**Old Woman Creek (OWC) NERR Site Nutrient Metadata**

March through December, 2007

Latest Update: November 15, 2011

**I. Data Set and Research Descriptors**

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**2.** **Research Objectives:**

Samples for chemical analysis are taken at least monthly at the four existing datalogger sites within or near the Old Woman Creek SNP and NERR. Three of the sites are 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). In August the site SU was replaced with Darrow Road (DR) as SU was inaccessible due to bridge and road work. Darrow Road is just upstream from site SU, so it is still an excellent representative site of the upper estuary. The final site (BR) is just upstream of the first riffle zone above the estuary in Old Woman Creek proper. The purpose of this part of the nutrient monitoring program is to document the spatial and temporal distribution of nutrient levels in this Great Lakes estuary.

At site WM samples are collected at 2 hour intervals over a 26 hour period once a month. The purpose of this part of the monitoring program is to examine temporal changes in nutrient levels in the estuary over the course of a day.

**3. Research methods:**

**Monthly Sampling**

The chemical monitoring program began on 26 March, 2007 at sites BR, SU, OL, and WM. The sampling at all sites ended for the year on 10 December, 2007, except site SU, which ended on 6 August. Site DR was sampled 27 August thereafter until the end of the year.

Replicate grab samples for chemical and chlorophyll analysis were collected sequentially at each of the data logger sites each time the data loggers were swapped out. The samples were collected immediately prior to changing the data loggers, insuring that the samples for chemical analysis were undisturbed.

Sample bottles, (previously washed with 10% HCl, rinsed six (6) times with distilled water and then allowed to air dry upside down prior to sampling), were rinsed with the sample water three times before the sample was collected for analysis. Temperature, dissolved oxygen, and pH values were determined on the samples at time of collection using field meters that were previously calibrated according to the manufacturer. If samples were not to be filtered and analyzed within the next hour or so, they were stored in a refrigerator or in the dark on ice.

**Diurnal Sampling**

Once a month- from March through December, 2006- samples were collected at site WM at two hour intervals for a 26 hour period using an ISCO Model 3700 FR refrigerated sampler. At each 2-hour interval, the sampler collected a single 850 ml sample. Prior to collecting each sample, the ISCO sampler was programmed to rinse the collection line three times. The diurnal samples were collected within one meter of the datalogger and at the same depth. The sample bottles for the sampler were cleaned using the same protocol outlined above.

4. 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. Salinity in Old Woman Creek is normally 1 ppt. or less.

The data logger at the State Route 6 (WM) site (Latitude 41° 22' 57” N, Longitude 82° 30'52” 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. 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. *Phragmites* *australis* is the dominant aquatic macrophyte near this site. Depth at this site will range from less than 10 cm to nearly 1 meter over the course of a year

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 site is located 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. Depth at this site ranged from about 20 cm up to over a meter in depth during 2007

The data logger at site OL (Latitude 410 22’ 54” N, Longitude 820 30’52” 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 near the northern tip of a *Nelumbo* *lutea* bed, and during many years these plants are within 3 meters of the site. This site varied in depth from 20 cm to over a meter over 2007.

The data logger at site BR (Latitude 410 20’54” N, Longitude 820 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 clay-silt that has been washed in from upstream. There are no aquatic macrophytes at or near this site, but there can be algal growth on the bottom rocks during much of the year. Depth during baseflow conditions was about 50 cm. Water levels here would rise to over 2 meters during storm flow.

The data logger at site DR (Latitude 410 21’54”N, Longitude 820 30’ 17”W) is at the southern boundary of the reserve. The logger trap is suspended from one of the supports on the north side of the Darrow Road bridge. At this site the creek is relatively narrow. Although water direction and flow is influenced at this site by changes in Lake Erie water levels, this site doesn’t have direct contact with Lake Erie waters. The bottom sediments at his site are silty clay. There is no rooted aquatic vegetation near or upstream from this site. Depth at this site was very similar to that at SU, ranging from about 20 cm up to over a meter in 2007.

