Old Woman Creek (OWC) NERR Water Quality Metadata
March through December 2004
Latest Update: September 12, 2005

1. Principal Investigator & contact person:

Dr. David Klarer, Research Coordinator
E-mail: david.klarer@oldwomancreek.org
Old Woman Creek SNP and NERR
2514 Cleveland Road East
Huron, Ohio 44839
Phone: (419) 433-4601

2. Entry verification:

The data were directly downloaded from the YSI PC6600 data loggers into the YSI Ecowatch for Windows program in the PC. The data were graphed and visually checked for any obvious outliers. Notes are made of any unusual data or faulty probes. The data is then exported as a .csv file into an Excel spreadsheet. The data files were edited to remove headers, footers, and spaces. The CDMO cdmomac3.xls macro was used to QA/QC the data. The macro automatically formatted the column widths to the correct number of decimal places based on YSI sensor specifications. It also compiled a list of all data that fell outside the stated range of the different data logger probes and is used to check for missing times. Data that fall outside of the range of the probes was deleted. Any negative depth values were deleted, because it means that the depth sensor was out of water at that time. All sensor data were deleted any time the specific conductivity fell to zero which indicated that the conductivity probe was out of water and it was assumed that the other sensor probes were likewise out of water. An explanation for the missing and the deleted data is included in this metadata report. Anomalous data not due to sensor malfunction or due to low water conditions were noted in the metadata, but not removed from the data set. The data were compiled into monthly units and then each parameter was graphed as a further check. Anomalous or bad data (which was deleted) was then determined from these graphs. The corrected data were then exported into a later version of Excel, where it was processed with the EQWinformat.xls macro that: inserts an identifying station code and inserts a corrected time column. The data were then imported into the EQWin database and text files were then transferred along with the associated metadata electronically to the CDMO. The files are archived at OWC. Dr. David Klarer is responsible for both data logger deployment and data management.

3. Research Objectives:

Measurements are taken every 15 minutes 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 is upstream from the WM site (OL) from the Spring at ice-out through the year until the next winter when ice again forms.. The final site (BR) is just upstream of the first riffle zone above the estuary in Old Woman Creek proper. The

loggers are normally switched out every two-weeks. 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. The role of the OL site is to document the degree of intrusion by lake water during wind setups and subsequent seiche events on Lake Erie.

4. Research methods:

The YSI monitoring program began on 8 March, 2004 at all four sites. The sampling at all sites ended for the year on 16 December, 2004, except for site OL, which we were unable to retrieve until 3 January, 2005. Prior to deployment of the data loggers, a 4-inch diameter PVC pipe was bolted to a metal 8-foot long metal post that had been driven into the sediment. 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 so that the probes would have direct contact with the surrounding waters. Dissolved oxygen, pH, temperature, turbidity, and specific conductance readings are taken when the instrument is pulled at each site. 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 dataloggers were the EDS (extended deployment dataloggers). The loggers were normally swapped out at two week intervals during the summer and at three intervals during the early spring and late fall. 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, pH (2 point calibration), and turbidity (2 point calibration) were calibrated using commercial standards. Formazin (Hach, 4000 NTU) was diluted to prepare the standards for turbidity. These standards were prepared prior to each deployment. The data loggers at sites WM and SU have vented depth sensors while the loggers at sites BR and OL have non-vented depth sensors.

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 Lake Erie, the OWC estuary and in the creek proper 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 2004, 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 .15 meters above the bottom sediments. On April 19.2004 at 8:15:00 the logger trap was cleared of sediment around its base. On May 5 between 07:45 and 08:00, the trap was raised 15 cm. On 11/29/2004, at 10:30:00, when the datalogger was swapped out, the new logger had a short guard instead of the long guard, this effectively lowered the logger 5 cm within the trap.

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 .13 meters above the bottom at this site. On 08/09/2004 at 07:15:00, when the datalogger was swapped out, the new logger had a long guard, this effectively raised the logger 5 cm within the trap. On 09/07/2004 at 07:45:00, when the data logger was swapped out, the new logger had a short guard, thus lowering the logger 5 cm within the trap. On 10/25/2004 at 09:00:00, when the logger was swapped out, the new logger had a long guard, thus raising the logger 5 cm within the trap. On 11/29/2004 at 09:15:00, when the logger was swapped out, the new logger had a short guard, this lowering the logger 5 cm within the trap.

The data logger at site Lower Estuary (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, unlike the previous year, there were no plants immediately adjacent to the data logger. The base of data logger is about 25 cm above the sediment. On 10 March, 2004 at about 10:40:00, the trap was raised 16 cm. On 08/09/2004 at 08:30:00, when the logger was swapped out, the new logger had a long guard , this raising the logger 5 cm within the trap. On 11/29/2004 at 10:30:00, when the logger was swapped out, the new logger had a short guard, this lowering the logger 5 cm within the trap. Due to ice formation at this site, the logger was unable to be pulled for the year until 01/03/2005 at 08:30:00. The logger ceased collecting data for the year at 08:00:00 on 12/29/2004.

The data logger at site Berlin Road (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 logger is about 13 cm above the bottom. On 03/10/2004 at about 11:20:00, the logger trap was raised about 2 cm. On 6/21/2004 (08:15:00) when the logger was swapped out, the new logger had a long guard, this raising the logger 5 cm within the trap. On 7/26/2004 (8:45:00) when the logger was swapped out, the new logger had a short guard, thus lowering the logger 5 cm in the trap.

6. Data collection periods:

Sampling at WM began on March 8, 2004 at 09:30:00. The logger was pulled for the year on 12/16/2004 at 10:00:00. Sampling at SU began on March 8, 2004 at 10:15:00. The logger was pulled for the year on 12/16/2004 at 08:45:00. Sampling at OL began on March 8, 2004 at 09:15:00, and ceased on 12/29/2004 at 08:00:00.. Sampling at BR began on March 8, 2004 at 10:30:00 and ceased on December 16, 2004 at 09:15:00. Specific deployment dates are listed below.

