Old Woman Creek (OWC) NERR Site Water Quality Metadata
March through December, 2007
Latest Update: 18 June 2010

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2. Entry verification:

Deployment data are uploaded from the YSI data logger to a Personal Computer (IBM compatible). Files are exported from EcoWatch in a comma-delimited format (.CDF) and uploaded to the CDMO where they undergo automated primary QAQC and become part of the CDMO's online provisional database. Excessive pre- and post-deployment data are removed from the file prior to upload with up to 2 hours of pre- and post-deployment data retained to assist in data management. During primary QAQC, data are flagged if they are missing or out of sensor range. The edited file is then returned to the Reserve where it is opened in Microsoft Excel and processed using the CDMO's NERRQAQC Excel macro. The macro inserts station codes, creates metadata worksheets for flagged data, and graphs the data for review. It allows the user to apply QAQC flags and codes to the data, remove remaining pre- and post-deployment data, append files, and export the resulting data file to the CDMO for tertiary QAQC and assimilation into the CDMO's authoritative online database. Where deployment overlap occurs between files, the data produced by the newly calibrated sonde is generally accepted as being the most accurate. For more information on QAQC flags and codes, see Sections 11 and 12.The files are archived at OWC. Dr. David Klarer was responsible for both data logger deployment and data management at Old Woman Creek NERR during the 2007 deployment.

3. Research Objectives:

Measurements are taken every 15 minutes over two or three-week periods at four sites within the Old Woman Creek- three in the estuary proper- one in the upper reaches at State Route 2 (SU), one near the mouth, just south of State Route 6 (WM), and the third site upstream from the WM site (OL). The final site (BR) is just upstream of the first riffle zone above the estuary in Old Woman Creek proper. The purpose of this monitoring program is to document the role of this Great Lakes estuary in the Lake Erie ecosystem, particularly the estuary's role in mitigating storm flow that passes through it. In August Site SU had to be moved upstream approximately 0.3 kilometers to DR (Darrow Road), as the Ohio Department of Transportation was working on the bridge and the adjacent road at the SU site. The role of the OL site is to

document the degree of intrusion by lake water during northerly winds and subsequent seiche events.

4. Research methods:

The YSI monitoring program began on 26`March, 2007 at all four sites. The sampling at all sites ended for the year on 10 December, 2007. Prior to deployment of the data loggers, a 4-inch diameter PVC pipe was bolted to an 8-foot long metal post that had been driven into the sediment. The logger trap at site DR was not bolted to an 8-foot metal post, but rather was suspended from the north side of the road bridge by metal chain. Each pipe had 4 rows of holes or 4 vertical slits ¾" wide drilled into it spanning the area of the probe guard on the data logger to insure that the probes would have direct contact with the surrounding waters. Additional field readings for dissolved oxygen, pH, temperature, turbidity, and specific conductance are taken when the instrument is changed at each site (see the Other Remarks Section). The data loggers are replaced in the field after a two or three-week deployment, depending on temperature and degree of fouling of the data loggers. All data loggers were the YSI 6600 extended deployment (EDS) loggers. The data was retrieved from each data logger and each data logger was recalibrated (according to the directions in the YSI Operations Manual) before being returned to the field. Conductivity, turbidity (2 point calibration using distilled water for zero turbidity and a YSI standard for the other turbidity point), pH (2 point calibration), and turbidity (2 point calibration) are calibrated using commercial standards. These standards were prepared prior to each deployment. The data logger at sites WM has vented water level sensors, while the loggers at sites BR, OL, and DR have non-vented depth sensors. Vented and non-vented depth sensors were used at SU. At sites WM and intermittently at sites SU and DR, the ROX optical dissolved oxygen probe was used. The calibration logs (available by contacting the Reserve directly) provide sensor information.

A Sutron Sat-Link2 transmitter was installed at Site OL during October 2006. This system transmits data to the NOAA Goes satellite, NESDIS ID# 3B02849A. The transmissions are scheduled hourly and contain four (4) data sets reflecting fifteen minute data sampling intervals. Upon receipt by the CDMO, the data undergoes the same automated primary QAQC process detailed in Section 2 above. The "real-time" telemetry data become part of the provisional dataset until undergoing secondary and tertiary QAQC and assimilation in the CDMO's authoritative online database. Provisional and authoritative data are available at http://cdmo.baruch.sc.edu.

