor
Model #: 6560
Range: -5 to 45 °C
Accuracy: +/-0.15 °C
Resolution: 0.01 °C

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

Parameter: Salinity
Units: parts per thousand (ppt)
Sensor Type: Calculated from conductivity and temperature
Range: 0 to 70 ppt
Accuracy: +/- 1.0% of reading or 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; 200-500 % 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 per Liter (mg/L)
Sensor Type: Rapid Pulse - Clark type, polarographic
Model #: 6562
Range: 0 to 50 mg/L
Accuracy: 0 to 20 mg/L, +/- 2 % of the reading or 0.2 mg/L, whichever is greater; 20 to 50 mg/L, +/- 6 % of the reading
Resolution: 0.01 mg/L

Parameter: 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 (EDS probe)
Units: units
Sensor Type: Glass combination electrode
Model #: 6561
Range: 0 to 14 units
Accuracy: +/- 0.2 units
Resolution: 0.01 units

Parameter: Turbidity
Units: nephelometric turbidity units (NTU)
Sensor Type: Optical, 90 ° scatter, with mechanical cleaning
Model #: 6136
Range: 0 to 1000 NTU
Accuracy: +/- 5 % reading or 2 NTU (whichever is greater)
Resolution: 0.1 NTU

The reliability of the dissolved oxygen (DO) data 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). Many reserves have upgraded to the YSI 6600 EDS data sondes, which increases DO accuracy and longevity by reducing the environmental effects of fouling. The user is therefore advised to consult the metadata and to exercise caution when utilizing the DO data beyond the initial 96-hour time period. However, this 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. The Research Coordinator at the specific NERR site should be contacted concerning the reliability of the DO data because of the site and seasonal variation in the fouling of the DO sensor.

The NERR System-Wide Monitoring Program utilizes YSI data sondes that can be equipped with either depth or water level sensors. Both sensors measure water depth, but by convention, level sensors refer to atmospherically vented measurements and depth refers to non-vented measurements. Standard calibration protocols for the non-vented sensor use the atmospheric pressure at the time of calibration. Therefore, changes in atmospheric pressure between calibrations appears as changes in water depth. The error is equal to approximately 1.03cm for every 1 millibar change in atmospheric pressure. This error is eliminated for level sensors because they are vented to the atmosphere throughout the deployment time interval. If proper atmospheric pressure data are available, non-vented sensor depth measurements can be corrected for deployments between calibrations. Water depth data for 2004 have been post-corrected for atmospheric pressure changes that occurred between time of calibration and field retrieval. Readings for both vented and non-vented are automatically compensated for water density changes due to variations in temperature and salinity.

10. Coded variable definitions

Sampling station:	Sampling site code:	Station code:
Claybank	CB	cbvcbwq

Goodwin Islands		GI	cbvgiwq
Sweet Hall Marsh	SH		cbvshwq
Taskinas Creek		TC	cbvtcwq

11. Data anomalies (suspect data)

Specific dates and time ranges of potentially influenced data are listed with each respective month. Starting with January, data were extracted in accordance with Version 5.1 of the CDMO Manual. Significantly elevated single point spike turbidity values which occurred between background values were considered to be a product of sensor interference. Single point spike turbidity values greater than 200 NTUs for Goodwin Island, SweetHall Marsh, and 300 NTUs for Claybank and Taskinas Creek were deleted. Values between 39-200 NTUs for Goodwin Island, 230-300 NTUs for Taskinas Creek, 105-300 NTUs for Claybank, 179-200 NTUs for Sweet Hall Marsh were reported as suspect and retained. These suspect values exceeded 3 standard deviation from mean values based on 2002 and 2003 site specific data; Goodwin Island: 2 year mean = 6.0, 2 year STDEV = 11.4, 3 STDEV plus mean = 39.4; Claybank: 2 year mean = 17.9, 2 year STDEV = 29.0, 3 STDEV plus mean = 105; Taskinas Creek: 2 year mean = 62.4 2 year STDEV = 55.7, 3 STDev plus mean = 229.5; Sweet Hall Landing: 2 year mean = 43.6, 2 year STDEV = 44.1, 3 STDEV plus mean = 178.2.

JANUARY

Claybank:

a) For the following dates and times, specific conductance and salinity values were significantly different as compared to pre and post measurement, which occurred at low tide and may indicate probe exposure. Data retained

01/12/04 06:00:00 - 01/12/04 06:30:00
01/12/04 07:15:00 - 01/13/04 07:30:00

b) For the month of January, depth values occasionally reported negative and/or zero due to sensor precision. Data retained.

Goodwin Island:

a) For the month of January, depth values occasionally reported negative and/or zero due to sensor precision. Data retained.

b) For the following dates and times, depth, specific conductance, salinity, and DO concentration are values were significantly different as compared to pre and post measurement, which occurred at low tide and may indicate probe exposure. Data retained.

01/08/04 02:45:00 - 01/08/04 03:30:00
01/08/04 15:00:00
01/08/04 16:30:00
01/09/04 02:30:00 - 01/09/04 02:45:00

01/16/04 21:00:00 - 01/16/04 22:00:00
01/16/04 23:45:00
01/17/04 11:15:00 - 01/17/04 11:45:00
01/22/04 15:15:00 - 01/22/04 15:30:00
01/22/04 16:00:00 - 01/22/04 16:15:00

c) For the following dates and times, DO % saturation and DO mg/L values were suspect due to a slow decrease in oxygen concentrations throughout the deployment. Data retained.

01/21/04 12:45:00 - 01/31/04 23:45:00

Sweet Hall Marsh:

a) For the month of January, depth values occasionally reported negative and/or zero due to sensor precision. Data retained.

b) For the following dates and times, turbidity readings are suspect. Data retained.

01/10/04 16:30:00 165 NTU

c) For the following dates and times, depth, specific conductance, salinity, and DO concentration are values were significantly different as compared to pre and post measurement, which occurred at low tide and may indicate probe exposure. Data retained.

01/08/04 05:30:00
01/08/04 08:00:00
01/12/04 09:15:00 - 01/12/04 10:30:00
01/16/04 13:45:00

d) For the following dates and times, depth, specific conductance, salinity, ph, and DO concentration are values were significantly different as compared to pre and post measurement, which occurred at low tide and may indicate probe exposure. Data retained.

01/16/04 23:45:00 - 01/17/04 00:00:00
01/17/04 16:00:00
01/21/04 17:45:00

e) For the following dates and times, specific conductance and salinity values were significantly different as compared to pre and post measurement, which occurred at low tide and may indicate probe exposure. Data retained.

01/18/04 02:00:00

Taskinas Creek:

(No suspect data)

FEBRUARY

Claybank:

a) For the month of February, depth values occasionally reported negative and/or zero due to sensor precision. Data retained.

Goodwin Island:

a) For the month of February, depth values occasionally reported negative and/or zero due to sensor precision. Data retained.

b) For the following dates and times, depth, specific conductance, salinity, and DO concentration are values were significantly different as compared to pre and post measurement, which occurred at low tide and may indicate probe exposure. Data retained.

02/09/04 18:30:00
02/10/04 04:30:00
02/10/04 06:00:00 - 02/10/04 06:15:00
02/10/04 17:00:00 - 02/10/04 17:15:00

c) For the following dates and times, DO % saturation and DO mg/L values were suspect due to a slow decrease in oxygen concentrations throughout the deployment. Data retained.

02/01/04 00:00:00 - 02/04/04 10:00:00

d) For the following dates and times, turbidity readings are suspect. Data retained.

02/17/04 09:45:00 41 NTU
02/18/04 19:30:00 150 NTU
02/25/04 14:45:00 46 NTU

e) For the month of February, turbidity values occasionally reported negative and/or zero due to sensor precision. Data retained.

Sweet Hall Marsh:

a) For the month of February, depth values occasionally reported negative and/or zero due to sensor precision. Data retained.

b) For the following dates and times depth, specific conductance, salinity, and DO concentration are values were significantly different as compared to pre and post measurement, which occurred at low tide and may indicate probe exposure. Data retained.

02/15/04 01:00:00 - 02/15/04 01:45:00

c) For the following dates and times, pH values are suspect. Data retained.

02/16/04 16:30:00 - 02/29/04 23:45:00

d) For the following dates and times, dissolved oxygen values are suspect. No known reason for drop in data. Data retained.

02/03/04 15:15:00

02/29/04 01:00:00

Taskinas Creek:

a) For the following dates and times, turbidity readings are suspect. Data retained.

