

# **RCCD Water Quality Monitoring Program**

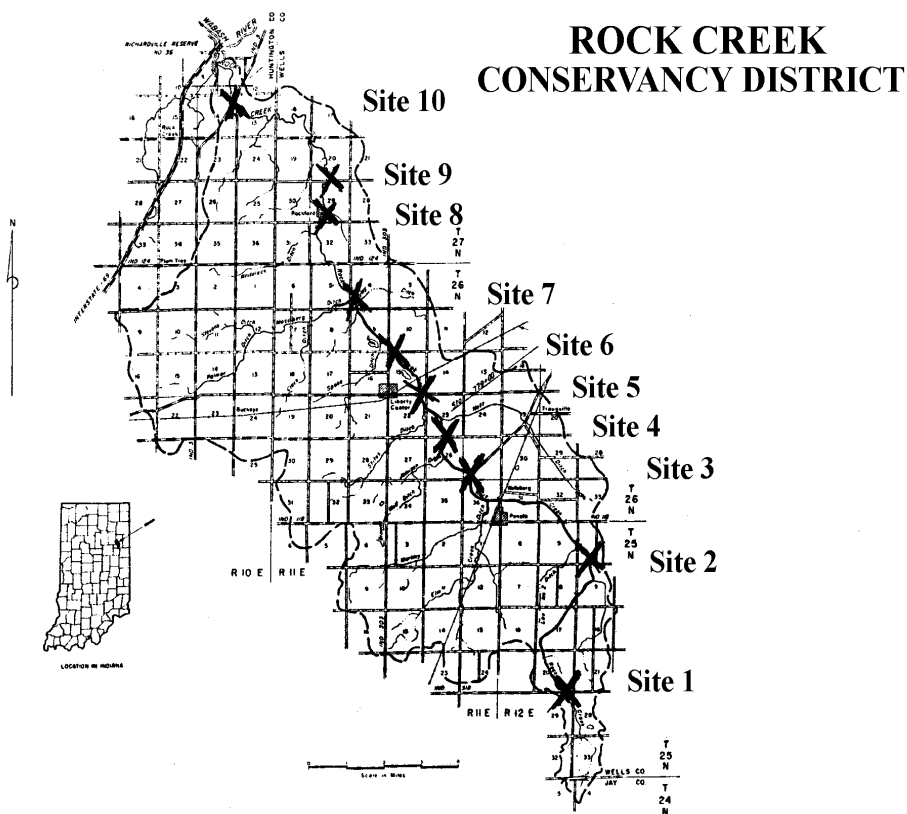
The Rock Creek Water Quality Monitoring Program began in 1999. Under the direction of the watershed coordinator, Mark Grimm, students collected water samples and sent them to a lab for chemical testing for possible contaminants to the creek. In 2002, the collection of benthic macro-invertebrates, habitat assessments, and stream flow measurements were added to the program. The RCCD stopped testing for the chemical pollutants in 2006, in an effort to make the program more cost effective. By collecting the macro-invertebrates, habitat assessments, and stream flow measurements, the RCCD gets the same outcome; an indication of whether the creek is healthy or not.

Unlike chemical monitoring, which provides information about water quality at the time of measurement, biological monitoring can provide information about past and/or episodic pollution. Collecting macro-invertebrates is just one of many ways to bio-monitor; that is the use of organisms to assess environmental conditions. Biological stream monitoring is based on the fact that different species react to pollution in different ways, and has become a significant activity for biologists, consulting companies and universities, as well as volunteers that are trained in water quality monitoring.

Using all of the data together; macro-invertebrate collections, habitat assessments, and stream flow; we evaluate the water quality conditions of the Rock Creek channel. It gives Rock Creek a baseline or benchmark for future reference if something would happen to dramatically change the Rock Creek water quality. It will be much easier to fix a problem that is identified early before it grows into a large issue. Over the years, the Rock Creek channel has had pollution tolerance index ratings ranging from excellent to poor, which is very common for streams and rivers in Indiana that have a primary use as drainage for cropland, small towns and rural housing. It is noted however, that fish and wildlife in and around the Rock Creek appears abundant, even during periods of low flow. In 2012, the RCCD added Nitrate and *E.Coli* testing to the monitoring program.

