Old Woman Creek (OWC) NERR Site Water Quality Metadata
March through December, 2006
Latest Update: October 1, 2019

1. Principal Investigator & contact person:

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2. Entry verification:

The data were directly downloaded from the YSI PC6600 EDS 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. 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 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, inserts a correct time if required, and allows for the removal of pre- and post deployment data. Where deployment overlap occurs between files, the data produced by the newly calibrated sonde is accepted as being the most accurate. 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 over two or three-week periods at four sites within the Old Woman Creek estuary. Three sites are located 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. 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:

For the 2006 sampling year, the YSI monitoring program began on 10 March, 2006 and ended on 21 December, 2006 at all four sites. 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. 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. Additional field readings for dissolved oxygen, pH, temperature, turbidity, and specific conductance are taken when the instrument is pulled 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 used during 2006 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, pH (2 point calibration), and turbidity (2 point calibration) are 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 site WM have vented water level sensors while the loggers at sites BR and OL have non-vented depth sensors. The loggers used at the SU site alternated between vented and non-vented 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 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 2006, 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 .20 meters above the bottom sediments. On May 28 between 09:15 and 09:30, the trap was raised 10 cm. Through the entire 2006 deployment period, a long data logger guard was used at this site.

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. On May 28, 2006 between 07:30 and 07:45, the trap was raised 7 cm. A long guard was used at this site until October 30 at 08:30, when the new logger deployed had a short guard, thus effectively lowering the logger 5 cm. in the trap. Short guards were used on all subsequent loggers at this site through 2006.

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 20 cm above the sediment. On May 28, 2006 between 09:00 and 09:15, the trap was raised 10 cm. Long guards were used all year long on the data loggers at this site. A major rainfall runoff event on 6/22/2006 ripped the trap from its base and dropped it to the bottom of the estuary. The trap was reset on 6/26/2006 (08:15-08:30) with the bottom of the logger 46 cm above the bottom.

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.

6. Data collection periods:

Sampling at WM began on March 13, 2006 at 12:00:00. The logger was pulled for the year on December 21, 2006 at 09:30:00. Sampling at SU began on March 13, 2006 at 14:45:00. The logger was pulled for the year on December 21, 2006 at 08:15:00. 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 13, 2006 at 11:45:00, and ceased on December 21, 2006 at 09:15:00.. Sampling at BR began on March 13, 2006 at 11:00:00 and ceased on December 21, 2006 at 08:30:00. Specific deployment dates are listed below.

Site	Deployed		Pulled	
WM	03/13/2006	(12:00:00)	04/03/2006	(08:00:00)
	04/03/2006	(08:15:00)	04/24/2006	(08:00:00)
	04/24/2006	(08:15:00)	05/15/2006	(07:45:00)
	05/15/2006	(08:00:00)	05/28/2006	(09:00:00)
	05/28/2006	(09:30:00)	06/12/2006	(08:45:00)
	06/12/2006	(09:00:00)	06/26/2006	(07:46:00)
	06/26/2006	(08:00:00)	07/10/2006	(08:00:00)
	07/10/2006	(08:15:00)	07/24/2006	(07:45:00)
	07/24/2006	(08:00:00)	08/06/2006	(08:15:00)
	08/06/2006	(08:30:00)	08/21/2006	(07:30:00)
	08/21/2006	(08:00:00)	09/03/2006	(08:30:00)
	09/03/2006	(08:45:00)	09/18/2006	(09:00:00)
	09/18/2006	(09:15:00)	10/08/2006	(09:00:00)

	10/08/2006	(09:15:00)	10/30/2006	(09:15:00)
	10/30/2006	(09:30:00)	11/20/2006	(09:15:00)
	11/20/2006	(09:30:00)	12/11/2006	(09:45:00)
	12/11/2006	(10:15:00)	12/21/2006	(09:30:00)
SU	03/13/2006	(14:45:00) (v)	4/03/2006	(08:45:00)
	04/03/2006	(09:00:00)(v)	04/24/2006	(08:45:00)
	04/24/2006	(09:00:00)(v)	05/15/2006	(08:15:00)
	05/15/2006	(08:30:00)(nv)	05/28/2006	(07:15:00)
	05/28/2006	(07:45:00)(v)	06/12/2006	(08:00:00)
	06/12/2006	(08:15:00)(nv)	06/26/2006	(08:45:00)
	06/26/2006	(09:00:00)(v)	07/10/2006	(08:30:00)
	07/10/2006	(08:45:00)(nv)	07/24/2006	(08:15:00)
	07/24/2006	(08:30:00)(v)	08/06/2006	(07:30:00)
	08/06/2006	(07:45:00)(nv)	08/21/2006	(08:15:00)
	08/21/2006	(08:30:00)(v)	09/03/2006	(07:30:00)
	09/03/2006	(07:45:00)(nv)	09/18/2006	(07:30:00)
	09/18/2006	(08:00:00)(v)	10/08/2006	(07:30:00)
	10/08/2006	(07:45:00)(nv)	10/30/2006	(08:15:00)
	10/30/2006	(08:30:00)(v)	11/20/2006	(08:15:00)
	11/20/2006	(08:30:00)(nv)	12/11/2006	(08:45:00)
	12/11/2006	(09:00:00)(v)	12/21/2006	(08:15:00)
OL	03/13/2006	(11:45:00)	4/03/2006	(08:00:00)
	04/03/2006	(08:15:00)	04/24/2006	(08:00:00)
	04/24/2006	(08:15:00)	05/15/2006	(07:45:00)
	05/15/2006	(08:00:00)	05/28/2006	(09:00:00)
	05/28/2006	(09:15:00)	06/12/2006	(08:30:00)
	06/12/2006	(08:45:00)	06/26/2006	(07:30:00)
	06/26/2006	(08:30:00)	07/10/2006	(07:45:00)
	07/10/2006	(08:00:00)	07/24/2006	(07:30:00)
	07/24/2006	(07:45:00)	08/06/2006	(08:00:00)
	08/06/2006	(08:30:00)	08/21/2006	(07:30:00)
	08/21/2006	(07:45:00)	09/03/2006	(08:30:00)
	09/03/2006	(08:45:00)	09/18/2006	(09:00:00)
	09/18/2006	(09:15:00)	10/08/2006	(08:45:00)
	10/08/2006	(09:00:00)	10/30/2006	(09:15:00)
	10/30/2006	(09:30:00)	11/20/2006	(09:15:00)
	11/20/2006	(09:30:00)	12/11/2006	(09:45:00)
	12/11/2006	(10:00:00)	12/21/2006	(09:15:00)
BR	03/13/2006	(11:00:00)	4/03/2006	(09:00:00)
	04/03/2006	(09:15:00)	04/24/2006	(09:00:00)
	04/24/2006	(09:15:00)	05/15/2006	(08:30:00)
	05/15/2006	(08:45:00)	05/28/2006	(07:45:00)
	05/28/2006	(08:00:00)	06/12/2006	(08:00:00)