Site	Deployed	Pulled
WM	03/08/2004 (09:30:00)	03/29/2004 (09:30:00)
	03/29/2004 (09:45:00)	04/19/2004 (08:15:00)

	04/19/2004 (08:30:00)	05/10/2004 (08:15:00)
	05/10/2004 (08:45:00)	06/01/2004 (08:15:00)
	06/01/2004 (08:30:00)	06/21/2004 (08:45:00)
	06/21/2004 (09:15:00)	07/06/2004 (08:45:00)
	07/06/2004 (09:00:00)	07/26/2004 (09:15:00)
	07/26/2004 (09:30:00)	08/09/2004 (08:15:00)
	08/09/2004 (08:30:00)	08/23/2004 (08:15:00)
	08/23/2004 (08:30:00)	09/07/2004 (08:15:00)
	09/07/2004 (08:45:00)	09/20/2004 (08:30:00)
	09/20/2004 (08:45:00)	10/05/2004 (08:15:00)
	10/05/2004 (08:30:00)	10/25/2004 (07:45:00)
	10/25/2004 (08:00:00)	11/08/2004 (10:15:00)
	11/08/2004 (10:30:00)	11/29/2004 (10:15:00)
	11/29/2004 (10:30:00)	12/16/2004 (10:00:00)
SU	03/08/2004 (10:15:00)	03/29/2004 (08:30:00)
	03/29/2004 (08:45:00)	04/19/2004 (07:15:00)
	04/19/2004 (07:45:00)	05/10/2004 (07:30:00)
	05/10/2004 (07:45:00)	06/01/2004 (07:15:00)
	06/01/2004 (07:45:00)	06/21/2004 (07:30:00)
	06/21/2004 (07:45:00)	07/06/2004 (07:45:00)
	07/06/2004 (08:00:00)	07/26/2004 (08:15:00)
	07/26/2004 (08:30:00)	08/09/2004 (07:15:00)
	08/09/2004 (07:30:00)	08/23/2004 (07:15:00)
	08/23/2004 (07:30:00)	09/07/2004 (07:30:00)
	09/07/2004 (07:45:00)	09/20/2004 (07:45:00)
	09/20/2004 (08:00:00)	10/05/2004 (07:30:00)
	10/05/2004 (07:45:00)	10/25/2004 (08:45:00)
	10/25/2004 (09:00:00)	11/08/2004 (08:45:00)
	11/08/2004 (09:15:00)	11/29/2004 (09:00:00)
	11/29/2004 (09:15:00)	12/16/2004 (08:45:00)
OL	03/08/2004 (09:15:00)	03/29/2004 (09:30:00)
	03/29/2004 (09:45:00)	04/19/2004 (08:00:00)
	04/19/2004 (08:15:00)	05/10/2004 (08:30:00)
	05/10/2004 (08:45:00)	06/01/2004 (08:30:00)
	06/01/2004 (08:45:00)	06/21/2004 (08:45:00)
	06/21/2004 (09:00:00)	07/06/2004 (08:45:00)
	07/06/2004 (09:00:00)	07/26/2004 (09:00:00)
	07/26/2004 (09:15:00)	08/09/2004 (08:15:00)
	08/09/2004 (08:30:00)	08/23/2004 (08:15:00)
	08/23/2004 (08:30:00)	09/07/2004 (08:45:00)
	09/07/2004 (09:00:00)	09/20/2004 (08:30:00)
	09/20/2004 (08:45:00)	10/05/2004 (08:15:00)
	10/05/2004 (08:30:00)	10/25/2004 (07:45:00)
	10/25/2004 (08:00:00)	11/08/2004 (10:30:00)

	11/08/2004 (10:45:00)	11/29/2004 (10:15:00)
	11/29/2004 (10:30:00)	01/03/2005 (08:30:00)*
BR	03/08/2004 (10:30:00)	03/29/2004 (09:00:00)
	03/29/2004 (09:15:00)	04/19/2004 (07:30:00)
	04/19/2004 (07:45:00)	05/10/2004 (07:45:00)
	05/10/2004 (08:00:00)	06/01/2004 (07:45:00)
	06/01/2004 (08:00:00)	06/21/2004 (07:45:00)
	06/21/2004 (08:15:00)	07/06/2004 (08:00:00)
	07/06/2004 (08:15:00)	07/26/2004 (08:45:00)
	07/26/2004 (09:00:00)	08/09/2004 (07:45:00)
	08/09/2004 (08:00:00)	08/23/2004 (07:45:00)
	08/23/2004 (08:00:00)	09/07/2004 (07:45:00)
	09/07/2004 (08:00:00)	09/20/2004 (08:00:00)
	09/20/2004 (08:30:00)	10/05/2004 (07:45:00)
	10/05/2004 (08:00:00)	10/25/2004 (09:00:00)
	10/25/2004 (09:15:00)	11/08/2004 (09:15:00)
	11/08/2004 (09:30:00)	11/29/2004 (09:30:00)
	11/29/2004 (09:45:00)	12/16/2004 (09:15:00)

* see Missing Data Section

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 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.
Several researchers use the water quality data, particularly at sites WM and SU:

Dr. Yu-Ping Chin and his students are examining the photolytic breakdown of organic contaminants in the estuary.
Dr. Lavrentyev and associates are using the water quality data in conjunction with a study of the eukaryotic plankton communities in the estuary and the nearshore zone of Lake Erie

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: 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: Vented Level – Deep (Depth)
Units: feet or meters (ft or m)
Sensor Type: Stainless steel strain gauge
Range: 0 to 656 ft (200 m)
Accuracy: +/- 1 ft (0.3 m)
Resolution: 0.001 ft (0.001 m)

Parameter: pH (specify whether EDS probe or not)
Units: units
Sensor Type: Glass combination electrode
Model #: 6561
Range: 0 to 14 units
Accuracy: +/- 0.2 units
Resolution: 0.01 units

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

The reliability of dissolved oxygen (DO) data after 96 hours of deployment for non-extended deployment system loggers may be problematic due to fouling of the DO sensor membrane. Since here at OWC only extended deployment sondes are being used, the DO data are much less problematic. The post-deployment checks (section 14 of this report) provide a general indication of how extensive fouling was on the different sensors at recovery, sice the post deployment checks are conducted on the sensors as they come out of the field.

