



# Rock River Reflections

A publication of the Rock River Coalition in cooperation with the Rock River Stormwater Group and the University of Wisconsin-Extension

Fall 2013 Volume 16, Number 4

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## Stormwater, Groundwater and Creek Health – Why Infiltration Matters

Have you been thinking about starting a rain garden in your yard? This is a great time to start a rain garden project. You can design it now for spring construction, or do the whole thing now. There are many sources of rain garden advice, including several on RenewTheRock.com.

You probably already know that rain gardens help keep our waterways healthy by reducing stormwater runoff. Every drop of water that soaks into the ground is one less drop rushing to the river. But do you also know the value of that water after it soaks into the ground?

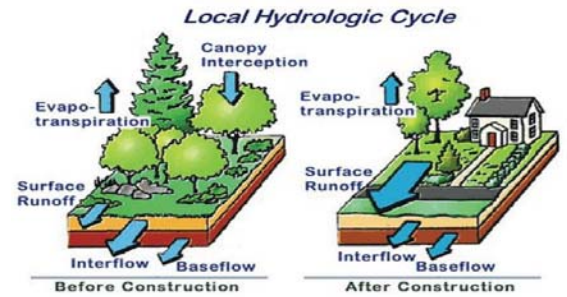
### “Base Flow”

Most creeks and rivers, including our own Rock River, have two sources of water – surface runoff from rain and snowmelt, and groundwater. In a period of extended drought, most streams and rivers don't stop flowing because they still have groundwater feeding

them. This is known as “base flow”. This base flow tends to be cooler and cleaner than surface runoff.

Urbanization threatens stream health in several ways. Pavement and rooftops cause more stormwater and snowmelt to reach our streams and rivers as surface runoff. It gets there more quickly, with more pollutants, and at a higher temperature as compared to natural conditions. And because that water didn't soak into the ground, less is available to recharge the underground water supply that provides the base flow for our streams.

As cities grow and hard surfaces expand, local streams can stop flowing during dry conditions due to the reduced groundwater supply. Then, when rain does come, there is a much more dramatic surge in the amount and temperature of water in the stream. Some aquatic species can't survive such conditions, leaving a barren stream.



This diagram shows how development changes river flow patterns by increasing surface runoff and decreasing groundwater flow.

Image source: Maryland Department of the Environment

The Rock River Stormwater Group thanks you for helping to Renew the Rock by reducing stormwater pollution throughout the Rock River area.

Learn more at:  
[www.RenewTheRock.com](http://www.RenewTheRock.com).

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## What You Can Do

There are several ways that you can help direct stormwater to the ground instead of the storm drain. Rain gardens are excellent. You can also ensure that your downspouts don't shoot water right to the street. Direct them to the lawn or garden, where the water is more likely to soak in. Consider pervious pavement options next time you improve a patio, sidewalk or driveway.

And, as always, do what you can to keep leaves and grass clippings out of the street, and out of the river.

This is a great example of a residential rain garden capturing water before it reaches the street. Some of the water that soaks in here will simply be used by the plants, but some of it will work its way down to groundwater, where it can feed the base flow of local waterways.

Image source: US Environmental Protection Agency



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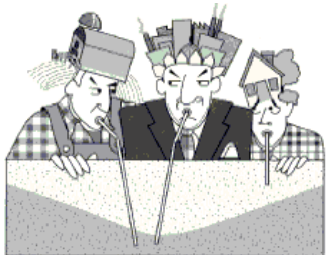
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# Rock River Coalition President's Message

Out of sight, out of mind. Unfortunately, that happens all too often when it comes to our groundwater. The Rock River Coalition Board knows that the quality and quantity of this underground resource is critical not only to our rivers, lakes, and wetlands, but also to our community health. Therefore, we decided to have the majority of the articles in this newsletter dedicated to the topic. I also want to highlight a current legislative proposal in Wisconsin.

In 2011, the Wisconsin Supreme Court reaffirmed the authority of the Department of Natural Resources (DNR) to regulate high capacity wells which could have negative impacts on



How many wells can be put into an aquifer before some are without water. Here a rural homeowner's well no longer has any water to draw.

our local lakes and rivers. To me, it is a check and balance to protect all of our water resources. It makes sense to have a process for reviewing and granting permits that will work to ease the potentially harmful impacts of high capacity wells.

On September 18th, a bill (SB 302) was introduced in the State Senate that will weaken the DNR's ability to regulate high capacity wells. This means that the DNR will not be able to adequately protect our public and private drinking water wells, lakes, rivers, and wetlands. The proposed legislation limits the DNR's authority to regulate a high capacity well even when it is known to cause depletions of groundwater or surface water. The bill limits the DNR's use of its own environmental review process for high capacity well permits. It also allows some permits to have conditions removed that would protect our drinking water and surface water resources.

SB 302 had a quick hearing by the Senate Natural Resources Committee just 7 days after it was introduced. There are a variety of organizations who oppose the bill including the River Alliance of Wisconsin, Wisconsin Lakes,

Wisconsin Farmers Union, Wisconsin League of Conservation Voters, and Wisconsin Towns Association.

Unfortunately, high capacity wells can have negative impacts on our drinking water and surface waters and are becoming more and more prevalent on our landscape. Instead of limiting the DNR's ability to regulate the wells, there should be an effort to work together. High capacity wells are needed by many industries. There should be ways to both allow the wells to operate and protect our resources at the same time. And one of the tools should be reasonable conditions in State permits.

