

North Carolina (NOC) National Estuarine Research Reserve Water Quality Metadata
January - December 2004
Last Update: August 13, 2020

I. Data Set & Research Descriptors

1) Principal investigator(s) and contact persons:

Address: North Carolina National Estuarine Research Reserve

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Morehead City, NC 28557
or
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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 May, Research Associate, was responsible for data management during 2004.

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 has a salinity range from 14-35 ppt and a tidal range that averages around 1.2 meters. 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. The sole source of freshwater is rain. *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 has a salinity range from 17-35 ppt and a tidal range that averages 1.2 meters. 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. The sole source of freshwater is rain. *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 has a salinity range from 7-33 ppt and a tidal range that averages 1.2 meters. Depth varies, but typically it can be found to range from 0.1 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 salinity range from 12-30 ppt and a tidal range that 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.

An asterisk (*) at the end of a deployment period indicates that a YSI 6600 sonde was used for that particular deployment. YSI 6600 EDS models were utilized for all other deployments. Each sonde is equipped with a non-vented depth probe and identical sensor models.

Deployment and Retrieval Dates for 2004

Began	Ended
Research Creek, Masonboro Island:	
12/11/03, 15:30	01/21/04, 16:00
01/21/04, 16:30	02/19/04, 14:30
02/25/04, 16:30	03/28/04, 21:00
03/31/04, 12:30	04/27/04, 10:30
04/27/04, 11:00	05/25/04, 08:30
05/25/04, 09:00	06/15/04, 11:30
06/15/04, 12:00	07/08/04, 09:30
07/08/04, 10:00	07/26/04, 09:30
07/26/04, 10:30	08/17/04, 14:30
08/17/04, 15:30	09/09/04, 09:30
09/09/04, 10:00	09/29/04, 14:00
09/29/04, 14:30	10/26/04, 12:30
10/26/04, 13:00	11/09/04, 11:30
11/09/04, 12:30	12/06/04, 09:30
12/06/04, 10:00	12/26/05, 12:30
Loosin Creek, Masonboro Island:	
12/11/03, 16:00	01/21/04, 15:30
01/21/04, 16:00	02/25/04, 15:30

02/25/04, 16:00
03/25/04, 15:30
04/27/04, 10:30
05/27/04, 08:00
06/16/04, 13:00
07/08/04, 09:30
07/26/04, 10:00
08/27/04, 11:00
09/09/04, 10:30
09/29/04, 14:00
10/26/04, 13:00
11/09/04, 13:00
12/06/04, 09:30

03/25/04, 15:00
04/27/04, 10:00
05/27/04, 07:30
06/16/04, 12:00
07/08/04, 09:00
07/26/04, 09:00
08/17/04, 15:30
09/09/04, 09:30
09/29/04, 13:30
10/26/04, 12:00
11/09/04, 12:30
12/06/04, 09:00
01/06/05, 10:30

East Cribbings, Zeke's Island:

12/12/03, 12:00
01/23/04, 11:30
02/24/04, 14:00
03/26/04, 14:00
04/27/04, 15:30
05/27/04, 16:00
06/16/04, 10:30
07/07/04, 14:00
07/27/04, 09:00
08/17/04, 11:30
09/29/04, 10:30
10/26/04, 09:30
11/09/04, 10:00
12/06/04, 17:00

01/23/04, 11:00
02/24/04, 13:30
03/26/04, 13:30
04/27/04, 15:00
05/27/04, 15:30
06/16/04, 09:30
07/07/04, 13:00
07/27/04, 08:00
08/17/04, 10:30
09/10/04, 08:30
10/26/04, 08:30
11/09/04, 09:00
12/06/04, 16:30
01/07/04, 09:00

Zeke's Basin, Zeke's Island:

12/12/03, 12:00
01/23/04, 12:00
02/24/04, 15:00
03/26/04, 14:30
05/06/04, 11:00
05/27/04, 16:30
06/16/04, 09:30
07/07/04, 14:00
07/27/04, 09:30
09/02/04, 09:00
09/10/04, 08:30
09/29/04, 11:00
10/26/04, 09:00
11/15/04, 11:00
12/06/04, 17:30

01/23/04, 11:00
02/24/04, 14:00
03/26/04, 14:00
05/06/04, 10:00
05/27/04, 16:00*
06/16/04, 09:00*
07/07/04, 13:30
07/27/04, 09:00
08/17/04, 11:30
09/10/04, 08:00
09/29/04, 10:30
10/26/04, 08:30
11/15/04, 10:30
12/06/04, 17:00
01/07/05, 09:30

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.

In 2004, water quality data were used by Greg Lovelace in a CICEET funded microbial source tracking study.

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: $\pm 0.5\%$ 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: $\pm 1.0\%$ 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, $\pm 2\%$ of the reading or 2 % air saturation, whichever is greater; 200-500 % air saturation, $\pm 6\%$ 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, $\pm 2\%$ of the reading or 0.2 mg/L, whichever is greater; 20-50 mg/L, $\pm 6\%$ 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
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 either extreme for the aquatic system being monitored or are outside the measurement range of the instrument. 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

DO data from 2/14/04 0:00 to 2/19/04 14:30 declines for unknown reasons, possibly battery failure, and should be considered suspect.

Declining Sp. Cond. for deployment 02/25 – 03/28 may be a result of rainfall or weakening batteries. Data were retained but should be considered suspect.

There were abnormal elevations in DO data from 3/3/04 through 3/7/04 for unknown reasons. Data were retained but should be considered suspect.

On 3/24/04, pH data jumped from 7.18 at 14:30 to 8.45 at 15:00, most likely due to fouling drift from algae prior to ISCO deployment around 15:00 on 3/24/04. Data were retained but should be considered suspect.

There were unusual elevations in pH values from 1/11/04 4:00 to 1/21/04 16:00 for unknown reasons. Data were retained but should be considered suspect.