5. Site Location and Character:

Old Woman Creek National Estuarine Research Reserve is located on the southern shore of Lake Erie, slightly east of the city of Huron, Ohio (Latitude 41° 23'N; Longitude 82° 33'W). Land use in the Old Woman Creek (OWC) watershed is primarily row crop agriculture. Other than the non-point source pollutants coming into the estuary from these agricultural practices and from the town of Berlin Heights, there are no other major pollution sources in the estuary. Salinity in Old Woman Creek is normally 1 ppt. or less, although it will rise, on occasion, to nearly 2 ppt. The tidal range in Lake Erie (and therefore in the estuary) is on the order of 4 cm or less. Water levels in the estuary and in the creek are extremely variable, with changes occurring daily, seasonally and annually.

The data logger at the State Route 6 (WM) site (Latitude 41° 22' 57" N, Longitude 82° 30'54" W) is very close to the mouth of Old Woman Creek. In this portion of the Reserve, the

creek is very shallow but extends over a large surface area. This site frequently experiences influx of Lake Erie waters. The bottom sediments at this site are silty clay. At the beginning of the deployment for 2007, there was no rooted aquatic vegetation directly adjacent to the site, although there was both emergent and submerged vegetation within 3 meters of the site. By mid September, *Phragmites australis* had grown up around the data logger trap. The data logger is about .30 meters above the bottom sediments. On 29 October, 2007 at 10:45-11:00, the trap was lowered 2 cm. During the 19 November deployment, a short guard was used, which effectively lowered the sonde 5 cm in the water column. On 28 November, 2007 at about 10:45, the trap was lowered 10 cm to get the sonde back into the water.

The data logger at the State Route 2 (SU) site (Latitude 41° 22' 2" N, Longitude 82° 30'26" W) is very near the southern boundary of the Reserve. This site is in the upper reaches of the estuary. The data logger is sited near a concrete piling of the eastbound Ohio State Route 2 bridge. At this site, the creek is relatively deep and narrow. Although water direction and flow is influenced at this site by changes in Lake Erie water levels, this site doesn't have direct contact with Lake Erie waters. The bottom sediments at this site are silty clay. There is no rooted aquatic vegetation near or upstream from this site. The data logger is about .15 meters above the bottom at this site. This site was abandoned on August .

The data logger at site OL (Latitude 41^0 22' 55" N, Longitude 82^0 30'51" W) is in the lower reaches of the estuary. This site is not in direct sight of the mouth, so northerly winds and resulting seiche activities should be less noticeable at this site. The bottom sediments are silty clay. This site is located about 5 meters north of a *Nelumbo lutea* bed, but, there were no plants immediately adjacent to the data logger. The base of data logger is about 46 cm above the sediment. On 29 October lowered the trap 29 cm to get logger back under water. The trap was now .17 meters above the bottom. On the 8 October deployment and on all subsequent deployments, used a short guard instead of the normal long guard. This effectively lowered the sonde 5 cm in the water column.

The data logger at site BR (Latitude 41^0 20'54" N, Longitude 82^0 30'30"W) is located in the lower portion of the creek proper. Just upstream from the data logger, Berlin Road crosses Old Woman Creek. The site is just upstream of the first riffle area above the estuary. Unlike the other three sites, Lake Erie water levels have no impact on this site. The bottom of the creek at this site is a combination of rocks interspersed with some clay-silt that has been washed in from upstream. There are no aquatic macrophytes at or near this site. The trap is 18 cm above the bottom at this site. Short guards were used on all loggers at this site through the year. On 10/8/2006 at 08:15 installed wire mesh fencing around trap to diminish debris build-up around the logger. Fencing was removed at end of deployment period.

The data logger at site DR (Latitude 41^0 21'54"N, Longitude 82^0 30' 17"W) is at the southern boundary of the reserve. The logger trap is suspended from one of the supports on the north side of the Darrow Road bridge. At this site the creek is relatively narrow. Although water direction and flow is influenced at this site by changes in Lake Erie water levels, this site doesn't have direct contact with Lake Erie waters. The bottom sediments at his site are silty clay. There is no rooted aquatic vegetation near or upstream from this site. The data logger is about .15 meters above the bottom at this site. The first deployment at this site was on 28 August, 2007. On 9 September, 2007 at 08:00:00 the trap and logger were moved from the edge of the creek channel to the center of the creek channel and the trap was lowered 20 cm. At this location, the logger was still about .15 meters above the bottom.