**5. Code variable definitions**

owcsunut: Old Woman Creek State Route 2 nutrients

owcwmnut: Old Woman Creek State Route 6 nutrients

owcolnut: Old Woman Creek Lower Estuary nutrients

owcbrnut: Old Woman Creek Berlin Road nutrients

owcdrnut: Old Woman Creek Darrow Road nutrients

monitoring program 1- grab sample

monitoring program 2 - diurnal sample

**6. Sample Collection Periods**

Sampling at WM began on March 26, 2007 at 08:15. Sampling for 2007 ceased at WM site on December 10, 2007 at 14:45. Sampling at SU began on March 26, 2007 at 16:45. Sampling ceased at this site on August 6, 2007 at 08:15, because of construction. Sampling at OL began on March 26, 2007 at 07:45, and ended on December 10, 2007 at 14:30. Sampling at BR began on March 26, 2007 at 09:30 and ended on December 10, 2007 at 15:45. Sampling at Darrow Road began on August 27, 2007 at 08:30 and ended on December 10, 2007 at 15:30. Specific deployment dates are listed below. **Note:** All times given are in Eastern Standard Time. The two grab samples were collected sequentially within 30 seconds of each other.

**Collection times:**

Site

WM 3/26/2007 (08:15)

4/16/2007 (07:40)

5/7/2007 (07:15)

5/21/2007 (07:55)

6/4/2007 (07:15)

6/25/2007 (07:25)

7/16/2007 (07:30)

8/6/2007 (07:15)

8/27/2007 (07:10)

9/17/2007 (08:30)

10/9/2007 (07:00)

10/29/2007 (08:15)

11/19/2007 (08:45)

12/10/2007 (14:45)

SU 3/26/2007 (16:45)

4/16/2007 (08:00)

5/7/2007 (08:15)

5/21/2007 (08:30)

6/4/2007 (08:00)

6/25/2007 (08:00)

7/16/2007 (08:00)

8/6/2007 (08:00)

OL 3/26/2007 (07:45)

4/16/2007 (07:30)

5/7/2007 (07:00)

5/21/2007 (07:45)

6/4/2007 (07:10)

6/25/2007 (07:15)

7/16/2007 (07:15)

8/6/2007 (07:10)

8/27/2007 (07:00)

9/17/2007 (08:15)

10/9/2007 (06:45)

10/29/2007 (10:00)

11/19/2007 (08:30)

12/10/2007 (14:30)

BR 3/26/2007 (09:00)

4/16/2007 (08:30)

5/7/2007 (08:15)

5/21/2007 (08:45)

6/4/2007 (08:15)

6/25/2007 (08:15)

7/16/2007 (08:15)

8/6/2007 (08:30)

8/27/2007 (07:45)

9/17/2007 (07:45)

10/9/2007 (11:15)

10/29/2007 (09:15)

11/19/2007 (09:30)

12/10/2007 (15:45)

DR 8/27/2007 (08:30)

9/17/2007 (07:30)

10/9/2007 (11:00)

10/29/2007 (08:45)

11/19/2007 (09:15)

12/10/2007 (15:30)

**Diurnal Sampling Periods**

Samples were collected at site WM at two hour intervals for the diurnal portion of the nutrient study at the following times:

beginning at: 4/1/2007 (04:00) and ending at: 4/2/2007 (06:00)

4/22/2007 (04:00) 4/23/2007 (06:00)

5/13/2007 (04:00) 5/14/2007 (06:00)

6/10/2007 (04:00) 6/11/2007 (06:00)

7/8/2007 (04:00) 7/9/2007 (06:00)

8/20/2007 (04:00) 8/21/2007 (06:00)

9/9/2007 (04:00) 9/10/2007 (06:00)

10/14/2007 (04:00) 10/15/2007 (06:00)

11/11/2007 (04:00) 11/12/2007 (06:00)

12/3/2007 (04:00) 12/4/2007 (06:00)

7. Associated projects:

Water quality dataloggers are deployed at each of the nutrient sampling sites as part of the SWMP program. These loggers are taking readings of water temperature, specific conductivity, dissolved oxygen, pH, turbidity, and depth at 15-minute intervals. SWMP Meteorological data are also collected at Old Woman Creek NERR. Both the water quality and meteorological data may be obtained through the research coordinator or the CDMO at <http://cdmo.baruch.sc.edu/QueryPages/googlemap.cfm>.