Post deployment calibration readings were low for Specific Conductivity for the deployment ending on 7/8/04 at 9:30 most likely due to fouling. However, data did not look unusual and were retained.

Turbidity data for the following dates and times were erratic for unknown reasons:

8/5/04 16:30 – 8/17/04 14:30 (possibly influenced by Tropical Storm Charley on 08/14/04)

9/17/04 15:30 – 9/29/04 14:00

10/11/04 14:30 – 10/26/04 12:30

Loosin Creek

On the following dates the depth values were negative. However, other parameters indicate the sonde was not out of the water. The data were retained.

1/18/04 23:00

01/22/04 02:00, 14:30
01/23/04 04:00
03/08/04 14:30, 15:00
7/2/04 13:00 – 14:00
12/11/04 00:30, 13:30
12/12/04 00:30 - 02:00

Unusually low DO values occurred on 09/29 02:00 – 02:30 possibly due to algal growth on the DO membrane. Data were retained but should be considered suspect.

East Cribbings

Turbidity data for the following dates and times should be considered suspect because the turbidity wiper brush fell off the probe during deployment.

7/07/04 14:00 – 7/27/04 8:00

Zeke's Basin

The temperature value was slightly negative at 9:00 on 1/11/04. However, the other parameters indicated that the sonde was submerged so data was retained.

On 5/17/04 at 15:30, the Turbidity value was slightly negative, but still within specification range for the probe, so data was retained.

For the month of June, there were several turbidity values that were slightly negative, but still within specification range for the probe, so data was retained.

DO data from 3/26/04, 14:30 through 5/6/04, 10:00 should be considered suspect due to the post deployment calibration reading of 40.9% and the presence of brown film on the DO membrane upon retrieval of the instrument.

DO data is negative on 6/8/04 at 22:30 possibly due to fouling. However, calibration exhibited good recovery upon retrieval so data was retained but is suspect.

DO values on 6/24/04 and 6/25/04 were abnormally elevated for unknown reasons. Data were retained but should be considered suspect.

DO data from 9/29/04, 11:00 through 10/26/04, 8:30 should be considered suspect due to a possible puncture in the DO membrane at some point during the deployment. Calibration exhibited good recovery and data did not look unusual so the values were retained.

On the following dates the depth values were zero or negative. However, other parameters indicate the sonde was not out of the water. The data were retained.

3/26/04 19:30

3/28/04 10:00 – 10:30
05/26/04 10:00 – 10:30
5/27/04 10:00 – 11:30
7/3/04 17:30
11/24/04 02:00 – 02:30
11/24/04 15:00
11/25/04 1:30 – 3:30, 16:00 – 17:00
11/26/04 3:00 – 4:30
11/27/04 17:30
11/28/04 4:00 – 5:30, 17:30 – 18:30
11/29/04 5:00 – 6:30
12/3/04 8:00 – 9:00, 21:30
12/4/04 22:30 – 23:00
12/5/04 23:00 – 23:30
12/6/04 00:00
12/11/04 04:00

12) Deleted Data:

Research Creek

DO data from 3/15/04, 20:30 through 03/28/04, 21:00 were deleted due to a tear in the DO membrane.

DO data from 8/19/04, 15:30 through 9/9/04, 9:30 were deleted due to probe malfunction during deployment.

Due to a broken probe bulb, pH data from 6/29/04, 21:00 through 07/08/04, 9:30 were deleted.

Turbidity data from 2/27/04, 9:30 to 3/24/04, 14:30 were deleted due to the absence of a turbidity wiper, the presence of large quantities of algae and a crab that was living inside the probe guard.

Turbidity data from 6/29/04, 13:00 to 7/8/04, 9:30 were deleted due to the wiper having parked over the optics during deployment.

Turbidity data from 8/18/04, 16:30 to 9/9/04, 9:30 were deleted due to a cracked probe.

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

Date	Time
4/16/2004	7:30:00
4/28/2004	9:00:00
4/28/2004	11:30:00
4/28/2004	18:30:00
4/29/2004	15:30:00

4/29/2004	18:30:00
5/2/2004	7:30:00
5/3/2004	1:00:00
5/3/2004	12:30:00
5/4/2004	1:30:00
5/4/2004	10:30:00
5/4/2004	12:30:00
5/5/2004	16:30:00
5/6/2004	17:30:00
5/9/2004	11:30:00
5/10/2004	13:00:00
5/15/2004	17:30:00
6/29/2004	10:00:00
6/29/2004	11:30:00
6/29/2004	12:30:00
7/8/2004	23:00:00
7/14/2004	22:30:00
8/5/2004	7:00:00
8/5/2004	10:00:00
8/5/2004	11:00:00
8/5/2004	12:00:00
8/5/2004	12:30:00
8/5/2004	14:30:00
8/5/2004	15:00:00
8/5/2004	17:00:00
8/5/2004	18:00:00
8/5/2004	19:30:00
8/5/2004	20:30:00
8/5/2004	23:00:00
8/6/2004	1:30:00
8/6/2004	3:00:00
8/6/2004	4:00:00
8/6/2004	5:30:00
8/6/2004	6:30:00
8/6/2004	7:30:00
8/6/2004	9:30:00
8/6/2004	10:00:00
8/6/2004	11:00:00
8/6/2004	13:00:00
8/6/2004	14:30:00
8/6/2004	15:30:00
8/6/2004	17:00:00
8/6/2004	18:00:00
8/6/2004	19:00:00
8/6/2004	19:30:00
8/6/2004	20:30:00
8/6/2004	21:30:00
8/6/2004	22:30:00

