North Carolina (NOC) National Estuarine Research Reserve Water Quality Metadata
January - December 2005
Last Update: August 13, 2020

I. Data Set & 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). 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. 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 CDMO. Paula Murray and Heather Wells, Research Associates, were responsible for data management during 2005.

3) Research Objectives:

Four long-term water quality monitoring stations have been established within the estuaries bordering Masonboro and Zeke's Islands of North Carolina's National Estuarine Research Reserve. Instruments are anchored to the bottom of the selected sites and measurements are taken at 30-minute intervals for approximately two to four week periods continuously throughout the year. Parameters measured include Depth, Temperature, Salinity, Specific Conductivity, pH, Dissolved Oxygen, and Turbidity. The goal is to assess short-term variability and long-term changes (i.e., localized impacts of seasonal storm events, inter-annual differences from rainfall, magnitude of climatic influence from El Nino/La Nina events, etc.) in estuarine water parameters within relatively pristine sites.

4) Research Methods:

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

Two data loggers are assigned to each of the four permanent monitoring stations and are generally not interchanged among sites. Before each YSI 6600/6600EDS is deployed, calibration and maintenance is performed following the manufacturer's instructions (YSI Manual addendum 7/94, sections 3, 4, and 7). Calibration standards are required for pH, turbidity and salinity; all other parameter calibrations are performed as described in the manual. Buffer solutions for a two-point pH calibration (pH 7 and 10) are purchased pre-made from a scientific supply house. The conductivity and turbidity standards are obtained from YSI. The dissolved oxygen membranes are replaced and allowed to settle at least 24 hrs prior to deployment.

Data sondes are wrapped in a wet, white towel and placed in a bucket or cooler for transport to the site. Monitoring stations are accessed using a small boat equipped with an outboard motor. During deployment the weather conditions and tide stage are recorded in the field observation log. The water quality instrument is placed inside a locked steel cage and anchored horizontally approximately 15cm off the bottom. Every 30 minutes during the sampling period measurements are taken for Temperature, Specific Conductance, Salinity, Dissolved oxygen saturation, Dissolved oxygen concentration, Depth, pH, and Turbidity. All data are recorded in Eastern Standard Time.

At the end of the sample period the water quality instrument is exchanged with a freshly calibrated instrument and transported back to the laboratory wrapped in a wet, white towel. The weather and water quality measurements are again noted in the field observation log. The calibration drift and the effect of biofouling on the water quality instrument are checked by comparing data readings in calibration standards. The water quality data are then uploaded, and the instrument is cleaned and calibrated as noted previously.

5) Site Location and Character:

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

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

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

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

D. Zeke's Basin, Zeke's Island

The second Zeke's Island site (added in 2002) is located 0.8 km south east of the Federal Point boat launch in a tidal basin estuary at 33° 57'17.0" latitude and 77° 56'6.0" longitude. This site receives minimal freshwater input from leakage of the Cape Fear River through the 5.6 km rock jetty that separates the two bodies of water The site has a characteristic salinity range of 12-30 ppt, but values below 10 ppt have been observed and are often associated with periods of heavy rainfall. Tidal range averages 1.2 meters. Depth varies, but typically it can be found to range from 0.1 to 1.8 meters. Bottom type substratum consists of sand and detritus based sediment with a layer of soft sulfuric mud. There are no pollutants from land. Marsh and dunes surround the site. It is not accessible to road traffic but experiences minimal boat traffic.

6) Data Collection Period:

Research Creek data collection began on 2 March 1992 while monitoring of Loosin Creek started on 26 February 2002. East Cribbing data collection commenced on 19 May 1994 and Zeke's Basin data collection began on 1 March 2002. All monitoring is considered long term.

YSI 6600 EDS models were utilized for all deployments. Each sonde is equipped with a non-vented depth probe and identical sensor models.

Deployment and Retrieval Dates for 2005

| Deployment Date and Time | Retrieval Date and Time |
|---|---|
| Research Creek, Masonboro Island: | |
| 12/06/04, 10:00 | 01/06/05, 11:00 |
| 01/06/05, 11:30 | 02/08/05, 13:00 |
| 02/08/05, 13:30 | 03/10/05, 09:00 |
| 03/10/05, 09:30 | 03/31/05, 10:30 |
| 03/31/05, 11:00 | 04/21/05, 14:00 |
| 04/21/05, 14:30 | 05/20/05, 10:00 |
| 05/20/05, 10:30 | 06/15/05, 08:30 |
| 06/15/05, 09:00 | 07/05/05, 13:30 |
| 07/05/05, 14:00 | 07/22/05, 09:30 |
| 07/22/05, 10:00 | 08/04/05, 13:30 |
| 08/04/05, 14:00 | 08/18/05, 11:30 |
| 08/18/05, 12:00 | 09/19/05, 12:30 |
| 09/19/05, 13:00 | 10/17/05, 13:00 |
| 10/17/05, 13:30 | 11/14/05, 12:00 |
| 11/14/05, 12:30 | 12/19/05, 11:00 |
| 12/19/05, 12:00 | 01/12/06, 12:00 |
| Loosin Creek, Masonboro Island: | |
| 12/06/04, 09:30 | 01/06/05, 10:00 |
| 01/06/05, 10:30 | 02/08/05, 12:00 |

| | |
|---|---|
| 02/08/05, 13:00 | 03/10/05, 08:30 |
| 03/10/05, 09:00 | 03/31/05, 10:00 |
| 03/31/05, 10:30 | 04/21/05, 13:30 |
| 04/21/05, 14:00 | 05/20/05, 09:30 |
| 05/20/05, 10:00 | 06/07/05, 13:30 |
| 06/24/05, 09:00 | 07/01/05, 09:30 |
| 07/05/05, 14:00 | 07/19/05, 11:00 |
| 07/19/05, 11:30 | 08/04/05, 13:00 |
| 08/04/05, 13:30 | 08/18/05, 11:00 |
| 08/18/05, 11:30 | 09/19/05, 13:00 |
| 09/19/05, 13:30 | 10/17/05, 12:00 |
| 10/17/05, 13:00 | 11/14/05, 11:30 |
| 11/14/05, 12:00 | 12/19/05, 10:30 |
| 12/19/05, 11:30 | 01/12/06, 13:00 |

