

Old Woman Creek (OWC) NERR Site Water Quality Metadata  
April through November, 1999  
Latest Update: March 27, 2000

1. Principal Investigator & contact persons:

Dr. David Klarer, Research Coordinator  
Mr. Gene Wright, Manager

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 data loggers into the YSI PC6000 program in the PC. The data were graphed and visually checked for any obvious outliers. The data were then transferred to an Excel spreadsheet. The data files were edited to remove headers, footers, and spaces. All three CDMO macros were used to QA/QC the data. Missing data were inserted into the spreadsheet and denoted by periods. The data files were then checked for readings that were outside the instrument range. These data were removed and replaced with a period. An explanation for the missing and the deleted data is included in this metadata sheet. The files were then transferred along with the associated metadata by disk 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 approximately two-week periods at two sites within the Old Woman Creek estuary- one in the upper reaches at State Route 2 (SU) and the other near the mouth, just south of State Route 6 (WM). The purpose of this monitoring program is to document the role of Great Lakes estuaries in mitigating storm flow that passes through them.

4. Research methods:

The YSI monitoring program began on 1 April, 1999 at both sites. Prior to deployment of the data loggers, a 4 inch diameter PVC pipe was bolted to a metal sign post that had been driven into the sediment. Each pipe had 4 rows of holes 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. The data logger at site SU is .47 meters above the bottom, while the YSI at site WM is 0.32 meters above the bottom. Due to very low Lake Erie water levels, it was necessary to move both the data logger sites in November 1999. The data logger was moved less than .5 meters into a deeper water area on 10 November 1999. The new datalogger site was 0.275 meters deeper than the previous depth at site WM and 0.225 meters deeper at site SU. The data logger at site WM was 0.10 meters above the bottom at the new location and at site SU the data logger was also 0.10 meters above the bottom. Dissolved oxygen, pH, temperature, turbidity, and specific conductance readings are taken when the instrument is pulled at each site. On alternate weeks, the data loggers are pulled. The data is retrieved from each data logger and each data logger is 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) was calibrated using commercial standards.

##### 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 22' N; longitude 82 31' W). The data logger at the State Route 2 (SU) (Latitude 41 22' 57" N, 82 30' 52") W site is very near the southern boundary of the reserve. 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 data logger at State Route 6 (WM) (Latitude 41 22' 56" N, 82 30' 26") 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.

#### 6. Data collection periods:

Sampling at WM began on April 1, 1999 at 00:00:00. Sampling ceased at WM site on November 30, 1999 at 23:45:00. Sampling at SU began on April 1, 1998 at 00:00:00. Sampling ceased at SU site on November 30, 1999 at 23:45:00.

7. Associated projects: Samples for chemical analysis of the water and phytoplankton analysis are collected at each site every time the data loggers are changed.

## II. Physical Structure and Descriptors:

#### 8. Variable sequence, range of measurements, units, resolution, accuracy:

| Variable Name                    | Range of Measurements | Resolution       | Accuracy             |
|----------------------------------|-----------------------|------------------|----------------------|
| DATE                             | 1-12, 1-31, 00-99     | 1 mo, 1day, 1yr  | NA                   |
| HOURL                            | 0-24, 0-60, 0-60      | 1hr, 1 min, 1sec | NA                   |
| TEMP                             | -5 to 45 (degrees C)  | 0.01 C           | +/-0.15C             |
| SPCOND                           | 0-100 (mS/cm)         | 0.01 mS/cm       | +/-0.5% reading      |
| +                                |                       |                  |                      |
| 0.001mS/cm                       |                       |                  |                      |
| SALINITY                         | 0-70 (ppt)            | 0.01 ppt         | +/-1.0% of reading   |
| or 0.1ppt (whichever is greater) |                       |                  |                      |
| DO%SAT                           | 0-200 (% saturation)  | 0.1% @air sat    | +/-                  |
| 2%                               |                       |                  |                      |
| @air sat.                        |                       |                  |                      |
| DO%SAT                           | 200-500(%saturation)  | 0.1% @air sat    | +/-                  |
| 6%                               |                       |                  |                      |
| @air sat.                        |                       |                  |                      |
| DO (mg/l)                        | 0-20 (mg/l)           | 0.01 mg/l        | +/-0.2 mg/l          |
| DO (mg/l)                        | 20-50 (mg/l)          | 0.01 mg/l        | +/-0.6 mg/l          |
| DEPTH (shallow)                  | 0-9.1 (m)             | 0.001 m          | +/- 0.018 m          |
| pH                               | 2 to 14 units         | 0.01 units       | +/-0.2 units         |
| Turb                             | 0-1500 NTU            | 0.1 NTU*         | +/- 5% of reading or |
| 2 NTU (whichever is greater)*    |                       |                  |                      |