8/7/2004	0:00:00
8/7/2004	1:00:00
8/7/2004	2:00:00
8/7/2004	2:30:00
8/7/2004	3:30:00
8/7/2004	4:00:00
8/7/2004	5:30:00
8/7/2004	7:30:00
8/7/2004	9:30:00
8/7/2004	10:30:00
8/7/2004	11:30:00
8/7/2004	13:00:00
8/7/2004	14:00:00
8/7/2004	17:00:00
8/7/2004	17:30:00
8/7/2004	20:00:00
8/7/2004	21:00:00
8/7/2004	22:30:00
8/7/2004	23:30:00
8/8/2004	1:30:00
8/8/2004	3:30:00
8/8/2004	6:30:00
8/8/2004	7:30:00
8/8/2004	8:30:00
8/8/2004	10:00:00
8/8/2004	11:00:00
8/8/2004	12:00:00
8/8/2004	13:00:00
8/8/2004	15:30:00
8/8/2004	16:00:00
8/8/2004	17:00:00
8/8/2004	17:30:00
8/8/2004	19:30:00
8/8/2004	20:30:00
8/8/2004	23:00:00
8/9/2004	0:30:00
8/9/2004	1:30:00
8/9/2004	2:00:00
8/9/2004	3:00:00
8/9/2004	4:30:00
8/9/2004	5:30:00
8/9/2004	6:00:00
8/9/2004	7:00:00
8/9/2004	8:00:00
8/9/2004	11:30:00
8/9/2004	12:00:00
8/9/2004	12:30:00
8/9/2004	14:30:00

8/9/2004	15:30:00
8/9/2004	16:00:00
8/9/2004	18:00:00
8/9/2004	20:30:00
8/9/2004	21:00:00
8/9/2004	23:00:00
8/10/2004	0:30:00
8/10/2004	2:30:00
8/10/2004	4:00:00
8/10/2004	7:30:00
8/10/2004	8:00:00
8/10/2004	9:30:00
8/10/2004	11:30:00
8/10/2004	12:00:00
8/10/2004	13:00:00
8/10/2004	15:00:00
8/10/2004	15:30:00
8/10/2004	16:30:00
8/10/2004	17:00:00
8/10/2004	20:00:00
8/10/2004	21:30:00
8/10/2004	22:00:00
8/10/2004	23:00:00
8/10/2004	23:30:00
8/11/2004	0:00:00
8/11/2004	1:30:00
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8/11/2004	6:30:00
8/11/2004	7:00:00
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8/11/2004	13:00:00
8/11/2004	14:30:00
8/11/2004	15:30:00
8/11/2004	18:00:00
8/11/2004	20:30:00
8/11/2004	22:00:00
8/12/2004	0:00:00
8/12/2004	2:30:00
8/12/2004	3:30:00
8/12/2004	4:00:00
8/12/2004	7:00:00
8/12/2004	10:00:00
8/12/2004	10:30:00
8/12/2004	11:00:00
8/12/2004	11:30:00
8/12/2004	12:00:00

8/12/2004	12:30:00
8/12/2004	13:30:00
8/12/2004	14:00:00
8/12/2004	15:00:00
8/12/2004	15:30:00
8/12/2004	18:30:00
8/12/2004	20:00:00
8/12/2004	21:30:00
8/12/2004	22:00:00
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8/13/2004	7:00:00
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8/13/2004	10:00:00
8/13/2004	10:30:00
8/13/2004	11:00:00
8/13/2004	12:00:00
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8/14/2004	1:30:00
8/14/2004	2:30:00
8/14/2004	3:30:00
8/14/2004	4:00:00
8/14/2004	4:30:00
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8/14/2004	6:00:00
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8/14/2004	8:30:00
8/14/2004	9:30:00
8/14/2004	11:00:00
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8/14/2004	13:00:00
8/14/2004	14:00:00
8/14/2004	15:00:00
8/14/2004	15:30:00
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8/14/2004	18:30:00
8/14/2004	19:30:00
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8/14/2004	22:30:00
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8/15/2004	1:00:00
8/15/2004	2:00:00
8/15/2004	3:00:00
8/15/2004	4:00:00
8/15/2004	5:00:00
8/15/2004	5:30:00
8/15/2004	6:30:00
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8/15/2004	9:30:00
8/15/2004	11:00:00
8/15/2004	11:30:00
8/15/2004	12:30:00
8/15/2004	13:30:00
8/15/2004	14:30:00
8/15/2004	15:30:00
8/15/2004	16:30:00
8/15/2004	17:30:00
8/15/2004	18:30:00
8/15/2004	19:30:00
8/15/2004	21:00:00
8/15/2004	21:30:00
8/15/2004	22:00:00
8/15/2004	22:30:00
8/15/2004	23:00:00
8/16/2004	0:00:00
8/16/2004	0:30:00
8/16/2004	1:30:00
8/16/2004	2:00:00
8/16/2004	2:30:00
8/16/2004	5:00:00

8/16/2004	6:30:00
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8/16/2004	9:00:00
8/16/2004	10:00:00
8/16/2004	11:00:00
8/16/2004	12:30:00
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8/16/2004	15:30:00
8/16/2004	17:30:00
8/16/2004	18:30:00
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8/17/2004	10:30:00
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8/17/2004	12:00:00
8/17/2004	13:30:00
8/17/2004	14:00:00
9/17/2004	18:00:00
9/17/2004	19:00:00
9/17/2004	22:30:00
9/18/2004	0:00:00
9/18/2004	4:30:00
9/18/2004	5:30:00
9/18/2004	7:30:00
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9/19/2004	4:00:00
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9/19/2004	9:30:00
9/19/2004	11:00:00
9/19/2004	15:30:00
9/19/2004	18:00:00
9/19/2004	21:00:00