02/02/04 06:45:00 228 NTU

MARCH

Claybank:

a) For the following dates and times, specific conductance and salinity values were significantly different as compared to pre and post measurement, which occurred at low tide and may indicate probe exposure. Data retained.

03/14/04 09:45:00

03/24/04 18:00:00 - 03/24/04 18:15:00

b) For the following dates and times, turbidity readings are suspect. Data retained.

03/13/04 07:30:00 123 NTU

c) For the following dates and times, specific conductance and salinity values are anomalous as compared to pre and post measurements. Data retained.

03/18/04 19:00:00 - 03/18/04 19:15:00

d) For the month of March, depth values occasionally reported negative and/or zero due to sensor precision. Data retained.

Goodwin Island:

a) For the following dates and times, turbidity readings are suspect. Data retained.

03/05/04 19:00:00 102 NTU

03/06/04 04:00:00 40 NTU

03/07/04 00:00:00 156 NTU

03/07/04 23:30:00 97 NTU

03/08/04 08:15:00 55 NTU

03/09/04 16:00:00 43 NTU

03/09/04 16:45:00 147 NTU

03/09/04 22:15:00 67 NTU

b) For the following dates and times, depth, specific conductance, salinity, and DO concentration are values were significantly different as compared to pre and post measurement, which occurred at low tide and

may indicate probe exposure. Data retained.

03/08/04 04:00:00 - 03/08/04 04:15:00

Sweet Hall Marsh:

a) For the month of March, depth values occasionally reported negative and/or zero due to sensor precision. Data retained.

b) For the following dates and times, pH values are suspect. Data retained.

03/01/04 00:00:00 - 03/04/04 14:15:00

c) For the following dates and times, turbidity readings are suspect. Data retained.

03/10/04 16:15:00 185 NTU

03/14/04 12:15:00 224 NTU

03/14/04 14:00:00 254 NTU

03/16/04 15:15:00 196 NTU

d) For the following dates and times, specific conductance and salinity values were significantly different as compared to pre and post measurement, which occurred at low tide and may indicate probe exposure. Data retained.

03/14/04 12:15:00

03/14/04 14:00:00

e) For the following dates and times, depth, specific conductance, salinity, pH, and DO concentration are values were significantly different as compared to pre and post measurement, which occurred at low tide and may indicate probe exposure. Data retained.

03/08/04 07:45:00 - 03/08/04 08:15:00

f) For the following dates and times, temperature, depth, specific conductance, salinity, pH, and DO concentration are values were significantly different as compared to pre and post measurement, which occurred at low tide and may indicate probe exposure. Data retained.

03/22/04 19:00:00 - 03/22/04 20:00:00

Taskinas Creek:

(No suspect data)

APRIL

Claybank:

a) For the following dates and times, specific conductance and salinity values were significantly different as compared to pre and post

measurement, which occurred at low tide and may indicate probe exposure. Data retained.

04/20/04 04:00:00 - 04/20/04 04:45:00
04/20/04 16:00:00 - 04/20/04 16:15:00

c) For the following dates and times, turbidity readings are suspect. Data retained.

04/11/04 09:45:00 173 NTU

d) For the month of April, depth values occasionally reported negative and/or zero due to sensor precision. Data retained.

Goodwin Island:

a) For the following dates and times, depth, specific conductance, salinity, and DO concentration values were significantly different as compared to pre and post measurement, which occurred at low tide and may indicate probe exposure. Data retained.

04/06/04 03:00:00
04/06/04 04:15:00 - 04/06/04 04:30:00
04/06/04 15:30:00 - 04/06/04 16:15:00

b) For the following dates and times, turbidity readings are suspect. Data retained.

04/11/04 14:45:00 68 NTU

Sweet Hall Marsh:

a) For the month of April, depth values occasionally reported negative and/or zero due to sensor precision. Data retained.

b) For the following dates and times, specific conductance and salinity values were significantly different as compared to pre and post measurement, which occurred at low tide and may indicate probe exposure. Data retained.

04/20/04 19:00:00 - 04/20/04 19:15:00

c) For the following dates and times, depth, specific conductance, salinity, and DO concentration are suspect due to potential depth and specific conductivity sensors being out of water. Data retained.

04/06/04 18:15:00
04/07/04 20:00:00 - 04/07/04 20:15:00
04/19/04 18:15:00 - 04/19/04 19:00:00
04/20/04 07:00:00
04/20/04 07:45:00

Taskinas Creek:

a) For the following dates and times, turbidity readings are suspect. Data retained.

04/07/04 05:45:00 203 NTU

b) For the following dates and times, DO % saturation and DO mg/L values were suspect due to a slow decrease in oxygen concentrations throughout the deployment. Data retained.

04/30/04 02:15:00 - 04/30/04 23:45:00

MAY

Claybank:

a) For the following dates and times, specific conductance and salinity values were significantly different as compared to pre and post measurement, which occurred at low tide and may indicate probe exposure. Data retained.

05/05/04 03:30:00 - 05/05/04 04:45:00

05/17/04 02:45:00

b) For the following dates and times, specific conductance and salinity values are anomalous as compared to pre and post measurements. Data retained.

05/13/04 03:00:00

c) For the following dates and times, turbidity brush wiper fell off during the deployment, but no heavy fouling occurred. All data retained.

05/18/04 08:45:00 - 05/27/04 08:45:00

d) For the month of May, depth values occasionally reported negative and/or zero due to sensor precision. Data retained.

Goodwin Island:

(No suspect data)

Sweet Hall Marsh:

a) For the following dates and times, specific conductance and salinity values were significantly different as compared to pre and post measurement, which occurred at low tide and may indicate probe exposure. Data retained.

05/17/04 05:15:00

b) For the following dates and times, depth, specific conductance, salinity, and DO concentration are suspect due to potential depth and specific conductivity sensors being out of water. Data retained.

05/17/04 05:30:00 - 05/17/04 06:00:00

Taskinas Creek:

a) For the following dates and times, DO % saturation and DO mg/L values were suspect due to a slow decrease in oxygen concentrations throughout the deployment. Data retained.

05/01/04 00:00:00 - 05/04/04 09:45:00

b) For the following dates and times, turbidity readings are suspect. Data retained.

05/12/04 20:30:00 226 NTU

05/16/04 01:15:00 237 NTU

JUNE

Claybank:

a) For the following dates and times, depth values are suspect. Data retained.

06/10/04 09:30:00 - 06/10/04 11:00:00

b) For the following dates and times, turbidity readings are suspect. Data retained.

06/20/04 15:45:00 176 NTU

06/26/04 06:00:00 280 NTU

06/27/04 08:45:00 152 NTU

06/30/04 12:00:00 129 NTU

06/30/04 16:00:00 257 NTU

Goodwin Island:

(No suspect data)

Sweet Hall Marsh:

a) For the month of June, depth values occasionally reported negative and/or zero due to sensor precision. Data retained.

Taskinas Creek:

(No suspect data)

JULY

Claybank:

a) For the following dates and times, turbidity readings are suspect.

Data retained.

07/03/04 13:45:00 162 NTU
07/23/04 04:45:00 195 NTU
07/23/04 15:45:00 109 NTU

Goodwin Island:

a) For the following dates and times, turbidity readings are suspect.
Data retained.

07/18/04 10:45:00 143 NTU

b) For the following dates and times, turbidity values were elevated compared to replacement sonde for the next deployment. Post calibration within standard specifications. Data suspect, data retained.

07/27/04 15:00:00 - 07/28/04 07:30:00

Sweet Hall Marsh:

(No suspect data)

Taskinas Creek:

(No suspect data)

AUGUST

Claybank:

a) For the following dates and times, turbidity readings are suspect.
Data retained.

08/04/04 13:30:00 400 NTU
08/04/04 13:45:00 172 NTU
08/10/04 11:00:00 257 NTU
08/17/04 07:00:00 147 NTU
08/25/04 11:30:00 960 NTU
08/28/04 15:00:00 666 NTU
08/29/04 04:00:00 215 NTU
08/29/04 05:45:00 288 NTU

b) For the following dates and times, depth values are suspect. Data retained.

08/31/04 11:00:00

c) For the following dates and times, DO% sat and DO mg/L data are suspect. Data retained.

08/09/04 15:30:00

Goodwin Island:

a) For the following dates and times, turbidity readings are suspect.
Data retained.