06/12/2006	(08:15:00)	06/26/2006	(09:00:00)
06/26/2006	(09:15:00)	07/10/2006	(08:45:00)
07/10/2006	(09:00:00)	07/24/2006	(08:30:00)
07/24/2006	(08:45:00)	08/06/2006	(07:45:00)
08/06/2006	(08:00:00)	08/21/2006	(08:30:00)
08/21/2006	(08:45:00)	09/03/2006	(07:45:00)
09/03/2006	(08:00:00)	09/18/2006	(08:15:00)
09/18/2006	(08:30:00)	10/08/2006	(08:00:00)
10/08/2006	(08:15:00)	10/30/2006	(08:45:00)
10/30/2006	(08:45:00)	11/20/2006	(08:45:00)
11/20/2006	(09:00:00)	12/11/2006	(09:15:00)
12/11/2006	(09:15:00)	12/21/2006	(08:30:00)

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

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

The reliability of the dissolved oxygen (DO) data after 96 hours post-deployment for non-EDS (Extended Deployment System) data sondes may be problematic due to fouling which forms on the DO probe membrane during some deployments (Wenner et al. 200*). Many reserves have upgraded to YSI 6600 EDS data sondes, which increase 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, ie. periodicity analysis. It should be noted that the amount of fouling is 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. All data

sondes used at OWC NERR sites in 2006 were EDS models.

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 2006, sites SU (on alternate deployments) and WM employed water level sensors and sites BR and OL (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

11. Anomalous/Suspect Data:

Note 1: There are numerous negative depth values throughout the dataset. These are generally due to the standardization of all non-vented sensor depth readings to local barometric pressure (see Depth Disclaimer above). Small negative values recorded by the vented sensors are within the acceptable calibration/accuracy error of the sensor, unless specifically noted below or in the deleted data section.

Note 2: The apparently random spikes in turbidity at the different site are probably due to debris at sites BR and SU, and probably due to biological activity (from April through September) or debris passing the sensor (March and October through December) at sites OL and WM.

March 2006

WM: None

SU: Turbidity 3/15/2006 (19:00) high possibly due to debris

OL: None

BR: Dissolved oxygen 3/23/2006 (00:00) through 4/3/2006 (09:00, end of deployment) data suspect. Readings decline through the end of the deployment, there is a marked difference with the start of the next deployment, and the post-cal reading was low at 63%.

April 2006
None

May 2006
WM: None

SU: Turbidity 5/13/2006 (12:00) high possibly due to debris
5/18/2006 (15:30) high possibly due to debris
5/22/2006 (05:30; 06:45; 07:00; 08:45) high possibly due to runoff

OL: None

BR: None

June 2006
WM: High turbidity 6/28/2006 (18:00) probably due to biological activity

SU: Turbidity levels high such as on 6/13/2006 (07:30) probably due to isolated debris passing the logger

OL: None

BR: None

July 2006
WM: Turbidity levels on 7/20/2006 at (10:30), (13:30), and (20:00) and on 7/22/2006 (4:45) high probably due to biological activity

SU: None

OL: None

BR: Dissolved oxygen data 7/21/2006 (06:45) through 7/24/2006 (08:30) are highly suspect. Data are characterized by a large spike followed by a rapid decline in values. There was a small membrane puncture noted during post-calibration and a marked difference in readings with the start of the new deployment.

August 2006
WM: None

SU: None

OL: Oxygen data from 8/6/2006 (05:45-08:00) questionable as sensor had punctured membrane in post-calibration.

BR: None

September 2006

October 2006
WM: None

SU: Specific conductivity sensor was partially out of water 10/23/2006 (2:15-3:00) and 10/23/2006 (19:30-20:00)

OL: None

BR: None

November 2006
WM: None

SU: Depth sensor may have been out of water:
11/1/2006 (08:00-22:30)
11/2/2006 (01:00) through 11/7/2006 (14:00)
11/7/2006 (16:00) through 11/9/2006 (23:00)
11/13/2006 (06:30) through 11/15/2006 (12:45)

OL: None

BR: None

December 2006
WM: High turbidity 12/13/2006 (10:45) probably due to passing debris

SU: Depth sensor may have been out of water:
12/12/2006 (19:45) through 12/13/2006 (06:30)
12/13/2006 (07:30-22:00)
12/14/2006 (02:45-11:30)
12/14/2006 (16:15) through 12/15/2006 (20:00)
12/16/2006 (21:00) through 12/17/2006 (08:00)
12/17/2006 (11:00-18:30)
12/19/2006 (09:00) through 12/20/2006 (10:15)
12/20/2006 (12:30-20:00)
12/21/2006 (01:30-08:15)
Turbidity 12/11/2006 (20:00) high probably due to debris moving past sensor

OL: None

BR: Dissolved oxygen data 12/1/2006 (03:30) through 12/3/2006 (11:45) are suspect.