9/19/2004	22:30:00
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9/20/2004	2:00:00
9/20/2004	5:30:00
9/20/2004	8:00:00
9/20/2004	11:30:00
9/20/2004	15:00:00
9/20/2004	15:30:00
9/20/2004	17:00:00
9/20/2004	19:00:00
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9/20/2004	20:30:00
9/20/2004	21:30:00
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9/22/2004	2:30:00
9/22/2004	3:30:00
9/22/2004	5:30:00
9/22/2004	6:00:00
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9/22/2004	14:30:00
9/22/2004	18:30:00
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9/22/2004	22:00:00
9/22/2004	23:00:00
9/23/2004	0:30:00
9/23/2004	1:00:00
9/23/2004	1:30:00
9/23/2004	3:30:00
9/23/2004	5:00:00
9/23/2004	8:00:00
9/23/2004	11:30:00
9/23/2004	15:00:00
9/23/2004	17:30:00

9/23/2004	19:00:00
9/23/2004	20:00:00
9/23/2004	21:30:00
9/23/2004	22:00:00
9/23/2004	23:00:00
9/24/2004	0:00:00
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9/27/2004	2:00:00
9/27/2004	2:30:00
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9/27/2004	9:00:00
9/27/2004	13:30:00
9/27/2004	14:00:00
9/27/2004	18:00:00
9/27/2004	20:00:00
9/27/2004	23:30:00

9/28/2004	0:00:00
9/28/2004	2:30:00
9/28/2004	3:00:00
9/28/2004	3:30:00
9/28/2004	8:00:00
9/28/2004	10:30:00
9/28/2004	21:30:00
9/29/2004	1:30:00
9/29/2004	3:00:00
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9/29/2004	5:30:00
9/29/2004	8:00:00
9/29/2004	10:30:00
9/29/2004	12:00:00
9/29/2004	12:30:00
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10/14/2004	10:30:00
10/14/2004	11:30:00
10/14/2004	13:30:00
10/14/2004	14:30:00
10/14/2004	15:30:00
10/14/2004	17:00:00
10/14/2004	17:30:00

10/14/2004	19:00:00
10/14/2004	20:00:00
10/14/2004	21:00:00
10/14/2004	21:30:00
10/14/2004	22:00:00
10/14/2004	23:30:00
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10/15/2004	1:00:00
10/15/2004	2:00:00
10/15/2004	3:00:00
10/15/2004	4:30:00
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10/15/2004	5:30:00
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10/15/2004	7:30:00
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10/15/2004	20:00:00
10/15/2004	21:00:00
10/15/2004	22:30:00
10/15/2004	23:00:00
10/16/2004	0:00:00
10/16/2004	2:00:00
10/16/2004	3:00:00
10/16/2004	3:30:00
10/16/2004	5:30:00
10/16/2004	7:00:00
10/16/2004	9:00:00
10/16/2004	10:30:00
10/16/2004	12:00:00
10/16/2004	12:30:00
10/16/2004	14:00:00
10/16/2004	14:30:00
10/16/2004	16:00:00
10/16/2004	17:30:00
10/16/2004	18:00:00
10/16/2004	20:00:00
10/16/2004	21:30:00

10/16/2004	23:30:00
10/17/2004	0:30:00
10/17/2004	1:00:00
10/17/2004	3:00:00
10/17/2004	3:30:00
10/17/2004	5:00:00
10/17/2004	5:30:00
10/17/2004	6:00:00
10/17/2004	6:30:00
10/17/2004	9:30:00
10/17/2004	11:00:00
10/17/2004	11:30:00
10/17/2004	12:00:00
10/17/2004	14:30:00
10/17/2004	15:00:00
10/17/2004	15:30:00
10/17/2004	16:00:00
10/17/2004	16:30:00
10/17/2004	17:00:00
10/17/2004	17:30:00
10/17/2004	18:00:00
10/17/2004	20:00:00
10/17/2004	20:30:00
10/17/2004	21:00:00
10/17/2004	22:30:00
10/18/2004	0:30:00
10/18/2004	1:00:00
10/18/2004	1:30:00
10/18/2004	2:00:00
10/18/2004	3:30:00
10/18/2004	4:00:00
10/18/2004	6:30:00
10/18/2004	7:00:00
10/18/2004	10:00:00
10/18/2004	14:30:00
10/18/2004	15:00:00
10/18/2004	15:30:00
10/18/2004	16:00:00
10/18/2004	16:30:00
10/18/2004	18:00:00
10/18/2004	18:30:00
10/18/2004	19:00:00
10/18/2004	19:30:00
10/18/2004	20:00:00
10/18/2004	23:00:00
10/19/2004	0:00:00
10/19/2004	0:30:00
10/19/2004	3:00:00

10/19/2004	5:00:00
10/19/2004	5:30:00
10/19/2004	6:00:00
10/19/2004	8:00:00
10/19/2004	11:00:00
10/19/2004	11:30:00
10/19/2004	13:00:00
10/19/2004	13:30:00
10/19/2004	14:00:00
10/19/2004	17:00:00
10/19/2004	17:30:00
10/19/2004	18:00:00
10/19/2004	18:30:00
10/19/2004	21:00:00
10/19/2004	21:30:00
10/20/2004	0:30:00
10/20/2004	1:00:00
10/20/2004	1:30:00
10/20/2004	3:00:00
10/20/2004	4:00:00
10/20/2004	5:00:00
10/20/2004	10:00:00
10/20/2004	10:30:00
10/20/2004	14:30:00
10/20/2004	15:30:00
10/20/2004	16:30:00
10/20/2004	20:00:00
10/20/2004	20:30:00
10/20/2004	22:30:00
10/21/2004	7:00:00
10/21/2004	14:30:00
10/21/2004	17:30:00
10/21/2004	18:30:00
10/21/2004	19:30:00
10/21/2004	21:00:00
10/21/2004	22:00:00
10/22/2004	0:30:00
10/22/2004	1:30:00
10/22/2004	3:00:00
10/22/2004	4:30:00
10/22/2004	6:00:00
10/22/2004	7:00:00
10/22/2004	7:30:00
10/22/2004	8:30:00
10/22/2004	9:00:00
10/22/2004	12:30:00
10/22/2004	17:30:00
10/22/2004	19:00:00