The NERRS System-Wide Monitoring Program utilize YSI data sondes that are equipped with either depth or water level sensors. Both sensors measure water depth, but by convention, level sensors provide atmospherically vented measurements and depth sensors provide non-vented measurements. Standard calibration protocols for the non-vented sensor use the atmospheric pressure at calibration time as zero depth. Therefore, changes in atmospheric pressure from this calibration pressure will appear as changes in water depth. The error is equal to approximately 1.03 cm 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. If proper atmospheric pressure data are available, non-vented depth measurements can be corrected. 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 each specific NERR site should be contacted in order to obtain information regarding atmospheric pressure data availability. At OWC, sites SU and WM employ water level sensors, and sites BR and OL employ 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

11. Anomalous/Suspect Data:

Anomalous or suspect data was retained in the data set, but has been marked as suspect due to problems with the sensors or recording of concentrations that are not characteristic of the site in general. For example, debris passing by the turbidity sensor when it was taking a measurement would give a high turbidity reading that would not be characteristic of the site.

March 2004

WM: High turbidity 3/20/2004 (17:15:00) probably due to wind activity

SU: High turbidity level 3/17/2004 (19:45:00) probably due to floating debris or to wiper not seating properly

OL: High turbidity levels around 3/25/2004 seem to be caused by physical factors such as wind
High turbidity levels around 3/30/2004 due to storm runoff

BR: High turbidity 03/08/2004 (10:30:00- 16:15:00) due to deployment problems and to cleaning site

High turbidity 03/13/2004 (21:45:00) due to floating debris

Low oxygen 03/30/2004 06:45:00 to 03/31/2004 20:30:00 due to buildup of debris possibly due to storm activity.

April 2004

WM: Dissolved oxygen readings were suspect due to a punctured membrane at some time during deployment

4/16/2004 (19:45:00) through 4/17/2004 (10:15:00)

Turbidity levels 4/1/2004 through 4/6/2004 may reflect sediment buildup around trap

Turbidity levels from 4/19/2004 (8:30:00) through 5/10/2004 (8:30:00) may be suspect, as the wiper was lost from the sensor during deployment

SU: High turbidity associated with storm events

OL: High turbidity levels during month and the isolated spikes such as on 4/12/2004 (17:00:00) probably a result of physical factors such as wind and storm runoff

BR: High turbidity 4/30/2004 (5:15:00) due to floating debris

May 2004

WM: Isolated high turbidity levels possibly due to biological activity or wind during early part of month (through 10 May), but high levels later in month due to storm activity

SU: High turbidity levels due to storm activity

OL: High turbidity levels probably due to physical processes such as wind or storm runoff

BR: Isolated high turbidity levels due to floating debris

June 2004

WM: Isolated high turbidity levels, (e.g. 6/19/2004 (13:45:00); (15:30:00); (17:30:00)) possibly due to biological activity or wind

SU: High turbidity levels due to storm activity

OL: High turbidity levels probably related to storm runoff, except 6/16/2004 (7:30:00) and (22:30:00) which may be due to biological activity

High oxygen levels, particularly on 6/23/2004, 6/26/2004, and 6/27/2004 characteristic of eutrophic conditions

BR: Turbidity data was high 6/13/2004 (14:30:00) due to floating debris

July 2004

WM:

SU: High turbidity levels due to storm activity

OL: High oxygen on July, particularly 07/02/2004, characteristic of eutrophic condidtions

BR: Turbidity data was high 7/24/2004 (14:45:00) due to floating debris

August 2004

WM: High turbidity probably due to biological activity or floating debris
8/1/2004 (21:30:00)
8/23/2004 (5:00:00)
8/25/2004 (5:30:00)

SU High turbidity 8/8/2004 (22:45:00) probably due to floating debris

OL: Turbidity spike 8/19/2004 (4:30:00) probably due to floating debris
High oxygen levels during month, particularly on 8/16/2004 due to eutrophic nature of water

BR: Turbidity data was high due to floating debris:
8/12/2004 (4:45:00); (19:30:00); (20:30:00)
8/13/2004 (00:15:00); (00:45:00)

September 2004

WM:

SU: High turbidity 9/1/2004 (10:00:00) probably due to physical factors coupled with low water conditions
OL: High turbidity 9/8/2004 (22:00:00) probably due to biological activity

BR: Isolated high turbidity levels due to floating debris

October 2004

WM:

SU: Isolated high turbidity levels due to floating debris

OL: High turbidity 10/2/2004 (21:15:00) and (21:45:00) probably due to biological activity
PH readings from 10/05/2004 (8:15:00) through 10/07/2004 (22:45:00) questionable as probe was broken some time during this deployment period
BR: High turbidity levels due to floating debris
10/2/2004 (18:15:00); (18:45:00)

November 2004

WM: Turbidity spikes may be due to shallowness of the site

SU: Turbidity spikes seem to be associated with storm activity

OL: High turbidity level 10/05/2004 (8:15:00) possibly due to biological activity
High turbidity level 10/25/2004 (9:45:00) due to storm runoff

BR: High turbidity levels due to floating debris
11/9/2004 (2:15:00)
High turbidity levels on 11/4/2004, 11/19/2004, and 11/27/2004/ through11/29/2004 due to storms
Low oxygen 11/17/2004 also related to storm runoff
Low oxygen 11/25/2004 01:45:00 to 11/29/2004 09:45:00 due to buildup of debris possibly due to storm activity.

December 2004

WM: Turbidity spikes may be due to shallowness of the site

SU: Turbidity spikes seem to be associated with storm activity

OL: high turbidity peaks through month due to physical factors such as wind and storm runoff

BR: High turbidity levels on 12/11/2004 and 12/12/2004 due to storms

12. Deleted Data:

Deleted data are denoted by a blank space in the data set. Data are deleted when the data collected was outside the range of the sensors, or was known to be unreliable for some other reason, such as probe failure. To find out more details about deleted data, contact the Research Coordinator at Old Woman Creek.