Dramatically decreased values are likely due punctured membrane caused by debris in storm runoff and correspond to an increase in depth and decrease in specific conductivity

12. Deleted Data:

March 2006
WM: None

SU: None

OL: Turbidity 3/13/2006 (13:00) deleted over range
3/29/2006 (17:30) deleted over range

BR: Turbidity 3/13/2006 (21:45) deleted over range
3/14/2006 (03:30) deleted over range

April 2006
WM: Dissolved oxygen data deleted from 4/13/2006 (10:15) through 4/24/2006 (08:00) due to punctured membrane

SU: None

OL: Turbidity 4/1/2006 (08:15) deleted over range
4/5/2006 (20:00) deleted over range

BR: None

May 2006
WM: Turbidity 5/5/2006 (00:15) deleted over range
5/8/2006 (23:00; 23:45) deleted over range
5/9/2006 (01:30) through 5/15/2006 (07:45) deleted due to buildup of debris in trap
5/26/2006 (16:15) deleted over range

SU: Turbidity 5/13/2006 (12:00) deleted over range
5/22/2006 (12:00) deleted over range
5/26/2006 (04:15-04:30; 05:00-05:15; 07:30-07:45; 11:00; 17:30: 18:30; 20:00; 21:00; 21:30: 22:00-22:15; 23:00; 23:30-23:45) deleted over range
5/27/2006 (00:15-00:30; 01:30-01:45; 16:00) deleted over range

OL: All turbidity data from 5/4/2006 (21:15) through 5/15/2006 (07:45) deleted due to erratic nature of data- could be possible wiper problem.
5/3/2006 (17:30) deleted over range
5/21/2006 (02:00) deleted over range
5/26/2006 (13:45, 15:15, 18:45, 19:45, 22:45, 23:00, 23:30, 23:45) deleted over range
5/27/2006 (00:00 – 00:30) deleted over range

BR: Turbidity 5/15/2006 (17:30) through 05/16/2006 (19:45) intermittent turbidity values deleted, over range
5/17/2006 (07:30-08:00, 09:15) deleted over range

5/18/2006 01:00 deleted over range
5/25/2006 23:45 deleted over range
5/26/2006 – 5/31/2006 intermittent turbidity values deleted – over range
5/28/2006 (19:15) deleted over range
5/31/2006 (18:45, 20:30) deleted over range

June 2006

WM: Dissolved oxygen data deleted from 6/5/2006 (18:45) through 6/12/2006 (08:45) because of a membrane puncture in the sensor

High turbidity levels on 6/6/2006 (10:15) and 6/7/2006 (21:30) deleted- probably due to biological activity

SU: Turbidity 6/10/2006 (17:30; 19:30) deleted over range

6/22/2006 (00:00; 01:15-01:45; 06:30; 07:45; 08:15-08:30; 09:00-09:15; 10:30; 11:00; 15:00) deleted over range all associated with storm passage

OL: All data was deleted on 6/26/2006 from 07:45 to 08:15 as the logger trap was found and reset after the major storm on 6/22/2006 and the loggers were out of the water.

Turbidity 6/9/2006 (12:30) deleted over range
6/22/2006 (07:00) deleted over range
6/22/2006 (08:45) through 6/23/2006 (02:45) deleted sensor malfunction, cause unknown

BR: Turbidity 6/21/2006 (21:30) delete over range

6/22/2006 (01:15) through 6/26/2006 (09:00) intermittent turbidity values deleted – over range

July 2006

WM: Turbidity readings 7/19/2006 (18:00); 7/20/2006 (3:30; 10:30); and 7/23/2006 (11:15) deleted- probably due to biological activity

SU: Turbidity 7/14/2006 (05:30) deleted over range
7/21/2006 (06:45) deleted over range
7/26/2006 (15:15) deleted over range

OL: Turbidity 7/4/2006 (09:15) deleted over range
7/7/2006 (13:00) deleted over range

BR: Turbidity 7/4/2006 (09:00) deleted over range
7/10/2006 (14:45) deleted over range
7/12/2006 (05:45-06:30, 07:15-08:00, 08:45-09:00, 09:30, 11:00-11:30)
7/28/2006 (06:15) through 7/31/2006 (19:45) intermittent turbidity values deleted – over range

August 2006

WM: Oxygen data from 8/13/2006 (23:30) through 8/21/2006 (7:30) deleted due to puncture in sensor membrane

Turbidity for 8/9/2006 (6:30) and 8/11/2006 (7:15) deleted due to very high values, caused by biological activity?

SU: Turbidity 8/21/2006 (23:15) deleted over range

OL: Oxygen data suspect from 8/14/2006 at about 16:00 to 8/21/2006 (07:30) as membrane appeared to be punctured at retrieval. This data was deleted.
Turbidity 8/10/2006 (07:15, 21:15, 23:00) deleted over range
8/11/2006 (00:30, 01:15, 01:45, 04:00) deleted over range
8/26/2006 (21:00) deleted over range

BR: Turbidity 8/1/2006 (00:00) through 8/6/2006 (07:45) intermittent readings deleted – over range.