\* for turbidity values of 0-1000 NTU

#### 9. Coded variable indicator and variable code definitions:

SU- State Route 2 WM-State Route 6

#### 10. Data anomalies (suspect data):

April 1999:

WM:

SU: Water levels were intermittently at or below 0 from 04/01/99 through 04/09/99 and again from 04/15/99 through 04/17/99. This was due to the low

water levels so that the depth recorder was often above water level at this time

coupled with changes in barometric pressure. Jump in DO from 73.2% to 139.2% due

to

redployment of instrument at 04/19/99 (07:45).

May 1999:

WM: Two high turbidity values (>1500 NTU) on 05/04/99 (19:15) and 05/08/99

(20:30)- could be due to biological or wind activity. Low oxygen levels from

05/17/99 through 05/19/99 at 08:00 due to periphyton growth on oxygen membrane.

Low oxygen on 05/29/99 through the end of the month due to periphyton growth on

oxygen membrane.

SU:

June 1999:

WM: Low oxygen levels until 06/01/99 at 08:45 due to periphyton growth on oxygen

membrane. Turbidity erratic from 06/05/99 through 06/08/99 possibly due to carp

activity - DO and pH level off during this same time period. Low oxygen from

06/09/99 to 06/15/99 at 08:30 due to periphyton growth on oxygen membrane. Two

high turbidity values (>1500 NTU) on 06/16/99 (12:30) to 06/19/99 (07:45) possibly due to biological activity.

SU:

July 1999:

WM: Low and/or erratic oxygen from 07/01/99 (00:00) through 07/06/99(08:15) due

to periphyton growth on oxygen membrane. One high turbidity value on 07/06/99

(14:30). Several small negative turbidity readings throughout the following

time period: 07/18/99 (12:30) to 07/19/99 (13:15). Negative water level readings from 07/09/99 (08:15 to 16:15) and 07/10/99 (00:30 to 02:30) due to low

water levels.

SU: Negative oxygen readings deleted 07/04/99 (05:45 to 11:15) and on 07/06/99

(04:45; 05:30; 06:15). Oxygen readings from 07/04/99 at 05:45 through 07/06/99

at 08:15 should be viewed with some reservation due to these negative readings.

Negative depth readings on 07/09/99 (09:30 through 18:15) due to very low water levels and changing barometric pressure.

August 1999:

WM: Turbidity erratic from 08/01/99 (00:00 to 23:30). All data missing from 08/23/99 (21:15) reason unknown (glitch in datalogger?)  
SU:

September 1999:

WM: Negative oxygen readings from 09/05/99 (05:30); (06:30 to 07:00); (07:30).  
One high turbidity value on 09/14/99 (18:30). Negative oxygen readings deleted from 09/05/99 (23:45) through 09/06/00 (09:45), on 09/07/99 (00:30 and 07:15) and on 09/08/99 (00:00-00:15; 03:30-03:45; 05:45; 06:15-06:30). Oxygen readings from 09/05/99 at 23:45 through 09/08/99 at 07:15 should be viewed with some reservation due to these negative readings.  
SU:

October 1999:

WM:  
SU: Negative oxygen readings deleted from 10/16/99 (11:45-13:15; 15:15-16:30; 21:30; 22:15); 10/16/99 (22:45) through 10/17/99 (02:30); 10/17/99 (17:00) through 10/18/99 (15:45); 10/18/99 (19:45) through 10/23/99 (13:15); 10/31/99 (09:15- 12:30)- probe failure. All oxygen readings from 10/16/99 through the end of the month are suspect due to problems with the oxygen probe.  
Negative water level readings from 10/22/99 (05:30 to 06:00) due to low water levels.