08/03/04	05:15:00	191 NTU
08/07/04	22:15:00	41 NTU
08/08/04	01:15:00	111 NTU
08/09/04	01:00:00	68 NTU
08/10/04	07:45:00	105 NTU
08/15/04	15:30:00	46 NTU
08/16/04	07:00:00	143 NTU
08/16/04	17:45:00	225 NTU
08/17/04	08:00:00	116 NTU
08/17/04	10:45:00	65 NTU
08/27/04	12:45:00	48 NTU

Sweet Hall Marsh:

(No suspect data)

Taskinas Creek:

a) For the following dates and times, turbidity readings are suspect.
Data retained.

08/05/04	01:45:00	218 NTU
08/09/04	21:15:00	284 NTU

SEPTEMBER

Claybank:

a) For the following dates and times, turbidity readings are suspect.
Data retained.

09/02/04	11:15:00	389 NTU
09/17/04	11:45:00	254 NTU
09/27/04	13:30:00	290 NTU

Goodwin Island:

a) For the following dates and times, turbidity readings are suspect.
Data retained.

09/10/04	11:00:00	106 NTU
09/28/04	06:45:00	119 NTU

Sweet Hall Marsh:

a) For the following dates and times, turbidity readings are suspect.
Data retained.

09/23/04	09:30:00	270 NTU
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Taskinas Creek:

(No suspect data)

OCTOBER

Claybank:

a) For the following dates and times, specific conductance and salinity values are anomalous as compared to pre and post measurements. Data retained.

10/04/04 11:45:00 - 10/04/04 12:15:00
10/23/04 23:15:00
10/25/04 12:00:00
10/26/04 01:15:00 - 10/26/04 02:30:00

b) For the following dates and times, turbidity readings are suspect. Data retained.

10/02/04 16:15:00 216 NTU
10/10/04 17:00:00 276 NTU
10/13/04 08:15:00 299 NTU
10/13/04 08:30:00 351 NTU
10/13/04 08:45:00 301 NTU
10/21/04 17:30:00 197 NTU

Goodwin Island:

a) For the following dates and times, turbidity readings are suspect. Data retained.

10/06/04 09:30:00	44 NTU
10/06/04 11:15:00	161 NTU
10/06/04 22:30:00	94 NTU
10/07/04 05:30:00	47 NTU
10/08/04 10:15:00	79 NTU
10/08/04 11:15:00	146 NTU
10/08/04 21:00:00	183 NTU
10/09/04 01:45:00	67 NTU
10/09/04 03:15:00	64 NTU
10/09/04 11:45:00	125 NTU
10/09/04 15:45:00	139 NTU
10/09/04 22:30:00	121 NTU
10/10/04 03:30:00	166 NTU
10/11/04 21:45:00	50 NTU
10/12/04 01:45:00	53 NTU
10/12/04 04:15:00	57 NTU
10/12/04 12:15:00	78 NTU
10/12/04 16:00:00	64 NTU
10/13/04 00:15:00	60 NTU
10/13/04 02:15:00	69 NTU
10/13/04 03:15:00	52 NTU

10/13/04 06:30:00	65 NTU
10/13/04 07:45:00	77 NTU
10/13/04 08:45:00	81 NTU
10/13/04 09:45:00	48 NTU
10/13/04 10:15:00	99 NTU
10/14/04 23:00:00	46 NTU
10/18/04 03:00:00	57 NTU
10/18/04 04:30:00	59 NTU
10/19/04 02:00:00	175 NTU

Sweet Hall Marsh:

(No suspect data)

Taskinas Creek:

(No suspect data)

NOVEMBER

Claybank:

a) For the following dates and times, turbidity readings are suspect.
Data retained.

11/17/04 11:15:00	293 NTU
11/18/04 11:15:00	266 NTU
11/26/04 11:00:00	208 NTU
11/29/04 08:45:00	187 NTU

b) For the following dates and times, specific conductance and salinity values are anomalous as compared to pre and post measurements. Data retained.

11/15/04 14:15:00
11/21/04 10:00:00
11/23/04 11:00:00

Goodwin Island:

a) For the following dates and times, specific conductance and salinity values are anomalous as compared to pre and post measurements. Data retained.

11/03/04 01:30:00
11/03/04 02:30:00
11/10/04 20:15:00

b) For the following dates and times, the turbidity brush wiper fell off during the deployment, but no heavy fouling occurred. All data retained.

11/03/04 09:30 - 11/16/04 11:15

Sweet Hall Marsh:

- a) For the month of November, depth values occasionally reported negative and/or zero due to sensor precision. Data retained.
- b) For the following dates and times, specific conductance and salinity values were significantly different as compared to pre and post measurement, which occurred at low tide and may indicate probe exposure. Data retained.

11/07/04 01:30:00
11/07/04 03:00:00 - 11/07/04 03:15:00

Taskinas Creek:

- a) For the following dates and times, turbidity readings are suspect. Data retained.

11/05/04 13:45:00 259 NTU

DECEMBER

Claybank:

- a) For the following dates and times, specific conductance and salinity values are anomalous as compared to pre and post measurements. Data retained.

12/09/04 04:45:00
12/09/04 18:00:00
12/10/04 06:15:00
12/14/04 00:00:00
12/15/04 23:30:00 - 12/15/04 23:45:00

Goodwin Island:

(No suspect data)

Sweet Hall Marsh:

- a) For the following dates and times, specific conductance and salinity values were significantly different as compared to pre and post measurement, which occurred at low tide and may indicate probe exposure. Data retained.

12/20/04 13:45:00
12/30/04 08:15:00

Taskinas Creek:

(No suspect data)

12. Deleted data:

JANUARY

Claybank:

a) For the following dates and times, all data were deleted due to datalogger being out of the water.

01/07/04 15:30:00 - 01/07/04 17:00:00
01/08/04 03:00:00 - 01/08/04 04:45:00
01/08/04 15:45:00 - 01/08/04 17:45:00
01/09/04 03:30:00 - 01/09/04 05:30:00
01/16/04 21:30:00 - 01/17/04 01:00:00
01/17/04 11:30:00 - 01/17/04 13:15:00
01/18/04 00:15:00
01/21/04 01:45:00 - 01/21/04 06:00:00
01/21/04 14:30:00 - 01/21/04 17:15:00
01/22/04 02:15:00 - 01/22/04 05:30:00
01/22/04 15:45:00 - 01/22/04 17:30:00

Goodwin Island:

a) For the following dates and times, all data were deleted due to datalogger being out of the water.

01/08/04 15:15:00 - 01/08/04 16:15:00
01/09/04 03:00:00 - 01/09/04 04:15:00
01/16/04 22:15:00 - 01/16/04 23:30:00
01/21/04 14:00:00 - 01/21/04 16:15:00
01/22/04 01:30:00 - 01/22/04 04:45:00
01/22/04 15:45:00

Sweet Hall Marsh:

a) For the following dates and times, all data were deleted due to datalogger being out of the water.

01/01/04 01:30:00 - 01/01/04 02:15:00
01/02/04 02:00:00 - 01/02/04 02:30:00
01/07/04 18:15:00 - 01/07/04 19:45:00
01/08/04 05:45:00 - 01/08/04 07:45:00
01/08/04 18:45:00 - 01/22/04 20:30:00
01/09/04 06:15:00 - 01/09/04 08:15:00
01/16/04 14:00:00 - 01/16/04 16:00:00
01/17/04 00:15:00 - 01/17/04 04:30:00
01/17/04 13:30:00 - 01/17/04 15:45:00
01/18/04 02:15:00 - 01/18/04 03:15:00
01/20/04 17:45:00 - 01/20/04 18:30:00
01/21/04 04:45:00 - 01/21/04 07:30:00
01/21/04 18:00:00 - 01/21/04 20:00:00
01/22/04 05:30:00 - 01/22/04 08:00:00
01/22/04 19:15:00 - 01/22/04 20:15:00

01/31/04 13:15:00 - 01/31/04 15:30:00

b) For the following dates and times, turbidity values greater than 1000 were deleted.

01/13/04 08:15:00 1617 NTU

c) For the following dates and times, elevated single point turbidity values deleted due to sensor interference. Data deleted.

01/11/04 06:00:00 266 NTU

01/12/04 09:45:00 983 NTU

01/12/04 13:30:00 445 NTU

01/18/04 00:30:00 419 NTU

01/19/04 15:15:00 275 NTU

01/19/04 15:45:00 226 NTU

01/21/04 14:45:00 217 NTU

d) For the following dates and times, depth values were deleted.

01/17/04 04:45:00 - 01/17/04 08:45:00

01/17/04 16:15:00 - 01/17/04 16:45:00

01/21/04 04:30:00

01/21/04 07:45:00 - 01/21/04 10:00:00

Taskinas Creek:

a) For the following dates and times, turbidity values greater than 1000 were deleted.