Samples for phytoplankton determination are collected at the same time at two sites near the data logger deployment sites WM and DR. A more comprehensive set of chemical parameters are determined on each grab and diurnal sample collected for this sampling program. This enhanced data set is available from the research coordinator at Old Woman Creek NERR.

The chemical data have been incorporated into several research projects, including a study on the plankton eukaryotic microorganisms, a study on the breakdown of selected organic contaminants, a study on the impacts of *Phragmites* control on non target communities, and a biomonitoring study on the aquatic vegetation of the estuary.

**8. 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 standards, 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 nutrient 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.

**II. Physical Structure Descriptors**

**9. Entry Verification**

All chemical test results collected in the laboratory for one set of samples are recorded on a datasheet. As well as the results from the various chemical tests, this sheet includes data collected in the field (temp, pH, dissolved oxygen) and the time of sample collection. In addition, any anomalies observed in the field or in the lab are also recorded on this worksheet. The worksheet is kept on file at the Old Woman Creek center.

The data collected on the various worksheets are then transferred to an excel spreadsheet by the office assistant. The research coordinator verifies the values on the spreadsheet by comparing with the original worksheets. Duplicate readings are visually inspected to identify any outliers, which would suggest either testing or contamination problems. The research coordinator verifies missing data and leaves those areas on the spreadsheet blank. The data in this spreadsheet are processed using the NutrientQAQC Excel macro. The NutrientQAQC macro sets up the data worksheet, metadata worksheets, and MDL worksheet; facilitates data entry; allows the user to set the number of significant figures to be reported for each parameter and rounds using banker’s rounding rules; allows the user to input MDL values and automatically flags and codes values below MDL; calculates parameters chosen by the user and automatically flags for component values below MDL and negative values; allows the user to apply QAQC flags and codes to the data; graphs selected parameters for review; append files; and export the resulting data files to the CDMO for tertiary QAQC and assimilation into the CDMO’s authoritative online database.

The research coordinator is responsible for the QA/QC both in entry verification and in nutrient analysis.

**10.Parameter Titles and Variable Names by Data Category**

Required NOAA/NERRS System-wide Monitoring Program nutrient parameters are denoted by an asterisks “\*”.

Data Category Parameter Variable Name Unit of Measure

Phosphorus \*Orthophosphate PO4F (SRP) mg/l as P

(Soluble Reactive Phosphorus)

Nitrogen \*Nitrite + Nitrate, Filtered NO23F mg/l as N

\*Nitrite, Filtered NO2F mg/l as N

\*Nitrate, Filtered NO3F mg/l as N

\*Ammonium, Filtered NH4F mg/l as N

Dissolved Inorganic Nitrogen DINF mg/l as N

Chlorophyll \*Chlorophyll a CHLA μg/l

Pheophytin a PHEOA μg/l

Field Parameters Water Temperature WTEM\_N degrees C

Specific Conductance SCON\_N mS/cm

Dissolved Oxygen DO\_N mg/L

pH PH\_N SU

Turbidity TURB\_N NTU

Notes:

1. Time is coded based on a 2400 clock and is referenced to Standard Time.

2. Reserves have the option of measuring either NO2 and NO3 or they may substitute NO23 for individual analyses if they can show that NO2 is a minor component relative to NO3.