10/22/2004	22:30:00
10/23/2004	1:30:00
10/23/2004	2:00:00
10/23/2004	6:00:00
10/23/2004	6:30:00
10/23/2004	9:00:00
10/23/2004	9:30:00
10/23/2004	11:00:00
10/23/2004	12:00:00
10/23/2004	12:30:00
10/23/2004	13:00:00
10/23/2004	14:00:00
10/23/2004	15:30:00
10/23/2004	19:30:00
10/23/2004	22:30:00
10/23/2004	23:00:00
10/24/2004	0:00:00
10/24/2004	3:30:00
10/24/2004	4:00:00
10/24/2004	11:30:00
10/24/2004	13:30:00
10/24/2004	14:00:00
10/24/2004	19:00:00
10/24/2004	19:30:00
10/24/2004	21:30:00
10/24/2004	22:30:00
10/24/2004	23:00:00
10/25/2004	2:00:00
10/25/2004	2:30:00
10/25/2004	6:00:00
10/25/2004	9:00:00
10/25/2004	9:30:00
10/25/2004	10:30:00
10/25/2004	11:00:00
10/25/2004	14:30:00
10/25/2004	18:00:00
10/25/2004	19:00:00
10/25/2004	20:00:00
10/26/2004	1:00:00
10/26/2004	3:30:00
10/26/2004	4:00:00
10/26/2004	4:30:00
10/26/2004	7:00:00
10/26/2004	8:00:00
10/26/2004	11:00:00
10/26/2004	11:30:00
12/19/2004	21:00:00

Loosin Creek

Data for all parameters were deleted for the following dates and times due to the exposure of the sonde at extremely low tides:

1/22/04 1:30, 15:00

1/23/04 2:00 – 3:30

3/6/04 14:00

3/7/04 1:00 – 2:00

3/8/04 2:00 – 3:30

5/3/04 12:30

5/4/04 00:30 – 01:00

Due to a broken probe bulb, pH data from 6/5/04, 12:00 through 06/16/04, 12:00 were deleted.

Specific conductivity, salinity, DO mg/L, and depth data from 4/24/04, 15:00 through 4/27/04, 10:00 were deleted due to conductivity probe failure during deployment.

Turbidity data from 7/3/04, 19:30 through 7/8/04, 9:00 were deleted because a toadfish was observed in the probe guard upon sonde retrieval.

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

Date	Time
1/10/2004	22:00:00
2/18/2004	4:00:00
3/7/2004	23:00:00
4/27/2004	23:30:00
4/29/2004	14:30:00
5/24/2004	10:00:00
5/25/2004	11:30:00
5/27/2004	7:30:00
6/4/2004	5:00:00
6/4/2004	6:30:00
6/5/2004	16:30:00
6/6/2004	8:30:00
6/12/2004	0:30:00
6/22/2004	0:30:00
6/22/2004	15:00:00
6/25/2004	20:30:00
7/3/2004	6:30:00
7/3/2004	11:00:00
10/14/2004	11:00:00
10/19/2004	11:30:00
10/19/2004	13:00:00
10/19/2004	14:00:00
10/20/2004	12:00:00

10/28/2004	7:30:00
10/29/2004	6:30:00
12/6/2004	21:00:00
12/26/2004	5:00:00

East Cribbings

Due to a broken probe bulb, pH data from 6/11/04, 12:00 through 06/16/04, 9:30 were deleted.

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

Date	Time
1/1/2004	8:30:00
1/10/2004	15:00:00
1/13/2004	6:30:00
1/19/2004	14:00:00
1/20/2004	11:30:00
1/21/2004	9:00:00
4/16/2004	23:30:00
4/29/2004	15:30:00
5/13/2004	4:00:00
5/26/2004	1:00:00
6/8/2004	10:30:00
6/9/2004	18:00:00
6/9/2004	18:30:00
6/9/2004	22:30:00
6/9/2004	23:00:00
6/10/2004	11:00:00
6/10/2004	11:30:00
6/10/2004	12:00:00
6/10/2004	19:00:00
6/10/2004	19:30:00
6/10/2004	20:00:00
6/11/2004	6:00:00
6/11/2004	6:30:00
6/11/2004	8:30:00
6/11/2004	9:00:00
6/11/2004	12:30:00
6/11/2004	16:00:00
6/11/2004	16:30:00
6/11/2004	17:30:00
6/11/2004	18:00:00
6/11/2004	20:00:00
6/11/2004	20:30:00
6/11/2004	21:30:00
6/11/2004	22:00:00
6/11/2004	22:30:00
6/11/2004	23:00:00
6/11/2004	23:30:00
6/12/2004	0:30:00

6/12/2004	1:00:00
6/12/2004	1:30:00
6/12/2004	3:30:00
6/12/2004	5:30:00
6/12/2004	6:00:00
6/12/2004	8:00:00
6/12/2004	8:30:00
6/12/2004	10:00:00
6/12/2004	10:30:00
6/12/2004	11:30:00
6/12/2004	12:00:00
6/12/2004	12:30:00
6/12/2004	14:00:00
6/12/2004	14:30:00
6/12/2004	15:00:00
6/12/2004	16:30:00
6/12/2004	17:00:00
6/12/2004	17:30:00
6/12/2004	19:00:00
6/12/2004	19:30:00
6/12/2004	20:00:00
6/12/2004	22:00:00
6/13/2004	0:30:00
6/13/2004	1:00:00
6/13/2004	1:30:00
6/13/2004	3:00:00
6/13/2004	3:30:00
6/13/2004	4:00:00
6/13/2004	5:30:00
6/13/2004	6:00:00
6/13/2004	8:00:00
6/13/2004	8:30:00
6/13/2004	9:00:00
6/13/2004	10:30:00
6/13/2004	11:00:00
6/13/2004	11:30:00
6/13/2004	13:00:00
6/13/2004	13:30:00
6/13/2004	14:00:00
6/13/2004	17:00:00
6/13/2004	17:30:00
6/13/2004	18:00:00
6/13/2004	19:30:00
6/13/2004	20:00:00
6/13/2004	20:30:00
6/13/2004	22:00:00
6/13/2004	22:30:00
6/13/2004	23:00:00
6/14/2004	1:00:00
6/14/2004	2:00:00