01/10/04 08:30:00 1020 NTU

b) For the following dates and times, elevated single point turbidity values deleted due to sensor interference. Data deleted.

01/17/04 17:00:00 692 NTU

01/21/04 22:30:00 249 NTU

FEBRUARY

Claybank:

a) For the following dates and times, all data were deleted due to datalogger being out of the water.

02/09/04 04:15:00 - 02/09/04 06:45:00

02/09/04 16:30:00 - 02/09/04 19:15:00

02/10/04 05:00:00 - 02/10/04 07:30:00

02/10/04 17:30:00 - 02/10/04 19:30:00

Goodwin Island:

a) For the following dates and times, all data were deleted due to datalogger being out of the water.

02/09/04 04:00:00 - 02/09/04 05:30:00
02/09/04 15:45:00 - 02/09/04 18:15:00
02/10/04 04:45:00 - 02/10/04 05:45:00
02/10/04 17:30:00 - 02/10/04 18:00:00

b) For the following dates and times, elevated single point turbidity values deleted due to sensor interference. Data deleted.

02/25/04 14:30:00 505 NTU

Sweet Hall Marsh:

a) For the following dates and times, all data were deleted due to datalogger being out of the water.

02/09/04 08:00:00 - 02/09/04 09:15:00
02/09/04 20:15:00 - 02/09/04 21:45:00
02/10/04 08:45:00 - 02/10/04 09:45:00
02/10/04 21:15:00 - 02/10/04 21:45:00

b) For the following dates and times, turbidity values greater than 1000 were deleted.

02/09/04 17:00:00 1483 NTU
02/10/04 18:00:00 2100 NTU
02/24/04 08:45:00 1078 NTU

c) For the following dates and times, elevated single point turbidity values deleted due to sensor interference. Data deleted.

02/02/04 12:15:00 245 NTU
02/04/04 17:00:00 519 NTU
02/05/04 11:15:00 509 NTU
02/05/04 13:45:00 471 NTU
02/10/04 07:15:00 318 NTU
02/26/04 08:45:00 374 NTU

Taskinas Creek:

(No deleted data)

MARCH

Claybank:

a) For the following dates and times, all data were deleted due to datalogger being out of the water.

03/08/04 05:00:00 - 03/08/04 05:45:00

b) For the following dates and times, all data were deleted due to

exchange of datalogger.

03/15/04 16:00:00

Goodwin Island:

a) For the following dates and times, elevated single point turbidity values deleted due to sensor interference. Data deleted.

03/14/04 14:00:00 617 NTU

Sweet Hall Marsh:

a) For the following dates and times, all data were deleted due to datalogger being out of the water.

03/14/04 12:30:00 - 03/14/04 13:45:00

b) For the following dates and times, turbidity values greater than 1000 were deleted.

03/03/04 15:15:00 1056 NTU

03/17/04 12:30:00 1764 NTU

03/27/04 09:45:00 1340 NTU

c) For the following dates and times, elevated single point turbidity values deleted due to sensor interference. Data deleted.

03/05/04 04:30:00 959 NTU

03/13/04 18:30:00 686 NTU

03/14/04 07:45:00 632 NTU

03/31/04 12:30:00 594 NTU

Taskinas Creek:

(No deleted data)

APRIL

Claybank:

a) For the following dates and times, all data were deleted due to datalogger being out of the water.

04/05/04 15:15:00 - 04/05/04 17:00:00

04/06/04 03:15:00 - 04/06/04 06:00:00

04/06/04 15:45:00 - 04/06/04 17:45:00

04/07/04 04:45:00 - 04/07/04 06:15:00

04/19/04 03:30:00 - 04/19/04 04:00:00

04/19/04 15:45:00 - 04/19/04 16:00:00

b) For the following dates and times, turbidity values greater than 1000 were deleted.

04/05/04 10:30:00 1240 NTU
04/10/04 23:30:00 1273 NTU
04/14/04 03:00:00 1275 NTU
04/24/04 05:45:00 1548 NTU

Goodwin Island:

a) For the following dates and times, all data were deleted due to datalogger being out of the water.

04/06/04 03:15:00 - 04/06/04 04:00:00

b) For the following dates and times, elevated single point turbidity values deleted due to sensor interference. Data deleted.

04/12/04 14:45:00 947 NTU

Sweet Hall Marsh:

a) For the following dates and times, all data were deleted due to datalogger being out of the water.

04/05/04 16:45:00 - 04/05/04 20:15:00
04/06/04 06:15:00 - 04/06/04 08:45:00
04/06/04 18:30:00 - 04/06/04 20:15:00
04/07/04 07:45:00 - 04/07/04 08:45:00
04/20/04 07:15:00 - 04/20/04 07:30:00

b) For the following dates and times, elevated single point turbidity values deleted due to sensor interference. Data deleted.

04/03/04 09:00:00 204 NTU

Taskinas Creek:

a) For the following dates and times, turbidity values greater than 1000 were deleted.

04/05/04 11:15:00 1184 NTU

b) For the following dates and times, elevated single point turbidity values deleted due to sensor interference. Data deleted.

04/22/04 16:15:00 593 NTU
04/22/04 16:30:00 323 NTU

MAY

Claybank:

(No deleted data)

Goodwin Island:

a) For the following dates and times, turbidity values greater than 1000 were deleted.

05/16/04 17:30:00 1457 NTU

Sweet Hall Marsh:

a) For the following dates and times, all data were deleted due to exchange of datalogger.

05/25/04 13:00:00

Taskinas Creek:

a) For the following dates and times, turbidity values greater than 1000 were deleted.

05/13/04 20:45:00 1157 NTU

05/15/04 22:00:00 1434 NTU

05/16/04 00:15:00 1867 NTU

05/19/04 18:00:00 1310 NTU

05/20/04 16:45:00 1208 NTU

05/22/04 00:30:00 1299 NTU

05/27/04 19:30:00 1871 NTU

05/27/04 20:15:00 1869 NTU

b) For the following dates and times, pH values high due to sensor malfunction. Data deleted.

05/10/04 10:15:00 - 05/19/04 09:30:00

JUNE

Claybank:

a) For the following dates and times, all data were deleted due to exchange of datalogger.

06/30/04 08:45:00

b) For the following dates and times, during the period when the Claybank station was being relocated, the datalogger was temporarily out of the water. Data deleted.

06/17/04 13:15:00 - 06/17/04 13:30:00

c) For the following dates and times, elevated single point turbidity values deleted due to sensor interference. Data deleted.

06/21/04 15:15:00 891 NTU

Goodwin Island:

a) For the following dates and times, turbidity values greater than 1000 were deleted.

06/04/04 23:00:00 1106 NTU
06/06/04 15:45:00 1364 NTU
06/07/04 04:15:00 1008 NTU

b) For the following dates and times, elevated single point turbidity values deleted due to sensor interference. Data deleted.

06/13/04 01:00:00 671 NTU
06/25/04 17:00:00 361 NTU

Sweet Hall Marsh:

(No deleted data)

Taskinas Creek:

a) For the following dates and times, turbidity values greater than 1000 were deleted.

06/01/04 07:45:00 1793 NTU
06/01/04 08:00:00 1795 NTU
06/03/04 01:45:00 1300 NTU
06/11/04 21:45:00 1466 NTU
06/12/04 09:30:00 1823 NTU
06/15/04 03:00:00 1179 NTU
06/30/04 04:00:00 1070 NTU
06/30/04 12:15:00 1309 NTU

b) For the following dates and times, elevated single point turbidity values deleted due to sensor interference. Data deleted.

06/30/04 15:15:00 303 NTU

July

Claybank:

a) For the following dates and times, elevated single point turbidity values deleted due to sensor interference. Data deleted.

07/02/04 01:30:00 302 NTU
07/05/04 10:15:00 609 NTU

b) For the following dates and times, DO % sat and DO mg/L data were deleted due to membrane puncture.

07/20/04 09:45:00 - 07/21/04 10:00:00

Goodwin Island:

a) For the following dates and times, during the period when the Goodwin station was being relocated, the datalogger was temporarily out of the water. Data deleted.

07/22/04 12:15:00 - 07/22/04 12:30:00

b) For the following dates and times, turbidity values greater than 1000 were deleted.

07/13/04 13:15:00 1450 NTU
07/20/04 22:45:00 1422 NTU
07/21/04 00:45:00 1419 NTU
07/30/04 00:30:00 1391 NTU

c) For the following dates and times, elevated single point turbidity values deleted due to sensor interference. Data deleted.