September 2006

WM: None

SU: None

OL: None

BR: Turbidity 9/1/2006 (00:30) deleted over range

October 2006

WM: All data deleted 10/22/1006 (13:15-21:30) as conductivity sensor was out of water
Depth data 10/22/2006 (12:00-13:00; 21:45-22:15) as sensor probably out of water
10/23/2006 (08:15-10:30; 12:30-14:00) as sensor probably out of water
10/24/2006 (00:45-02:00) as sensor probably out of water
10/28/2006 (16:15) through 10/29/2006 (06:00) as sensor probably out of water
10/29/2006 (07:15-17:45) as sensor probably out of water

SU: All data deleted 10/22/2006 (11:45) through 10/23/2006 (00:00); 10/23/2006 (08:00-16:30); and 10/23/2006 (20:15) through 10/24/2006 (05:30) as conductivity sensor was out of water

OL: All data deleted on 10/10/2006 09:30-11:00 as logger out of water while working on Goes station. All data deleted on 10/22/2006 13:45-21:15 as logger out of water while working on Goes station.
Dissolved oxygen 10/16/2006 (05:00) through 10/30/2006 (19:15) deleted due to membrane puncture
Turbidity 10/18/2006 (04:15) deleted over range

BR: Turbidity 10/17/2006 (07:45) through 10/30/2006 (08:30) intermittent readings deleted, over range

November 2006

WM: DO membrane appears to be punctured 11/16/2006 at (16:15). All oxygen data from this time to 11/20/2006 (9:15) was deleted.

SU: All data 11/2/2006 (15:15-15:45) deleted, logger out of water.

OL: DO membrane appears to be punctured 11/10/2006 at 05:30. All oxygen data from this time to 11/20/2006 (09:15) was deleted

Turbidity 11/6/2006 (10:15) deleted over range
11/15/2006 (00:45) deleted over range
11/26/2006 (17:45) deleted over range
11/29/2006 (17:45) deleted over range

BR: Turbidity 11/16/2006 (02:30) through 11/30/2006 (23:45) intermittent readings deleted, over range

December 2006

WM: All data 12/1/2006 (18:00-23:00) deleted as conductivity sensor our of water
All data 12/8/2006 (21:30) through 12/9/2006 (14:00) deleted as conductivity sensor out of water
Turbidity 12/1/2006 at (10:15) deleted, probably due to debris associated with storm.
12/7/2006 at (8:15) deleted, cause of high value unknown- due to debris?
Depth 12/1/2006 (23:15) through 12/2/2006 (00:30) deleted as sensor out of water
12/2/2006 (07:45-11:30) deleted as sensor out of water
12/3/2006 (01:45-02:45) deleted as sensor out of water
12/4/2006 (17:45-18:00; 18:45-19:15) deleted as sensor out of water
12/6/2006(03:30) deleted as sensor out of water

SU: All data deleted 12/6/2006 (06:45-11:00) conductivity sensor out of water
All data deleted 12/8/2006 (19:00) through 12/10/2006 (15:45) conductivity sensor out of water
Turbidity 12/1/2006 (05:30; 06:15; 10:45; 14:15) deleted over range
12/8/2006 (17:45) deleted over range
Depth values 12/4/2006 (03:00) through 12/5/2006 (06:15) deleted ice formation in sensor
12/5/2006 (16:00-20:45) deleted ice formation in sensor
12/7/2006 (19:15) through 12/8/2006 (18:45) deleted ice formation in sensor
pH data 12/11/2006 (09:00) deleted, reading was an artifact from logger change

OL: All data deleted 12/1/2006 (21:30 – 23:00), the logger was out of the water.
Depth data 12/8/2006 (19:45-21:30) deleted, depth sensor out of the water, ice formation caused high depth readings.
All data deleted 12/8/2006 (21:45-23:45), the logger was out of the water.
Turbidity 12/1/2006 (16:15) deleted over range
12/20/2006 (02:15, 02:30, 08:00, 11:00, 11:15) deleted over range
12/7/2006 (17:15) deleted over range

BR: Turbidity 12/1/2006 (00:00) through 12/3/2006 (11:45) intermittent readings deleted, over range
Turbidity 12/11/2006 (09:15) through 12/20/2006 (22:30) intermittent readings deleted, over range

13. Missing data:

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

March 2006
None

April 2006
WM: None

SU: All data missing from 4/3/2006 (09:00) through 4/24/2007 (08:45) when sonde failed during deployment

May 2006
None

June 2006
WM: None

SU: None

OL: None

BR: All data missing 6/12/2006 (05:30-08:00) due to sonde power failure

July 2006
WM: None

SU: None

OL: None

BR: None

August 2006
WM: All data missing 8/21/2006 (07:45) due to swapping loggers

SU: None

OL: All data missing 8/6/2006 (08:15) due to swapping loggers

BR: None

September 2006
WM: None

SU: All data missing 9/18/2006 (07:45) due to servicing logger

OL: None

BR: None

October 2006
WM: None

SU: None

OL: None

BR: None

November 2006
WM: None

SU: None

OL: None

BR: None

December 2006
WM: None

SU: None

OL: All data were missing for the following dates/times. The logger stopped collecting due to power failure – battery power was under 7 volts.