6. Data collection periods:

Sampling at WM began on March 26 2007 at 08:15. The logger was pulled for the year on

December 10, 2007 at 14:45. Sampling at SU began on March 26, 2007 at 16:45. The logger was pulled for the year on August 23,2007 at 13:15, due to pending bridge construction. The (v) or (nv) following deployment times for Site SU denote whether the logger deployed was vented (v) or non-vented (nv). Sampling at OL began on March 26, 2007 at 07:45, and ceased on December 10, 2007 at 14:30. Sampling at BR began on March 26, 2007 at 09:30 and ceased on December 10, 2007 at 15:45. Sampling at DR began on August 28, 2007 at 10:30 and ended for the year on December 10, 2007 at 15:30. Specific deployment dates are listed below.

Site	Deployed	Pulled
WM	3/26/2007 (08:15)	4/16/2007 (07:30)
	4/16/2007 (07:45)	5/7/2007 (05:30)
	5/7/2007 (07:30)	5/21/2007 (07:45)
	5/21/2007 (08:15)	6/4/2007 (07:15)
	6/4/2007 (07:30)	6/8/2007 (07:45)
	6/8/2007 (08:00)	6/25/2007 (07:15)
	6/25/2007 (07:30)	7/16/2007 (07:30)
	7/16/2007 (07:45)	8/6/2007 (07:15)
	8/6/2007 (07:30)	8/27/2007 (07:00)
	8/27/2007 (07:30)	9/17/2007 (08:30)
	9/17/2007 (08:45)	10/9/2007 (07:00)
	10/9/2007 (07:15)	10/29/2007 (08:15)
	10/29/2007 (08:30)	11/19/2007 (08:45)
	11/19/2007 (09:00)	12/10/2007 (14:45)
SU	3/26/2007 (16:45)	4/16/2007 (08:00) V
	4/16/2007 (08:15)	5/7/2007 (08:00) NV
	5/7/2007 (08:15)	5/21/2007 (08:30) NV
	5/21/2007 (09:00)	6/4/2007 (08:00) NV
	6/4/2007 (08:15)	6/25/2007 (08:00) V
	6/25/2007 (08:15)	7/16/2007 (08:00) NV
	7/16/2007 (08:15)	8/6/2007 (08:00) V
	8/6/2007 (08:15)	8/23/2007 (13:15) NV
OL	3/26/2007 (07:45)	4/16/2007 (07:30)
	4/16/2007 (07:45)	5/7/2007 (07:00)
	5/7/2007 (07:15)	5/21/2007 (07:45)
	5/21/2007 (08:00)	6/4/2007 (07:15)
	6/4/2007 (07:30)	6/25/2007 (07:15)
	6/25/2007 (07:30)	7/16/2007 (07:15)
	7/16/2007 (07:45)	8/6/2007 (07:15)
	8/6/2007 (07:30)	8/27/2007 (07:00)
	8/27/2007 (07:15)	9/17/2007 (08:15)
	9/17/2007 (08:30)	10/9/2007 (06:45)
	10/9/2007 (07:15)	10/29/2007 (10:00)
	10/29/2007 (10:15)	11/19/2007 (08:30)
	11/19/2007 (09:00)	12/10/2007 (14:30)
BR	3/26/2007 (09:30)	4/16/2007 (08:30)
	4/16/2007 (08:45)	5/7/2007 (08:15)