East Cribbings, Zeke's Island:

| | |
|---|---|
| 12/06/04, 17:00 | 01/07/05, 09:00 |
| 01/07/05, 09:30 | 02/09/05, 10:30 |
| 02/09/05, 11:00 | 03/11/05, 10:30 |
| 03/11/05, 11:00 | 03/31/05, 13:30 |
| 03/31/05, 14:30 | 04/20/05, 08:00 |
| 04/20/05, 08:30 | 05/20/05, 03:30 |
| 05/20/05, 08:00 | 06/14/05, 13:30 |
| 06/14/05, 14:00 | 06/30/05, 15:00 |
| 06/30/05, 16:00 | 07/19/05, 09:00 |
| 07/19/05, 09:30 | 08/04/05, 09:00 |
| 08/04/05, 10:00 | 08/17/05, 07:00 |
| 08/17/05, 07:30 | 09/19/05, 10:00 |
| 09/19/05, 10:30 | 10/17/05, 09:30 |
| 10/17/05, 10:00 | 11/14/05, 09:00 |
| 11/14/05, 9:30 | 12/20/05, 12:30 |
| 12/20/05, 13:00 | 01/12/06, 09:00 |

Zeke's Basin, Zeke's Island:

| | |
|---|---|
| 12/06/04, 17:30 | 01/07/05, 09:30 |
| 01/07/05, 10:30 | 02/09/05, 11:00 |
| 02/09/05, 11:30 | 03/11/05, 10:00 |
| 03/11/05, 10:30 | 03/31/05, 14:30 |
| 03/31/05, 15:00 | 04/20/05, 08:30 |
| 04/20/05, 09:00 | 05/20/05, 07:00 |
| 05/20/05, 07:30 | 06/14/05, 14:00 |
| 06/14/05, 14:30 | 06/30/05, 15:30 |
| 06/30/05, 16:00 | 07/19/05, 08:30 |
| 07/19/05, 09:00 | 08/04/05, 09:30 |
| 08/04/05, 10:00 | 08/17/05, 07:00 |
| 08/17/05, 07:30 | 09/19/05, 10:30 |

| | |
|---|---|
| 09/19/05, 11:00 | 10/17/05, 10:00 |
| 10/17/05, 10:30 | 11/14/05, 09:30 |
| 11/14/05, 10:00 | 12/20/05, 13:00 |
| 12/20/05, 13:30 | 01/12/06, 10:00 |

7) Distribution:

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

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

8) Associated Researchers and Projects:

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

II. Physical Structure Descriptors

9) Sensor specifications:

YSI 6600/6600 EDS 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; 20-50 mg/L, +/- 6 % of the reading
Resolution: 0.0001 ft (0.001 m)

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

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

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

Dissolved Oxygen Qualifier: 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.

Depth Qualifier: 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 appear 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. Readings for both vented and non-vented are automatically compensated for water density changes due to variations in temperature and salinity. The Research Coordinator at the specific NERR site should be contacted in order to obtain information regarding atmospheric pressure data availability.

10) Coded variable definitions:

Sampling station: Sampling site code: Station code:

| | | |
|---|---|---|
| Research Creek | RC | nocrcwq |
| Loosin Creek | LC | noclcwq |
| East Cribbings | EC | nocecwq |
| Zeke's Basin | ZB | noczbwq |

11) Anomalous/Suspect Data:

This section lists and explains all anomalous (suspect) data that still remains in the data set. The data are generally extreme for the aquatic system being monitored. The cause of such anomalies may be a bad calibration, fouling of the sensors, boat traffic disturbances, malfunction of the instrument, or the measurements may be correct.

Research Creek

The post deployment calibration value for Sp.Cond. was low (43.3 mS/cm) for 10 March through 31 March most likely due to sediment observed inside the probe. Specific conductivity and salinity data for this deployment were retained.

Turbidity data were erratic from 8 June until the end of the deployment on 15 June at 08:30 most likely due to the presence of large amounts of algae. Data were retained but should be considered suspect.

All data collected during the deployment from 15 June through 5 July should be considered suspect due to a leaking battery hatch shortly after deployment of the instrument.

Time stamps were off by 4 to 16 seconds for the 22 July through 4 August deployment because the DO warm-up had been mistakenly set for 44 seconds instead of 60 seconds. Time stamps were corrected to reflect half hour sampling increments.

The post deployment calibration value for pH was high (7.59) for 14 November through 19 December. Values for pH also seemed high during the deployment perhaps a result of calibration error, probe error or true readings. The probe used during this deployment was a new flat glass probe (see comments in section 15). Data were retained but should be considered suspect.

In general, large positive Turbidity spikes (>150 NTU, but < 1000) occurring for unknown reasons were retained. The high value may reflect the turbid conditions that occur during heavy rainfall and high wind events, when the probe is covered by sediment, or if a fish gets caught in the probe guard cup. In addition, slightly negative Turbidity values that were within range of the probe were also retained.

Dips in Sp. Cond. and Salinity data that were generally due to fouling drift between deployments or periods of heavy rainfall were retained.

Loosin Creek

A crack was found in the pH probe for the deployment from 31 March through 21 April. Partial data during the deployment from 10:30 on 31 March until 11:00 on 6 April were retained but should be considered suspect.

There was an unusual dip in Sp. Cond./Salinity on 12 April at 7:00 for an unknown reason. The value was retained but should be considered suspect.

The post deployment calibration values for pH were high (7.4 or higher) for the following deployments. The probe used during these deployments was a new flat glass probe (see comments in section 15). Data were retained but should be considered suspect.
4/19/2005 – 5/20/2005
6/24/2005 – 7/01/2005
7/19/2005 – 8/04/2005

Time stamps were off by one minute for the 24 June through 1 July deployment due to a programming error. Time stamps were corrected to reflect half hour sampling increments.

Turbidity values were erratic midway through the end of the deployment dated 18 August through 19 September for unknown reasons.

Several negative or zero Depth values were not rejected as they corresponded to Specific Conductivity data indicating that the sonde was still in the water. These instances were recorded on:
3/08/05 12:30 – 14:30
4/24/05 13:30 – 14:00
10/10/05 19:30 – 20:30
10/11/05 6:00
12/06/05 5:30

In general, large positive Turbidity spikes (>150 NTU, but < 1000) occurring for unknown reasons were retained. The high value may reflect the turbid conditions that occur during heavy rainfall and high wind events, when the probe is covered by sediment, or if a fish gets caught in the probe guard cup. In addition, slightly negative Turbidity values that were within range of the probe were also retained.

Dips in Sp. Cond. and Salinity data that were generally due to fouling drift between deployments or periods of heavy rainfall were retained.

East Cribbings

The post deployment calibration value for Sp.Cond. was low (44.6 mS/cm) for 20 April through 20 May most likely due to fouling of the probe. Specific conductivity and salinity data for this deployment were retained.

There were unusual dips in Sp. Cond. and Salinity for the following dates and times for unknown reasons. Data were retained but should be considered suspect.
7/8/2005 00:30
7/10/2005 20:00

In general, large positive Turbidity spikes (>150 NTU, but < 1000) occurring for unknown reasons were retained. The high value may reflect the turbid conditions that occur during heavy rainfall and high wind events, when the probe is covered by sediment, or if a fish gets caught in the probe guard cup. In addition, slightly negative Turbidity values that were within range of the probe were also retained.