Don't let your groundwater be out of sight, out of mind. If you would like to comment, you can register your opinion by contacting your legislator. Find out how here: <http://legis.wisconsin.gov/pages/waml.aspx>



Patricia Cicero,  
RRC President

## Water Star Webinar Highlights Award-Winning Water Conservation Tool: H2Oscore

by Beth Gehred, Town and Country RCD

There is a buzz growing around H2Oscore, an online portal developed in Milwaukee that allows residents to monitor their water use, and receive incentives for conservation. The October Water Star Wisconsin free webinar featured McGee Young, founder of H2Oscore, and Rick Lien, City of Whitewater's Water Superintendent, H2Oscore, its potential, and what makes it exciting to implement. The archive of this program, and the schedule for 2013 Municipal Water Series webinars, is available at [www.waterstarwisconsin.org](http://www.waterstarwisconsin.org).

H2Oscore is meant to provide city water customers actionable information about their water use. If the program is adopted in a particular community, anyone who receives a water bill from this community can access his or her

H2Oscore water use dashboard from a smartphone or computer at no cost. Here they learn about water usage given in average gallons per day. They can make comparisons to the average water use in the entire City and neighborhood; as well as a per capita comparison. Depending on how frequently the water utility reads its water meters, they receive either a day-over-day, month-over-month, or quarterly graph of average gallons per day use plus links to water efficiency tips.

Roughly 150 households in Whitewater utilize H2Oscore thanks to a pilot study through a partnership with UW-Whitewater. "Over the past year we have cut our water bill by \$30-35 per month, and it was directly related to knowing how much we were using and looking for ways to conserve" says John Wilberding, a Whitewater resident.

"Overall there was very little expense, and only a couple of changes that we made in our daily routine."

As an added incentive, participating homeowners are automatically credited one penny for every gallon they save compared to the same month in the previous year. Residents can then use those rewards as they would a gift certificate at local businesses.

Water bill payers in Grafton, Waukesha, Whitewater, and Milwaukee have the H2Oscore service since this spring. Madison is set to join by the end of the year and talks with other area communities are in progress.

Anyone with questions or comments regarding H2Oscore is encouraged to email or call H2Oscore directly at: [contact@h2oscore.com](mailto:contact@h2oscore.com) or 414-540-8788.



### Mission

*"To educate and bring together people of diverse interests to protect and improve the economic, environmental, cultural, and recreational resources of the Rock River Basin in Wisconsin"*

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Next deadline is January 7, 2014.

A letter-sized color version of this newsletter is available at [www.rockrivercoalition.org](http://www.rockrivercoalition.org).

Sign up for a monthly email update at <https://lists.uwex.edu/mailman/listinfo/rock-river-basin-update>.

Contact Marie Rubietta at [marier@jeffersoncountywi.gov](mailto:marier@jeffersoncountywi.gov) if you'd prefer a pdf of the newsletter emailed to you.

*RRC is a 501(c)(3) not-for-profit organization, providing equal opportunity in employment & programming.*

TTY: 711 for Wisconsin Relay

*If you need special accommodation for programs please contact the RRC at least two weeks in advance.*

### RRC 20th Anniversary

Planning is underway for a variety of events in 2014 to commemorate our 20th anniversary, including a celebratory party in the fall of 2014. If you would like to partner with us contact Suzanne at [suzanne@rockrivercoalition.org](mailto:suzanne@rockrivercoalition.org) Activities are being planned that accent the mission of the Rock River Coalition and celebrate all aspects of the human experience including:

1. **Mind = Knowledge**
2. **Body = Active Experiences**
3. **Heart = Human Spirit through art and writing**

Watch for further announcements on our website, Facebook page and in this newsletter.



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# Stream-Side Notes

Nancy Sheehan, RRC Stream Monitoring Coordinator

For many of you, October represents the last month for stream monitoring. I certainly have enjoyed working with all of you – from the early spring days of training and site selection to mid-summer registration and database management. Together we have accomplished much in a few short months.

## A Few Accomplishments In Focus:

***We are ending the monitoring season with a BANG.***

**Trainings:** April and May were busy training months. Fifty six individuals (56) participated in Level 1-3 trainings across the Rock River Basin.

**Yahara River Watershed Project:** With funding from Yahara WINs, Rock River Coalition's stream monitoring effort in the Yahara River watershed has been a success. With our partners in Madison Metropolitan Sewerage District (MMSD), US Geological Survey, Dane County Office of Lakes and Watersheds and Land and Water Resources Division, WDNR/UW-Extension Water Action Volunteer (WAV) Program and you, our treasured volunteers, more streams in the Yahara River watershed are monitored than ever before.

For the past five months, volunteers have collected nutrient samples from six sites in the Six Mile Creek subwatershed.

MMSD has analyzed these samples for total phosphorus, total suspended solids, total kieldahl nitrogen, ammonia, nitrate and nitrite, and ortho-phosphorus.

Working together, we have added five new Level 2 sites where volunteers have been collecting monthly dissolved oxygen with meters, checking water clarity with transparency tubes, and collecting continuous temperature with submerged thermistors.