March 2004

WM: Depth readings deleted because readings were below 0, indicating that the depth sensor was out of the water
3/12/2004 (1:00:00-7:00:00)

3/14/2004 (21:45:00-22:15:00)
Turbidity levels were above 1000 NTU and deleted- probably due to floating debris
3/31/2004 (23:45:00)

SU: All data deleted as conductivity sensor was all or partially out of water:
3/11/2004 (6:15:00) through 3/12/2004 (12:45:00)
3/12/2004 (20:15:00) through 3/13/2004 (4:45:00)
3/14/2004 (9:30:00) through 3/15/2004 (5:30:00)
3/15/2004 (7:00:00-16:15:00)
Depth readings deleted because readings were below 0, indicating that the depth sensor was out of the water
3/8/2004 (10:15:00) through 3/16/2004 (3:30:00)
3/17/2004 (2:15:00-20:00:00)
3/18/2004 (9:15:00) through 3/20/2004 (22:45:00)
3/21/2004 (10:00:00-17:30:00); (19:00:00) through 3/22/2004 (12:30:00)
3/23/2004 (9:15:00) through 3/25/2004 (12:30:00)
3/25/2004 (21:15:00) through 3/27/2004 (00:45:00)
3/28/2004 (9:00:00-14:30:00)
3/29/2004 (00:00:00-8:30:00)

OL: All data deleted as conductivity sensor was all or partially out of water:
3/12/2004 (1:30:00-6:45:00); (7:30:00-8:15:00)
Depth readings deleted because readings were below 0, indicating that the depth sensor was out of the water
3/10/2004 (10:45:00)
3/11/2004 (11:00:00); (13:15:00-18:15:00); (19:15:00-20:00:00); (20:45:00-22:45:00); (23:30:00) through 3/12/2004 (00:00:00)
3/12/2004 (00:30:00-01:00:00)
3/14/2004 (12:15:00-19:00:00)

BR: Turbidity levels were above 1000 NTU and deleted- due to storm runoff
3/8/2004 (10:30:00-11:45:00); (12:15:00); (12:45:00)
3/30/2004 (5:15:00-5:45:00); (7:00:00-7:15:00); (8:15:00); (9:00:00); (10:30:00); (14:45:00)

April 2004

WM: Turbidity levels were deleted - due to sediment buildup under trap
4/6/2004 (19:00:00) through 4/19/2004 (08:30:00)
4/21/2004 (13:45:00) through 4/30/2004 (23:45:00)
Turbidity levels were above 1000 NTU and deleted- probably due to floating debris
4/1/2004 (2:00:00-2:15:00), (7:15:00)
Dissolved oxygen (both % saturation and mg/l) were deleted
4/17/2004 (10:30:00) through 4/19/2004 (8:15:00)- due to punctured sensor membrane

SU: Depth readings deleted because readings were below 0, indicating that the depth sensor was out of the water
4/6/2004 (13:00:00-16:45:00)

4/7/2004 (2:30:00-6:15:00); (20:00:00-21:00:00)
4/8/2004 (9:15:00-11:15:00)
4/9/2004 (16:15:00-20:00:00)
4/16/2004 (10:45:-17:00:00); (22:45:00) through 4/17/2004 (18:00:00)
4/18/2004 (14:00:00) through 4/19/2004 (14:30:00)
4/19/2004 (15:00:00-15:30:00); (18:00:00-22:45:00)
4/21/2004 (8:15:00) through 4/22/2004 (00:30:00)
4/22/2004 (1:30:00-3:45:00); (4:30:00-9:30:00)
4/23/2004 (19:30:00-21:30:00); (22:45:00)
4/24/2004 (00:00:00-00:15:00); (2:00:00-9:15:00)

OL: Depth readings deleted because readings were below 0, indicating that the depth sensor was out of the water
4/19/2004 (3:15:00-3:30:00)

BR: Depth readings deleted because readings were below 0, indicating that the depth sensor was out of the water:
4/5/2004 (2:45:00-22:45:00)
4/7/2004 (18:30:00) through 4/8/2004 (16:15:00)
4/12/2004 (15:15:00-20:00:00)
4/21/2004 (1:45:00-19:45:00)
Turbidity levels were above 1000 NTU and deleted- probably due to floating debris
4/1/2004 (2:00:00-2:15:00); 2:45:00
4/13/2004 (23:45:00)
4/14/2004 (4:45:00)

May 2004

WM: Turbidity levels were deleted - due to sediment buildup under trap
5/1/2004 (00:00:00) through 5/5/2004 (07:45:00)
Turbidity levels were above 1000 NTU and deleted- possibly due to biological activity or failure of turbidity probe finding the wiper
5/5/2004 (15:00:00)
5/9/2004 (12:30:00)
5/16/2004 (17:15:00); (17:45:00)
5/17/2004 (00:15:00); (2:15:00); (3:00:00); (4:30:00); (5:15:00-5:30:00); (6:15:00); (7:30:00)
5/19/2004 (18:45:00); (23:15:00-23:30:00)
5/20/2004 (00:00:00); (2:15:00); (3:00:00); (4:30:00-4:45:00); (5:15:00); (8:00:00); (8:30:00); (9:45:00); (10:15:00); (13:00:00); (13:30:00); (15:00:00); (16:30:00-16:45:00); (18:15:00); (23:00:00)
5/21/2004 (00:30:00); (1:00:00)

SU: depth readings deleted because readings were below 0, indicating that the depth sensor was out of the water
5/4/2004 (10:45:00-17:30:00); (23:30:00) through 5/5/2004 (8:00:00)

5/5/2004 (18:45:00-19:45:00)
5/6/2004 (6:15:00-14:00:00); (16:00:00-16:15:00)
5/7/2004 (00:15:00)
5/14/2004 (12:45:00-13:30:00); (14:30:00-17:15:00)
5/18/2004 (7:45:00-8:15:00); (9:00:00)

Turbidity levels were above 1000 NTU and deleted- due to storm activity
5/12/2004 (3:45:00-5:30:00)
5/21/2004 (4:30:00); (10:30:00); (17:15:00)

OL: Turbidity levels were above 1000 NTU and deleted- due to storm activity
5/12/2004 (6:30:00-7:45:00); (8:15:00); (10:00:00); (11:00:00)
5/19/2004 (08:00:00)
5/20/2004 (0:00:00); (3:15:00); (4:30:00): (18:45:00); (19:15:00)
5/21/2004 (8:15:00); (9:00:00); (9:30:00-9:45:00); (10:15:00); (10:45:00-12:15:00); (12:45:00-13:30:00); (14:00:00-14:30:00); (15:00:00-15:15:00); (16:00:00); (17:00:00); (22:00:00)
5/22/2004 (2:00:00-2:15:00); (8:15:00); (10:00:00); (10:45:00); (12:45:00); (18:00:00-18:15:00); (18:45:00); (19:15:00); (22:30:00); (23:30:00)
5/23/2004 (00:30:00); (3:15:00); (4:30:00-4:45:00); (6:30:00); (12:30:00-12:45:00); (16:15:00); (19:00:00)