Dips in Sp. Cond. and Salinity data that were generally due to fouling drift between deployments or periods of heavy rainfall were retained.

Zeke's Basin

DO data from 2/09/05, 11:30 through 3/11/05, 10:00 should be considered suspect due to a puncture in the DO membrane discovered during post deployment calibration. The DO % value was 71.0% in saturated air at the end of deployment recordings, and 96.1% after running for 1 minute during the post deployment calibration. It is unknown when the puncture occurred and the data do not appear abnormal, so the entire deployment dataset was retained but should be considered suspect.

During several instances, the depth sensor recorded negative values while other parameters indicated that the sonde was submerged in the water. One of these instances was due to barometric pressure changes associated with Hurricane Ophelia, on 9/14/05 from 9:00 to 14:30. All data were retained, but should be considered suspect. The other instances were:
2/27/05 19:30
3/06/05 1:00 - 1:30
3/08/05 2:30 - 3:30
3/09/05 4:00 - 4:30
3/10/05 5:00
5/06/05 3:00 - 4:30
11/22/05 10:00 - 10:30
12/24/05 22:00 - 12/31/05 5:00

The pH values were slightly elevated on 4/17/05 from 11:30-14:30 for unknown reasons. Data were retained.

From 9:00 on 4/20/05 through 5/07/05 at 5:00, temperature values seemed lower than usual, possibly due to a malfunctioning probe. Though data were retained, the values should be considered suspect.

At 5:30 and 6:00 on 4/26/05, a dip in temperature was recorded. There was light rain in the area that morning, so data were retained.

On 5/06/05 at 5:00 and 5:30, there were dips in specific conductivity and salinity values. There was heavy rain on that date so data were retained.

For the 8/17/05, 7:30 through 9/19/05, 10:30 deployment, the conductivity post deployment calibration value was unacceptable due to a malfunctioning probe. However, the probe was new and the data collected during the deployment did not seem unusual and were retained. It was originally thought that the connection from the sonde to the probe was compromised causing the misreading during the post deployment calibration check, but, a small leak in the probe was later discovered. Data for the entire deployment should be considered suspect.

During the 10/17/05, 10:30 through 11/14/05, 9:30 deployment, the same conductivity probe from the 8/17/05-9/19/05 deployment was used. The probe calibrated properly and it was assumed that perhaps the earlier malfunction was due to moisture in the probe connection or a loose connection. Though the probe calibrated fine and was deployed, it malfunctioned again during the post deployment calibration. This data set should also be considered suspect.

There were three instances considered suspect due to dips in temperature values for unknown reasons. These data occurred on 11/26/05 at 2:30, 12/03/05 at 7:30, and 12/14/05 at 5:00.

Throughout the data set, there were high peaks for dissolved oxygen values. The cause(s) of these peaks are unknown though it is speculated that low total depth and windy conditions may be factors contributing to super saturated conditions.

In general, large positive Turbidity spikes (>150 NTU, but < 1000) occurring for unknown reasons were retained. The high value may reflect the turbid conditions that occur during heavy rainfall and high wind events, when the probe is covered by sediment, or if a fish gets caught in the probe guard cup. In addition, slightly negative Turbidity values that were within range of the probe were also retained.

Dips in Sp. Cond. and Salinity data that were generally due to fouling drift between deployments or periods of heavy rainfall were retained.

12) Deleted Data:

Research Creek

Data for all parameters were deleted for the following dates and times due to the exposure of the sonde at extremely low tides:
3/11/05 02:30 – 03:00
7/17/05 22:00 – 23:30

7/18/05 00:00 – 00:30; 08:00 – 13:00; 22:00 – 23:30
7/19/05 00:00 – 2:00; 09:00 – 11:30

All parameters were deleted for 11 April at 16:00 because the sonde was out of water during Isco deployment.

Turbidity data for the following dates and times were deleted as they were out of sensor range:

| | | | |
|---|---|---|---|
| 01/23/2005 | 06:00:00 | - | 14:30:00 |
| 04/26/2005 | 05:00:00 | - | 23:30:00 |
| 04/27/2005 | 00:00:00 | - | 17:30:00 |
| 05/03/2005 | 03:00:00 | - | 23:30:00 |
| 05/04/2005 | 00:00:00 | - | 12:00:00 |
| 05/09/2005 | 10:30:00 | | |
| 05/19/2005 | 21:30:00 | | |
| 06/08/2005 | 06:30:00 | | |
| 06/08/2005 | 11:00:00 | | |
| 06/08/2005 | 12:00:00 | | |
| 06/08/2005 | 13:30:00 | | |
| 06/08/2005 | 15:00:00 | | |
| 06/08/2005 | 19:00:00 | | |
| 06/08/2005 | 20:30:00 | | |
| 06/09/2005 | 07:30:00 | | |
| 06/09/2005 | 11:30:00 | | |
| 06/09/2005 | 12:00:00 | | |
| 06/09/2005 | 13:30:00 | - | 14:30:00 |
| 06/09/2005 | 15:30:00 | | |
| 06/09/2005 | 16:00:00 | | |
| 06/09/2005 | 18:00:00 | | |
| 06/09/2005 | 18:30:00 | | |
| 06/10/2005 | 14:30:00 | | |
| 06/10/2005 | 15:00:00 | | |
| 06/10/2005 | 16:00:00 | - | 17:00:00 |
| 06/10/2005 | 19:00:00 | | |
| 06/11/2005 | 01:00:00 | | |
| 06/11/2005 | 03:30:00 | | |
| 06/12/2005 | 07:00:00 | | |
| 06/12/2005 | 18:30:00 | | |
| 06/12/2005 | 20:00:00 | | |
| 06/13/2005 | 03:00:00 | | |
| 06/13/2005 | 03:30:00 | | |
| 06/13/2005 | 07:30:00 | | |
| 06/13/2005 | 09:30:00 | | |
| 06/14/2005 | 05:00:00 | | |
| 06/14/2005 | 11:00:00 | | |
| 06/14/2005 | 14:00:00 | - | 15:00:00 |
| 06/14/2005 | 19:00:00 | | |
| 06/14/2005 | 19:30:00 | | |
| 06/14/2005 | 21:30:00 | | |
| 06/15/2005 | 13:00:00 | - | 15:30:00 |