We have also fielded ten new Level 1 sites where volunteers are measuring dissolved oxygen levels using HACH kits, stream velocity, water clarity with transparency tubes, temperature and calculating Biotic Index.

## Side-by-Side Quality Assurance Checks:

With our partner, UW-Extension/WDNR Water Action Volunteer Stream Monitoring Program, we have conducted a quality assurance check of a portion of our Level 2 volunteers in the Rock River Basin.

Thanks go out to Katie VanGheem, UW-Madison graduate student, for her assistance this summer. And thanks to our Level 2 volunteers Jeanine Mason, Dale Klingbeil, Gina Cook, Kevin Cook, Carl Glassford and Jim Kerler for their participation.

Our long term volunteer monitors continued their monitoring efforts throughout the Basin assisted by county level partners, Anne Miller (Rock Co.), Patricia Cicero (Jefferson Co.), Pete Jopke (Dane Co.) and Jayne Jenks (Waukesha Co.).

## Winter Plans

**Equipment Check-in and Repair:** All monitors will soon receive an email or letter detailing how to care for, or turn in your equipment for repair, storage and restocking. Please look for it and handle the request promptly.

**Report writing:** During the winter months, I will be busy reviewing all the data from 2013. Look for more information about these summary reports soon.

**Building Connections:** Come rain, sleet or snow, I plan to continue to build partnerships with Friends organizations, non-profit groups, government agencies and businesses to promote our stream monitoring.

Toward this end, I am working with Dane County Office of Lakes and Watersheds to organize a Watershed Network Gathering in Dane County.

This gathering will take place at the UW Arboretum on Tuesday, November 5 from 6:00-8:30 PM. The focus of this particular gathering will be citizen monitoring. I will post announcement on our website and on Facebook as the date approaches.

## Did You Know Sewers Leak? Groundwater and Public Health in Wisconsin

Water wells and sanitary sewers both play an important role in keeping us healthy. In Wisconsin, we are blessed with an abundant supply of groundwater.

Most of Wisconsin's cities and villages rely on groundwater for high quality drinking water; these systems serve about 2 million residents across the state.

In all of our villages and cities, sanitary sewer systems safely transport and treat residential and industrial waste. However, much of this infrastructure, such as the pipes and pumps that distribute drinking water and the network of pipes that collect wastewater, is aging. We have discovered that leakage from sewer pipes can contaminate groundwater.

*Nearly one-quarter of the water samples taken from residential taps contained enough viruses to cause illness.*

In a recent study, investigators documented the health effects of pathogens (bacteria and viruses) in drinking water on communities that do not disinfect their groundwater supplies. These water systems were tested for viruses at residential taps. At the same time, over 600 households were surveyed weekly to determine if any family members were suffering from illness that could be caused by virus-contaminated drinking water.

Nearly one-quarter of the water samples taken from residential taps contained enough viruses to cause illness. The investigators attributed 6% to 22% of reported 1,843 cases of acute gastrointestinal illness (AGI) during the study period to contaminated drinking water. They also found that as much as 63% of AGI among children younger than five may be explained by periods of higher concentrations of norovirus in the drinking water. The source of these viruses was identified as leakage from municipal sanitary sewer systems.

This study showed that viruses enter the drinking water system in two ways: leaky sewer pipes allow viruses to enter the water table, which then flow to the well. Viruses also enter the water supply in the distribution system, when pipes are open for maintenance or repair, or during short pressure drops in the distribution system.

Routine disinfection of drinking water supplies protects citizens from waterborne illness. Disinfection has been a common practice in the United States since the early 1900s. The addition of small amounts of chlorine, exposure to ultraviolet light, or purging with ozone gas are the most common methods used to protect against pathogens. In the study ultraviolet light was used to disinfect the water supply. This treatment reduced viruses to safe levels.

Although there are no federal or state regulations that require municipal water systems to treat groundwater for disease-causing pathogens, all but 60 of the Wisconsin's municipal groundwater systems voluntarily disinfect their well water. More information about groundwater quality in Wisconsin is available from University of Wisconsin Extension and the Wisconsin Geological Survey here:  
<http://wisconsingeologicalsurvey.org/pdfs/espdf/ES053.pdf>

By Madeline Gotkowitz, Wisconsin Geological and Natural History Survey

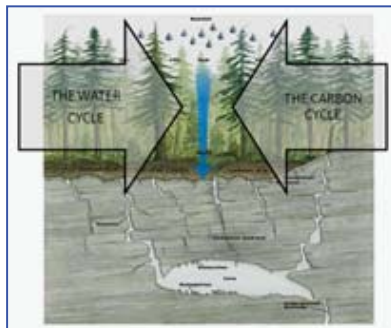
David Liebl, UW Cooperative Extension Solid and Hazardous Waste Education Center

## Buried Treasure

Groundwater is often referred to as buried treasure. Many of the articles included in this fall edition of the Rock River Reflections highlight the need to focus on protecting high quality groundwater. As a stream monitor, you play an important role in creating a more complete picture of water's journey across the landscape. I am also excited to work more with municipalities as they begin to think how volunteers might be involved in stormwater monitoring.

If you are an educator, please check out the educational resources available on groundwater, stream monitoring and karst landscapes highlighted on page 4.