12/3/2006 (23:45) through 12/4/2006 (10:15)
12/4/2006 (18:00) through 12/5/2006 (10:00)
12/5/2006 (20:30) through 12/6/2006 (12:30)
12/6/2006 (17:15) through 12/7/2006 (11:00)
12/7/2006 (11:30-12:00)
12/7/2006 (20:30) through 12/8/2006 (10:30)
12/9/2006 (00:00-10:30)

BR: Logger stopped collecting data from 12/3/2006 (12:00) through 12/11/2006 (09:00) due to power failure on logger.

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 1.413 mS/cm. The pH standard is 7.00. Turbidity standard is zero, and if a second standard is used, it will be in parentheses after the second turbidity reading. The second depth reading is the expected depth reading when correcting for changes in barometric pressure. Note, since site WM and site SU (half the time) had vented sondes, there is no second depth readings after these,

since the corrected depth would still be 0. An asterisk after the DO% reading signifies that the DO membrane was punctured at time of retrieval.

Site	Date	Sp. Cond.	DO(%)	pH	Turb	Depth
WM	04/03/2006	1.370	98.6	7.09	3.3; 137(104)	-.005
	04/24/2006	1.407	17.1*	7.13	6.9; 130(122)	-.002
	05/15/2006	1.356	139.3	7.02	2.0; 130.5(121)	-.028
	05/28/2006	1.42	102.6	6.97	2.1; 133.5(123)	.001
	06/12/2006	1.375	20.5*	7.10	0.4; 128.3(123)	-.018
	06/26/2006	1.382	100.2	6.93	0.5;125.2(123)	-.001
	07/10/2006	1.367	106.8	7.04	0.7;122.2(122)	-.002
	07/24/2006	1.343	100.0	7.04	3.9;128.2(123)	.001
	08/06/2006	1.51	99.6	7.03	0.6;75.2(121)	-.004
	08/21/2006	1.370	0.5*	7.09	0.9;110(121)	0
	09/03/2006	1.244	96.6	7.08	0.7;170.1(122)	-.004
	09/18/2006	1.344	102.9	7.08	1.7;122.6(122)	0
	10/08/2006	1.463	101.8	6.99	0.4;125.6(123)	-.064
	10/30/2006	1.452	103	6.78	1.6;123(123)	-.006
	11/20/2006	1.314	33.7*	6.81	1.9;113(122)	-.01
	12/11/2006	1.40	103.9	7.08	0.8;125.6(123)	-.001
	12/21/2006	1.443	106.2	7.51	0.3;122(123)	-.019

Site	Date	Sp. Cond.	DO(%)	pH	Turb	Depth
SU	04/03/2006	1.402	99.4	7.06	0.4;178(123)	.006
	04/24/2006	Post-cal information unavailable				
	05/15/2006	1.398	95.7	7.06	3.1;145.7(121)	-.001
	05/28/2006	1.66	116.9	7.14	-.1;130.4(121)	-.178/-.181
	06/12/2006	1.418	102.3	7.07	1.3;126.7(123)	.001
	06/26/2006	1.394	96.4	7.08	0.6;124.4(123)	-.224/-.219
	07/10/2006	1.404	101.6	7.11	-.1;124.3(122)	-.002
	07/24/2006	1.40	97.9	7.08	0.4;123.3(123)	-.220/-.219
	08/06/2006	1.408	102.5	7.09	-3.1;123.6(121)	.003
	08/21/2006	1.395	99.7	7.14	0.6;122.3(121)	-.156/-.159
	09/03/2006	1.415	100.9	6.91	.6;123(122)	-.002
	09/18/2006	1.400	100	7.08	-.2;120.2(122)	-.293/-.294
	10/08/2006	1.446	75.5	7.13	0.2;123.1(123)	
	10/30/2006	1.411	99.3	6.98	0.7;125.7(123)	-.258/-.253
	11/20/2006	1.38	107	6.99	0.9;112.9(122)	-.002
	12/11/2006	1.398	102.8	7.12	0.2;123.6(123)	-.067/-.073
	12/21/2006	1.439	103.3	7.14	0.2;123.9(123)	0

Site	Date	Sp. Cond.	DO(%)	pH	Turb	Depth
OL	04/03/2006	1.416	100.4	7.00	3.1;139(104)	-.321/-.315
	04/24/2006	1.386	104.6	7.10	3.4;125.6(122)	-.236/-.228

	05/15/2006	1.371	103.9	7.05	13;132.6(121)	-.270/-.262
	05/28/2006	1.440	116.8	7.08	-.1;130.4(123)	-.178/-.181
	06/12/2006	1.328	95	7.17	1.2;125.3(123)	-.152/-.147
	06/26/2006	1.419	95.3	7.07	0.8;124.8(123)	-.231/-.220
	07/10/2006	1.330	100.8	7.04	0.7;122.7(122)	-.195/-.188
	07/24/2006	1.385	104.4	7.06	0.8;124.3(123)	-.222/-.219
	08/06/2006	1.146	92.6	6.98	0.2;88.6(121)	/-.144
	08/21/2006	1.333	22.6*	7.02	0.6;123.1(121)	0.58/-.158
	09/03/2006	1.166	98.5	7.04	-.1;126.4(122)	-.182/-.181
	09/18/2006	1.357	100.8	7.05	1.3;121.7(122)	-.295/-.294
	10/08/2006	1.468	111.3	6.93	1.3;123.9(123)	-.125/-.118
	10/30/2006	1.392	*	6.92	0.6;124.7(123)	-.266/-.255
	11/20/2006	1.364	37.4*	6.80	1.2;123.9(122)	-.108/-.095
	12/11/2006	1.400	106.7	6.95	.6;124.2(123)	-.072/-.073
	12/21/2006	1.406	108.4	7.35	0.5;123.9(123)	-.134/-.110