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| 06/15/2005 | 22:00:00 | - | 23:30:00 |
| 06/16/2005 | 01:00:00 | - | 04:00:00 |
| 06/16/2005 | 13:30:00 | - | 19:00:00 |
| 06/16/2005 | 22:30:00 | | |
| 06/16/2005 | 23:00:00 | | |
| 06/17/2005 | 00:00:00 | - | 07:30:00 |
| 06/17/2005 | 11:30:00 | | |
| 06/17/2005 | 12:00:00 | | |
| 06/17/2005 | 13:30:00 | - | 21:30:00 |
| 06/18/2005 | 00:00:00 | - | 23:30:00 |
| 06/19/2005 | 00:00:00 | - | 23:30:00 |
| 06/20/2005 | 00:00:00 | - | 23:30:00 |
| 06/21/2005 | 00:00:00 | - | 22:30:00 |
| 06/22/2005 | 05:30:00 | | |
| 06/22/2005 | 06:30:00 | | |
| 06/22/2005 | 07:30:00 | | |
| 06/22/2005 | 08:00:00 | - | 09:00:00 |
| 06/22/2005 | 18:30:00 | | |
| 06/22/2005 | 19:30:00 | | |
| 06/22/2005 | 20:00:00 | - | 22:30:00 |
| 06/23/2005 | 07:30:00 | - | 10:00:00 |
| 06/23/2005 | 17:30:00 | | |
| 06/23/2005 | 19:30:00 | - | 23:30:00 |
| 06/24/2005 | 00:00:00 | | |
| 06/24/2005 | 06:00:00 | | |
| 06/24/2005 | 07:00:00 | - | 11:30:00 |
| 06/24/2005 | 17:30:00 | - | 18:30:00 |
| 06/24/2005 | 20:30:00 | - | 23:30:00 |
| 06/25/2005 | 00:00:00 | | -01:00:00 |
| 06/25/2005 | 07:00:00 | | -13:00:00 |
| 06/25/2005 | 17:30:00 | | |
| 06/25/2005 | 18:00:00 | | |
| 06/25/2005 | 19:00:00 | - | 23:30:00 |
| 06/26/2005 | 00:30:00 | - | 01:30:00 |
| 06/26/2005 | 06:30:00 | - | 11:30:00 |
| 06/26/2005 | 13:00:00 | | |
| 06/26/2005 | 20:00:00 | | |
| 06/26/2005 | 20:30:00 | | |
| 06/26/2005 | 23:00:00 | | |
| 06/27/2005 | 00:00:00 | - | 02:30:00 |
| 06/27/2005 | 11:00:00 | - | 13:00:00 |
| 06/27/2005 | 14:00:00 | | |
| 06/28/2005 | 23:30:00 | | |
| 06/29/2005 | 01:00:00 | - | 04:00:00 |
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| 06/29/2005 | 21:30:00 | | |
| 06/29/2005 | 22:00:00 | | |
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| 06/30/2005 | 04:00:00 | | |

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| 06/30/2005 | 11:30:00 | - | 13:00:00 |
| 06/30/2005 | 14:00:00 | | |
| 06/30/2005 | 15:30:00 | - | 17:00:00 |
| 06/30/2005 | 22:30:00 | | |
| 07/01/2005 | 01:00:00 | - | 03:00:00 |
| 07/01/2005 | 04:30:00 | | |
| 07/01/2005 | 15:00:00 | | |
| 07/01/2005 | 16:00:00 | - | 17:00:00 |
| 07/02/2005 | 01:30:00 | | |
| 07/02/2005 | 02:30:00 | | |
| 07/02/2005 | 03:00:00 | | |
| 07/02/2005 | 15:30:00 | | |
| 07/02/2005 | 16:00:00 | | |
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| 07/03/2005 | 02:30:00 | | |
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| 07/03/2005 | 16:00:00 | - | 20:00:00 |
| 07/05/2005 | 03:00:00 | - | 10:00:00 |
| 09/01/2005 | 20:00:00 | | |
| 09/14/2005 | 12:00:00 | | |
| 10/18/2005 | 19:30:00 | - | 23:30:00 |
| 10/19/2005 | 00:00:00 | - | 23:30:00 |
| 10/20/2005 | 00:00:00 | - | 23:30:00 |
| 10/21/2005 | 00:00:00 | - | 23:30:00 |
| 10/22/2005 | 00:00:00 | - | 23:30:00 |
| 10/23/2005 | 00:00:00 | - | 23:30:00 |
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| 10/26/2005 | 00:00:00 | - | 06:00:00 |
| 11/04/2005 | 15:00:00 | | |
| 11/09/2005 | 16:00:00 | | |
| 12/21/2005 | 17:00:00 | - | 23:30:00 |
| 12/22/2005 | 00:00:00 | - | 23:30:00 |
| 12/23/2005 | 00:00:00 | - | 23:30:00 |
| 12/24/2005 | 00:00:00 | - | 23:30:00 |
| 12/25/2005 | 00:00:00 | - | 23:30:00 |
| 12/26/2005 | 00:00:00 | - | 23:30:00 |
| 12/27/2005 | 00:00:00 | - | 23:30:00 |
| 12/28/2005 | 00:00:00 | - | 23:30:00 |
| 12/29/2005 | 00:00:00 | - | 23:30:00 |
| 12/30/2005 | 00:00:00 | - | 23:30:00 |
| 12/31/2005 | 00:00:00 | - | 23:30:00 |

Data for all parameters were deleted for the following dates and times due to the exposure of the sonde at extremely low tides:
3/8/2005 14:00
3/22/2005 11:00

Due to a cracked probe, pH data from 11:30 on 6 April through 13:30 on 21 April were deleted.

The value for pH on 28 May at 6:00 was reported as 0 for an unknown reason. The value was deleted.

Data for all parameters were deleted from 17:30 on 28 May through 13:30 on 7 June and from 6:30 on 11 October through 12:00 on 17 October due to vandalism. The sonde was relocated close to the shoreline and exposed out of water for extended periods of time.

Data for all parameters were deleted at 19:00 on 28 June due to either exposure of the sonde at extremely low tide or the sonde being picked up out of the water by a curious citizen during the sampling period.

Turbidity data for the following dates and times were deleted as they were out of sensor range:

| | | | |
|---|---|---|---|
| 03/17/2005 | 00:30:00 | | |
| 07/18/2005 | 23:30:00 | | |
| 07/19/2005 | 00:00:00 | - | 02:30:00 |
| 07/19/2005 | 06:30:00 | | |
| 07/19/2005 | 08:30:00 | | |
| 07/19/2005 | 11:00:00 | | |
| 08/27/2005 | 21:30:00 | | |
| 08/28/2005 | 00:00:00 | | |
| 08/28/2005 | 02:30:00 | | |
| 08/28/2005 | 04:00:00 | | |
| 08/28/2005 | 06:30:00 | | |
| 08/28/2005 | 09:00:00 | | |
| 08/28/2005 | 11:30:00 | | |
| 08/28/2005 | 13:30:00 | | |
| 08/28/2005 | 16:00:00 | | |
| 08/28/2005 | 18:30:00 | | |
| 08/28/2005 | 21:00:00 | | |
| 08/28/2005 | 23:30:00 | | |
| 08/29/2005 | 01:30:00 | | |
| 09/02/2005 | 21:00:00 | | |
| 09/03/2005 | 12:00:00 | | |
| 09/03/2005 | 13:30:00 | | |
| 09/03/2005 | 15:00:00 | | |
| 09/03/2005 | 15:30:00 | | |
| 09/03/2005 | 16:30:00 | | |
| 09/03/2005 | 17:00:00 | | |
| 09/03/2005 | 18:00:00 | | |
| 09/03/2005 | 18:30:00 | | |

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09/04/2005 12:00:00
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| 09/19/2005 | 13:00:00 |
| 11/17/2005 | 00:30:00 |

East Cribbings

Dissolved Oxygen data (% and mg/L) were removed from 17:30 to 22:00 on 5 June due to a DO probe failure.