6/14/2004	2:30:00
6/14/2004	3:00:00
6/14/2004	4:30:00
6/14/2004	5:00:00
6/14/2004	5:30:00
6/14/2004	7:00:00
6/14/2004	7:30:00
6/14/2004	9:30:00
6/14/2004	10:00:00
6/14/2004	12:00:00
6/14/2004	12:30:00
6/14/2004	13:00:00
6/14/2004	14:00:00
6/14/2004	14:30:00
6/14/2004	15:00:00
6/14/2004	16:30:00
6/14/2004	17:00:00
6/14/2004	17:30:00
6/14/2004	19:00:00
6/14/2004	19:30:00
6/14/2004	20:00:00
6/14/2004	21:30:00
6/14/2004	22:00:00
6/14/2004	22:30:00
6/15/2004	0:00:00
6/15/2004	0:30:00
6/15/2004	1:00:00
6/15/2004	3:00:00
6/15/2004	3:30:00
6/15/2004	6:00:00
6/15/2004	6:30:00
6/15/2004	7:00:00
6/15/2004	8:30:00
6/15/2004	9:00:00
6/15/2004	9:30:00
6/15/2004	11:00:00
6/15/2004	11:30:00
6/15/2004	12:00:00
6/15/2004	12:30:00
6/15/2004	13:00:00
6/15/2004	15:00:00
6/15/2004	15:30:00
6/15/2004	17:30:00
6/15/2004	18:00:00
6/15/2004	18:30:00
6/15/2004	20:00:00
6/15/2004	20:30:00
6/15/2004	21:00:00
6/15/2004	22:30:00
6/15/2004	23:00:00

6/16/2004	0:30:00
6/16/2004	1:00:00
6/16/2004	1:30:00
6/16/2004	3:00:00
6/16/2004	3:30:00
6/16/2004	4:00:00
6/16/2004	5:30:00
6/16/2004	6:00:00
6/16/2004	6:30:00
6/16/2004	8:00:00
6/16/2004	8:30:00
6/16/2004	9:00:00
7/3/2004	15:30:00
7/3/2004	16:00:00
7/3/2004	19:00:00
7/4/2004	5:00:00
7/4/2004	5:30:00
7/4/2004	8:00:00
7/4/2004	8:30:00
7/4/2004	10:00:00
7/4/2004	11:30:00
7/4/2004	13:00:00
7/4/2004	14:00:00
7/4/2004	15:00:00
7/4/2004	16:00:00
7/4/2004	18:00:00
7/4/2004	18:30:00
7/4/2004	19:30:00
7/4/2004	20:00:00
7/4/2004	20:30:00
7/4/2004	22:00:00
7/4/2004	22:30:00
7/4/2004	23:30:00
7/5/2004	1:00:00
7/5/2004	2:30:00
7/5/2004	3:00:00
7/5/2004	5:00:00
7/5/2004	6:00:00
7/5/2004	6:30:00
7/5/2004	7:30:00
7/5/2004	8:00:00
7/5/2004	9:30:00
7/5/2004	10:00:00
7/5/2004	11:00:00
7/5/2004	11:30:00
7/5/2004	12:30:00
7/5/2004	13:00:00
7/5/2004	14:00:00
7/5/2004	15:30:00
7/5/2004	17:00:00

7/5/2004	17:30:00
7/5/2004	20:30:00
7/5/2004	21:00:00
7/5/2004	22:00:00
7/5/2004	22:30:00
7/6/2004	1:30:00
7/6/2004	2:00:00
7/6/2004	3:30:00
7/6/2004	5:00:00
7/6/2004	5:30:00
7/6/2004	7:00:00
7/6/2004	8:30:00
7/6/2004	9:00:00
7/6/2004	12:00:00
7/6/2004	12:30:00
7/6/2004	14:00:00
7/6/2004	15:30:00
7/6/2004	16:00:00
7/6/2004	19:00:00
7/6/2004	19:30:00
7/6/2004	20:30:00
7/6/2004	23:30:00
7/7/2004	0:30:00
7/7/2004	1:00:00
7/7/2004	2:00:00
7/7/2004	4:00:00
7/7/2004	6:30:00
7/7/2004	8:00:00
7/7/2004	8:30:00
7/7/2004	12:00:00
8/9/2004	18:00:00
9/6/2004	4:30:00
10/20/2004	18:00:00
10/21/2004	1:00:00
10/24/2004	18:30:00
10/25/2004	9:30:00
10/25/2004	10:30:00
10/25/2004	11:00:00
10/25/2004	14:00:00
10/25/2004	14:30:00
10/25/2004	18:00:00
10/25/2004	18:30:00
10/25/2004	21:30:00
10/25/2004	22:00:00
10/26/2004	0:30:00
10/26/2004	3:00:00
10/26/2004	3:30:00
10/26/2004	4:00:00
10/26/2004	8:00:00
10/26/2004	8:30:00

10/28/2004 18:30:00
12/26/2004 2:30:00

Zeke's Basin

Data for all parameters were deleted for the following dates and times due to the exposure of the sonde at extremely low tides:

3/26/04 20:00 – 21:00
5/17/04 16:00
5/18/04 16:30

Due to a broken probe bulb, pH data from 5/4/04, 17:00 through 5/6/04, 10:00 were deleted.