Site	Date	Sp. Cond.	DO(%)	pH	Turb	Depth
BR	04/03/2006	1.410	63.5	7.08	0.6;130.5(104)	-.379/-.367
	04/24/2006	1.399	97.4	7.07	0.2;124.4(122)	-.236/-.234
	05/15/2006	1.403	98.3	7.06	-.5;122.2(121)	-.259/-.258
	05/28/2006	1.593	98	6.99	0.6;131.7(123)	-.189/-.179
	06/12/2006	1.506	77	7.08	0;104.6(123)	-.140/-.140
	06/26/2006	1.476	99.9	7.01	0.2;124.4(123)	-.225/-.226
	07/10/2006	1.391	104.3	7.07	0.3;123.5(122)	-.192/-.181
	07/24/2006	1.390	5.4*	7.09	0;124.6(123)	-.221/-.226
	08/06/2006	1.388	100.8	7.03	1.5;124.6(121)	-.141/-.137/
	08/21/2006	1.407	100.1	7.05	0.1;122.2(121)	-.159/-.159
	09/03/2006	1.382	99.7	7.09	.6;121.3(122)	/-.193
	09/18/2006	1.401	99.6	7.08	0.1;122.1(122)	-.301/-.292
	10/08/2006	1.404	102.9	7.10	0.4;126(123)	-.110/-.107
	10/30/2006	1.445	97.2	6.98	0.3;122.2(123)	-.274/-.258
	11/20/2006	1.364	102.3	7.07	.2;124.2(122)	-.109/-.110
	12/11/2006	1.408	107.6	7.04	.1;122.4(123)	-.086/-.079
	12/21/2006	1.410	96.8	6.95	0;119.3(123)	-.104/-.101

15. Other Remarks:

On 10/01/2019 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.

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	03/13/2006	14.4	.589	9.06	7.79
	04/03/2006	11.7	.635	9.84	8.21
	04/24/2006	14.3	.568	6.32	7.93
	05/15/2006	14.1	.619	5.2	7.6
	05/28/2006	21.0	.404	8.01	7.76
	06/12/2006	21.4	.334	8.58	8.14
	06/26/2006	22.0	.527	6.55	7.48
	07/10/2006	23.6	.470	7.02	7.86
	07/24/2006	24.9	.474	6.69	7.82
	08/06/2006	25.7	.355	5.59	7.73
	08/21/2006	22.8	.306	7.33	8.11
	09/03/2006	19.6	.318	6.73	7.68
	09/18/2006	21.8	.411	6.63	7.69
	10/08/2006	15.8	.554	8.7	7.87
	10/30/2006	9.6	.482	10.0	7.86
	11/20/2006	5.5	.556	10.77	7.96
	12/11/2006	3.8	.558	12.52	8.1
	12/21/2006	6.7	.658	12.47	8.02

Site	Date	Temp	Sp. Cond.	DO(mg/l)	pH
SU	03/13/2006	14.7	.635	10.19	7.8
	04/03/2006	12.7	.748	9.3	8.07
	04/24/2006	14.9	.629	7.83	8.06
	05/15/2006	12.1	.727	7.58	7.75
	05/28/2006	19.9	.490	7.49	7.63
	06/12/2006	18.5	.734	7.45	7.74
	06/26/2006	22.0	.579	8.50	7.65
	07/10/2006	22.7	.626	7.60	7.80
	07/24/2006	23.7	.660	6.87	7.77
	08/06/2006	25.5	.629	5.99	7.84
	08/21/2006	23.7	.657	5.71	7.97
	09/03/2006	19.1	.671	6.03	7.54
	09/18/2006	21.6	.761	7.45	7.86
	10/08/2006	13.4	.694	6.32	7.76
	10/30/2006	9.0	.523	10.41	7.82
	11/20/2006	5.8	.571	11.31	7.86
	12/11/2006	4.2	.665	12.31	7.96
	12/21/2006	5.5	.684	12.08	7.86

Site	Date	Temp	Sp. Cond.	DO(mg/l)	pH
OL	03/13/2006	13.9	.576	9.01	7.73
	04/03/2006	12.2	.717	7.98	7.98
	04/24/2006	14.4	.602	9.3	7.95
	05/15/2006	14.2	.624	4.86	7.52
	05/28/2006	22.4	.453	6.48	7.54
	06/12/2006	21.0	.331	8.42	8.12
	06/26/2006	22.4	.514	5.94	7.46
	07/10/2006	23.4	.514	7.12	7.81
	07/24/2006	24.3	.490	6.50	7.84
	08/06/2006	25.2	.360	5.42	7.74
	08/21/2006	21.5	.308	7.00	8.08
	09/03/2006	19.5	.319	6.83	7.75
	09/18/2006	21.8	.418	6.82	7.74
	10/08/2006	16.1	.603	9.88	7.85
	10/30/2006	9.4	.494	10.16	7.80
	11/20/2006	6.2	.601	10.86	7.97
	12/11/2006	3.8	.652	12.41	8.09
	12/21/2006	6.8	.625	12.48	8.08