	5/7/2007 (08:30)	5/21/2007 (08:45)
	5/21/2007 (09:15)	6/4/2007 (08:15)
	6/4/2007 (08:30)	6/25/2007 (08:15)
	6/25/2007 (08:30)	7/16/2007 (08:15)
	7/16/2007 (08:30)	8/6/2007 (08:30)
	8/6/2007 (08:45)	8/27/2007 (07:45)
	8/27/2007 (08:00)	9/17/2007 (07:45)
	9/17/2007 (08:00)	10/9/2007 (11:15)
	10/9/2007 (11:30)	10/29/2007 (09:15)
	10/29/2007 (09:30)	11/19/2007 (09:30)
	11/19/2007 (10:00)	12/10/2007 (15:45)
DR	8/28/2007 (07:00)	9/17/2007 (07:30)
	09/17/2007 (07:45)	09/20/2007 (12:15)
	09/20/2007 (12:30)	10/9/2007 (11:00)
	10/9/2007 (11:15)	10/9/2007 (17:15)
	10/9/2007 (17:30)	10/28/2007 (14:30)
	10/28/2007 (14:45)	10/29/2007 (08:45)
	10/29/2007 (09:15)	11/19/2007 (09:15)
	11/19/2007 (09:30)	12/10/2007 (15:30)

7. Distribution

NOAA/ERD retains the right to analyze, synthesize, and publish summaries of the NERRS System-wide Monitoring Program data. The OWC Research Coordinator (RC) retains the right to be fully credited for having collected and processed the data. Following academic courtesy standard, the RC and the 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 in the enclosed metadata reporting statement. The user bears all responsibility for its subsequent use/misuse in any further analyses or comparisons. The Federal government and the State of Ohio do not assume liability to the Recipient or third persons, nor will the Federal government or the State of Ohio 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 section 1, Principal Investigators and Contact Persons), from the Data Manager at the Centralized Data Management Office (please see personnel directory under general information link on CDMO homepage) and online at the CDMO homepage http://cdmo.baruch.sc.edu/. Data are available in text tab-delimited format.

8. Associated researchers and projects:

Replicate samples for chemical analysis of the water are collected at each site every time the data loggers are changed. Samples for phytoplankton determination are collected at the same time at sites near two of the data logger deployment sites (SU and WM). Additionally, a 26 hour sampling regime (samples are collected at 2 hour intervals over the 26 hours) is conducted at the WM site once during each month. These data are part of the OWC SWMP nutrient dataset.

In addition, meteorological data are collected at 15-minute intervals at OWC and are available as part of the OWC SWMP meteorological dataset.

II. Physical Structure and Descriptors:

9. Sensor specifications:

YSI 6600EDS datalogger

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

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

Parameter: Salinity
Units: parts per thousand (ppt)
Sensor Type: Calculated from conductivity and temperature
Range: 0 to 70 ppt
Accuracy: +/- 1.0% of reading or 0.1 ppt, whichever is greater
Resolution: 0.01 ppt

Parameter: Dissolved Oxygen % saturation
Units: percent air saturation (%)
Sensor Type: Rapid Pulse – Clark type, polarographic
Model #: 6562
Range: 0 to 500 % air saturation
Accuracy: 0-200 % air saturation, +/- 2 % of the reading or 2 % air saturation, whichever is greater; 200-500 % air saturation, +/- 6 % of the reading
Resolution: 0.1 % air saturation

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

Units: milligrams per Liter (mg/L)
Sensor Type: Rapid Pulse – Clark type, polarographic
Model #: 6562
Range: 0 to 50 mg/L
Accuracy: 0 to 20 mg/L, +/- 2 % of the reading or 0.2 mg/L, whichever is greater; 20 to 50 mg/L, +/- 6 % of the reading
Resolution: 0.01 mg/L

Parameter: Dissolved Oxygen % saturation
Units: percent air saturation (%)
Sensor Type: Optical probe with mechanical cleaning
Model #: 6150 ROX
Range: 0 to 500% air saturation
Accuracy: 0-200% air saturation- +/- 1% of the reading or 1% air saturation, whichever is greater
200-500% air saturation- +/- 15% 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: Optical probe with mechanical cleaning
Model #: 6150 ROX
Range: 0-50 mg/L
Accuracy: 0-20 mg/L- +/- 2% of the reading or 0.2 mg/L, whichever is greater
20-50 mg/L- +/- 6% of the reading
Resolution: 0.01 mg/L

Parameter: Non-Vented Level – Shallow (Depth)
Units: feet or meters (ft or m)
Sensor Type: Stainless steel strain gauge
Range: 0 to 30 ft (9.1 m)
Accuracy: +/- 0.06 ft (0.018 m)
Resolution: 0.001 ft (0.001 m)

Parameter: 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 0-10 ft: +/- 0.01 ft (0.003 m)
Accuracy 10-30 ft: +/- 0.06 ft (0.018 m)
Resolution: 0.001 ft (0.001 m)

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

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

The NERRS 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 atmosphere 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 1.03 cm for every 1millibar 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 is available, non-vented sensor depth measurements can be corrected for deployments between calibrations. Readings for both vented and non-vented sensors are automatically compensated for water density changes due to variations in temperature and salinity.