For copies of past data reports, or if you have questions, contact the Rock Creek Conservancy District office or Water Quality Project Coordinator, Mark Grimm at 260/824-0624 ext. 3.

# Water Quality Monitoring Project Sites



## Monitoring Site Locations

*Sites 1—9 are in Wells Co.; Site 10 is in Huntington Co.*

- Site 1:** CR1000 S between CR100 E & CR200 E
- Site 2:** CR700 S between CR200 E & CR250E
- Site 3:** CR500 S on Hoosier Hwy
- Site 4:** CR400 S between CR100 W & CR200 W
- Site 5:** CR300 S between CR200 W & CR300 W
- Site 6:** CR200 S between CR200 W & CR300 W
- Site 7:** CR400 W between CR100 S & SR 124 W
- Site 8:** CR100 N between CR400 W & CR500 W
- Site 9:** CR200 N between CR400 W & CR500 W
- Site 10:** on SR 3 in Huntington County

# **Bio-Monitoring**

Biological monitoring, the collection of macro-invertebrates that are present in the stream, are divided into pollution tolerance groups then additional factors are applied to allow the RCCD to assign and track the Pollution Tolerance Index for each site.

<b>POLLUTION TOLERANCE GROUPS</b>			
<b>PT Group 1</b> <i><b>Intolerant</b></i>	<b>PT Group 2</b> <i><b>Moderately Intolerant</b></i>	<b>PT Group 3</b> <i><b>Fairly Tolerant</b></i>	<b>PT Group 4</b> <i><b>Very Tolerant</b></i>
Stonefly Nymph	Damselfly Nymph	Midge Larvae	Left-handed Snail
Mayfly Nymph	Dragonfly Nymph	Black Fly Larvae	Aquatic Worms
Caddis Fly Larvae	Sowbug	Planaria	Blood Midge
Dobsonfly Larvae	Scud	Leech	Rat-tailed Maggot
Riffle Beetle	Crane Fly Larvae		
Water Penny	Clams/Mussels		
Right-handed Snail	Crayfish		