07/17/04 17:00:00 376 NTU
07/18/04 08:15:00 341 NTU

d) For the following dates and times, DO % sat and DO mg/L data were deleted due to membrane puncture.

07/21/04 00:45:00 - 07/21/04 11:30:00

Sweet Hall Marsh:

a) For the following dates and times, elevated single point turbidity values deleted due to sensor interference. Data deleted.

07/02/04 11:30:00 427 NTU

Taskinas Creek:

a) For the following dates and times, turbidity values greater than 1000 were deleted.

07/31/04 15:00:00 1197 NTU

b) For the following dates and times, elevated single point turbidity values deleted due to sensor interference. Data deleted.

07/12/04 08:00:00 552 NTU

AUGUST

Claybank:

a) For the following dates and times, all data were deleted due to exchange of datalogger.

08/10/04 13:15:00

b) For the following dates and times, turbidity values greater than

1000 were deleted.

08/21/04 09:45:00 1212 NTU
08/25/04 11:00:00 2163 NTU
08/25/04 11:15:00 1594 NTU
08/28/04 14:30:00 1670 NTU
08/28/04 14:45:00 1054 NTU
08/29/04 13:15:00 2164 NTU
08/29/04 13:30:00 1235 NTU
08/29/04 13:45:00 2199 NTU
08/29/04 15:45:00 1519 NTU
08/29/04 16:30:00 1346 NTU
08/29/04 16:45:00 1370 NTU
08/29/04 17:00:00 1223 NTU
08/29/04 17:15:00 2210 NTU
08/30/04 04:30:00 2171 NTU

c) For the following dates and times, elevated single point turbidity values deleted due to sensor interference. Data deleted.

08/17/04 09:15:00 475 NTU
08/25/04 10:15:00 457 NTU
08/29/04 10:45:00 318 NTU

Goodwin Island:

a) For the following dates and times, turbidity values greater than 1000 were deleted.

08/09/04 19:00:00 1812 NTU
08/10/04 21:45:00 1391 NTU
08/11/04 00:15:00 1393 NTU
08/11/04 02:00:00 1394 NTU
08/11/04 02:15:00 1388 NTU
08/15/04 10:45:00 1049 NTU

b) For the following dates and times, elevated single point turbidity values deleted due to sensor interference. Data deleted.

08/07/04 20:00:00 235 NTU
08/08/04 04:00:00 256 NTU
08/10/04 01:15:00 206 NTU
08/10/04 23:00:00 752 NTU
08/11/04 00:00:00 660 NTU
08/11/04 01:30:00 777 NTU
08/14/04 00:45:00 705 NTU
08/14/04 22:45:00 270 NTU
08/15/04 00:30:00 252 NTU
08/15/04 04:15:00 201 NTU
08/15/04 05:15:00 216 NTU
08/15/04 07:30:00 219 NTU
08/15/04 08:00:00 266 NTU
08/15/04 10:30:00 283 NTU
08/15/04 13:15:00 613 NTU

08/15/04 20:00:00 340 NTU
08/16/04 07:45:00 382 NTU
08/16/04 09:15:00 623 NTU
08/16/04 09:45:00 273 NTU
08/16/04 12:15:00 228 NTU
08/16/04 14:15:00 364 NTU
08/16/04 15:15:00 374 NTU
08/16/04 18:30:00 269 NTU
08/16/04 19:00:00 557 NTU
08/16/04 22:45:00 400 NTU
08/17/04 04:45:00 498 NTU
08/17/04 09:00:00 403 NTU
08/18/04 00:15:00 444 NTU
08/18/04 02:00:00 440 NTU
08/18/04 08:00:00 522 NTU

Sweet Hall Marsh:

a) For the following dates and times, elevated single point turbidity values deleted due to sensor interference. Data deleted.

08/28/04 15:00:00 234 NTU

Taskinas Creek:

a) For the following dates and times, all data were deleted due to exchange of datalogger.

08/04/04 12:45:00

08/25/04 09:45:00

b) For the following dates and times, pH values high due to sensor malfunction. Data deleted.

08/17/04 09:45:00 - 08/25/04 09:30:00

c) For the following dates and times, turbidity values greater than 1000 were deleted.

08/06/04 01:15:00 1859 NTU

d) For the following dates and times, elevated single point turbidity values deleted due to sensor interference. Data deleted.

08/05/04 01:30:00 382 NTU

SEPTEMBER

Claybank:

a) For the following dates and times, turbidity values greater than 1000 were deleted.

09/02/04 11:30:00 1219 NTU

09/05/04 15:45:00 1218 NTU

b) For the following dates and times, elevated single point turbidity values deleted due to sensor interference. Data deleted.

09/15/04 16:30:00 432 NTU

09/18/04 02:15:00 592 NTU

Goodwin Island:

a) For the following dates and times, turbidity values greater than 1000 were deleted.

09/25/04 14:15:00 1116 NTU

09/25/04 22:15:00 1110 NTU

09/26/04 19:15:00 1112 NTU

09/26/04 20:00:00 1110 NTU

09/28/04 01:15:00 1107 NTU

Sweet Hall Marsh:

a) For the following dates and times, turbidity values greater than 1000 were deleted.

09/23/04 09:15:00 2223 NTU

b) For the following dates and times, elevated single point turbidity values deleted due to sensor interference. Data deleted.

09/20/04 16:15:00 322 NTU

Taskinas Creek:

a) For the following dates and times, pH values high due to sensor malfunction. Data deleted.

09/01/04 09:30:00 - 09/09/04 12:00:00

09/15/04 12:45:00 - 09/22/04 09:15:00

OCTOBER

Claybank:

a) For the following dates and times, turbidity values greater than 1000 were deleted.

10/03/04 12:45:00 1199 NTU

10/06/04 10:00:00 2085 NTU

10/16/04 14:45:00 1248 NTU

Goodwin Island:

a) For the following dates and times, turbidity values greater than

1000 were deleted.

10/02/04 17:45:00 1011 NTU
10/06/04 13:00:00 1090 NTU
10/06/04 20:15:00 1093 NTU
10/07/04 02:30:00 1090 NTU
10/07/04 10:15:00 1090 NTU
10/08/04 01:30:00 1093 NTU
10/08/04 05:45:00 1030 NTU
10/08/04 15:30:00 1107 NTU
10/08/04 17:15:00 1106 NTU
10/08/04 18:45:00 1104 NTU
10/09/04 04:15:00 1099 NTU
10/09/04 08:15:00 1099 NTU
10/09/04 09:15:00 1101 NTU
10/09/04 16:45:00 1106 NTU
10/10/04 01:45:00 1101 NTU
10/10/04 16:45:00 1110 NTU
10/12/04 07:45:00 1085 NTU
10/12/04 11:15:00 1089 NTU
10/13/04 21:45:00 1084 NTU
10/16/04 13:00:00 1078 NTU
10/16/04 20:00:00 1079 NTU
10/16/04 21:15:00 1080 NTU
10/17/04 03:30:00 1068 NTU
10/18/04 15:00:00 1073 NTU
10/19/04 05:45:00 1075 NTU

b) For the following dates and times, elevated single point turbidity values deleted due to sensor interference. Data deleted.

10/01/04 19:15:00 344 NTU
10/02/04 01:45:00 323 NTU
10/02/04 14:00:00 449 NTU
10/02/04 18:00:00 250 NTU
10/03/04 10:45:00 364 NTU
10/07/04 13:45:00 380 NTU
10/08/04 02:45:00 938 NTU
10/09/04 04:30:00 209 NTU
10/09/04 11:15:00 395 NTU
10/10/04 14:30:00 522 NTU
10/18/04 07:30:00 508 NTU
10/13/04 18:00:00 212 NTU
10/18/04 22:45:00 270 NTU

Sweet Hall Marsh:

a) For the following dates and times, elevated single point turbidity values deleted due to sensor interference. Data deleted.

10/20/04 11:45:00 219 NTU

Taskinas Creek:

(No deleted data)

NOVEMBER

Claybank:

a) For the following dates and times, turbidity values greater than 1000 were deleted.

11/03/04 17:15:00 1271 NTU
11/04/04 21:00:00 1436 NTU
11/04/04 21:30:00 1971 NTU
11/17/04 08:30:00 1066 NTU
11/20/04 12:30:00 1083 NTU

b) For the following dates and times, elevated single point turbidity values deleted due to sensor interference. Data deleted.

11/01/04 23:00:00 608 NTU
11/04/04 19:45:00 352 NTU
11/19/04 09:30:00 404 NTU
11/21/04 13:30:00 410 NTU
11/28/04 14:00:00 316 NTU

Goodwin Island:

a) For the following dates and times, turbidity values greater than 1000 were deleted.