**11.** **Measured and Calculated Laboratory Parameters**

**a.Variables Measured Directly**

Phosphorus Species: PO4

Nitrogen Species: NH4, NO2+3, NO2

Chlorophyll Species: CHLA, PHEA

**b.Computed Variables**

Nitrogen Species: NO3 (NO2+3-NO2); and DIN (NO2+3 and NH4 )

**12.**  **Limits of Detection**

The Minimum Detection Limits (MDL), the lowest concentration of a parameter that an analytical procedure can reliably detect, have been established by the Old Woman Creek Analytical Laboratory. The MDL is determined as 3 times the standard deviation of a minimum of 7 replicates of a single low concentration sample. The table below presents the MDL’s for the 2007 analytical period. These values are reviewed and revised annually.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Parameter | Variable | Mean Conc. mg/l as N or P | Std. Dev. | MDL mg/l as N or P | Dates in use |
| Ammonia | NH4 | .0966 | .0004 | .001 | 3/2007-12/2007 |
| Nitrate + Nitrite | NO23 | .102 | .0017 | .005 | 3/2007-12/2007 |
| Nitrite | NO2 | .040 | .00017 | .0005 | 3/2007-12/2007 |
| Orthophosphate | PO4 | .005 | .00004 | .00011 | 3/2007-12/2007 |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Parameter | Variable | Mean Conc μg/l | Std. Dev. | MDL μg/l | Dates in use |
| Chlorophyll a | CHLA | 1.5257 | 0.248715 | 0.746 | 3/2007-12/2007 |
| Phaeophyton | PHEOA |  |  | 0.746 | 3/2007-12/2007 |

**13. Laboratory Methods**

Upon returning to the laboratory, each bottle was shaken and a 100 ml sub-sample for total P and metals (stored in a plastic bottle and preserved with 1 ml 10% HCl) and a 25 ml sub-sample for alkalinity determination were removed. Also prior to filtering, turbidity and conductivity were determined using laboratory meters. Samples for chemical and chlorophyll analysis were filtered as quickly as possible using an aspirator/vacuum system.

**Samples for chlorophyll analysis:** A sample of known volume (for chlorophyll analysis) was filtered through a Gelman 47 mm diameter A/E filter (1 micron). The filter was then removed, folded, cut into small pieces, and then placed into 10 ml. aqueous acetone (90% acetone, 10% saturated magnesium carbonate solution) in a 100 ml glass-stoppered bottle and stored in the freezer in the dark until analysis was conducted one week later. The procedure for chlorophyll analysis is described in Standard Methods for the Analysis of Water and Wastewater, 19th Edn. (1995) (Standard Methods) under “Spectrophotometric Determination of Chlorophyll”, page 10-18.

**Samples for chemical analysis:** After filtration for chlorophyll analysis, the water used for chemical analysis was then filtered through a 47 mm diameter membrane filter (.45 micron) that had been prepared by soaking in distilled water as outlined in Standard Methods. The chemical procedures used were from Standard Methods:

**a) Parameter Ammonia:**

Standard Methods Reference: 4500-NH3 Phenate Method page 4-80

Old Woman Creek SOP- ammonia test

Preservation method: none- tested within 12 hours of collection

**b) Parameter Nitrite**:

Standard Methods Reference: 4500-NO2 Colorimetric Method page 4-83

Old Woman Creek SOP- nitrite test

Preservation method: none- tested within 12 hours of collection

**c) Parameter Nitrate:**

Standard Methods Reference: 4500-NO3 Cadmium Reduction Method

page 4-87

Old Woman Creek SOP- nitrate test

Preservation method: none- tested within 12 hours of collection

**d) Parameter Phosphorus (soluble reactive phosphorus):**

Standard Methods Reference: 4500-P Ascorbic Acid Method page 4-113

Old Woman Creek SOP- Soluble reactive phosphorus test

Preservation method: none- tested within 24 hours of collection

The compete protocol used in both the chlorophyll and chemical analysis of the water is detailed in the Old Woman Creek Standard Operating Procedures Manual (2003).

**14. QA/QC Programs**

**a) Precision**

**Field Variability**- In the SWMP Monitoring program, two replicate samples are collected at all four of the data logger sites. These samples are collected consecutively.