All data were removed for the following dates and times due to a crack in the turbidity probe that affected all parameters:

6/5/2005 22:30 – 6/14/2005 13:30
7/3/2005 16:00 – 7/6/2005 19:30

Turbidity data were removed from 16:00 on 30 June through 9:00 on 19 July due to a crack in the turbidity probe.

Dissolved Oxygen data (% and mg/L) for the following dates and times were irregular. These data were most likely affected by a cracked Turbidity probe and were deleted.
6/30/2005 16:00
7/6/2005 20:00 – 7/8/2005 21:00
7/17/2005 00:30 – 7/19/2005 09:00

The values for Sp. Cond./Salinity for 16:30 on 13 July were deleted. The data were very low suggesting the instrument was out of the water, however, all the other parameters indicated that the sonde was in the water.

Due to a broken probe bulb, pH data from 20 December, 13:00 through 31 December, 23:30 were deleted.

Turbidity data for the following dates and times were deleted as they were out of sensor range:

| | | | |
|---|---|---|---|
| 01/23/2005 | 12:00 | | |
| 01/31/2005 | 17:30 | | |
| 06/05/2005 | 03:30 | - | 04:30 |
| 06/05/2005 | 06:00 | | |
| 06/05/2005 | 06:30 | | |
| 06/05/2005 | 20:00 | - | 21:00 |
| 07/30/2005 | 11:00 | | |
| 07/30/2005 | 19:30 | | |
| 07/30/2005 | 20:30 | | |
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| 07/31/2005 | 08:30 | | |
| 07/31/2005 | 10:30 | - | 11:30 |
| 07/31/2005 | 13:30 | - | 14:30 |
| 07/31/2005 | 16:30 | | |
| 07/31/2005 | 17:00 | | |
| 07/31/2005 | 18:00 | | |
| 07/31/2005 | 20:00 | | |
| 07/31/2005 | 20:30 | | |
| 07/31/2005 | 21:30 | | |
| 07/31/2005 | 23:30 | | |
| 08/01/2005 | 00:00 | - | 01:00 |
| 08/01/2005 | 03:00 | - | 04:00 |

| | | | |
|---|---|---|---|
| 08/01/2005 | 07:00 | - | 09:00 |
| 08/01/2005 | 11:00 | - | 13:00 |
| 08/01/2005 | 14:30 | | |
| 08/01/2005 | 15:00 | | |
| 08/01/2005 | 16:00 | | |
| 08/01/2005 | 16:30 | | |
| 08/01/2005 | 19:00 | - | 21:00 |
| 08/12/2005 | 19:00 | | |
| 08/13/2005 | 02:00 | | |
| 08/13/2005 | 04:00 | | |
| 08/13/2005 | 08:00 | | |
| 08/15/2005 | 23:30 | | |
| 08/16/2005 | 14:30 | | |
| 08/16/2005 | 15:00 | | |
| 08/16/2005 | 20:00 | | |
| 08/16/2005 | 21:00 | | |
| 08/17/2005 | 00:30 | | |
| 08/17/2005 | 02:00 | | |
| 08/29/2005 | 23:00 | | |
| 08/30/2005 | 18:00 | | |
| 08/30/2005 | 19:30 | | |
| 08/30/2005 | 20:00 | | |
| 08/30/2005 | 22:00 | | |
| 08/31/2005 | 00:30 | - | 01:30 |
| 08/31/2005 | 02:30 | | |
| 08/31/2005 | 03:00 | | |
| 08/31/2005 | 04:00 | | |
| 08/31/2005 | 05:00 | | |
| 08/31/2005 | 05:30 | | |
| 08/31/2005 | 06:30 | | |
| 08/31/2005 | 07:30 | | |
| 08/31/2005 | 08:00 | | |
| 08/31/2005 | 10:00 | | |
| 08/31/2005 | 10:30 | | |
| 08/31/2005 | 11:30 | | |
| 08/31/2005 | 12:00 | | |
| 08/31/2005 | 13:00 | | |
| 08/31/2005 | 14:00 | | |
| 08/31/2005 | 15:30 | | |
| 08/31/2005 | 16:00 | | |
| 08/31/2005 | 18:00 | | |
| 08/31/2005 | 20:00 | | |
| 08/31/2005 | 22:00 | | |
| 09/01/2005 | 00:00 | | |
| 09/01/2005 | 01:00 | | |
| 09/01/2005 | 02:00 | | |
| 09/01/2005 | 02:30 | | |
| 09/01/2005 | 05:30 | | |
| 09/01/2005 | 07:30 | | |
| 09/01/2005 | 08:00 | | |

| | | | |
|---|---|---|---|
| 09/01/2005 | 09:00 | | |
| 09/01/2005 | 11:00 | | |
| 09/01/2005 | 16:00 | | |
| 09/02/2005 | 02:30 | | |
| 09/02/2005 | 04:00 | | |
| 09/02/2005 | 06:00 | | |
| 09/02/2005 | 12:00 | | |
| 09/02/2005 | 19:00 | | |
| 09/02/2005 | 21:30 | | |
| 09/03/2005 | 00:00 | | |
| 09/03/2005 | 02:30 | | |
| 09/03/2005 | 04:30 | | |
| 09/03/2005 | 06:30 | | |
| 09/03/2005 | 07:30 | | |
| 09/03/2005 | 16:30 | | |
| 09/03/2005 | 18:30 | | |
| 09/03/2005 | 21:00 | | |
| 09/03/2005 | 21:30 | | |
| 09/03/2005 | 23:00 | | |
| 09/04/2005 | 00:00 | | |
| 09/04/2005 | 00:30 | | |
| 09/04/2005 | 02:30 | | |
| 09/04/2005 | 03:00 | | |
| 09/04/2005 | 05:00 | | |
| 09/04/2005 | 05:30 | | |
| 09/04/2005 | 07:30 | | |
| 09/04/2005 | 08:00 | | |
| 09/04/2005 | 09:30 | | |
| 09/04/2005 | 10:30 | | |
| 09/04/2005 | 11:30 | | |
| 09/04/2005 | 12:30 | | |
| 09/04/2005 | 13:00 | | |
| 09/04/2005 | 14:30 | | |
| 09/04/2005 | 17:00 | | |
| 09/04/2005 | 18:00 | | |
| 09/05/2005 | 06:30 | - | 07:30 |
| 09/05/2005 | 09:00 | - | 11:00 |
| 09/05/2005 | 12:00 | | |
| 09/05/2005 | 13:00 | | |
| 09/05/2005 | 14:00 | | |
| 09/05/2005 | 14:30 | | |
| 09/05/2005 | 16:00 | | |
| 09/05/2005 | 17:00 | | |
| 09/05/2005 | 20:30 | | |
| 09/05/2005 | 22:30 | | |
| 09/05/2005 | 23:30 | | |
| 09/06/2005 | 00:00 | | |
| 09/06/2005 | 00:30 | | |
| 09/06/2005 | 03:00 | | |
| 09/06/2005 | 04:30 | | |