Turbidity levels were above 1000 NTU and deleted- believed due to biological activity
5/16/2004 (3:15:00)
5/17/2004 (7:00:00); (07:45:00); (9:00:00); (9:45:00); (13:15:00)
5/24/2004 (11:30:00); (12:15:00)
5/25/2004 (3:45:00); (8:30:00)

BR: Depth readings deleted because readings were below 0, indicating that the depth sensor was out of the water:
5/1/2004 (3:30:00); (4:15:00-4:30:00)
5/27/2004 (12:45:00-23:45:00)
5/30/2004 (16:30:00-18:45:00); (20:30:00)

Turbidity levels were above 1000 NTU and deleted- due to storm runoff
5/2/2004 (11:00:00-14:00:00)
5/3/2004 (2:30:00-3:00:00); (4:15:00-4:45:00)
5/12/2004 (1:00:00-1:30:00); (2:00:00); (2:30:00-4:00:00); (6:00:00); (10:30:00)
5/18/2004 (23:00:00) through 5/19/2004 (00:15:00)
5/19/2004 (1:00:00); (1:30:00); (2:15:00-5:00:00); (12:00:00)
5/21/2004 (3:30:00-4:45:00); (5:15:00); (6:45:00) through 5/22/2004 (5:00:00)
5/22/2004 (5:30:00-10:45:00); (11:15:00-15:00:00)
5/23/2004 (1:15:00)
5/31/2004 (3:00:00)

June 2004

WM: Turbidity levels were above 1000 NTU and deleted- possibly due to biological activity
6/14/2004 (10:00:00)
6/17/2004 (20:45:00)
6/21/2004 (3:45:00)

SU: No deleted data

OL: Turbidity levels were above 1000 NTU and deleted- due to storm runoff
6/14/2004 (07:30:00)

BR: Turbidity levels were above 1000 NTU and deleted- due storm runoff
6/2/2004 (21:15:00); (23:15:00-23:30:00)
6/3/2004 (2:00:00); (3:00:00); (4:00:00)
6/11/2004 (15:45:00); (17:15:00-17:45:00); (18:15:00); (21:15:00); (21:45:00); (22:15:00)
6/14/2004 (00:00:00); (00:30:00-00:45:00); (1:30:00); (20:00:00)
6/28/2004 (17:00:00-17:30:00)
Depth readings deleted because readings were below 0, indicating that the depth sensor was out of the water
6/21/2004 (10:45:00) through 6/23/2004 (03:45:00)
6/23/2004 (14:45:00) through 6/24/2004 (17:30:00)

July 2004

WM: No deleted data

SU: Turbidity levels were above 1000 NTU and deleted- due storm runoff
7/17/2004 (20:15:00); (20:45:00)
7/31/2004 (7:15:00); (12:45:00)

OL: Turbidity levels were above 1000 NTU and deleted- due to storm runoff
7/31/2004 (9:15:00); (9:45:00-10:15:00); (14:30:00-15:15:00); (16:15:00-16:45:00); (17:30:00); (18:30:00-19:15:00); (20:00:00-20:45:00); (22:00:00-23:15:00)
Turbidity levels were above 1000 NTU and deleted-probably due to floating debris
7/19/2004 (11:00:00)

BR: Turbidity levels were above 1000 NTU and deleted- due storm runoff
7/17/2004 (17:00:00-17:30:00); (18:00:00); (18:30:00); (19:15:00); (19:45:00-20:00:00); (21:45:00)
7/18/2004 (00:00:00)
7/31/2004 (1:45:00); (5:45:00); (6:30:00); (7:30:00)
Turbidity levels were above 1000 NTU and deleted-probably due to floating debris
7/24/2004 (17:15:00)
Depth readings deleted because readings were below 0, indicating that the depth sensor was out of the water
7/2/2004 (18:00:00-21:00:00)
7/3/2004 (1:45:00) through 7/5/2004 (22:00:00)
7/6/2004 (2:00:00) through 7/8/2004 (23:30:00)
7/11/2004 (15:30:00) through 7/17/2004 (16:15:00)
7/19/2004 (12:15:00) through 7/23/2004 (11:30:00)

Dissolved oxygen data deleted due to punctured membrane 07/06/2004 09:15:00 –

07/26/2004 21:15:00

August 2004

WM: Turbidity levels were above 1000 NTU and deleted- believed due to suspended debris
8/29/2004 (20:30:00)

SU: Depth readings deleted because readings were below 0, indicating that the depth sensor was out of the water
8/11/2004 (15:30:00); (21:00:00-23:30:00)
8/18/2004 (7:00:00-10:15:00); (23:45:00) through 8/19/2004 (00:00:00)
8/19/2004 (00:30:00-2:45:00)
8/22/2004 (12:15:00-13:15:00); (13:45:00)
8/23/2004 (2:00:00-8:45:00)
Oxygen (both % saturation and mg/l) deleted from 8/23/2004 (17:45:00) through 8/31/2004 (23:45:00) because of membrane rupture

OL: No deleted data

BR: Turbidity levels were above 1000 NTU and deleted- probably due to floating debris
8/19/2004 (21:00:00)
Depth readings deleted because readings were below 0, indicating that the depth sensor was out of the water
8/28/2004 (12:00:00) through 8/29/2004 (12:15:00)

September 2004

WM: No deleted data

SU: Oxygen (both % saturation and mg/l) deleted from 9/1/2004 (00:00:00) through 9/07/2004 (07:30:00) because of membrane rupture

OL: No deleted data

BR: Depth readings deleted because readings were below 0, indicating that the depth sensor was out of the water:
9/6/2004 (12:30:00) through 9/7/2004 (06:15:00)
9/7/2004 (08:00:00) through 9/8/2004 (12:30:00)
9/12/2004 (14:00:00) through 9/13/2004 (00:30:00)
9/13/2004 (1:30:00-2:00:00); (2:30:00)
9/13/2004 (12:15:00) through 9/18/2004 (09:00:00)
9/28/2004 (00:15:00-18:45:00)
Turbidity levels were above 1000 NTU and deleted- due storm activity
9/9/2004 (04:15:00); (08:00:00)

October 2004

WM: No deleted data

SU: First reading of deployment on 10/05/2004 07:45:00 was deleted due to artifact of changing datalogger.