November 1999:

WM: All data deleted 11/05/99 (19:00) through 11/10/99 (15:45) data logger out of water. Negative depth readings on: 11/12/99 (14:45-23:15); 11/13/99 (09:00-12:45; 13:15-13:45); 11/13/99 (20:45) through 11/14/99 (08:45); 11/15/99 (12:45-15:15; 16:15-16:30); 11/17/99 (11:30); 11/17/99 (21:15) through 11/18/99 (16:15); 11/18/99 (19:30) through 11/19/99 (18:45); 11/20/99 (15:00); 11/22/99 (07:15)- due to very low water levels.  
SU: Negative Dissolved Oxygen readings deleted 11/01/99 (05:00; 06:45-09:15; 10:00;11:15); 11/02/99 (23:00)- probe failure. All dissolved oxygen readings

from 11/01/99 (00:00) through 11/03/99 (08:00) suspect due to oxygen probe failure. Jump in DO due to redeployment of instrument on 11/03/99 (08:15);  
Jump in DO due to redeployment of instrument on 11/10/99 (16:00).  
Negative water level readings 11/13/99 (20:00) through 11/14/99 (09:45); 11/23/99 (19:30) through 11/24/99 (03:15); 11/25/99 (22:15-22:30);  
11/26/99 (05:45) through 11/27/99 (02:00); 11/27/99 (04:30) due to low water levels.

#### 11. Missing data:

##### April 1999:

WM: No data was collected from 04/01/99 at 00:00:00 through 04/19/99 at 07:45:00  
due to a software problem with the sonde.  
SU:

##### May 1999:

WM:

SU:

##### June 1999:

WM: All data missing 06/08/99 at 08:30- servicing data logger.  
SU:

##### July 1999:

WM:

SU: Negative oxygen readings deleted 07/04/99 (05:45 to 11:15) and on 07/06/99 (04:45; 05:30; 06:15).

##### August 1999:

WM: All data missing 08/03/99 at 07:45- servicing datalogger. All data missing 08/23/99 at 21:15- reason unknown (glitch in datalogger?).  
SU: All data missing 08/09/99 at 07:15- servicing datalogger.

##### September 1999:

WM: Negative oxygen readings from 09/05/99 (05:30); (06:30 to 07:00); (07:30).  
Negative oxygen readings deleted from 09/05/99 (23:45) through 09/06/00 (09:45),  
on 09/07/99 (00:30 and 07:15) and on 09/08/99 (00:00-00:15; 03:30-03:45; 05:45; 06:15-06:30). Salinity readings are missing from 09/21/99 at 08:15 through 09/22/99 at 15:30 due to operator error. All data missing 09/22/99 at 13:30- servicing data logger.  
SU:

##### October 1999:

WM:

SU: No salinity readings from 10/04/99 (07:30) through 10/15/99 (09:15) - operator error. Negative oxygen readings deleted from 10/16/99 (11:45-13:15; 15:15-16:30; 21:30; 22:15); 10/16/99 (22:45) through 10/17/99 (02:30); 10/17/99 (17:00) through 10/18/99 (15:45); 10/18/99 (19:45) through 10/23/99 (13:15); 10/31/99 (09:15- 12:30) - probe failure.

November 1999:

WM: No salinity or DO (mg/l) data from 11/03/99 (08:45) through 11/05/99 (18:45) operator error. All data deleted 11/05/99 (19:00) through 11/10/99 (15:45) data logger out of water. No salinity or DO (mg/l) data from 11/10/99 (16:00) through 11/23/99 (08:45) operator error. No data 11/23/99 (09:00 through 17:15) servicing data logger.  
SU: Negative Dissolved Oxygen readings deleted 11/01/99 (05:00; 06:45-09:15; 10:00;11:15); 11/02/99 (23:00) - probe failure. All data missing 11/08/99 (09:00) through 11/10/99 (15:45) pulled data logger due to low water level.

## 12. Other Remarks

The time recorded by the YSI 6000 instrument was off the following date/times:

SU: time was off +40 sec from 06/08/99 (07:45:40) to 06/15/99 (07:30:40)  
WM: time was off +40 sec from 06/08/99 (08:30:40) to 06/15/99 (08:30:40)  
time was off +52 sec from 09/22/99 (13:30:52) to 09/30/99 (23:45:52)  
time was off +52 sec from 10/01/99 (00:00:52) to 10/31/99 (23:45:52)  
time was off +52 sec from 11/01/99 (00:00:52) to 11/31/99 (23:45:52)