# Sinkholes and Caves! Connecting Groundwater and Surface Water — A Curriculum Guide for Educators



Excerpts from the curriculum:

This year there have been spectacular reports in the news of houses and even some residents being swallowed by sinkholes. Wisconsin does have sinkholes but luckily not quite like those seen in news reports from locations such as Florida. Indeed, Wisconsin's rich geologic history has provided the ideal bedrock for sinkholes and other karst features to form. Karst features are just "solution" features. If you have ever seen sugar dissolving in hot tea you are familiar with a solution.

Karst features are the result of slightly acidic water coming in contact with dolomite and limestone bedrock over long periods of time. Water dissolves the carbon in the bedrock to create spectacular karst landscape features including springs, enlarged fractures, caves, sink lakes, cover collapsed sinkholes, and cover subsidence sinkholes.

Karst landscapes with their unique bedrock also provide the most productive groundwater supplies on Earth. The Earth's surface and the Earth's subterranean world are nowhere more connected than in karst regions. Why?

Typically, in karst landscapes, the soil horizon is thin and, therefore, cannot filter contaminants that appear on the surface of the land. In addition, karst features such as sinkholes create actual conduits for pollution to flow and reach the groundwater with little or no natural filtration.

With ever increasing urban sprawl, possible sources of surface contaminants increase. But this critical connection between surface and groundwater is often misunderstood and overlooked. Sinkholes, caves and springs provide an ideal learning opportunity to bring home the message that groundwater and surface water should really be thought of as one resource.

Many students are familiar with how water moves across the land into our streams and lakes. Some students learn about groundwater and how water is stored within different rock layers – from sandstone to dolomite. Few students, however, are able to connect surface water and groundwater beyond a basic understanding of the water cycle.

In 2011, with funding from the Wisconsin Environmental Education Board, faculty and staff from the Wisconsin Geologic and Natural History Survey joined two educators to design a curriculum guide which explores the formation of sinkholes and caves through lesson plans, model building and a field study.

Information about this curriculum can be found on the following website: <http://karsthydrogeology.weebly.com> or by contacting the program director: Nancy Sheehan at [nancyansheehan@gmail.com](mailto:nancyansheehan@gmail.com).

## Other Educational Resources:

### Groundwater Study Guide: Wisconsin's Buried Treasure

<http://basineducation.uwex.edu/gpsp/stormwater%20program/Buried%20Treasure.pdf>

### Exploring Streams: Stream Monitoring Curriculum Guide for Middle and High School Teachers and Students

<http://watermonitoring.uwex.edu/wav/monitoring/curriculum/>

## Sinkhole potential

In Wisconsin, sinkholes can form in areas where the bedrock is a type of rock called dolomite, which can be worn away in places by water to create the potential for the collapse of the soil above.



SOURCE: Wisconsin Geological and Natural History Survey

State Journal



## Karst Avoid that Sinking Feeling

Award winning brochure and display produced by the Rock River Coalition.

Brochures available as well as a pdf of the display by emailing [suzanne@rockrivercoalition.com](mailto:suzanne@rockrivercoalition.com).

[suzanne@rockrivercoalition.com](mailto:suzanne@rockrivercoalition.com).

## Rock River Coalition Lends-A-Hand

by Nancy Sheehan, RRC Monitoring Coordinator

It was a beautiful fall morning. The fog lifting off Mill Creek gave the perching egrets an ephemeral appearance. Indeed, the egrets soon flew off downstream as the sounds of exuberant students could be heard. The egrets needed to make way for "student scientists" from the School of Agriculture and Environmental Studies (SAGES), a public charter school within the Waupun School District. Mill Creek, just downstream of Fox Lake dam, became an outdoor classroom for a day as students assessed water quality using Level 2 Water Action Volunteer methods.

Only two years in the making, SAGES educators have embraced their mission "to produce responsible, productive citizens who have both a local and global perspective and are committed to preserving and sustaining national and world environments, food sources and other natural resources." SAGES educators have been working closely with Tamara Baker, Wisconsin Green School Network's Field Biologist, to create meaningful field studies for the students. Reflecting this mission and recognizing that success relies on teamwork, Tamara and SAGES educators created a "dream team" including representatives from non-profits, individual citizens committed to improving water quality, experts from governmental agencies, parents and currently and retired teachers. The Rock River Coalition was glad to be part of this "dream team".



RRC's Stream Monitoring Coordinator, Nancy Sheehan, was joined by Bob Roell, Citizen Lake Monitor for Beaver Dam, to assess dissolved oxygen and water temperature. (Bob and Nancy have been working together to identify stream monitoring sites for prospective volunteers in the Beaver Dam/Fox Lake area.) Ben Nadolski WDNR Conservation Warden, worked with students to identify fish. SAGES teacher, Mark Hoffman, got wild about arthropods. Tamara Baker covered clarity. Retired teacher Mr. Imhoff was on hand to lend his expertise.



Upper photo by Nancy Sheehan, Lower photo by Bob Roell, Citizen Lake Monitor for Beaver Dam

# New Option Could Save Municipalities Millions

by Sarah Chase, Wisconsin DNR

The Wisconsin Department of Natural Resources (WDNR) has begun rolling out a new mechanism for reducing pollutants across the state. Although drafts have been available for nearly a year, WDNR released their "Guidance for Implementing Water Quality Trading in WPDES Permits" finalized document at the end of August.