OL: PH readings from 10/7/2004 (23:00:00) through 10/25/2004 (7:45:00) deleted due to cracked pH sensor

BR: Depth readings deleted because readings were below 0, indicating that the depth sensor was out of the water:

10/1/2004 (23:45:00) through 10/2/2004 (05:00:00);
10/2/2004 (5:45:00); (6:15:00)
10/4/2004 (3:30:00-6:00:00)
10/8/2004 (11:00:00) through 10/10/2004 (04:15:00)
10/11/2004 (13:45:00) through 10/22/2004 (08:45:00)
10/22/2004 (09:30:00) through 10/25/2004 (09:00:00)

November 2004

WM: All data deleted because conductivity probe was completely or partially out of water

11/5/2004 (20:45:00) through 11/6/2004 (9:30:00)
11/6/2004 (14:15:00-19:00:00)
11/7/2004 (5:30:00-12:00:00)

Depth readings deleted because readings were below 0, indicating that the depth sensor was out of the water:

11/4/2004 (13:45:00) through 11/5/2004 (1:30:00)
11/5/2004 (2:15:00-20:30:00)
11/6/2004 (9:45:00-14:00:00); (19:15:00-23:00:00)
11/7/2004 (2:30:00-5:15:00); (12:15:00-16:00:00)
11/8/2004 (14:45:00); (15:45:00-21:45:00)
11/10/2004 (3:15:00) through 11/11/2004 (8:30:00)
11/17/2004 (4:45:00) through 11/19/2004 (3:30:00)
11/21/2004 (4:30:00-9:00:00); (10:15:00-12:00:00); (16:30:00) through 11/22/2004 (16:30:00)
11/22/2004 (17:00:00); (17:30:00); (18:30:00-19:15:00); (19:45:00); (20:15:00) through 11/23/2004 (19:15:00)
11/23/2004 (20:00:00-20:15:00); (21:45:00) through 11/24/2004 (00:00:00)
11/24/2004 (1:45:00-3:00:00)
11/26/2004 (5:15:00-11:00:00); (17:30:00) through 11/27/2004 (3:00:00)
11/27/2004 (7:15:00-7:30:00); (9:00:00-16:45:00); (18:00:00); (21:30:00) through 11/28/2004 (20:15:00)
11/29/2004 (1:15:00-8:45:00)

Turbidity levels were above 1000 NTU and deleted- due to suspended debris

11/5/2004 (14:15:00)

SU: All data deleted because conductivity probe was completely or partially out of water

11/5/2004 (22:00:00) through 11/6/2004 (23:15:00)
11/7/2004 (3:30:00-16:00:00)

11/8/2004 (18:45:00-21:30:00)
11/10/2004 (6:00:00) through 11/11/2004 (9:00:00)
11/17/2004 (5:00:00) through 11/19/2004 (3:30:00)
11/21/2004 (20:00:00) through 11/22/2004 (16:45:00)
11/22/2003 (20:30:00) through 11/24/2004 (4:15:00)
11/27/2004 (12:00:00-16:30:00); (22:45:00) through 11/28/2004 (20:45:00)
11/29/2004 (5:00:00-9:00:00)

Depth readings deleted because readings were below 0, indicating that the depth sensor was out of the water:

11/4/2004 (1:30:00-4:15:00); (5:30:00-8:45:00); (10:45:00-20:15:00)
11/5/2004 (3:30:000) through 11/5/2004 (21:45:00)
11/6/2004 (23:30:00) through 11/7/2004 (3:15:00)
11/7/2004 (16:15:00-19:45:00)
11/8/2004 (3:15:00); (4:15:00-5:00:00); (5:45:00-18:30:00); (21:45:00) through 11/9/2004 (1:15:00)
11/9/2004 (6:00:00) through 11/10/2004 (5:45:00)
11/11/2004 (9:15:00-10:15:00)
11/13/2004 (15:00:00) through 11/17/2004 (4:45:00)
11/19/2004 (3:45:00-19:00:00)
11/21/2004 (2:15:00-19:45:00)
11/22/2004 (17:00:00-20:15:00)
11/24/2004 (4:30:00-7:30:00)
11/26/2004 (4:30:00) through 11/27/2004 (11:45:00)
11/27/2004 (16:45: 00-22:30:00)
11/28/2004 (21:00:00) through 11/29/2004 (4:45:00)

Turbidity levels were above 1000 NTU and deleted- probably due to floating debris

11/26/2004 (6:45:00)

OL: Depth readings deleted because readings were below 0, indicating that the depth sensor was out of the water:

11/4/2004 (14:45:00-20:30:00)
11/5/2004 (21:30:00) through 11/6/2004 (9:45:00)
11/6/2004 (10:30:00); (12:15:00-19:15:00)
11/7/2004 (5:00:00-12:00:00)

Turbidity levels were above 1000 NTU and deleted- probably due to floating debris

11/22/2004 (23:45:00)

BR: Depth readings deleted because readings were below 0, indicating that the depth sensor was out of the water:

11/1/2004 (21:15:00) through 11/2/2004 (15:00:00)

Turbidity levels were above 1000 NTU and deleted- probably due to floating debris

11/2/2004 (22:00:00); (22:30:00)
11/19/2004 (22:00:00); (23:45:00)
11/20/2004 (17:15:00)
11/27/2004 (10:00:00); (12:00:00)
11/28/2004 (12:00:00)

Turbidity levels were above 1000 NTU and deleted- due to storm runoff

11/24/2004 (21:00:00-21:15:00); (23:15:00)
11/25/2004 (00:45:00-1:30:00); (2:00:00-2:45:00); (14:15:00-16:30:00)

11/26/2004 (12:30:00)

December 2004

WM: Depth readings deleted because readings were below 0, indicating that the depth sensor was out of the water

12/3/2004 (3:00:00-10:15:00); (21:00:00-23:45:00)
12/4/2004 (7:45:00) through 12/5/2004 (00:45:00)
12/5/2004 (2:00:00-4:00:00)
12/7/2004 (22:00:00) through 12/8/2004 (3:30:00)