11/03/04 12:30:00 1282 NTU

Sweet Hall Marsh:

a) For the following dates and times, all data were deleted due to datalogger being out of the water.

11/07/04 01:45:00 - 11/07/04 02:45:00

Taskinas Creek:

a) For the following dates and times, turbidity values greater than 1000 were deleted.

11/26/04 20:45:00 1175 NTU

DECEMBER

Claybank:

a) For the following dates and times, elevated single point turbidity values deleted due to sensor interference. Data deleted.

12/01/04 10:00:00 639 NTU
12/09/04 09:00:00 478 NTU
12/13/04 10:45:00 459 NTU
12/15/04 00:15:00 459 NTU
12/16/04 15:30:00 394 NTU

Goodwin Island:

a) For the following dates and times, turbidity values greater than 1000 were deleted.

12/05/04 09:00:00 1136 NTU

b) For the following dates and times, elevated single point turbidity values deleted due to sensor interference. Data deleted.

12/15/04 12:00:00 358 NTU
12/26/04 07:30:00 574 NTU

Sweet Hall Marsh:

a) For the following dates and times, all data were deleted due to datalogger being out of the water.

12/15/04 08:30:00 - 12/15/04 09:30:00
12/20/04 14:00:00 - 12/20/04 15:15:00
12/30/04 08:30:00 - 12/30/04 08:45:00

Taskinas Creek:

a) For the following dates and times, turbidity values greater than 1000 were deleted.

12/10/04 04:30:00 1668 NTU

b) For the following dates and times, elevated single point turbidity values deleted due to sensor interference. Data deleted.

12/03/04 12:15:00 659 NTU

13. Missing data:

Data are missing due to equipment failure, specific probes not being deployed, and time of maintenance or calibration of equipment. For more details on deleted data, see the Deleted Data Section (12.). If additional information on missing data are needed, contact the Research Coordinator at the reserve submitting the data.

JANUARY

Taskinas:

a) For the following dates and times, all data are missing due to an internal error within the sonde.

01/01/04 00:00:00 - 01/07/04 13:30:00

AUGUST

Goodwin Island:

a) For the following dates and times, all data are missing due to an internal error within the sonde.

08/28/04 16:00:00 - 08/31/04 08:00:00

SEPTEMBER

Claybank:

a) For the following dates and times, all data are missing due to an internal error within the sonde.

09/07/04 10:45:00 - 09/14/04 11:30:00

NOVEMBER

Taskinas Creek:

a) For the following dates and times, all data are missing due to an internal error within the sonde.

11/29/04 00:00:00 - 11/29/04 13:30:00

14. Post-deployment Information

End of deployment Post-calibration Readings in Standard Solutions:

na = no data available for that particular standard

Claybank:

Date (post cal)	Cond (ms) (Std:10)	DO (AirSat) (Std: 100%)	pH (Std:7)	Turb (Std:0)	Depth (Std:0)
01/08/04	10.190	109.0	7.05	-0.1	0.049
01/23/04	10.140	83.3	7.05	0.4	-0.102
02/05/04	9.957	101.7	7.05	-0.9	0.215
02/18/04	10.160	96.5	7.12	-0.4	-0.033
03/05/04	10.050	99.1	7.07	-3.1	-0.146
03/16/04	10.040	94.1	7.49	-0.1	-0.077
04/01/04	10.000	100.3	6.93	0.0	-0.240
04/15/04	10.130	100.3	6.98	-0.3	0.014
04/30/04	10.040	101.7	7.11	-0.2	0.150
05/06/04	10.060	102.6	7.05	0.1	-0.102
05/14/04	9.967	101.1	7.05	-0.1	0.039

05/19/04	9.973	100.3	7.01	-0.2	-0.027
05/28/04	9.697	99.0	7.01	-0.1	-0.228
06/03/04	9.850	99.7	7.06	0.1	0.090
06/11/04	9.930	100.7	7.04	-0.1	0.037
06/18/04	9.924	92.7	7.00	-0.1	-0.068
06/25/04	9.942	101.6	6.99	0.1	-0.010
07/01/04	9.897	97.8	7.08	-0.1	0.074
07/08/04	10.020	98.7	7.04	0.0	-0.042
07/14/04	9.817	99.2	7.02	0.0	-0.095
07/22/04	9.842	02.0	6.98	-0.3	0.002
07/29/04	9.985	99.2	7.07	0.0	0.050
08/04/04	9.952	98.6	7.04	0.1	-0.080
08/11/04	10.000	98.7	7.01	0.3	-0.067
08/19/04	10.150	99.1	7.03	-0.2	-0.040
08/24/04	9.933	97.1	7.04	-0.1	-0.008
09/01/04	10.120	98.5	6.99	0.0	0.050
09/08/04	9.892	97.8	6.96	0.1	-0.100
09/15/04	na	na	na	na	na
09/21/04	9.896	100.1	7.09	0.1	0.013
09/29/04	9.993	99.6	7.04	-0.1	-0.164
10/05/04	10.070	100.5	7.03	0.0	0.089
10/20/04	9.928	98.8	7.01	-0.2	-0.084
10/29/04	10.120	99.2	6.97	0.1	-0.021
11/12/04	10.280	79.6	6.99	0.6	0.016
12/01/04	9.970	99.0	7.07	-0.2	-0.112
12/16/04	10.070	89.9	6.96	-0.2	-0.008
01/06/05	9.964	100.0	6.91	-0.1	-0.212

Goodwin Island:

Date (post cal)	Cond (ms) (Std:10)	DO (AirSat) (Std: 100%)	pH (Std:7)	Turb (Std:0)	Depth (Std:0)
01/08/04	10.070	102.5	7.04	-0.3	0.185
01/22/04	10.100	92.3	7.00	-0.5	-0.217
02/05/04	10.050	60.7	7.01	-0.8	0.128
02/20/04	10.100	65.8	7.02	-0.2	-0.116
03/05/04	9.929	101.5	7.01	-0.1	0.037
03/16/04	10.270	93.9	7.08	0.2	-0.114
04/01/04	10.130	96.9	6.86	0.1	-0.250
04/14/04	9.921	97.6	7.05	0.2	-0.134
04/30/04	10.040	99.2	6.92	0.1	0.145
05/06/04	10.090	102.1	6.90	-0.5	-0.110
05/14/04	9.981	96.8	7.06	-0.3	0.130
05/19/04	9.976	100.1	6.99	-0.1	-0.004
05/28/04	9.909	92.5	7.07	0.1	-0.244
06/03/04	10.010	100.1	7.00	-0.1	0.050
06/11/04	9.988	104.3	6.99	-0.2	0.047
06/18/04	10.000	97.1	7.06	-0.1	-0.066
06/25/04	9.995	97.2	7.03	0.3	-0.018
07/01/04	9.826	100.2	7.05	-0.5	0.074
07/08/04	10.090	99.5	7.01	0.1	-0.060
07/14/04	9.959	67.7	7.00	0.0	-0.091
07/22/04	9.953	62.8	6.99	0.2	-0.037

07/29/04	9.738	99.6	7.01	-0.2	0.051
08/04/04	9.893	95.8	7.00	0.2	-0.102
08/11/04	9.773	101.8	7.10	0.6	-0.049
08/19/04	9.846	98.4	7.04	0.0	-0.055
08/24/04	10.030	98.6	7.00	-0.3	-0.009
09/01/04	9.946	93.4	6.91	0.1	0.032
09/08/04	9.925	97.8	7.07	0.3	0.009
09/15/04	9.774	88.9	6.98	0.1	-0.014
09/23/04	9.952	97.8	6.90	-0.1	0.111
09/29/04	9.949	98.5	7.01	0.1	-0.150
10/05/04	9.988	100.6	6.96	0.2	0.065
10/20/04	9.773	90.0	7.09	0.3	-0.080
10/29/04	9.976	97.1	6.90	0.1	-0.019
11/04/04	10.130	82.9	6.95	-0.2	-0.056
11/12/04	10.020	99.2	7.13	0.8	-0.008
11/17/04	10.130	95.1	6.95	-0.3	-0.042
12/01/04	10.050	96.8	6.95	0.1	-0.297
12/16/04	10.310	85.0	7.04	0.3	0.002
01/06/05	10.140	60.6	6.88	-0.4	-0.196

Sweethall Landing:

Date (post cal)	Cond (ms) (Std:10)	DO (AirSat) (Std: 100%)	pH (Std:7)	Turb (Std:0)	Depth (Std:0)
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01/07/04	na	na	na	na	na
01/22/04	10.030	97.7	6.97	0.5	-0.234
02/05/04	10.030	102.4	7.29	-0.8	0.118
02/17/04	10.030	102.4	7.05	-0.9	0.084
03/05/04	9.926	100.4	7.11	-0.6	-0.133
03/18/04	10.040	104.6	6.89	-0.8	-0.001
03/31/04	10.040	104.3	7.04	0.1	-0.018
04/13/04	10.050	101.2	6.92	0.0	-0.197
04/29/04	9.989	105.5	7.06	-0.6	0.137
05/12/04	10.150	101.3	na	0.1	0.142
05/26/04	9.988	100.8	7.03	-0.1	-0.132
06/09/04	10.170	100.5	7.10	-0.1	0.088
06/23/04	10.050	103.2	7.07	-0.1	-0.083
07/09/04	10.230	101.0	7.02	0.0	-0.005
07/20/04	10.080	102.0	7.01	0.0	0.008
08/05/04	9.936	107.5	7.07	-0.2	0.039
08/18/04	10.070	102.8	7.05	0.2	0.021
09/02/04	10.070	101.9	7.04	0.2	0.103
09/16/04	10.150	102.8	7.01	0.0	-0.003
09/30/04	9.896	na	7.00	0.1	0.088
10/14/04	10.060	101.8	7.01	0.1	-0.177
10/28/04	10.230	102.0	7.00	-0.3	-0.065
11/11/04	10.120	102.6	7.02	0.4	0.083
11/30/04	10.080	103.4	6.98	-0.1	0.050
12/15/04	10.200	103.4	7.03	0.0	0.117
01/05/05	10.180	102.4	7.00	-0.3	0.129

Taskinas Creek:

Date	Cond (ms)	DO (AirSat)	pH	Turb	Depth
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	(Std:10)	(Std: 100%)	(Std:7)	(Std:0)	(Std:0)
01/08/04	na	na	na	na	na
01/22/04	10.490	96.9	7.06	-2.1	-0.247
02/05/04	9.882	102.4	7.03	-0.4	0.111
02/18/04	10.020	102.0	7.07	-1.2	-0.037
03/05/04	9.951	98.9	7.04	-0.5	-0.165
03/16/04	9.966	100.6	7.16	-0.5	-0.104
04/01/04	10.010	97.9	7.08	-0.7	-0.235
04/13/04	10.010	98.9	7.05	-5.3	-0.243
04/28/04	9.921	96.7	7.01	0.4	0.068
05/05/04	10.010	68.0	7.05	0.1	0.070
05/11/04	10.030	98.0	7.07	0.1	0.020
05/20/04	9.944	101.9	na	0.0	0.059
05/26/04	10.050	91.2	7.10	-0.4	-0.175
06/04/04	10.000	99.8	7.07	-0.1	0.077
06/09/04	9.974	96.0	6.99	-0.1	0.143
06/16/04	10.180	101.8	7.01	-0.4	-0.005
06/23/04	10.060	96.1	7.01	-0.2	-0.054
06/29/04	10.100	102.0	7.03	-0.1	0.080
07/09/04	9.894	98.1	7.05	-0.2	0.005
07/15/04	10.040	100.9	7.01	0.1	-0.145
07/20/04	10.100	95.4	6.94	-0.3	0.042
07/28/04	10.010	95.9	7.02	-0.2	0.092
08/05/04	10.020	95.5	6.95	0.1	-0.127
08/12/04	10.020	84.2	6.97	-0.3	0.004
08/18/04	9.999	97.7	6.97	-0.1	-0.041
08/26/04	10.050	88.8	6.56	-0.1	0.103
09/02/04	9.956	99.1	7.04	0.0	0.052
09/10/04	10.130	101.0	6.99	-0.2	0.156
09/16/04	10.060	97.5	6.96	0.0	0.055
09/23/04	10.090	101.5	7.11	0.0	0.003
10/01/04	9.972	99.4	7.06	-0.1	-0.045
10/07/04	10.060	101.7	7.08	-0.1	0.096
10/14/04	10.070	103.9	6.95	-0.2	-0.295
10/20/04	10.030	99.5	6.93	-0.2	-0.170
10/28/04	10.220	103.0	6.91	-0.2	0.302
11/16/04	10.150	100.5	7.04	0.2	0.150
11/30/04	10.100	104.5	6.94	0.0	0.051
12/15/04	10.180	98.9	7.03	-0.2	0.102
01/05/04	10.160	102.7	6.99	0.0	0.117

Field verifications were recorded with a YSI-85 and/or a YSI 600 XLM,
and LaMotte titration kit immediately prior to sonde retrieval.
na = no data available

Claybank:

Date	Salinity ppt	pH	Water Temp C	Secchi m	DO mg/L
01/07/04	9.8	7.707	5.2	0.40	9.7
01/22/04	13.6	7.698	2.9	0.50	10.7
02/04/04	12.8	7.840	3.1	0.80	11.9/11.4
02/17/04	13.0	7.948	4.0	0.50	7.2/7.2
03/04/04	11.2	8.306	12.6	0.50	6.8/7.7

03/15/04	14.9	8.217	10.1	0.50	11.6/11.4
03/31/04	13.07	8.07	11.08	0.80	10.0/10.0
04/14/04	14.98	8.11	12.57	0.60	11.4/11.4
04/30/04	9.8	8.17	18.0	0.50	8.6/9.0
05/05/04	12.4	7.75	18.4	0.68	8.0/8.2
05/13/04	11.42	7.49	22.47	0.39	6.2/5.8
05/18/04	13.11	7.62	23.12	0.45	6.7/6.8
05/27/04	13.96	7.80	24.63	0.40	6.6/6.8
06/02/04	18.33	7.77	22.92	0.60	4.8/4.8
06/10/04	15.61	7.55	26.30	0.22	6.0/5.9
06/17/04	15.09	7.59	25.74	0.45	6.2/6.2
06/24/04	15.82	7.74	27.05	0.85	6.2/6.1
06/30/04	17.15	7.65	25.49	0.60	5.5/5.6
07/07/04	13.98	7.72	29.12	0.50	6.0/6.3
07/13/04	14.34	7.86	29.14	0.56	6.3/6.4
07/21/04	17.27	7.86	27.96	0.50	6.2/6.4
07/28/04	15.85	7.63	27.58	0.60	5.4/5.6
08/03/04	13.77	7.47	28.04	0.40	4.2/4.3
08/10/04	9.89	8.46	28.08	0.45	8.0/8.4
08/18/04	10.53	7.79	25.84	0.50	6.6/6.5
08/23/04	10.25	7.69	25.25	0.70	6.1/5.9
08/31/04	11.23	7.72	27.05	0.40	5.6/5.4
09/07/04	7.78	7.75	25.99	0.69	6.6/6.8
09/14/04	10.22	7.76	25.36	0.75	5.8/5.8
09/20/04	13.80	7.76	23.41	0.80	5.8/6.1
09/28/04	14.15	7.69	23.38	0.40	4.4/5.4
10/04/04	9.59	7.82	22.38	0.70	6.7/6.8
10/19/04	13.76	7.78	17.63	0.80	7.9/7.9
10/28/04	15.43	7.78	16.15	0.80	6.8/6.4
11/11/04	14.99	7.84	13.65	0.70	9.2/8.9
11/30/04	11.85	7.84	11.57	1.30	8.9/8.8
12/16/04	10.25	8.00	7.53	0.80	10.4/10.6
01/05/05	12.46	8.03	7.68	0.75	11.1/11.2

Goodwin Island:

Date	Salinity ppt	pH	Water Temp C	Secchi m	DO mg/L
01/07/04	15.60	8.326	6.70	0.80	10.2/10.5
01/21/04	16.80	8.134	na	0.40	12.3/12.4
02/04/04	15.00	8.014	1.50	1.00	11.8/12.1
02/19/04	14.20	8.118	3.80	0.90	11.8/12.1
03/04/04	14.70	8.353	9.20	0.70	6.7/6.6
03/15/04	17.00	8.246	16.50	0.50	11.3/11.0
03/31/04	18.18	8.44	10.25	0.70	10.8/10.6
04/13/04	18.06	8.07	10.52	0.60	8.8/9.2
04/30/04	16.60	8.27	17.30	0.60	8.7/9.0
05/05/04	17.30	8.08	16.10	0.90	8.1/8.2
05/13/04	18.03	8.21	21.58	0.40	7.6/7.2
05/18/04	18.01	8.26	23.05	0.75	7.2/8.0
05/27/04	18.14	8.04	24.30	0.65	5.8/5.5
06/02/04	18.03	8.22	23.56	na	6.7/6.7
06/10/04	17.26	8.19	24.51	0.41	6.5/6.4
06/17/04	18.88	8.06	24.54	0.70	5.1/4.6