Beginning in 2006, NERR SWMP standard calibration protocol calls for all non-vented depth sensors to read 0 meters at a (local) barometric pressure of 1013.25 mb (760 mm/hg). To achieve this, each site calibrates their depth sensor with a depth offset number, which is calculated using the actual atmospheric pressure at the time of calibration and the equation provided in the SWMP calibration sheet or Digital Calibration Log. This offset procedure standardizes each depth calibration for the entire NERR System. If accurate atmospheric pressure data are available, non-vented sensor depth measurements at any NERR site can be corrected. The Research Coordinator at the specific NERR site should be contacted in order to obtain information regarding atmospheric pressure data availability. . At OWC NERR in 2007, sites SU (on alternate deployments) and WM employed water level sensors and sites BR, OL, and DR (and SU on alternate deployments) employed non-vented depth sensors.

10. Coded variable definitions:

Sampling Station	Sampling site code	Station code
State Route 6	WM	owcwmwq
State Route 2	SU	owcsuwq
Lower Estuary	OL	owcolwq
Berlin Road	BR	owcbrwq
Darrow Road	DR	owcdrwq

11. QAQC flag

QAQC flags provide documentation of the data and are applied to individual data points by insertion into the parameter's associated flag column (header preceded by an F_). During primary automated QAQC (performed by the CDMO), -5, -4, and -2 flags are applied automatically to indicate data that is missing and above or below sensor range. All remaining data are then flagged 0, passing initial QAQC checks. During secondary

and tertiary QAQC 1, -3, and 5 flags may be used to note data as suspect, rejected due to QAQC, or corrected.

-5 Outside High Sensor Range
-4 Outside Low Sensor Range
-3 Data Rejected due to QAQC
-2 Missing Data
-1 Optional SWMP Supported Parameter
0 Data Passed Initial QAQC Checks
1 Suspect Data
2 *Open - reserved for later flag*
3 *Open - reserved for later flag*
4 Historical Data: Pre-Auto QAQC
5 Corrected Data

12. QAQC code definitions

QAQC codes are used in conjunction with QAQC flags to provide further documentation of the data are are also applied by insertion into the associated flag column. There are three (3) different code categories, general, sensor, and comment. General errors document general problems with deployment or YSI datasonde, sensor errors are sensor specific, and comment codes are used to further document conditions or a problem with the data. Only one general or sensor error and one comment code can be applied to a particular data point.

General Errors

GIC	No Instrument Deployed Due to Ice
GIM	Instrument Malfunction
GIT	Instrument Recording Error; Recovered Telemetry Data
GMC	No Instrument Deployed Due to Maintenance/Calibration
GNF	Deployment Tube Clogged / No Flow
GOW	Out of Water Event
GPF	Power Failure / Low Battery
GQR	Data Rejected Due to QA/QC Checks
GSM	See Metadata

Sensor Errors

SBO	Blocked Optic
SCF	Conductivity Sensor Failure
SDF	Depth Port Frozen
SDO	DO Suspect
SDP	DO Membrane Puncture
SIC	Incorrect Calibration / Contaminated Standard
SNV	Negative Value
SOW	Sensor Out of Water
SPC	Post Calibration Out of Range
SSD	Sensor Drift
SSM	Sensor Malfunction
SSR	Sensor Removed / Not Deployed
STF	Catastrophic Temperature Sensor Failure
STS	Turbidity Spike
SWM	Wiper Malfunction / Loss