SU: Data deleted from 12/04/2004 (10:00:00) through 12/05/2004 (04:45:00) as conductivity sensor was all or partially out of water

Depth readings deleted because readings were below 0, indicating that the depth sensor was out of the water

12/2/2004 (5:30:00-7:45:00); (13:30:00) through 12/3/2004 (13:00:00)
12/3/2004 (18:00:00) through 12/4/2004 (9:45:00)
12/5/2004 (5:00:00-13:15:00); (14:00:00-21:45:00)
12/6/2004 (22:30:00-23:30:00)
12/7/2004 (16:45:00) through 12/8/2004 (4:30:00)
12/8/2004 (9:15:00-20:00:00)
12/9/2004 (00:00:00-9:15:00); (11:00:00) through 12/10/2004 (00:15:00)
12/10/2004 (00:45:00-3:45:00); (4:15:00-6:15:00)
12/12/2004 (19:15:00) through 12/13/2004 (18:15:00)
12/15/2004 (8:30:00-11:45:00)

OL: Depth readings deleted because readings were below 0, indicating that the depth sensor was out of the water

12/4/2004 (10:30:00-21:45:00)

BR: Turbidity levels were above 1000 NTU and deleted- due to storm runoff

12/1/2004 (2:00:00-2:15:00); (3:15:00); (3:45:00); (4:15:00-4:30:00); (5:00:00-5:15:00); (13:45:00-14:30:00); (18:00:00)
12/12/2004 (1:00:00)

Depth readings deleted because readings were below 0, indicating that the depth sensor was out of the water

12/7/2004 (4:45:00-19:15:00)

13. Missing data:

Missing data are denoted by a blank space in the data set. Data are missing due to equipment failure, when no probes deployed, or maintenance/calibration of equipment, To find out more details about missing data, contact the Research Coordinator at the site submitting the data.

March 2004
None

April 2004

SU: All data missing 04/19/2004 (07:30:00) due to changing the data logger

May 2004

WM: All data missing 05/10/2004 (8:30:00) due to changing the data logger

June 2004

WM: All data missing 6/21/2004 (09:00:00) due to changing datalogger

BR: All data missing 6/21/2004 (08:00:00) due to changing datalogger

July 2004

WM: All data missing 07/06/2004 (09:00:00-19:30:00) due to sonde malfunction

BR: All data missing 7/31/2004 (02:15:00-05:00:00) due to sonde malfunction

August 2004

BR: All data missing from 8/9/2004 (7:45:00) due to sonde problems
All data missing from 08/23/2004 (08:00:00) to 08/26/2004 (14:30:00) due to sonde problems

September 2004

WM: All data missing 09/07/2004 (08:30:00) due to changing the dataloggers

BR: All data missing 09/20/2004 (08:15:00) due to changing the dataloggers

October 2004

BR: All data missing from 10/25/2004 (09:15:00) through end of the month due to sonde problems

November 2004

SU: All data missing 11/08/2004 (09:00:00) due to changing dataloggers
All data missing 11/29/2004 (05:00:00-09:00:00) due to sonde problems

BR: All data missing from 11/01/2004 (00:00:00-10:15:00) due to sonde problems

December 2004

OL: Due to ice formation at this site, the logger was unable to be pulled for the year until 01/03/2005 at 08:30:00. The logger ceased collecting data for the year, therefore all data missing 08:00:00 on 12/29/2004 through 23:45 on 12/31/04.

14. Post deployment information:

End of Deployment Post-calibration Readings in Standard Solutions: Dissolved oxygen standard is 100%, unless noted. Depth is always 0.0 meters. The specific conductivity standard is 1 mS/cm prior to 06/21/2004 and .717mS/cm after that. The pH standard is 7.00.

Site	Date	Sp. Cond.	DO(%)	pH	Turb	Depth
WM	03/29/2004	.987	103.4	7.05	11.3	-.001
	04/19/2004	.960	99.9	7.03	1.0	.000
	05/10/2004	.973	117.4	7.04	31/-.03*	-.006
	*lost turbidity wiper during deployment/ second reading is after cleaning sensor					
	06/01/2004	.901	89.0	7.18	-.03	.001
	06/21/2004	.703	124	7.10	1.6	-.022
	07/06/2004	.671	105.2	7.18	5.4	.000
	07/26/2004	.621	145.7	7.01	1.1	-.016
	08/09/2004	.675	96.4	7.51	2.9	.000
	08/23/2004	.650	124.1	7.10	7.9	-.013
	09/07/2004	.676	100.5	7.10	0.7	-.001
	09/20/2004	.714	108.0	6.99	1.8	-.034
	10/05/2004	.700	114	7.21	7.1	.001
	10/25/2004	.709	110.2	7.07	1.3	-.023
	11/08/2004	.690	110.7	7.15	1.2	-.002
	11/29/2004	.706	111.2	7.09	0.5	-.027
	12/16/2004	.712	109.6	7.09	2.3	.000

Site	Date	Sp. Cond.	DO(%)	pH	Turb	Depth
SU	03/29/2004	.991	108.3	7.10	1.0	-.004
	04/19/2004	.961	98.7	6.84	1.3	.002
	05/10/2004	.990	97.6	7.11	0.9	-.002
	06/01/2004	.959	97.2	7.11	0.6	.000
	06/21/2004	.702	107.4	7.15	24.2	-.001
	07/06/2004	.690	94.5	7.21	0.5	.003
	07/26/2004	.628	104.2	7.14	6.9	-.004
	08/09/2004	.699	93.0	7.20	0.5	.004
	08/23/2004	.680	98.7	7.16	0.5	.001
	09/07/2004	.691	4.2*	7.23	0.6	-.001
			* (punctured membrane)			
	09/20/2004	.695	101.6	7.13	0.8	-.001

	10/05/2004	.706	92.9	7.16	0.6	-.001
	10/25/2004	.726	96.1	7.04	8.0	-.004
	11/08/2004	.717	101.9	7.04	0.2	.001
	11/29/2004	.711	111.3	7.08	0.6	.001
	12/16/2004	.711	102.3	7.16	0.6	.004