Water quality trading (WQT) is designed as an option for wastewater

However, phosphorus and suspended solids will likely be the focus within the Rock River Basin, as more than 40 rivers, streams, and lakes in the basin are impaired by phosphorus and sediment, and more stringent water quality based limits are required for these pollutants.

Now, you're probably wondering, "what on earth is water quality trading?" Water quality trading is an option for WPDES permit holders to meet their discharge limits. In other words, it is a way for your local municipal or industrial WWTF to meet state standards on how much pollution they can discharge into the local stream or river.

Sounds great, but how does WQT work? Boiled down to its simplest form, WQT is an agreement between two (or more) parties, "credit generators" and "credit users". Credit users are discharging above their pollution limits and need to purchase credits to offset their discharge (see figure 1). Credit generators are discharging below their limits, so they have extra credits they can sell.

For example, two WWTFs are each allowed to discharge 10 lbs of phosphorus a day. WWTF #1 is currently discharging 13 lbs/day, while WWTF #2 is only discharging 5 lbs/day. WWTF #1 could purchase credits from WWTF #2 in order to offset their discharge.

Hold on a second, isn't that just shifting pollutants from one source to the other? No. A trade must result

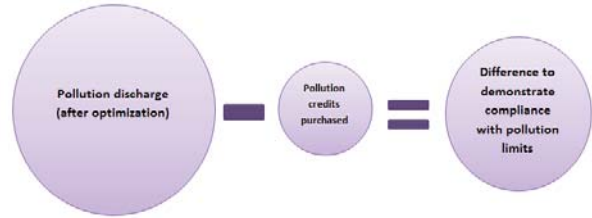


Figure 1: Facilities can purchase credits or phosphorus reduction from others to help offset their own discharge.

in a reduction of the pollutant being traded. That means that the user must purchase more credits than they need to meet their discharge limit, i.e., greater than a 1:1 ratio. So using our earlier example, WWTF #1 would need to purchase more than 3 lbs/day to offset their discharge.

These agreements can be between two wastewater facilities, or between a wastewater facility and a non-point source such as agriculture or urban stormwater. When trading with non-point sources, the WWTF pays the landowner to install practices (conservation tillage, riparian filter strips, etc.) that will reduce phosphorus and sediment runoff.

So what's in it for me or my community? If your municipal wastewater facility discharges below its limits and, better yet, can cheaply reduce how much of the pollutant it discharges, it can turn around and sell credits for a profit to other WWTFs – so you pay less on your sewer bill.

Your municipal WWTF may not be able

to sell credits though; it may be discharging above its' limit. In that case, the plant must go through optimizing its treatment system. If the discharge is still above discharge limits, your WWTF can either upgrade the facility or consider other compliance tools, such as WQT. Facility upgrades can be exceedingly expensive, often to the tune of tens or even hundreds of millions of dollars. So WQT may save your WWTF millions if the facility can purchase credits for a fraction of the cost of an upgrade.

In the next year or so, all WWTFs across the Rock River Basin will have received their new phosphorus and suspended solids limits and many will consider WQT as an option.

If you would like to learn more about Water Quality Trading contact Amy Schmidt, Southern District WQT Coordinator, WDNR (Amy.Schmidt@wisconsin.gov), or visit <http://dnr.wi.gov/topic/SurfaceWater/WaterQualityTrading.html>



Above is a riparian filter strip, one of many practices that can reduce runoff and generate credits.

USDA NRCS File Photo

treatment facilities (WWTFs) to demonstrate compliance with their WPDES permit limits. WDNR will consider any pollutant parameter for trading except bioaccumulative chemicals, such as lead and mercury.

## Monitors Around the Basin

Monitoring Coordinator Nancy Sheehan has worked with many of our monitors during the year. Here are a few of them along with a diversity of types of sites that we monitor in the Rock River Basin.



A few of our monitors at their monitoring sites clockwise from left: Brad Lake at Six Mile Creek, Amy Jo Dusik, Six Mile Creek, Mary Ellen Gabriel and kids at Murphy Creek, Katie VanGheem, Jeanine Mason, Dale Klingbeil and Julia Sheehan-Klenk during a quality assurance test of Level 2 equipment, Karen Knetter at Willow Creek on the UW Madison campus and Monty Baker and Intern at Six Mile Creek.

Photos by Nancy Sheehan



# Nitrates Are Increasing In Local Wells

by Rick Wietersen, Groundwater Program Manager Rock County Health Department

The Rock County Health Department has been tracking a significant increase in well water nitrates over the past two years. In Rock County, approximately 1 in 3 wells were testing in excess of the health advisory level for nitrates in 2012. This rate is even higher so far in 2013.

Nitrates are found naturally in our groundwater at levels less than 1 part per million (ppm) from the decomposition of organic materials such as plants. Nitrate levels can be elevated in groundwater from sources such as fertilizers, septic systems, manure or industrial wastes.

When nitrates in groundwater exceed a level of 10 ppm, drinking water is considered unsafe for pregnant women and infants less than 6 months of age. High nitrates can contribute to a health problem called "blue baby syndrome" which depletes the amount of oxygen in an infant's blood. Pregnant women who drink high nitrates can have an increased risk of miscarriages.

High nitrates may also be linked to an increased risk of certain cancers and may contribute to thyroid problems.