Site	Date	Temp	Sp. Cond.	DO(mg/l)	pH
BR	03/13/2006	12.2	.580	9.79	7.79
	04/03/2006	12.5	.754	9.70	8.13
	04/24/2006	13.9	.648	9.15	8.18
	05/15/2006	13.0	.634	9.45	7.84
	05/28/2006	19.1	.510	8.33	7.72
	06/12/2006	18.5	.734	7.45	7.74
	06/26/2006	21.4	.586	9.21	7.72
	07/10/2006	22.0	.652	8.31	7.85
	07/24/2006	22.1	.692	7.69	7.95
	08/06/2006	22.9	.682	6.69	7.92
	08/21/2006	19.8	.800	7.01	7.93
	09/03/2006	18.0	.807	8.10	7.74
	09/18/2006	19.3	.875	7.08	7.81
	10/08/2006	12.1	.726	7.54	7.80
	10/30/2006	7.9	.538	10.85	7.92
	11/20/2006	6.0	.501	11.76	7.93
	12/11/2006	3.8	.644	12.42	8.04
	12/21/2006	5.4	.673	11.84	8.02

A Sutron Sat-Link2 transmitter was installed at the OL station on 10/10/2006 and transmits data to the NOAA GOES satellite, NESDIS ID #3B017310. The transmissions are scheduled hourly and contain four (4) datasets reflecting fifteen minute data sampling intervals. The telemetry data is "Provisional" data and not the "Authentic" dataset used for long term monitoring and study. This data can be viewed by going to http://cdmo.baruch.sc.edu."

Rainfall for 2006 is presented below. Values are in mm rainfall. Rain gauge during January and February was working only intermittently.

Date	TotPrcp
1/1/2006	0.00
1/2/2006	0.00
1/3/2006	0.00
1/4/2006	0.00
1/5/2006	0.00
1/6/2006	0.00
1/7/2006	0.00
1/8/2006	0.00
1/9/2006	0.00
1/10/2006	2.00
1/11/2006	0.50
1/12/2006	0.00
1/13/2006	5.60
1/14/2006	3.00
1/15/2006	0.00
1/16/2006	0.50
1/17/2006	16.80
1/18/2006	2.00
1/19/2006	2.50
1/20/2006	0.00
1/21/2006	0.00
1/22/2006	0.00
1/23/2006	0.00
1/24/2006	0.00
1/25/2006	0.00
1/26/2006	0.00
1/27/2006	0.00
1/28/2006	0.00
1/29/2006	0.00
1/30/2006	0.00
1/31/2006	0.00
2/1/2006	0.00
2/2/2006	0.00
2/3/2006	0.00
2/4/2006	0.00
2/5/2006	0.00
2/6/2006	0.00
2/7/2006	0.00
2/8/2006	0.00
2/9/2006	0.00
2/10/2006	0.00
2/11/2006	0.00
2/12/2006	0.00
2/13/2006	1.00
2/14/2006	0.00
2/15/2006	0.00
2/16/2006	5.60
2/17/2006	0.00

2/18/2006	0.00
2/19/2006	0.00
2/20/2006	0.00
2/21/2006	0.00
2/22/2006	0.00
2/23/2006	0.00
2/24/2006	0.00
2/25/2006	0.00
2/26/2006	0.00
2/27/2006	0.00
2/28/2006	0.00
3/1/2006	0.00
3/2/2006	0.00
3/3/2006	0.00
3/4/2006	0.00
3/5/2006	0.00
3/7/2006	0.00
3/8/2006	0.00
3/9/2006	0.00
3/10/2006	0.00
3/11/2006	0.00
3/12/2006	0.00
3/13/2006	0.00
3/14/2006	0.00
3/15/2006	0.00
3/16/2006	0.00
3/17/2006	0.00
3/18/2006	0.00
3/19/2006	0.00
3/20/2006	0.00
3/21/2006	0.00
3/22/2006	0.00
3/23/2006	0.00
3/24/2006	0.00
3/25/2006	0.00
3/26/2006	0.00
3/27/2006	0.00
3/28/2006	0.00
3/29/2006	0.00
3/30/2006	0.00
3/31/2006	0.00
4/1/2006	0.00
4/2/2006	0.00
4/3/2006	0.00
4/4/2006	5.10
4/5/2006	0.50
4/6/2006	0.30
4/7/2006	0.00
4/8/2006	14.70
4/9/2006	0.00
4/10/2006	0.00
4/11/2006	0.00
4/12/2006	0.00

4/13/2006	3.30
4/14/2006	0.00
4/15/2006	1.00
4/16/2006	0.00
4/17/2006	0.50
4/18/2006	0.00
4/19/2006	0.00
4/20/2006	0.00
4/21/2006	0.00
4/22/2006	35.80
4/23/2006	1.80
4/24/2006	4.80
4/25/2006	0.00
4/26/2006	1.50
4/27/2006	0.00
4/28/2006	0.00
4/29/2006	0.00
4/30/2006	0.00
5/1/2006	0.00
5/2/2006	0.00
5/3/2006	3.60
5/4/2006	0.30
5/5/2006	0.00
5/6/2006	0.00
5/7/2006	0.00
5/8/2006	0.00
5/9/2006	0.00
5/10/2006	0.00
5/11/2006	15.50
5/12/2006	0.80
5/13/2006	6.10
5/14/2006	3.00
5/15/2006	9.40
5/16/2006	19.80
5/17/2006	4.10
5/18/2006	6.60
5/19/2006	7.40
5/20/2006	0.30
5/21/2006	0.00
5/22/2006	0.30
5/23/2006	0.00
5/24/2006	0.00
5/25/2006	2.00
5/26/2006	15.50
5/27/2006	5.60
5/28/2006	0.00
5/29/2006	0.00
5/30/2006	0.00
5/31/2006	0.00
6/1/2006	0.00
6/2/2006	0.00
6/3/2006	2.30
6/4/2006	0.00