Site	Date	Sp. Cond.	DO(%)	pH	Turb	Depth
OL	03/29/2004	.994	111.7	7.06	1.0	.025
	04/19/2004	.954	108.4	7.05	0.3	-.135
	05/10/2004	.971	110.4	7.12	0.7	-.024
	06/01/2004	.954	95.4	7.13	0.2	-.078
	06/21/2004	.698	98.5	7.25	2.2	.067
	07/06/2004	.684	104.9	7.17	0.6	-.068
	07/26/2004	.623	94.5	7.23	1.0	.004
	08/09/2004	.679	92.0	7.20	0.6	.026
	08/23/2004	.638	99.7	7.15	2.0	.053
	09/07/2004	.681	109.0	7.17	0.4	.010
	09/20/2004	.700	99.4	6.98	1.1	.051
	10/05/2004	.703	105.7	7.22	0.8	.122
	10/25/2004	.705	108.7	5.94	2.5	-.060
	11/08/2004	.699	104.4	7.14	0.5	0.110
	11/29/2004	.700	94.3	7.12	19.4	0.185
	01/03/2005	.717	105.0	7.13	1.9	.071

Site	Date	Sp. Cond.	DO(%)	pH	Turb	Depth
BR	03/29/2004	.997	101.3	7.07	1.6	0.22
	04/19/2004	.964	103.9	7.02	1.5	-.137
	05/10/2004	.983	101.5	7.04	-0.6	-.024
	06/01/2004	.946	88.1	7.15	-0.2	-.092
	06/21/2004	.721	96.7	7.14	10.0	.065
	07/06/2004	.691	101.9	7.21	0.5	-.066
	07/26/2004	.683	38.8*	7.22	0.7	-.004
			*(punctured membrane)			
	08/09/2004	.698	110.7	7.17	0.7	.029
	08/23/2004	.678	98.5	7.13	1.0	.052
	09/07/2004	.689	108.3	7.20	9.3	.009
	09/20/2004	.697	100.3	7.11	20.0	.041
	10/05/2004	.717	109.0	7.17	-.03	.125
	10/25/2004	.714	97.4	7.13	0.9	-.054
	11/08/2004	---	----	----	----	-----
	11/29/2004	.712	105.7	7.42	0.4	0.19
	12/16/2004	.713	102.7	7.23	-.10	-.056

15. Other Remarks:

Area rainfall during deployment: (Rainfall in mm/day)

Date	TotPrcp
03/02/2004	02.8
03/03/2004	00.5
03/04/2004	00.8
03/05/2004	12.7
03/06/2004	01.3
03/08/2004	02.0
03/09/2004	00.3
03/10/2004	00.5
03/12/2004	00.5
03/15/2004	01.3
03/17/2004	01.8
03/18/2004	00.5
03/19/2004	01.8
03/21/2004	12.2
03/22/2004	00.5
03/25/2004	08.4
03/26/2004	03.6
03/27/2004	07.9
03/30/2004	13.2
03/31/2004	18.0
04/01/2004	05.3
04/02/2004	12.2
04/03/2004	06.1
04/04/2004	03.0
04/08/2004	04.6
04/12/2004	05.3
04/13/2004	05.8
04/17/2004	05.8
04/21/2004	01.5
04/22/2004	01.3
04/23/2004	00.3
04/25/2004	06.1
04/27/2004	01.3
04/30/2004	05.3
05/01/2004	10.2
05/02/2004	21.8
05/07/2004	00.3
05/08/2004	08.9
05/10/2004	00.8
05/11/2004	01.0
05/12/2004	08.4
05/14/2004	01.3
05/15/2004	03.0
05/16/2004	04.6
05/18/2004	03.3
05/19/2004	12.7
05/20/2004	00.8
05/21/2004	29.0
05/22/2004	44.7
05/23/2004	08.4

05/24/2004	04.1
05/28/2004	09.4
05/31/2004	15.2
06/01/2004	01.5
06/02/2004	02.5
06/03/2004	02.5
06/10/2004	07.4
06/11/2004	25.4
06/12/2004	14.2
06/13/2004	03.6
06/14/2004	08.6
06/15/2004	15.7
06/16/2004	00.3
06/17/2004	00.5
06/18/2004	06.9
06/20/2004	00.3
06/23/2004	00.5
06/26/2004	14.0
06/29/2004	22.1
06/30/2004	00.3
07/05/2004	07.6
07/12/2004	00.3
07/13/2004	02.8
07/14/2004	00.0
07/15/2004	07.9
07/16/2004	00.0
07/17/2004	04.3
07/18/2004	20.1
07/19/2004	02.0
07/22/2004	01.0
07/23/2004	03.3
07/27/2004	05.3
07/28/2004	03.6
07/29/2004	00.3
07/31/2004	41.1
08/01/2004	02.8
08/02/2004	00.3
08/05/2004	15.5
08/17/2004	00.3
08/18/2004	02.3
08/19/2004	12.4
08/20/2004	17.3
08/21/2004	09.1
08/22/2004	00.3
08/28/2004	04.1
08/29/2004	07.4
08/30/2004	06.6
09/01/2004	00.3
09/06/2004	00.3
09/09/2004	29.0
09/11/2004	00.3
09/13/2004	00.3
09/17/2004	01.5

09/18/2004	01.8
09/23/2004	00.3
09/25/2004	00.3
09/29/2004	00.3
10/02/2004	00.3
10/03/2004	02.8
10/04/2004	00.3
10/14/2004	05.6
10/15/2004	00.3
10/16/2004	17.3
10/19/2004	07.6
10/24/2004	07.1
10/26/2004	00.3
10/29/2004	10.7
11/02/2004	18.8
11/04/2004	09.7
11/16/2004	02.5
11/17/2004	04.3
11/18/2004	00.3
11/19/2004	09.9
11/20/2004	00.8
11/24/2004	21.6
11/25/2004	02.0
11/26/2004	00.5
11/27/2004	00.3
11/28/2004	01.8
11/29/2004	00.8
11/30/2004	15.0
12/01/2004	02.3
12/06/2004	02.8
12/07/2004	04.6
12/09/2004	02.0
12/10/2004	01.5
12/11/2004	03.8
12/12/2004	00.8
12/13/2004	00.3
12/28/2004	02.0
12/29/2004	05.1
12/30/2004	00.8
12/31/2004	03.6