## **POLLUTION TOLERANCE INDEX**

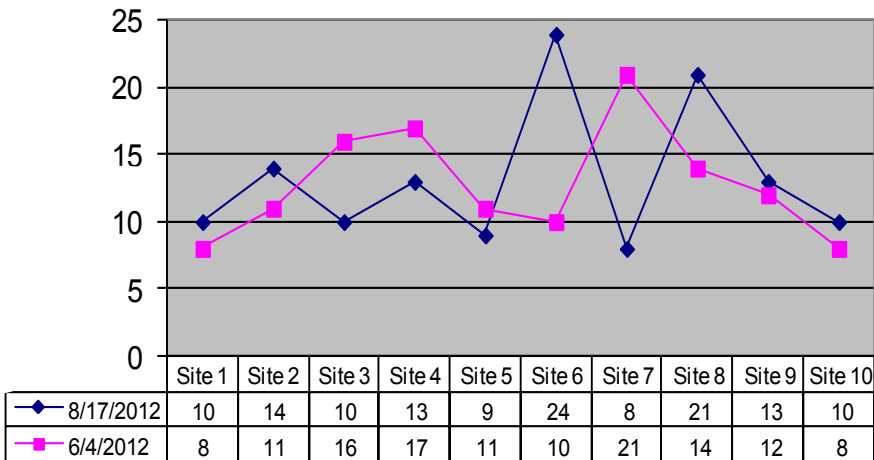
**23 or more = Excellent**

**17-22 = Good**

**11-16 = Fair**

**10 or less = Poor**

## ***2012 Pollution Tolerance Index Results***



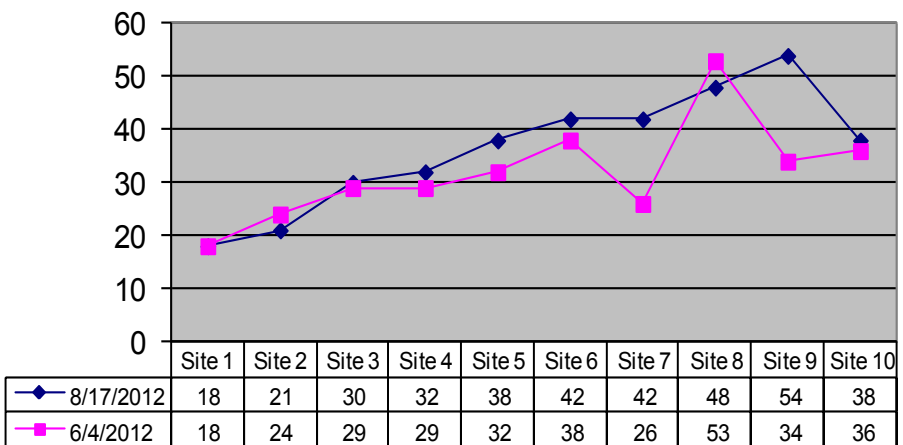
Reports from 2002 - 2012 can be obtained from the RCCD office.

# Habitat Assessments

Another method used to measure the water body's health is habitat assessment. The condition of the substrate (bottom) and the land within and adjacent to the stream channel is critical to the health of the stream and its ability to support aquatic life. The Citizens Qualitative Habitat Evaluation Index (CQHEI), utilizes land use, substrate, flow rate, depth, shape, riparian vegetation, and erosion or sedimentation to provide a measure of stream habitat and riparian health that generally corresponds to the physical factors that affects fish and other aquatic life, such as macro-invertebrates. The CQHEI was designed to be used primarily in wade-able streams. The CQHEI produces a total score that can be used to compare changes at one site over time, or compare different sites, and will often mirror the results from the macro-invertebrate collections.

The maximum total points for the CQHEI is 114. If the score is over 100 it is considered an exceptional high-quality stream. A set of ranges for excellent, medium, poor, and very poor has not yet been developed for this index, but scores over 60 are found to be generally conducive to the existence of warm water fauna.

## 2012 CQHEI Results



# Stream Flow

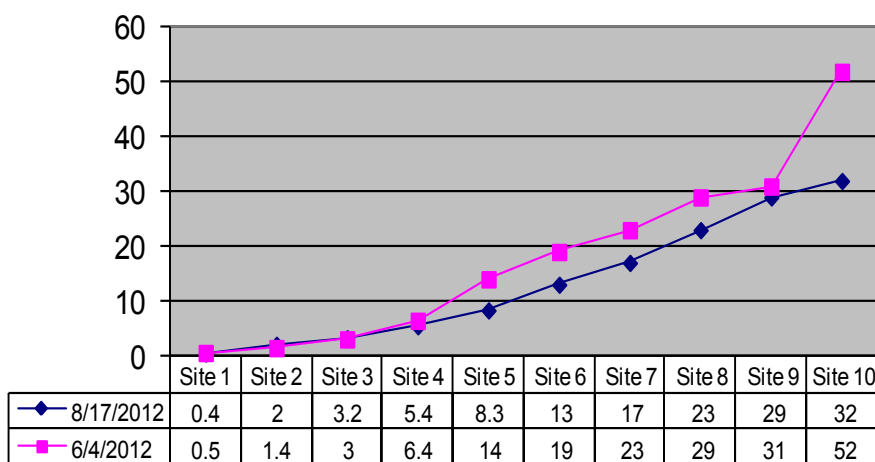
Stream flow calculations are important because stream flow influences other physical, chemical, and biological factors in the stream. A high discharge rate may indicate recent rainfall or snowmelt events. When a large amount of rain runs off the land, it often carries sediments and nutrients into the stream. Very low discharge rates may indicate dry conditions, which also effects water quality and aquatic life. The rain fall data below was collected at the Bluffton station, by the Indiana State Climate Office, Purdue University.