**Laboratory Variability**- At Old Woman Creek two of the 8 samples (25%) are duplicated in the chemical testing program to determine the variability in the chemical methods.

**Inter-organizational Splits**- Old Woman Creek SNP and NERR does not participate in an inter-organizational split program with any other lab.

1. **Accuracy**

**Sample Spikes**- Spikes on conducted on a sub-sample of one of the duplicate sample every third grab sampling time. These data are kept on file at Old Woman Creek.

**Standard Reference Material Analysis**- One standard reference Material analysis was conducted at the Old Woman Creek laboratory during 2007. The certified sample was from APG Catalog Number 4022 (lot number 47215-47216). The nitrite standard is also from APG Catalog Number 4782 (lot number 45543) The information is below:

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Table 1. Results of the SRM analysis for OWC NERR. | | | |  |  |  | |
|  | **NH4-N (mg/L)** | **NO3-N (mg/L)** | **NO2-N (mg/L)** | **PO4-P (mg/L)** | **Total P (mg/L)** | **Total N (mg/l)** |
| Certified conc. | 8.45+0.0268 | 4.25+0.008 | 1.05+0.0098 | 4.53+0.019 | 2.20+0.0109 | 7.59+0.0593 |
| OWC rep #1 | 8.352 | 4.006 | .986 | 4.350 | 2.11 | 7.354 |
| OWC rep #2 | 8.376 | 3.899 | .992 | 4.360 | 2.13 | 7.610 |
| Acceptable limits | 6.17-10.5 | 3.32-5.17 | 0.838-1.24. | 3.55-5.1 | 1.71-2.62. | 5.05-9.87 |

In addition, a standard of known concentration is analyzed each week along with the regular field samples. If the standard varies by more than 5% from the stand curve, the standard curve is recalibrated with new standards.

**Cross Calibration Exercises**- Old Woman Creek SNP and NERR did not participate in any cross calibration exercises with other labs during 2005

**15) QAQC flag definitions –** This section details the primary and secondary QAQC flag definitions.

QAQC flags provide documentation of the data and are applied to individual data points by insertion into the parameter’s associated flag column (header preceded by an F\_). QAQC flags are applied to the nutrient data during secondary QAQC to indicate data that are out of sensor range low (-4), rejected due to QAQC checks (-3), missing (-2), optional and were not collected (-1), suspect (1), and that have been corrected (5). All remaining data are flagged as having passed initial QAQC checks (0) when the data are uploaded and assimilated into the CDMO ODIS as provisional plus data. The historical data flag (4) is used to indicate data that were submitted to the CDMO prior to the initiation of secondary QAQC flags and codes (and the use of the automated primary QAQC system for WQ and MET data). This flag is only present in historical data that are exported from the CDMO ODIS.

-4 Outside Low Sensor Range\*

-3 Data Rejected due to QAQC

-2 Missing Data

-1 Optional SWMP Supported Parameter

0 Data Passed Initial QAQC Checks

1 Suspect Data

4 Historical Data: Pre-Auto QAQC

5 Corrected Data

\*The -4 Outside Low Sensor Range flag was added to the 2007 dataset in August of 2011. See the Other Remarks section for more details.

**16) QAQC code definitions** – This section details the secondary QAQC Code definitions used in combination with the flags above.

QAQC codes are used in conjunction with QAQC flags to provide further documentation of the data and are also applied by insertion into the associated flag column. There are three (3) different code categories, general, sensor, and comment. General errors document general problems with the sample or sample collection, sensor errors document common sensor or parameter specific problems, and comment codes are used to further document conditions or a problem with the data. Only one general or sensor error and one comment code can be applied to a particular data point. However, a record flag column (F\_Record) in the nutrient data allows multiple comment codes to be applied to the entire data record.