| | |
|---|---|
| 09/06/2005 | 05:30 |
| 09/06/2005 | 06:30 |
| 09/06/2005 | 07:30 |
| 09/06/2005 | 15:00 |
| 09/06/2005 | 15:30 |
| 09/06/2005 | 17:00 |
| 09/06/2005 | 17:30 |
| 09/06/2005 | 20:00 |
| 09/06/2005 | 21:30 |
| 09/06/2005 | 22:00 |
| 09/06/2005 | 23:30 |
| 09/07/2005 | 01:30 |
| 09/07/2005 | 02:30 |
| 09/07/2005 | 04:30 |
| 09/07/2005 | 06:00 |
| 09/07/2005 | 07:00 |
| 09/17/2005 | 19:30 |
| 09/19/2005 | 06:30 |
| 09/19/2005 | 18:30 |
| 10/25/2005 | 08:00 |
| 11/12/2005 | 22:00 |
| 11/17/2005 | 13:30 |
| 11/17/2005 | 14:00 |

Zeke's Basin

On 1/14/05 at 21:30 the pH value dropped to zero for unknown reasons. There is a possibility that the probe was out of water however, all other parameters suggested the sonde was in the water. The value was deleted.

On 3/06/05, pH data at 1:00 and 1:30 were deleted due to abnormally low pH readings believed to be a result of the pH probe being out of water. Although Spec. Cond. data indicated the sonde was submerged, there was a negative value for depth. The sonde was most likely partially exposed during a low tide event.

All parameter data were deleted due to unusually low temperature values for the following dates and times:
4/25/05 11:30
4/27/05 13:30, 14:00
The low values were possibly due to probe malfunction.

During several deployments, the temperature probe malfunctioned, resulting in the deletion of all parameters for the following data sets:
5/07/05, 5:00 – 5/20/05, 7:00
6/14/05, 14:30 – 6/30/05, 15:30
7/19/05, 9:30 – 8/04/05, 9:00

Data for all parameters were deleted for the 7/01/05, 0:30 through 7/19/05, 8:30 due to the repeated exposure of the sonde at extremely low tides.

Turbidity data for the following dates and times were deleted as they were out of sensor range:

| | | | |
|---|---|---|---|
| 01/14/2005 | 21:00:00 | | |
| 01/24/2005 | 22:30:00 | | |
| 04/23/2005 | 17:00:00 | | |
| 05/23/2005 | 03:30:00 | | |
| 05/23/2005 | 15:00:00 | | |
| 05/23/2005 | 15:30:00 | | |
| 05/23/2005 | 18:00:00 | | |
| 05/26/2005 | 16:30:00 | | |
| 05/26/2005 | 17:30:00 | | |
| 05/26/2005 | 22:30:00 | | |
| 05/26/2005 | 23:00:00 | | |
| 05/27/2005 | 01:00:00 | - | 02:30:00 |
| 05/27/2005 | 09:30:00 | | |
| 05/27/2005 | 14:00:00 | | |
| 05/27/2005 | 14:30:00 | | |
| 05/27/2005 | 16:30:00 | | |
| 05/27/2005 | 17:00:00 | | |
| 05/28/2005 | 05:00:00 | | |
| 05/28/2005 | 06:30:00 | | |
| 05/28/2005 | 10:00:00 | | |
| 05/28/2005 | 10:30:00 | | |
| 05/28/2005 | 14:00:00 | - | 15:30:00 |
| 05/28/2005 | 17:00:00 | | |
| 05/28/2005 | 17:30:00 | | |
| 06/02/2005 | 08:30:00 | | |
| 06/04/2005 | 08:30:00 | | |
| 06/07/2005 | 00:00:00 | | |
| 06/07/2005 | 19:00:00 | | |
| 06/07/2005 | 19:30:00 | | |
| 06/07/2005 | 20:30:00 | | |
| 06/07/2005 | 21:30:00 | | |
| 06/07/2005 | 23:30:00 | | |
| 09/02/2005 | 02:00:00 | - | 03:30:00 |
| 09/02/2005 | 18:30:00 | | |
| 09/02/2005 | 20:30:00 | - | 21:30:00 |
| 09/03/2005 | 00:30:00 | | |
| 09/03/2005 | 01:30:00 | - | 03:00:00 |
| 09/03/2005 | 15:00:00 | | |
| 09/03/2005 | 16:30:00 | - | 19:00:00 |
| 09/03/2005 | 21:30:00 | | |
| 09/03/2005 | 22:00:00 | | |
| 09/03/2005 | 22:30:00 | | |
| 09/04/2005 | 00:30:00 | | |
| 09/04/2005 | 01:00:00 | - | 10:30:00 |
| 09/04/2005 | 14:00:00 | | |