During the following periods, the DO% and DO mg/L readings were irregular due to a membrane puncture. Data were deleted.

6/25/04 6:00 – 7/7/04 13:30

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

Date	Time
1/11/2004	1:00:00
1/12/2004	2:30:00
1/12/2004	3:00:00
1/12/2004	5:30:00
1/12/2004	6:00:00
1/12/2004	12:30:00
1/14/2004	16:30:00
1/21/2004	10:30:00
3/8/2004	14:30:00
3/11/2004	15:00:00
3/21/2004	10:30:00
3/21/2004	11:00:00
3/21/2004	12:00:00
3/27/2004	14:00:00
3/27/2004	19:30:00
3/27/2004	20:00:00
3/27/2004	20:30:00
3/27/2004	21:00:00
3/27/2004	21:30:00
3/27/2004	22:00:00
3/27/2004	22:30:00
3/27/2004	23:00:00
3/27/2004	23:30:00
3/28/2004	0:00:00
3/28/2004	5:30:00
3/28/2004	7:30:00
3/28/2004	8:00:00
3/28/2004	9:00:00

3/28/2004	13:00:00
3/28/2004	13:30:00
3/28/2004	15:00:00
3/28/2004	16:00:00
3/28/2004	16:30:00
3/28/2004	17:00:00
3/28/2004	17:30:00
3/29/2004	13:30:00
3/31/2004	13:30:00
4/1/2004	3:00:00
4/1/2004	3:30:00
4/1/2004	7:00:00
4/1/2004	8:30:00
4/1/2004	17:30:00
4/1/2004	18:00:00
4/1/2004	20:00:00
4/7/2004	13:00:00
4/7/2004	21:30:00
4/8/2004	15:30:00
4/10/2004	18:00:00
4/13/2004	9:00:00
4/14/2004	7:30:00
5/2/2004	21:30:00
5/31/2004	8:00:00
5/31/2004	9:00:00
5/31/2004	9:30:00
5/31/2004	15:00:00
5/31/2004	15:30:00
5/31/2004	16:00:00
5/31/2004	16:30:00
5/31/2004	17:00:00
5/31/2004	17:30:00
5/31/2004	18:30:00
5/31/2004	19:00:00
5/31/2004	19:30:00
5/31/2004	20:00:00
5/31/2004	20:30:00
5/31/2004	21:00:00
5/31/2004	21:30:00
5/31/2004	23:00:00
6/1/2004	14:00:00
6/1/2004	14:30:00
6/1/2004	15:00:00
6/1/2004	17:00:00
6/1/2004	17:30:00
6/1/2004	19:00:00
6/2/2004	7:00:00
6/4/2004	12:30:00
6/4/2004	13:00:00
6/4/2004	13:30:00

6/4/2004	14:00:00
6/4/2004	14:30:00
6/4/2004	15:00:00
6/4/2004	15:30:00
6/4/2004	16:00:00
6/4/2004	16:30:00
6/4/2004	18:30:00
6/4/2004	19:00:00
6/4/2004	19:30:00
6/4/2004	20:00:00
6/4/2004	20:30:00
6/4/2004	21:00:00
6/5/2004	1:00:00
6/5/2004	1:30:00
6/5/2004	2:00:00
6/5/2004	2:30:00
6/5/2004	3:00:00
6/5/2004	3:30:00
6/10/2004	13:30:00
6/10/2004	18:30:00
6/10/2004	19:00:00
6/10/2004	19:30:00
6/10/2004	21:00:00
6/10/2004	22:00:00
6/10/2004	22:30:00
6/10/2004	23:00:00
6/10/2004	23:30:00
6/11/2004	0:00:00
6/11/2004	0:30:00
6/11/2004	1:00:00
6/11/2004	1:30:00
6/11/2004	2:00:00
6/11/2004	2:30:00
6/11/2004	7:30:00
6/11/2004	10:30:00
6/11/2004	14:30:00
6/11/2004	15:00:00
6/11/2004	22:00:00
6/17/2004	11:30:00
6/18/2004	8:00:00
6/18/2004	8:30:00
6/18/2004	11:30:00
6/18/2004	15:30:00
6/18/2004	16:00:00
6/22/2004	22:30:00
6/22/2004	23:00:00
6/22/2004	23:30:00
6/23/2004	14:30:00
6/23/2004	15:00:00
6/25/2004	16:00:00

6/25/2004	17:30:00
6/25/2004	21:30:00
7/13/2004	23:30:00
7/25/2004	9:00:00
7/26/2004	9:30:00
7/26/2004	18:00:00
8/13/2004	23:30:00
12/13/2004	12:30:00
12/13/2004	15:30:00
12/14/2004	1:30:00
12/14/2004	2:30:00
12/14/2004	8:30:00
12/14/2004	18:00:00
12/14/2004	22:00:00
12/15/2004	1:00:00
12/15/2004	12:00:00
12/15/2004	14:00:00
12/17/2004	16:00:00
12/17/2004	22:00:00

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 are 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

<u>Date</u>	<u>Time</u>	<u>Reason</u>
02/15/04	2100, 2230	Battery Failure
02/16/04	0000, 0130, 0300-0330, 0500-0600, 0730-1200, 1330-1630, 1800-2100, 2200-2330	Battery Failure
02/17/04	0000-0100	Battery Failure
02/17/04 0230 -02/19/04 1330		Battery Failure
02/19/04 1500 -02/25/04 1600		Battery Failure
03/28/04 2130 -03/31/04 1200		Battery Failure
07/26/04	1000	Sonde Switch
08/17/04	1500	Sonde Switch
11/09/04	1200	Sonde Switch
12/26/04 1300 -12/31/04 2330		Battery Failure