General errors

GCM Calculated value could not be determined due to missing data

GCR Calculated value could not be determined due to rejected data

GDM Data missing or sample never collected

GQD Data rejected due to QA/QC checks

GQS Data suspect due to QA/QC checks

Sensor errors

SBL Value below minimum limit of method detection

SCB Value calculated with a value that is below the MDL

SCC Calculation with this component resulted in a negative value

SNV Calculated value is negative

SRD Replicate values differ substantially

SUL Value above upper limit of method detection

Parameter Comments

CAB Algal bloom

CDR Sample diluted and rerun

CHB Sample held beyond specified holding time

CIP Ice present in sample vicinity

CIF Flotsam present in sample vicinity

CLE Sample collected later/earlier than scheduled

CRE Significant rain event

CSM See metadata

CUS Lab analysis from unpreserved sample

Record comments

CAB Algal bloom

CHB Sample held beyond specified holding time

CIP Ice present in sample vicinity

CIF Flotsam present in sample vicinity

CLE Sample collected later/earlier than scheduled

CRE Significant rain event

CSM See metadata

CUS Lab analysis from unpreserved sample

*Cloud cover*

CCL clear (0-10%)

CSP scattered to partly cloudy (10-50%)

CPB partly to broken (50-90%)

COC overcast (>90%)

CFY foggy

CHY hazy

CCC cloud (no percentage)

*Precipitation*

PNP none

PDR drizzle

PLR light rain

PHR heavy rain

PSQ squally

PFQ frozen precipitation (sleet/snow/freezing rain)

PSR mixed rain and snow

*Tide stage*

TSE ebb tide

TSF flood tide

TSH high tide

TSL low tide

*Wave height*

WH0 0 to <0.1 meters

WH1 0.1 to 0.3 meters

WH2 0.3 to 0.6 meters

WH3 0.6 to > 1.0 meters

WH4 1.0 to 1.3 meters

WH5 1.3 or greater meters

*Wind direction*

N from the north

NNE from the north northeast

NE from the northeast

ENE from the east northeast

E from the east

ESE from the east southeast

SE from the southeast

SSE from the south southeast

S from the south

SSW from the south southwest

SW from the southwest

WSW from the west southwest

W from the west

WNW from the west northwest

NW from the northwest

NNW from the north northwest

*Wind speed*

WS0 0 to 1 knot

WS1 > 1 to 10 knots

WS2 > 10 to 20 knots

WS3 > 20 to 30 knots

WS4 > 30 to 40 knots

WS5 > 40 knots

17) Other remarks/notes

Data may be missing due to problems with sample collection or processing.  Laboratories in the NERRS System submit data that are censored at a lower detection rate limit, called the Method Detection Limit or MDL.  MDLs for specific parameters are listed in the Laboratory Methods and Detection Limits Section (Section II, Part 12) of this document.  Concentrations that are less than this limit are censored with the use of a QAQC flag and code, and the reported value is the method detection limit itself rather than a measured value.  For example, if the measured concentration of NO23F was 0.0005 mg/l as N (MDL=0.0008), the reported value would be 0.0008 and would be flagged as out of sensor range low (-4) and coded SBL.  In addition, if any of the components used to calculate a variable are below the MDL, the calculated variable is removed and flagged/coded -4 SCB.  If a calculated value is negative, it is rejected and all measured components are marked suspect.  If additional information on MDL’s or missing, suspect, or rejected data is needed, contact the Research Coordinator at the Reserve submitting the data.

Note: The way below MDL values are handled in the NERRS SWMP dataset was changed in November of 2011.  Previously, below MDL data from 2007-2010 were also flagged/coded, but either reported as the measured value or a blank cell.  Any 2007-2011 nutrient/pigment data downloaded from the CDMO prior to November of 2011 will reflect this difference.

\*The 2007 dataset was updated on August of 2011 to include the -4 Outside Low Sensor Range flag. The 2007 data published prior to that time used the -3 Rejected data flag with the SBL and SCB QAQC codes to indicate that data were below the minimum detection limit. These flag code combinations were all replaced with the -4 SBL or SCB update as mandated by the Data Management Committee.