According to state groundwater experts, there are many factors creating a perfect storm scenario for higher nitrates in Rock County and other regions in Wisconsin. Some of these factors include the drought of 2012, changes in cropping practices, increased irrigation, and even corn prices.

The severe drought condition in Southern Wisconsin in 2012 is believed to be one of the main factors in the recent nitrate increases in Rock County. The drought resulted in significant reductions in crop growth and therefore a significant reduction in the amount of nitrogen fertilizers utilized by the crops in 2012.

Most of the nitrogen not utilized by crops in 2012, was likely leached into the groundwater table. A soil nitrate

monitoring network established by the University of Wisconsin seems to confirm this nitrogen use inefficiency and subsequent loss.

In the fall of 2012, the soil nitrate monitoring network indicated up to 325 pounds of nitrogen per acre in one area was still in the top 3 feet of soil after the crop was removed. Monitoring of these same soil profiles in the spring of 2013 after winter snow recharge and spring rains, indicated a potential leaching loss of up to 172 pounds of nitrogen per acre in some areas.

Corn prices may also be playing a part in the trend of higher nitrates in groundwater. As corn prices increased in recent years, there has been a trend towards more corn acreage, including more corn-on-corn rotations being utilized.

Corn is a crop that needs high levels of nitrogen fertilizer to maintain maximum economic yields. When the applied nitrogen fertilizer is not completely utilized by a crop, such as during a drought, it is susceptible to leaching into the groundwater.

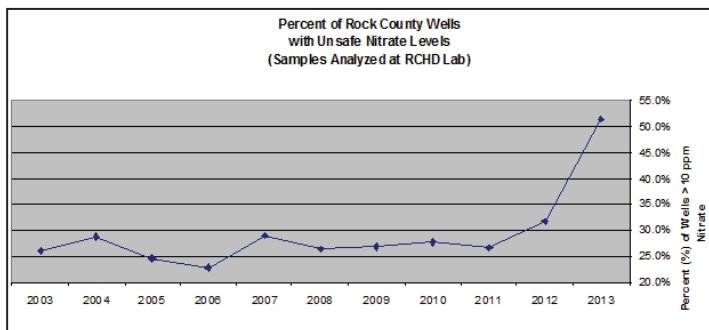
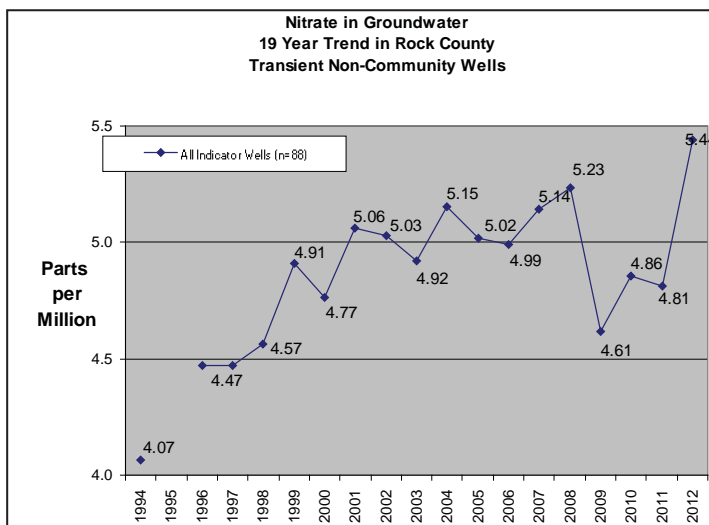
Rock County has also seen an increase in the number of high capacity irrigation wells, especially in areas of course sandy soils.

Irrigation can result in increased potential for leaching of nutrients into the groundwater if not carefully managed, especially on sandy soils.

Many homeowners, businesses, and municipalities have had to purchase bottled water, drill deeper wells, or install water treatment systems to deal with high nitrates.

There is a price to pay, both from an economic and health perspective with high nitrates in our groundwater.

Our groundwater in Wisconsin is a very valuable resource that we need to protect and manage properly.



Properly applied fertilizer, accounting for nitrogen in residue and only applying to the needs of the crop, along with buffers along ditches and thoughtful crop rotations can help protect groundwater from nitrogen contamination.

Photo by Margaret Burlingham

## What can homeowners do if they have high nitrates?

- Purchase bottled water
- Construct deeper wells
  - Could be \$10,00 or more for a homeowner
  - Could be more than a million dollars for some cities
- Treat their water to reduce nitrates
  - Reverse osmosis systems are the most common
- Reduce lawn fertilizer applications
- Test your well water to know your current health implications
- Properly maintain your septic system

## What can growers do to help?

- Conduct and follow a nutrient management plan
- Use split applications of nitrogen
- Reduce nitrogen inputs by taking nitrogen credits
  - manure application credits
  - soil profile test credits
  - credits for industrial or municipal land applications
- Use an irrigation management plan
- Use crop rotations with less nitrogen intense crops
- Apply only what is necessary, no more

# Groundwater Quality and Your Private Well

by Jeanne Scherer

Our lakes and rivers are incredible water resources, but they are not the only water sources key to our lives. Even more important to our health and wellbeing is the water from faucets used for drinking, bathing and cooking. When the faucet is on, people are tapping into another invaluable resource—groundwater.