6/5/2006	6.40
6/6/2006	0.00
6/7/2006	0.00
6/8/2006	0.00
6/9/2006	2.50
6/10/2006	0.00
6/11/2006	0.00
6/12/2006	0.00
6/13/2006	0.00
6/14/2006	0.00
6/15/2006	0.00
6/16/2006	0.00
6/17/2006	0.00
6/18/2006	0.00
6/19/2006	2.00
6/20/2006	27.40
6/21/2006	0.00
6/22/2006	64.50
6/23/2006	85.60
6/24/2006	0.50
6/25/2006	0.00
6/26/2006	0.00
6/27/2006	0.00
6/28/2006	0.00
6/29/2006	1.50
6/30/2006	0.00
7/1/2006	0.00
7/2/2006	0.00
7/3/2006	3.80
7/4/2006	1.80
7/5/2006	31.80
7/6/2006	0.00
7/7/2006	0.00
7/8/2006	0.00
7/9/2006	0.00
7/10/2006	0.00
7/11/2006	2.00
7/12/2006	10.40
7/13/2006	3.60
7/14/2006	0.00
7/15/2006	18.00
7/16/2006	0.00
7/17/2006	0.00
7/18/2006	0.00
7/19/2006	0.00
7/20/2006	0.00
7/21/2006	0.00
7/22/2006	2.54
7/23/2006	0.00
7/24/2006	0.00
7/25/2006	0.00
7/26/2006	1.78
7/27/2006	26.16

7/28/2006	19.30
7/29/2006	0.00
7/30/2006	0.00
7/31/2006	0.00
8/1/2006	0.00
8/2/2006	0.00
8/3/2006	0.00
8/4/2006	0.00
8/5/2006	0.00
8/6/2006	0.00
8/7/2006	0.25
8/8/2006	0.00
8/9/2006	0.00
8/10/2006	0.00
8/11/2006	0.76
8/12/2006	0.00
8/13/2006	0.00
8/14/2006	5.04
8/15/2006	0.00
8/16/2006	0.00
8/17/2006	0.00
8/18/2006	0.00
8/19/2006	5.08
8/20/2006	0.00
8/21/2006	0.00
8/22/2006	0.00
8/23/2006	0.00
8/24/2006	0.25
8/25/2006	0.00
8/26/2006	0.25
8/27/2006	14.26
8/28/2006	15.25
8/29/2006	13.72
8/30/2006	0.00
8/31/2006	0.00
9/1/2006	0.00
9/2/2006	8.38
9/3/2006	0.00
9/4/2006	0.00
9/5/2006	0.00
9/6/2006	0.00
9/7/2006	0.00
9/8/2006	0.00
9/9/2006	0.25
9/10/2006	0.00
9/11/2006	5.33
9/12/2006	10.41
9/13/2006	1.27
9/14/2006	0.00
9/15/2006	0.00
9/16/2006	0.25
9/17/2006	0.00
9/18/2006	20.83

9/19/2006	0.00
9/20/2006	0.00
9/21/2006	0.00
9/22/2006	0.25
9/23/2006	0.51
9/24/2006	3.05
9/25/2006	0.00
9/26/2006	0.00
9/27/2006	17.00
9/28/2006	0.25
9/29/2006	2.03
9/30/2006	13.97
10/1/2006	0.25
10/2/2006	0.76
10/3/2006	0.51
10/4/2006	1.52
10/5/2006	0.00
10/6/2006	0.00
10/7/2006	0.00
10/8/2006	0.00
10/9/2006	0.00
10/10/2006	0.00
10/11/2006	12.45
10/12/2006	0.00
10/13/2006	0.00
10/14/2006	0.00
10/15/2006	0.00
10/16/2006	4.32
10/17/2006	46.74
10/18/2006	0.00
10/19/2006	1.02
10/20/2006	8.38
10/21/2006	0.00
10/22/2006	1.52
10/23/2006	0.00
10/24/2006	0.25
10/25/2006	0.00
10/26/2006	0.76
10/27/2006	20.07
10/28/2006	3.05
10/29/2006	0.00
10/30/2006	0.00
10/31/2006	2.54
11/1/2006	0.00
11/2/2006	0.00
11/3/2006	0.00
11/4/2006	0.00
11/5/2006	0.00
11/6/2006	0.00
11/7/2006	0.00
11/8/2006	3.05
11/9/2006	0.25
11/10/2006	0.00

11/11/2006	0.00
11/12/2006	2.79
11/13/2006	0.00
11/14/2006	0.00
11/15/2006	0.00
11/16/2006	18.80
11/17/2006	11.94
11/18/2006	3.30
11/19/2006	0.00
11/20/2006	2.54
11/21/2006	0.00
11/22/2006	0.00
11/23/2006	0.00
11/24/2006	0.00
11/25/2006	0.00
11/26/2006	0.00
11/27/2006	0.00
11/28/2006	0.00
11/29/2006	0.00
11/30/2006	0.00
12/1/2006	44.45
12/2/2006	37.85
12/3/2006	0.00
12/4/2006	0.00
12/5/2006	0.00
12/6/2006	0.00
12/7/2006	0.00
12/8/2006	0.25
12/9/2006	0.00
12/10/2006	0.00
12/11/2006	0.00
12/12/2006	0.00
12/13/2006	3.30
12/14/2006	0.00
12/15/2006	0.00
12/16/2006	0.00
12/17/2006	0.00
12/18/2006	1.78
12/19/2006	4.83
12/20/2006	0.00
12/21/2006	0.00
12/22/2006	4.57
12/23/2006	13.21
12/24/2006	0.00
12/25/2006	0.00
12/26/2006	7.87
12/27/2006	6.10
12/28/2006	0.00
12/29/2006	0.00
12/30/2006	0.00
12/31/2006	0.00