Comments

CAB	Algal Bloom
CAF	Acceptable Calibration/Accuracy Error of Sensor
CAP	Depth Sensor in Water, Affected by Atmospheric Pressure
CBF	Biofouling
CCU	Cause Unknown
CDA	DO Hypoxia (<3 mg/L)
CDB	Disturbed Bottom
CDF	Data Appear to Fit Conditions
CFK	Fish Kill
CIP	Surface Ice Present at Sample Station
CLT	Low Tide
CMC	In Field Maintenance/Cleaning
CMD	Mud in Probe Guard
CND	New Deployment Begins
CRE	Significant Rain Event
CSM	See Metadata
CTS	Turbidity Spike
CVT	Possible Vandalism/Tampering
CWD	Data Collected at Wrong Depth

13. Post deployment information:

End of Deployment Post-calibration Readings in Standard Solutions: Dissolved oxygen standard is in parentheses following the DO reading. Depth is always 0.0 meters for the vented loggers. For the unvented loggers, the depth reading in parentheses after the first depth reading is the expected depth reading when correcting for changes in barometric pressure. The specific conductivity standard is 1.413 mS/cm. The pH standard is 7.00. The primary turbidity standard is zero, and the second standard is in parentheses after the second turbidity reading. An asterisk after the DO% reading signifies that the DO membrane was punctured at time of retrieval. Complete post deployment data are in the calibration sheets which can be obtained by contacting the Reserve directly.

Site	Date	Sp. Cond.	DO(%)	pH	Turb	Depth
WM	4/16/2007	1.450	96.0 (97.8)	7.10	0.3; 124.7 (121)	.036(suspect)
	5/7/2007	1.473	100.4 (98.7)	6.91	0.9;119.5 (119)	-.005
	5/21/2007	1.576	95.1 (98.7)	7.04	0.6;126.7 (123)	0.000
	6/4/2007	1.440	96.8 (96.2)	7.09	1.7;123.7 (123)	-.003
	6/8/2007	1.383	97.3 (97.3)	7.02	0.7 ;123.8 (123)	.000
	6/25/2007	1.397	99.1 (98.4)	7.02	1.4;82.2 (123)	-.002
	7/16/2007	1.323	99.6 (97.9)	7.03	3.2;126.5 (123)	-.001
	8/6/2007	1.255	96.6 (97.3)	6.97	-0.4; 119.1 (123)	.002
	8/27/2007	1.339	98.0 (98.3)	7.05	2.8;112.2 (123)	.000
	9/17/2007	1.467	99.7 (99.0)	7.07	0.2; 113(123)	.001
	10/9/2007	1.341	99.3 (98.2)	7.13	1.5;125.6(123)	-.006
	10/29/2007	1.253	98.5 (99.3)	7.00	0.6123.0 (123)	.000
	11/19/2007	1.414	95.6 (98.0)	7.11	2.5;123.8(123)	-.002
	12/10/2007	1.400	100.0 (99.1)	7.06	1.3;124.8(123)	.003

Site	Date	Sp. Cond.	DO(%)	pH	Turb	Depth
SU	4/16/2007	1.395	106.5 (97.5)	7.19	0.6; 123.5 (123)	7.615(failure)
	5/7/2007	1.493	85.0 (98.8)	6.97	1.4; 119.5 (119)	-.129 (-.121)
	5/21/2007	1.626	103.4 (98.6)	6.96	0.1; 123 (123)	.000 (-.005)
	6/4/2007	1.453	96.1 (96.0)	7.06	1.8; 125.1 (123)	-.392 (-.393)
	6/25/2007	1.436	*	7.04	11.3;134.1 (123)	-.020
	7/16/2007	1.412	96.8 (98.2)	7.09	0.0;125.4 (123)	-.191 (-.191)
	8/6/2007	1.306	113.6 (97.4)	7.07	0.2; 141.2 (123)	-.003
	8/23/2007	1.267	97.7 (97.5)	7.11	0.9; 112 (123)	-.253(-.257)