Groundwater is water trapped in the pore spaces between soil particles and within open areas of fractured rocks below ground. Rain, snowmelt or irrigation water not captured by plant roots, lakes or rivers travels underground to contribute to groundwater.

Wells are drilled to a depth where the water can be drawn up to the surface for our use. Unlike municipal water systems that are routinely tested for a variety of contaminants, private well owners are responsible for their own testing. The most common issues of concern are bacteria, nitrates and pesticides. If your home was built prior to 1985, lead pipes or lead solder on copper pipes may also be a concern.

Contaminants have the potential to end up in the groundwater and put a well at risk if it is within ¼ mile of feedlots, barnyards, agricultural fields using fertilizer or pesticides, municipal sewage systems, a factory that uses chemicals, or fields where manure or municipal sludge are spread. The risks increase if the well is downhill of any of these sources.

## Nitrates

Nitrates are compounds formed when nitrogen, usually from fertilizer applications of ammonia, combines with oxygen in water. A serious condition called “blue-baby syndrome” can result when infants ingest nitrates. If the condition is not responded to promptly, coma or death may occur. Pregnant women should not drink nitrate-contaminated water because there is a risk of birth defects. People with certain medical conditions, such as heart disease, may also want to avoid nitrate contaminated water.

A 2007 survey of domestic wells in Wisconsin revealed that 14% of the wells had nitrate concentrations above the standard considered safe for drinking water. The Department of Natural Resources (DNR) recommends annual testing for wells within a ¼ mile of fertilized fields or feedlots, twice in the first year for new wells, and annually for wells that have test results near ten parts per million.

Families planning for pregnancy should have their wells tested prior to pregnancy if possible and again when the baby is born.

## Pesticides

A pesticide is a substance used to control or repel pests that may harm crops or plants in our yards. In Wisconsin, atrazine is commonly used on corn crops and is a suspected carcinogen. During the 2007 survey, atrazine was found above drinking water standards in 1% of the wells, although it occurred in 12% of the wells at lower levels.

The DNR recommends you test your well for atrazine or other pesticides once and follow up every 5 to 10 years if you are in an area within ¼ mile of corn fields or locations where pesticides are made, mixed or stored.

## Bacteria

Coliform bacteria, including E. coli, may occur in animal wastes, decaying vegetation or fouled surface water. Most coliform bacteria do not cause illness. However E. coli are often present with other bacteria, viruses, and parasites that can cause flu-like illnesses. The sulfur water smell noted in some drinking water is due to iron and sulfur bacteria, which are considered nuisance bacteria, but are otherwise safe. Often odor, taste, or color changes are indicators of bacterial contamination and signal a need to test the well. If none of these occur, testing is recommended once per year.

## Become a RRC Member

In addition to supporting RRC work, members receive newsletters, notices of conferences, and special events. To become a member, complete the following:

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 Affiliation \_\_\_\_\_  
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 City \_\_\_\_\_ State \_\_\_\_\_  
 Zip \_\_\_\_\_ Phone (\_\_\_\_) \_\_\_\_\_  
 E-mail \_\_\_\_\_  
 I am a member of \_\_\_\_\_ Chapter.

### Memberships Fees

Individual	\$ 25
Family	\$ 35
Student/Senior Citizen	\$ 15
Classroom	\$ 25
Affiliates*	\$ 50
Municipal**	\$125
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\*Includes small businesses, organizations, lake districts, small municipalities and individual municipal departments  
 \*\*Covers entire municipality including all departments, administrative staff and elected officials

Any donation or membership of \$150 or more will be recognized and linked to your website from our website: [www.rockrivercoalition.org](http://www.rockrivercoalition.org)

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Amount	Purpose
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	Citizen Monitoring
	Other:

Donations are greatly appreciated and can be targeted towards specific projects.

Please mail this completed form with check to:

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 864 Collins Rd  
 Jefferson, WI 53549

or register and pay online with PayPal at:  
[www.rockrivercoalition.org/membership.asp](http://www.rockrivercoalition.org/membership.asp)

## Private Well Testing

Although home tests are available, the DNR does not recommend them because they do not include the range of tests a professional lab can measure, and are not going to provide the concentration of the contaminant in the water. Without knowing the concentration level, it is difficult to decide if any action is necessary.

Testing your well water is a simple process that will produce results you can trust provided you follow directions carefully, including sterilizing your faucet or the sample tap on your pressure tank, and you return the sample to the lab within 48 hours. Once you have your results, you will know if your well is safe or if you have to take steps to protect yourself and your family. If a new well or other expensive measures are necessary, there are grants available to help with costs if your family income is under \$65,000.

## Helpful Links

DNR's information on private well testing: <http://dnr.wi.gov/topic/Wells/privateWellTest.html>

State Lab of Hygiene well testing: <http://www.slh.wisc.edu/dotAsset/26491.pdf>

Water & Environmental Analysis Lab well testing (homeowners test package is \$49): <http://www.uwsp.edu/cnr-ap/weal/Pages/Homeowner.aspx>

Well Compensation Grants: <http://dnr.wi.gov/Aid/WellCompensation.html>

# Send Your Legislator Down the River Recap

It was a hot and sunny evening, perfect for being on the water.