## *2012 Rain Fall Data*

January	2.71	July	3.29
February	2.22	August	4.23
March	2.3	September	2.92
April	1.31	October	3.36
May	1.88	November	0.79
June	1.19	December	2.47
<b>2012 TOTAL</b>			<b>28.67</b>

<b>2011</b>	<b>54.46</b>
<b>2010</b>	<b>35.79</b>
<b>2009</b>	<b>41.71</b>
<b>2008</b>	<b>42.00</b>
<b>2007</b>	<b>39.93</b>
<b>2006</b>	<b>44.26</b>

## *2012 Stream Flow Results*



# Chemical Tests

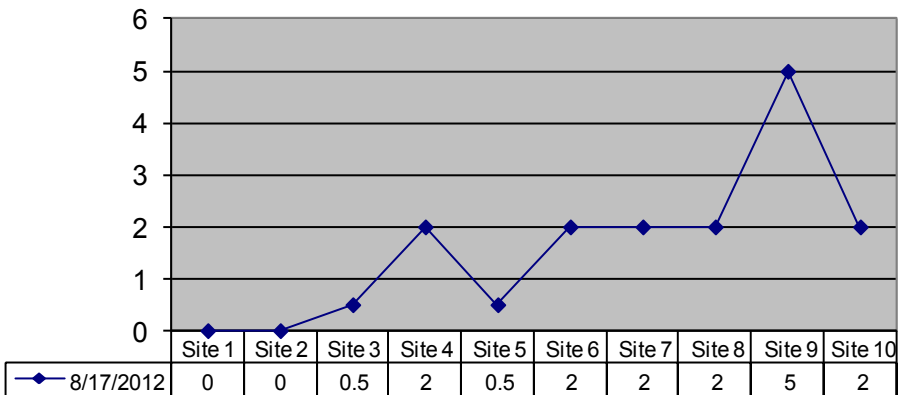
The RCCD added chemical testing for Total Nitrate and *E.Coli* to the biological testing to further evaluate possible contaminants to the Rock Creek .

*MCL = maximum contaminant level that is the highest permissible level of a contaminant in water that is delivered to any public water system.*

## **2012 Total Nitrate Results**

mg/L

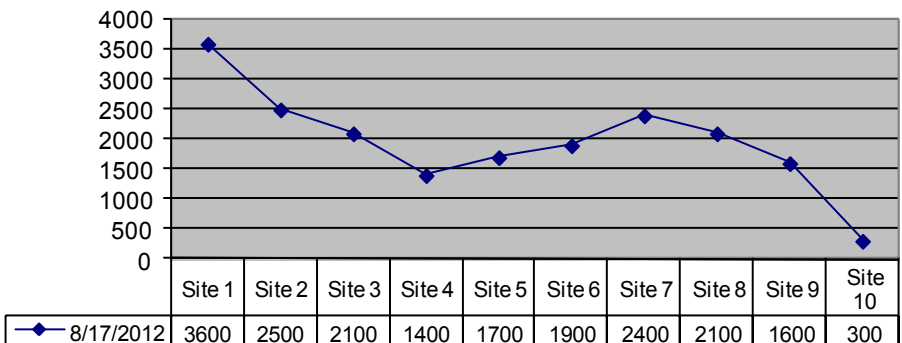
MCL=10mg/L



## **2012 E.Coli Results**

colonies/100 ml

MCL=235col./100ml for total body contact



Reports from past Nitrate and *E.Coli* tests (1999 - 2005) can be obtained from the RCCD office.