Site	Date	Sp. Cond.	DO(%)	pH	Turb	Depth
OL	4/16/2007	1.413	66.0 (97.8)	7.15	1.6;124.0 (121)	-.237 (-.227)
	5/7/2007	1.496	105.4 (98.8)	6.99	0.8; 121.6 (119)	-.143 (-.125)
	5/21/2007	1.574	102.6 (98.7)	7.09	1.8;128 (123)	-.148 (-.139)
	6/4/2007	1.417	101.2 (96.2)	7.09	1.4; 126.2 (123)	-.402 (-.396)
	6/25/2007	1.315	103.1 (98.2)	7.11	2.2; 133.0 (123)	-.181 (-.182)
	7/16/2007	1.220	105.5 (97.9)	7.10	2.7; 125.9 (123)	-.215 (-.209)
	8/6/2007	1.461	104.1 (97.3)	6.94	-.06; 141 (123)	-.312 (-.269)
	8/27/2007	1.423	*	7.02	0.2; 112.9 (123)	-.157 (-.156)
	9/17/2007	1.392	109.0 (99.0)	6.98	0.5; 125.0 (123)	-.134 (-.101)
	10/9/2007	1.378	104.4 (98.0)	6.82	1.3; 130.8 (123)	-.209 (-.213)
	10/29/2007	1.461	105.9 (99.5)	7.09	0.7; 117.8 (123)	-.060 (-.054)
	11/19/2007	1.402	113.9 (98.0)	7.07	0.2; 126.6 (123)	-.205 (-.212)
	12/10/2007	1.421	*	7.00	0.7; 122.4 (123)	-.109 (-.101)

Site	Date	Sp. Cond.	DO(%)	pH	Turb	Depth
BR	4/16/2007	1.392	91.8 (97.4)	7.03	1.0; 122.5 (121)	-.289 (-.272)
	5/7/2007	1.450	106.3 (98.8)	6.94	0.7; 119.4 (119)	-.136 (-.124)
	5/21/2007	1.392	111.0 (98.7)	7.05	0.3; 126.0 (123)	-.142 (-.135)
	6/4/2007	1.390	94.5 (96.3)	7.03	0.6; 124.5 (123)	-.388 (-.385)
	6/25/2007	1.436	*	7.02	4.4; 121.0 (123)	-.192 (-.198)
	7/16/2007	1.405	*	6.99	2.1; 125.2 (123)	-.198 (-.196)
	8/6/2007	1.399	*	7.03	0.5; 134.6 (123)	-.254 (-.247)
	8/27/2007	1.426	101.2 (98.6)	7.15	0; 113.6 (123)	-.150 (-.148)
	9/17/2007	1.413	*	7.00	0.9; 124.8 (123)	-.112 (-.109)
	10/9/2007	1.538	*	7.04	1.5; 126.8 (123)	-.210 (-.208)
	10/29/2007	1.464	103.0 (99.3)	7.05	0.2; 123.4 (123)	-.063 (-.069)
	11/19/2007	1.438	104.5 (98.2)	6.96	0.0; 125.2 (123)	-.190 (-.184)
	12/10/2007	1.404	94.4 (99.0)	6.94	0.1; 125.5 (123)	-.107 (-.116)

Site	Date	Sp. Cond.	DO(%)	pH	Turb	Depth
DR	9/17/2007	1.413	95.8 (99.0)	7.13	1.1; 124.5 (123)	-.106 (-.107)
	9/20/2007	*	*	*	*	*

10/9/2007	1.436	90.8 (97.6)	7.11	1.5; 123.8 (123)	-.257 (-.245)
10/9/2007	1.445	92.6 (97.6)	7.14	1.2; 149.5 (123)	-.002 (.000)
10/28/2007	1.391	105.2 (99.9)	7.07	-1.6; 135.8 (123)	.487 (-.016)
10/29/2007	1.447	111.3 (99.4)	7.06	1.2; 120.5 (123)	-.020 (-.065)
11/19/2007	1.411	101.3 (98.2)	7.08	-0.5; 125.7 (123)	-.177 (-.189)
12/10/2007	1.359	112.5 (91.1)	6.98	1.4; 125.7 (123)	-.098 (-.092)

15. Other Remarks:

Depth data for WM from 3/26/2007 (08:15) through 4/16/2007 (06:45) questionable as there was water in vent line- It was blown out on 4/12/2007

Depth data for SU from 3/26/2007 (16:45) through 4/16/2007 (08:00) questionable as there was water in the vent line

Field data collected at time of data logger swap is reported below. Specific conductivity was taken in the laboratory immediately after returning from the field. Temperature is reported in Degrees C, specific conductivity in millimhos, and oxygen in milligrams/liter.