| | | | |
|---|---|---|---|
| 09/04/2005 | 16:30:00 | - | 18:30:00 |
| 09/04/2005 | 20:30:00 | - | 22:00:00 |
| 09/04/2005 | 23:00:00 | | |
| 09/04/2005 | 23:30:00 | | |
| 09/05/2005 | 00:00:00 | - | 07:30:00 |
| 09/05/2005 | 21:30:00 | - | 23:30:00 |
| 09/06/2005 | 00:00:00 | - | 15:00:00 |
| 09/06/2005 | 17:00:00 | - | 19:00:00 |
| 09/07/2005 | 02:30:00 | | |
| 09/07/2005 | 03:30:00 | | |
| 09/07/2005 | 04:00:00 | | |
| 09/07/2005 | 12:30:00 | - | 23:30:00 |
| 09/08/2005 | 00:00:00 | - | 01:30:00 |
| 09/08/2005 | 03:30:00 | | |
| 09/08/2005 | 04:00:00 | | |
| 09/08/2005 | 05:00:00 | | |
| 09/08/2005 | 05:30:00 | | |
| 09/09/2005 | 20:30:00 | - | 22:00:00 |
| 09/12/2005 | 14:00:00 | - | 16:00:00 |
| 09/13/2005 | 09:30:00 | | |
| 09/13/2005 | 13:30:00 | - | 14:30:00 |
| 09/13/2005 | 15:30:00 | - | 20:00:00 |
| 09/14/2005 | 08:00:00 | | |
| 09/14/2005 | 09:00:00 | - | 10:00:00 |
| 09/14/2005 | 13:00:00 | - | 15:00:00 |
| 09/15/2005 | 05:00:00 | | |
| 09/15/2005 | 05:30:00 | | |
| 09/15/2005 | 22:30:00 | | |
| 09/17/2005 | 09:30:00 | | |
| 09/18/2005 | 14:00:00 | - | 15:00:00 |
| 09/18/2005 | 16:00:00 | | |
| 09/27/2005 | 15:00:00 | | |
| 10/25/2005 | 01:00:00 | | |
| 10/25/2005 | 01:30:00 | | |
| 10/25/2005 | 11:30:00 | - | 15:30:00 |
| 11/04/2005 | 13:30:00 | | |
| 11/10/2005 | 02:00:00 | - | 04:00:00 |
| 11/10/2005 | 05:00:00 | - | 08:00:00 |
| 11/16/2005 | 20:30:00 | | |
| 11/21/2005 | 23:30:00 | | |
| 11/22/2005 | 00:30:00 | - | 01:30:00 |
| 11/22/2005 | 03:00:00 | - | 04:30:00 |
| 11/22/2005 | 05:30:00 | - | 06:30:00 |
| 11/24/2005 | 03:00:00 | - | 04:00:00 |
| 11/24/2005 | 13:30:00 | | |
| 12/18/2005 | 18:30:00 | | |

13) Missing data:

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. For more details on deleted data, see the Deleted Data Section (12). If additional information on missing data is needed, contact the Research Coordinator at the reserve submitting the data.

Specifically, data for the dates and times described below are missing for the following reasons:

Research Creek

| Date | Time | Reason |
|---|---|---|
| 01/01/05 | 00:00-23:30 | Battery Failure |
| 01/02/05 | 00:00-23:30 | Battery Failure |
| 01/03/05 | 00:00-23:30 | Battery Failure |
| 01/04/05 | 00:00-23:30 | Battery Failure |
| 01/05/05 | 00:00-23:30 | Battery Failure |
| 01/06/05 | 00:00-11:00 | Battery Failure |
| 12/19/05 | 11:30 | Sonde Switch |

Loosin Creek

| Date | Time | Reason |
|---|---|---|
| 02/08/05 | 12:30 | Sonde Switch |
| 06/07/05 | 14:00-23:30 | Not Deployed (Vandalism) |
| 06/08/05 | 00:00-23:30 | Not Deployed (Vandalism) |
| 06/09/05 | 00:00-23:30 | Not Deployed (Vandalism) |
| 06/10/05 | 00:00-23:30 | Not Deployed (Vandalism) |
| 06/11/05 | 00:00-23:30 | Not Deployed (Vandalism) |
| 06/12/05 | 00:00-23:30 | Not Deployed (Vandalism) |
| 06/13/05 | 00:00-23:30 | Not Deployed (Vandalism) |
| 06/14/05 | 00:00-23:30 | Not Deployed (Vandalism) |
| 06/15/05 | 00:00-23:30 | Not Deployed (Vandalism) |
| 06/16/05 | 00:00-23:30 | Not Deployed (Vandalism) |
| 06/17/05 | 00:00-23:30 | Not Deployed (Vandalism) |
| 06/18/05 | 00:00-23:30 | Not Deployed (Vandalism) |
| 06/19/05 | 00:00-23:30 | Not Deployed (Vandalism) |
| 06/20/05 | 00:00-23:30 | Not Deployed (Vandalism) |
| 06/21/05 | 00:00-23:30 | Not Deployed (Vandalism) |
| 06/22/05 | 00:00-23:30 | Not Deployed (Vandalism) |
| 06/23/05 | 00:00-23:30 | Not Deployed (Vandalism) |
| 06/24/05 | 00:00-08:30 | Not Deployed (Vandalism) |
| 07/01/05 | 10:00-23:30 | Not Deployed (Vandalism) |
| 07/02/05 | 00:00-23:30 | Not Deployed (Vandalism) |
| 07/03/05 | 00:00-23:30 | Not Deployed (Vandalism) |

| | | |
|---|---|---|
| 07/04/05 | 00:00-23:30 | Not Deployed (Vandalism) |
| 07/05/05 | 00:00-13:30 | Not Deployed (Vandalism) |
| 10/17/05 | 12:30 | Sonde Switch |
| 12/19/05 | 11:00 | Sonde Switch |

East Cribbings

| Date | Time | Reason |
|---|---|---|
| 04/25/05 | 02:00-16:30 | Battery Failure |
| 04/26/05 | 04:00-23:30 | Battery Failure |
| 04/27/05 | 00:00-09:00 | Battery Failure |
| 05/05/05 | 04:30-23:00 | Battery Failure |
| 05/06/05 | 00:00-23:30 | Battery Failure |
| 05/07/05 | 00:00-23:30 | Battery Failure |
| 05/08/05 | 00:00-14:00 | Battery Failure |
| 05/08/05 | 07:00-13:00 | Battery Failure |
| 05/13/05 | 22:00-23:30 | Battery Failure |
| 05/14/05 | 00:00-14:00 | Battery Failure |
| 05/17/05 | 18:00-23:30 | Battery Failure |
| 05/18/05 | 00:00-23:30 | Battery Failure |
| 05/19/05 | 00:00-12:30 | Battery Failure |
| 06/30/05 | 15:30 | Sonde Switch |
| 07/08/05 | 11:30-12:30 | Battery Failure |

Zeke's Basin

| Date | Time | Reason |
|---|---|---|
| 01/07/05 | 10:00 | Sonde Switch |

14) Post Deployment Information:

End of Deployment Post-calibration Readings in Standard Solutions prior to probe cleaning.
[Standards used: DO = 100%; pH = 7.00; Specific conductivity = 50.00 mS/cm; Turbidity = 0.0 NTU]

Site RC

Date; DO (%Sat.); pH 7; Specific Conductivity 50.00mS/cm; Turbidity 0NTU; Depth 0.000m

02/08/05; 101.6; 6.89; 49.62; 0.0; -0.001
03/10/05; 98.3; 7.07; 50.29; 0.5; -0.138
03/31/05; 101.2; 6.93; 43.3; -0.1; 0.063