06/24/04	19.41	8.12	26.07	0.57	5.8/5.8
06/30/04	18.20	8.29	25.13	0.90	7.0/7.2
07/07/04	18.25	8.36	28.97	0.90	8.7/8.4
07/13/04	18.87	8.10	28.25	0.78	6.0/6.0
07/21/04	19.76	8.36	29.13	0.70	7.2/7.3
07/28/04	19.84	8.07	26.95	0.80	5.8/6.0
08/03/04	18.98	8.09	27.12	0.45	6.0/6.2
08/10/04	17.47	8.19	28.39	0.60	6.8/6.8
08/18/04	17.60	8.00	25.23	0.90	7.2/6.6
08/23/04	18.04	8.20	25.80	0.90	8.0/8.0
08/31/04	18.59	8.15	26.58	0.80	3.2/3.2
09/07/04	17.54	7.87	24.65	0.64	6.0/5.8
09/14/04	15.47	8.27	25.19	1.10	7.6/7.6
09/22/04	15.29	8.13	23.43	0.90	9.4/9.5
09/28/04	16.46	8.07	23.23	0.90	5.5/6.0
10/04/04	16.47	8.11	22.00	1.20	6.7/7.7
10/19/04	19.09	8.02	17.27	0.70	6.7/6.9
10/28/04	16.78	8.37	15.49	1.50	9.4/9.6
11/03/04	17.37	8.09	18.37	1.10	6.9/8.7
11/11/04	17.01	8.29	12.59	1.30	11.0/11.0
11/16/04	16.70	8.27	11.48	1.30	11.2/10.8
11/30/04	18.13	8.19	11.41	1.30	10.2/10.8
12/16/04	17.19	7.90	8.09	1.10	10.5/10.5
01/05/05	16.68	8.27	8.88	0.80	12.6/12.2

Sweethall Landing:

Date	Salinity ppt	pH	Water Temp C	Secchi m	DO mg/L
01/07/04	0.100	7.027	7.20	0.40	9.5
01/21/04	0.100	7.005	3.10	0.30	9.8/9.8
02/04/04	0.400	7.103	3.00	0.50	10.0
02/16/04	0.100	6.642	4.80	0.30	11.3/11.6
03/04/04	0.200	7.012	10.80	0.50	11.0
03/17/04	0.200	7.264	10.20	0.40	10.3/10.5
03/30/04	0.120	7.660	11.70	0.60	10.2/10.0
04/12/04	0.140	7.260	11.59	0.30	9.0/9.2
04/27/04	0.000	na	20.50	0.60	9.0/9.6
05/11/04	0.100	na	22.70	0.40	7.6/7.7
05/25/04	0.090	7.460	28.73	0.40	6.4/6.6
06/08/04	0.570	6.960	27.63	0.30	5.8/5.8
06/22/04	0.170	7.340	28.06	0.25	6.4/6.4
07/08/04	0.400	na	28.90	0.30	5.2/5.2
07/19/04	0.340	7.230	28.76	0.45	5.1/5.2
08/04/03	0.100	7.180	28.50	0.60	5.0/5.0
08/17/03	0.040	7.340	26.20	0.55	6.0/6.0
09/01/04	0.030	6.630	26.18	0.13	4.4/4.2
09/15/04	0.000	7.350	24.80	0.35	4.8/4.9
09/30/04	0.050	6.730	22.49	0.45	5.2/5.2
10/13/04	0.100	7.160	19.40	0.40	7.1/6.7
10/27/04	0.710	7.100	15.55	0.40	6.8/6.4
11/10/04	0.270	7.530	14.80	0.25	8.8/8.8
11/29/04	0.004	7.030	11.38	0.35	9.4/9.2

12/14/04	0.000	na	9.80	0.50	9.7/9.6
01/04/05	0.050	7.500	6.76	0.25	11.4/11.6

Taskinas Creek:

Date	Salinity ppt	pH	Water Temp C	Secchi m	DO mg/L
01/07/04	4.10	7.334	6.30	0.30	7.6/7.8
01/21/04	3.40	7.519	0.60	0.40	8.6
02/05/04	10.20	7.416	2.10	0.50	7.7/8.0
02/17/04	1.30	7.503	2.30	0.40	11.2/11.1
03/04/04	8.20	7.634	13.10	0.40	9.3/9.1
03/15/04	4.30	7.469	12.70	0.40	6.8/6.9
03/30/04	5.05	7.450	10.70	0.40	6.4/6.2
04/12/04	7.66	7.600	10.73	0.20	9.0/9.4
04/27/04	0.30	na	18.50	0.25	5.2/5.0
05/04/04	8.30	7.640	14.40	0.15	8.4/8.1
05/10/04	2.90	7.630	23.80	0.35	5.4/5.2
05/19/04	10.64	7.220	24.96	0.20	5.0/5.0
05/25/04	7.21	7.390	27.24	0.40	4.0/4.0
06/03/04	15.08	7.150	23.75	0.25	5.0/5.1
06/08/04	6.54	7.170	24.08	0.30	5.0/4.9
06/15/04	8.60	7.460	26.91	0.40	5.0/5.2
06/22/04	10.44	7.390	26.71	0.20	5.1/5.2
06/28/04	3.31	7.320	26.75	0.25	5.6/5.7
07/08/04	2.30	7.270	26.50	0.30	2.2/2.2
07/14/04	12.39	7.270	29.37	0.20	4.3/4.4
07/19/04	11.80	7.340	27.61	0.30	5.7/5.6
07/27/04	4.06	7.220	27.21	0.30	4.71
08/04/04	9.00	7.670	29.10	0.20	5.4/5.4
08/11/04	3.32	8.060	28.18	0.25	8.0/8.2
08/17/04	7.48	7.370	24.43	0.20	5.6/5.5
08/25/04	5.03	7.370	25.37	0.30	5.0/5.0
09/01/04	4.68	7.370	26.23	0.17	6.2/6.4
09/09/04	0.47	7.260	25.03	1.35	3.4/3.5
09/15/04	5.40	7.700	24.10	0.30	6.3/6.3
09/22/04	3.68	7.100	19.47	0.30	5.2/5.2
09/30/04	8.31	7.300	22.41	0.25	6.4/6.4
10/06/04	3.40	7.890	18.20	0.32	5.8/6.0
10/13/04	10.59	7.330	17.98	0.35	5.7/6.1
10/19/04	11.02	7.500	16.95	0.25	7.0/7.0
10/27/04	12.90	7.270	14.76	0.32	6.1/6.2
11/15/04	9.92	7.400	9.17	0.21	9.4/9.4
11/29/04	7.56	7.570	10.17	0.15	10.3/10.7
12/14/04	7.80	na	6.70	0.15	9.8/9.7
01/04/05	3.16	7.420	10.26	0.35	8.6/8.7

15. Other remarks

On 08/12/2020 this dataset was updated to include embedded QAQC flags for anomalous/suspect data. System-wide monitoring data beginning in 2007 were processed to allow for QAQC flags and codes to be embedded in the data files rather than detailed in the metadata alone (as in the anomalous/suspect, deleted, and missing data sections above).

Prior to 2006, rejected data were deleted from the dataset so they are unavailable to be used at all, but suspect data were only noted in the metadata document. Suspect data flags <1> were embedded retroactively in order to allow suspect data to be easily identified and filtered from the dataset if desired for analysis and reporting purposes. No other flags or codes were embedded in the dataset and users should still refer to the detailed explanations above for more information.

a) Negative depth values can be due to extremely low water conditions, low-pressure systems, or probes being out of the water. In the event where probes were clearly out of the water, as verified by specific conductance values, data were deleted. When specific conductance values did not indicate probe exposure, negative depth values were retained and data was marked as suspect. Significant negative depth values were observed at Sweet Hall Marsh during the months of January through March; data reflects tidal patterns and were retained.

b) Any time a reference is made to turbidity data being negative and/or zero, it was recorded as a negative in the raw data file and a zero in the edited data file due to the formatting of Excel. The technician edited none of these data points by hand nor did he/she delete any of them.

c) Latitudes and longitudes of the fixed monitoring stations reflect re-surveying of the sites conducted in 2004 using Trimble Real Time Kinenmatic (RTK) survey equipment.

d) Please note: Time skips can occur due to low batteries, water leakage into the battery compartment, and for no apparent reason.