The 12th annual Send Your Legislator Down the River event started with a town hall meeting at the River Bend RV Resort Community Room on the Crawfish River near Watertown. Citizens, Wisconsin Department of Natural Resources representatives, and local elected officials talked about water quality issues and initiatives in the Rock River Basin. Participants also shared their favorite place to paddle or otherwise enjoy the plentiful water resources of the Basin. A delicious meal catered by Willy Street Coop was served.

Afterwards, participants launched canoes, kayaks, and an impressive Voyageur canoe at the Garden Road Boat Launch on the Crawfish River. From there we paddled into the Mud Lake Wildlife Area near the confluence of the Crawfish and Beaver Dam Rivers. An on-the-water talk was presented by Mike Ayers, a long-time area resident and steward of the Mud Lake marsh. Mike provided an interesting and informative talk about the area history, the local flora and fauna, and the many ecological services provided by the marsh. Meanwhile, fish jumped, a great egret stood like a sentinel, and a pelican and many blue herons flew by. Mike pointed out an eagle's nest, although its occupant remained elusive. Because of recent dry weather there was some concern about having enough water depth for the voyageur canoe, but it sailed through with only one minor grounding, easily overcome by its enthusiastic paddlers. The evening ended with a beautiful sunset over the bulrushes and long good-byes at the boat launch.

Thanks again to the participants and our co-sponsors - River Bend RV Resort, Department of Natural Resources, and Dodge County Parks Department - for making this a fun and successful event! Stay tuned for next year's plan.



RRC President, Patricia Cicero learns about the Mud Lake Wildlife Area from expert Mike Ayers.  
Photo by Jane Carlson

## There are Goats on the Island!

Reprinted with permission from the October 3rd Herald Independent covering Monona & Cottage Grove. View from the Pier, a column by Sunny Schubert.



Frost Woods Neighborhood Association have placed goats on Frost Woods Island to clear out invasive species. The goats will be on the island for a couple of weeks. (editor's note: they have done their job and have been removed since this article was written.)

Frost Island is a little, uninhabited dot of land just off the eastern shore of Lake Monona's Squaw Bay. It is owned by the Frost Woods Homes Association "and maintained by the Association as a wilderness area and wildlife refuge," according to the Homes Association website.

"Maintained" is a bit of a stretch. The only "maintenance" done by the association that I know of has been the removal of some dead trees to stop them from falling into the channel that runs between the island and the mainland homes on Winnequah Road.

When my kids were much younger, we visited the island fairly regularly, via pedal boat.

We bushwhacked a few overgrown paths, found a sandy depression in the middle of the

island that held the remains of a long-ago campfire and some ancient beer cans, explored the shoreline and examined the ground under trees while searching for owl pellets. (Never found any.)

Monona Mayor Bob Miller, whose home overlooks Frost Island, tipped me off Sunday that the Homes Association had planted a small herd (or "flock," "trip," or "tribe") of "rent-a-goats" on the island for the next two weeks to get rid of invasive species.

According to a Maryland-based company called Eco-Goats, goats will eat just about anything, including vines, shrubs and poison ivy. They don't, however, much care for grass, which is considered a more desirable ground cover.

Also, because of the very efficient way they chew their food, goats don't spread seeds through their droppings.

Unlike herbicides, goats don't contaminate the water. Unlike mechanical methods of brush control, they don't compact the soil or require petroleum products to run.

Sounds like a "win-win" to me.

By the way, the island is posted "No trespassing." My understanding is that it's a liability issue. (Darn lawyers!)

So if you boat or canoe or kayak or pedal around the island hoping to see the goats, please stay in your watercraft.

## Lake Ripley Volunteer Action Day

The Lake Ripley Management District is hosting another Volunteer Action Day at its 167-acre nature preserve on Saturday, November 9th. Volunteers will gather at the Lake District Preserve parking lot (County Road A, next door to the Oakland Conservation Club) at 9:00 AM before trekking out to help finish a new woodland trail.

The trail work will involve the trimming and clearing of branches and other debris, and will require a fair amount of hiking to get out to the project site. Tools and supplies will be provided, but volunteers are encouraged to bring along their own work gloves and water bottles.



George Clokey, UW-Whitewater, clearing undesirable tree species this past spring to make way for a new woodland trail. Photo by Richard Schoerner

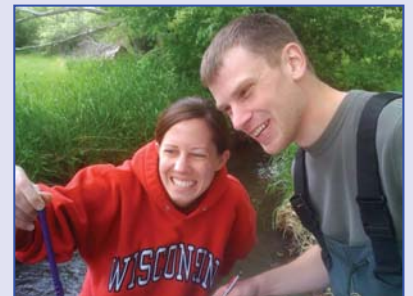
We hope to have the work completed by around noon, but volunteers are welcome to stay for as much time as they can offer to help.

If interested, please contact the Lake District office at (608)423-4537 or ripley@oaklandtown.com for further details. We also extend a heartfelt thank you to the Friends of Glacial Heritage Area and University of Wisconsin-Whitewater for their continued partnership in this effort.



Clare Carlson, Friends of Glacial Heritage Area, helps clean the Preserve woodlot this spring in preparation for a new trail. Photo by Jeanne Scherer

## Find Out What's Up with Monitoring on Pages 3 & 4.



Monitors Debbie and Steven taking stream temps at Swan Creek. Photo by Nancy Sheehan