04/21/05; 100.9; 7.06; 49.54; 0.0; -0.061
05/20/05; 102.7; 6.89; 45.25; 0.6; -0.053
06/15/05; 97.3; 7.14; 48.42; 0.6; -0.052
07/05/05; 101.0; 7.34; 48.7; -8.4; 0.047
07/22/05; 100.6; 7.17; 50.71; -0.1; -0.003
08/04/05; 100.0; 7.14; 50.4; 0.4; 0.016
08/18/05; 100.5; 7.14; 49.78; 0.3; -0.026
09/29/05; 101.1; 7.08; 50.20; 2.5; 0.061
10/17/05; 100.5; 6.80; 50.41; 0.3; -0.098
11/14/05; 103.1; 7.10; 50.18; 0.5; 0.097
12/19/05; 105.5; 7.59; 51.19; 0.6; -0.057
01/12/06; 102.0; 7.21; 51.37; 0.4; -0.081

Site LC

Date; DO (%Sat.); pH 7; Specific Conductivity 50.00; Turbidity 0; Depth 0.000m

02/08/05; 100.2; 6.87; 46.88; 0.3; 0.090
03/10/05; 100.8; 7.20; 56.94; 0.6; -0.139
03/31/05; 102.7; 7.01; 50.5; 0.1; 0.065
04/21/05; 101.3; 9.3; 49.52; -0.1; -0.066
05/20/05; 100.8; 7.40; 49.08; 0.0; -0.040
06/07/05; 98.0; 7.01; 50.37; 0.1; 0.016
07/01/05; 99.9; 7.43; 47.56; 0.4; -0.075
07/19/05; 101.1; 7.05; 49.09; 0.6; 0.001
08/04/05; 101.4; 7.55; 50.33; 0.5; -0.012
08/18/05; 100.1; 7.11; 51.52; 1.0; -0.017
09/19/05; 102.7; 6.95; 49.33; 0.9; 0.060
10/17/05; 92.6; 6.92; 50.48; -0.3; -0.090
11/14/05; 101.8; 6.99; 49.26; 0.1; 0.073
12/19/05; 101.1; 7.13; 49.80; 0.7; -0.026
01/12/06; 101.4; 7.09; 51.87; 0.2; -0.076

Site EC

Date; DO (%Sat.); pH 7; Specific Conductivity 50.00; Turbidity 0; Depth 0.000m

02/09/05; 100.8; 6.96; 49.74; -0.8; -0.096
03/11/05; 100.7; 6.98; 50.87; 0.5; -0.093
03/31/05; 98.8; 7.05; 50.2; 1.6; 0.069
04/20/05; 100.3; 7.16; 46.92; 0.0; -0.038
05/20/05; 99.2; 7.11; 44.64; 1.2; -0.122
06/14/05; -99.9; 7.17; 49.04; -3.3; -0.025
06/30/05; 103.3; 7.05; 48.33; 0.2; -0.012
07/19/05; 98.7; 7.01; 49.30; -8.2; 0.034
08/04/05; 102.8; 7.00; 50.94; 0.4; 0.008

08/17/05; 102.4; 7.23; 50.66; 0.7; -0.053
09/19/05; 100.9; 7.01; 48.81; 0.3; 0.085
10/17/05; 105.0; 7.06; 50.05; 0.1; -0.094
11/14/05; 103.0; 7.06; 48.69; 0.3; 0.086
12/20/05; 103.5; 7.01; 51.96; 0.5; -0.006
01/12/06; 100.2; 5.05; 49.73; -0.6; -0.087

Site ZB

Date; DO (%Sat.); pH 7; Specific Conductivity 50.00; Turbidity 0; Depth 0.000m

02/09/05; 101.0; 6.71; 50.59; 0.6; -0.500
03/11/05; 96.1; 7.26; 50.30; 0.5; -0.092
03/31/05; 106.0; 6.90; 51.0; 1.5; 0.221
04/20/05; 101.6; 6.92; 48.3; 0.3; -0.028
05/20/05; 108.1; 6.86; 50.59; -0.1; -0.327
06/14/05; 100.9; 7.36; 51.99; 2.3; -0.078
06/30/05; 106.0; 7.02; 44.83; 0.6; -0.020
07/19/05; 104.1; 7.15; 48.81; 1.6; 0.038
08/04/05; 94.7; 6.6; 58.0; 0.1; -0.077
08/17/05; 101.6; 7.28; 49.53; 1.0; -0.049
09/19/05; 1023.5; 6.83; -178.0; 0.7; 0.247
10/17/05; 99.7; 7.14; 51.55; 0.6; -0.108
11/14/05; 102.1; 7.23; -191; 0.0; 0.218
12/20/05; 100.7; 7.22; 51.00; 1.0; -0.002
01/12/06; 103.20; 7.04; 51.52; 0.0; -0.269

15) Other remarks:

**On 08/13/2020 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.

Editing of data followed CDMO protocol. Data outside the range specifications of the instrument were rejected, except for Depth. Negative or zero Depth values were not rejected unless they corresponded to Specific Conductivity data indicating that the sonde was out of the water. Large positive Turbidity spikes (>150 NTU, but < 1000) occurring for unknown reasons were retained. The high value may reflect the turbid conditions that

occur during heavy rainfall and high wind events, when the probe is covered by sediment, or if a fish gets caught in the probe guard cup.
In general, if no probe failure could be documented from the pre- and post-deployment calibration data, the data were retained but reported in the anomalous data section.

Whenever specific conductivity or salinity data (referred to as conductivity data) were suspect, consider DO data in mg/l and depth suspect as well, since specific conductivity is used to calculate depth and DO data in mg/l.

There is a consistent problem with the position of the East Cribbings sonde. The sonde is located in a deep area between a sandbar and a bank. At high tide, it is difficult to tell if the sonde is positioned correctly and as a result, the sonde is sometimes positioned on the incline from the sandbar, which accounts for the various depths depicted in the data and the graphs.

Hurricane Ophelia passed over the area on 14 September 2005.

There was a large sewage spill in Hewlett's Creek on 1 July 2005 (estimated 3 million gallons) and again in September (about 750,000 gallons).

We experienced problems with the new flat glass pH probe model 6561FG. We used this model probe for many deployments throughout the year. A few of the probes had to be returned to YSI for replacement because they would not calibrate properly, malfunctioned, or in some cases, the probe casing cracked. In addition, the lifespan of the probes seemed to be shorter than models we had used in the past. For some deployments, the values recorded by this model probe seemed higher than values recorded by previous models.

There were a few instances at this NERR site where turbidity recorded small negative values (-0001 and -0002). Because turbidity has a range of accuracy of +/-2 NTU, the technician did not edit or deleted these values in any way.