Site	Date	Temp	Sp. Cond.	DO(mg/l)	pH
WM	3/26/2007	15.2	.556	8.26	7.84
	4/16/2007	6.5	.484	11.1	8.04
	5/7/2007	14.6	.466	9.1	7.74
	5/21/2007	16.4	.540	9.27	7.95
	6/4/2007	21.1	.609	4.82	7.68
	6/8/2007	24.7	.604	6.43	7.77
	6/25/2007	23.9	.522	8.81	7.96
	7/16/2007	23.9	.589	4.99	7.78
	8/6/2007	25.9	.613	3.70	7.42
	8/27/2007	23.8	.331	7.66	8.48
	9/17/2007	18.4	.473	7.06	7.92
	10/9/2007	24.0	.535	10.78	7.92
	10/29/2007	9.6	.698	8.15	7.84
	11/19/2007	6.2	.659	10.78	7.87
	12/10/2007	5.4	.577	11.36	7.74

Site	Date	Temp	Sp. Cond.	DO(mg/l)	pH
SU	3/26/2007	15.5	.586	9.33	7.91
	4/16/2007	8.2	.675	10.69	8.14
	5/7/2007	15.7	.567	11.1	8.24
	5/21/2007	14.8	.691	8.96	8.01
	6/4/2007	20.5	.524	7.38	7.78
	6/25/2007	22.6	.678	7.49	7.79

	7/16/2007	23.6	.750	6.38	7.85
	8/6/2007	25.4	.608	6.96	7.99
	8/23/2007	23.8	.525	7.20	7.56

Site	Date	Temp	Sp. Cond.	DO(mg/l)	pH
OL	3/26/2007	15.5	.572	9.26	7.92
	4/16/2007	6.2	.564	11.22	7.98
	5/7/2007	14.4	.478	8.80	7.74
	5/21/2007	16.2	.539	9.92	8.00
	6/4/2007	20.8	.640	4.42	7.58
	6/25/2007	23.7	.526	10.22	8.08
	7/16/2007	22.8	.592	5.24	7.78
	8/6/2007	25.8	.596	3.65	7.42
	8/27/2007	23.0	.398	6.98	8.14
	9/17/2007	16.8	.545	7.20	7.90
	10/9/2007	22.4	.736	4.52	7.60
	10/29/2007	11.4	.706	8.30	7.92
	11/19/2007	6.0	.666	10.83	7.90
	12/10/2007	5.4	.572	11.45	7.74

Site	Date	Temp	Sp. Cond.	DO(mg/l)	pH
BR	3/26/2007	13.3	.576	9.76	8.00
	4/16/2007	6.1	.651	11.88	8.10
	5/7/2007	13.2	.590	9.99	8.15
	5/21/2007	14.3	.668	8.67	8.09
	6/4/2007	20.0	.553	7.56	7.90
	6/25/2007	21.4	.728	8.49	7.82
	7/16/2007	18.4	.886	6.14	7.70
	8/6/2007	23.2	.810	6.30	7.64
	8/27/2007	20.3	.564	7.82	7.88
	9/17/2007	14.2	.769	8.34	7.82
	10/9/2007	22.6	.760	6.12	7.68
	10/29/2007	10.4	.703	9.71	7.84
	11/19/2007	6.8	.685	11.75	7.88
	12/10/2007	6.0	.514	11.76	7.76

Site	Date	Temp	Sp. Cond.	DO(mg/l)	pH
DR	8/28/2007	25.0	.596	7.00	7.78
	9/17/2007	15.3	.720	7.20	7.79
	9/20/2007	24.0	.728	8.66	7.83
	10/9/2007	22.6	.751	5.08	7.58
	10/9/2007	22.4	.736	4.52	7.60
	10/28/2007	14.9	.681	8.51	7.71

10/29/2007	10.5	.706	8.47	7.85
11/19/2007	6.7	.680	10.98	7.76
12/10/2007	5.8	.522	11.61	7.73

Data are missing due to equipment or associated specific probes not being deployed, equipment failure, time of maintenance or calibration of equipment, or repair/replacement of a sampling station platform. Any NANs in the dataset stand for "not a number" and are the result of low power, disconnected wires, or out of range readings. If additional information on missing data is needed, contact the Research Coordinator at the reserve submitting the data.