Loosin Creek

<u>Date</u>	<u>Time</u>	<u>Reason</u>
06/16/04	1230	Sonde Switch
07/26/04	0930	Sonde Switch
08/17/04 1600 -8/27/04 1030		Deployment Structure Replacement
09/09/04	1000	Sonde Switch
10/26/04	1230	Sonde Switch

East Cribbings

<u>Date</u>	<u>Time</u>	<u>Reason</u>
06/16/04	1000	Sonde Switch
07/07/04	1330	Sonde Switch
07/27/04	0830	Sonde Switch
08/17/04	1100	Sonde Switch
09/10/04 0900 -09/29/04 1000		Deployment Structure Replacement
10/26/04	0900	Sonde Switch
11/09/04	0930	Sonde Switch

Zeke's Basin

<u>Date</u>	<u>Time</u>	<u>Reason</u>
01/23/04	1130	Sonde Switch
02/24/04	1430	Sonde Switch
05/06/04	1030	Sonde Switch
08/17/04 1200 -09/02/04 0830		Deployment Structure Replacement

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 50.00; Turbidity 0; Depth 0.000m

01/21/04; 103.0; 7.10; 49.55; 0.3; 0.094
 02/19/04; 104.6; 7.12; 48.75; 0.0; -0.063
 03/31/04; 125.0; 7.32; 50.23; 0.0; -0.011
 04/27/04; 99.1; 7.01; 50.3; 0.4; 0.012

05/25/04; 87.2; 7.03; 49.8; -0.3; 0.025
06/15/04; 98.5; 6.97; 48.7; 0.1; 0.020
07/08/04; 98.6; 5.94; 14.35; 1.6; -0.012
07/26/04; 100.9; 7.04; 46.51; 1.8; .031
08/17/04; 99.6; 7.13; 18.92; 2.7; 0.035
09/09/04; 49.0; 7.07; 49.47; -34.3; 0.067
09/29/04; 101.6; 7.06; 50.40; 1.0; 0.049
10/26/04; 104.0; 7.20; 49.33; -0.2; 0.039
11/09/04; 101.9; 6.87; 50.61; 0.5; 0.079
12/06/04; 99.8; 6.87; 49.77; 0.5; -0.100
01/06/05; 73.3; 7.01; 45.36; 0.1; -0.091

Site LC

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

01/21/04; 103; 7.02; 48.0; -0.1; 0.100
02/25/04; 100.9; 7.28; 52.0; 0.1; -0.054
03/25/04; 103.1; 7.13; 50.48; 0.1; 0.156
04/27/04; 104.3; 6.8; 215.7; -0.3; -0.067
05/27/04; 100.9; 7.00; 48.3; 0.4; -0.039
06/16/04; 99.5; 6.14; 45.9; -0.3; 0.067
07/08/04; 99.8; 6.88; 49.29; 2.0; -0.044
07/26/04; 98.4; 7.02; 48.51; 0.5; .043
08/17/04; 101.5; 7.05; 23.54; 2.1; -0.002
09/09/04; 96.8; 7.07; 49.38; 0.0; -0.043
09/29/04; 100.8; 7.01; 51.05; 0.4; 0.015
10/26/04; 101.4; 6.93; 49.67; -0.5; 0.059
11/09/04; 101.4; 7.20; 50.71; 0.4; 0.084
12/06/04; 98.3; 6.99; 49.00; 0.3; -0.100
01/06/05; 101.9; 7.00; 50.52; 0.1; -0.097

Site EC

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

01/23/04; 104.1; 7.13; 53.55; 0.8; -0.053
02/24/04; 100.7; 7.10; 50.75; -0.8; -0.041
03/26/04; 102.5; 7.04; 49.76; 0.2; 0.108
04/27/04; 100.9; 7.2; 49.6; -1.0; -0.183
05/27/04; 95.5; 7.0; 49.9; 1.0; -0.022
06/16/04; 99.9; 5.16; 45.6; 0.6; 0.058
07/07/04; 98.5; 7.0; 48.71; 1.4; -0.068
07/27/04; 94.4; 7.02; 50.45; 0.9; 0.027
08/17/04; 98.8; 7.08; 51.16; 2.1; 0.007
09/10/04; 99.7; 7.07; 50.12; 0.2; -0.017

10/26/04; 101.8; 7.19; 50.45; -0.7; 0.039
11/09/04; 102.0; 7.05; 50.32; -0.1; 0.081
12/06/04; 98.4; 6.91; 50.00; 0.1; -0.111
01/05/05; 101.2; 6.96; 50.61; -0.1; 0.001

Site ZB

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

01/23/04; 99.7; 7.25; 50.31; 0.4; -0.056
02/24/04; 98.1; 7.02; 50.43; 0.1; -0.098
03/26/04; 92.7; 7.04; 49.66; -0.1; 0.188
05/06/04; 40.9; 5.24; 50.23; -0.2; -0.126
05/27/04; 101.6; 7.18; 48.8; 0.5; -0.112
06/16/04; 97.3; 7.3; 49.25; 0.3; 0.090
07/07/04; 93.3; 7.10; 49.8; 0.5; -0.083
07/27/04; 101.3; 7.03; 50.02; 0.3; 0.117
08/17/04; 92.8; 7.14; 49.05; 0.9; 0.017
09/10/04; 105.5; 7.22; 50.42; 0.3; -0.003
09/29/04; 102.7; 7.12; 48.15; 1.0; -0.069
10/26/04; 101.5; 7.15; 50.91; -0.2; 0.186
11/15/04; 99.8; 6.92; 50.22; 0.3; 0.117
12/06/04; 97.3; 6.93; 49.83; 0.4; -0.602
01/07/05; 104.2; 6.86; 50.58; 0.0; 0.000

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.

Date/Time stamps were slightly off for some of this year's data sets due to a glitch in the YSI EDS software. Time stamps were corrected to reflect half hour sampling increments.

Tropical Storm Charley passed over the area on 14 August 2004.

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.