



Rock River Reflections

A publication of the Rock River Coalition
in cooperation with the Rock River Stormwater Group

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Historic First for the Rock River Coalition

By Suzanne Wade, Testing the Water Coordinator

Dip and Glide, Dip and Glide, for 148 miles, six people paddled the Rock River in May 2016 - doing something no one has ever done before.

Much of what we did was new and innovative.

Innovation #1:

Attached to two of the kayaks were four probes: dissolved oxygen, temperature, pH and conductivity.

A cell phone triggered the probes to take a reading every ten seconds: More than 30,000 times over eleven days.

Innovation #2:

A cell phone transmitted the data instantaneously to a server housed 90 miles away. Now, many expensive professional monitoring stations run by the USGS use similar technology. We were able to do this, a non-profit group, at significantly lower cost.

Hopefully you followed the paddle and cheered them on.

Here are more details about our adventure:

The Rock River Coalition paddlers traveled from the headwaters of the Rock River north of Mayville to where the Rock River leaves WI in Beloit. Paddlers and guest speakers hosted community events to share stories about paddling adventures and conservation practices community members can do to keep the Rock and its tributaries clean and healthy into the future.

More than 50 people joined the paddle, giving a lift to our team, while they enjoyed the beautiful scenery and biodiversity the Rock River has to offer.

Mark Riedel, a frequent paddler and coordinator of the WDNR Rock River TMDL program, commented on how the water color changed dramatically from very muddy waters in the

What we Accomplished:

- 11 days of paddling
- 30,000 datapoints
- 56 phosphorus samples
- 10 outreach meetings
- 429 students in 7 schools

headwaters to clear waters as we traveled south.

Surprisingly, even in the Horicon Marsh the water was brown. There are a number of these stories

we are still trying to tease apart.

In addition to the data from



Data project coordinator and developer of the probe system, UW-Whitewater Professor Eric Compas with his home-made kayak and probe array.

the probes, the team took periodic grab samples for analysis of phosphorus at key locations along the route to provide a more detailed view of the river. This method of testing directly while paddling had never been done before,

and offers significant possibilities for ways citizens can get involved with monitoring local streams. The sample results, along with pictures taken of the river along the route, can be viewed at testingwaters.org. An article focusing on the data can be found on pages 4 and 5.

"Most people think of a Rock as being hard and tough, I can tell you that the heart of the Rock River is compassion-

ate and generous. The best thing about our trip has been meeting the wonderful people who care so much about their communities, their lakes, their waters. From the mayor of Mayville to the lake groups around Lake Sinissippi they have shared their dreams, the work they have done and their concerns. Each community is linked by the water." One of the paddlers noted.

The topics we covered as we traveled down the river were diverse, in Horicon, we learned how they have a dream of making the waterfront a more important center of their city, bringing people to live down on the river, with vibrant business and recreational opportunities. As the RRC traveled through Watertown, the Fire Department's Fast Water Rescue joined us for a while,



Our paddlers taking a lunch break near Janesville.

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Article continued on page 2.

Rock River Coalition President's Message

I hope this message finds you enjoying the last warm days of the year. The Rock River Coalition has been busy since our last newsletter. In May we completed our Testing the Waters - a Paddle and Probe Adventure and it was a great success. The details are in Suzanne Wade's article in this newsletter. Also in May we welcomed new board members Andy Selle, Lindsey Schreiner, Carl Korfmacher, and student board member Karl Brandstaetter. Our June board meeting was hosted by board member Joe Zakovec at the Janesville wastewater treatment plant, followed by a tour of this resource reclamation facility. All summer our volunteer citizen monitors have been collecting water quality and biological data from streams throughout the Basin. Analysis of stream samples from the Yahara River watershed included total phosphorus to support phosphorus reduction efforts by the local communities. In July I was pleased to attend a wonderful community event in Beaver Dam to promote recreation

on Beaver Dam Lake. In August we held our annual board retreat in Fort Atkinson, where we reaffirmed our mission and set priorities for the coming year. Board members also participated in Rock River Recovery meetings and did other activities to further our mission. We hired a new bookkeeper, Tara Callis, in September which will allow our volunteer-extraordinaire Patty Lynch to step down.

We're looking forward to our bi-annual Confluence in October, organized by coordinator Nancy Sheehan. This is an event to honor our citizen monitors and give them an opportunity to connect with each other and to learn even more about the water resources of our Basin. Our membership drive will take place in November, so please watch for your renewal letter and ask your friends and associates to join, too!

Although our board members and employees have a lot of talent and energy, we can always use

more help. If you can volunteer your expertise in the following areas: web site management, Access database improvements, graphic design, and fundraising, please contact me (jane@rockrivercoalition.org) or info@rockrivercoalition.org.

If you are interested in joining our team of citizen stream monitors, please contact Nancy Sheehan (nancy@rockrivercoalition.org).

Have a peaceful and reflective fall!

Jane Carlson
RRC President



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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A letter-sized color version of this newsletter is available at 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 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.

Testing the Waters Continued from page 1

sharing their mission of ensuring the safety of the people.

In Jefferson our group learned about the fishery and the effectiveness of the fish ladder that allows fish to pass around the dam, providing access to spawning areas that had been blocked for more than a hundred years.

It's these stories as well as the water quality information that we are generating that makes this project so unique.

The Rock River Coalition strives to protect and improve the Rock River and this project has allowed us a whole new way to do it.

The Rock River Coalition received significant funding and support from the Wisconsin Department of Natural

Resources, the University of Wisconsin-Whitewater and We Energies Foundation.

Other sponsors included American Institute of Professional Geologists-Wisconsin Chapter, Alliant Energy, ATC, Rutabaga Paddlesports, Angus Young, Donohue and Associates and many other cash and in-kind donations.

Testing the Waters is a project of the Rock River Coalition, but this project couldn't have been done without the assistance of the University of Wisconsin-Whitewater, Current Data, Wisconsin Department of Natural Resources, UW-Extension, Jefferson County Land and Water Conservation Department, Rock River Stormwater Group and many individuals.



The Testing the Waters Team:

From left Dave Hoffman, Rock County Parks; Patricia Cicero, Jefferson County; Joe Van Rossum, UWEX; Ingrid West, RRC; Rachel Terracina, UW-W; Eric Compas, UW-W; Caitlin Peterson, RRC; Porter Vande Voort, UW-W; Mark Riedel, DNR; Jojo O'Brien, RRC; Suzanne Wade, RRC; Bill Frisbee, Beloit; Marsha Vomastic, RRC; and Jeff Smyczek, UW-W. Not pictured Karl Brandstaetter, UW-W; Sandy Thorpe; Becky Binz, RRS; and Anna Courtier, UW-W.

2016 Confluence:

A Gathering for Lake and Stream Volunteer Monitors

WDNR Horicon Marsh Education and Visitors Center

Saturday, October 22nd,
9:15 am - 3:30 pm

The Confluence is a special advanced training and networking opportunity for existing stream monitors.

This year's topics include

- The Story of Horicon Marsh: How Volunteers Have Shaped its Past, Present and Future
- Stream and Lake Water Quality Monitoring – State and Basin-Wide
- Assessing Stream Life and Examining Stream Macroinvertebrates.
- Where Does All the Data Go? Navigating The WDNR Databases
- Aquatic Invasive Species--cool facts and ecological adaptations; hands on id tips; monitoring programs.

Interested in becoming a monitor in 2017? Contact Nancy Sheehan, stream monitoring program coordinator at: nancy@rockrivercoalition.org.

Stream Side Notes

By Nancy Sheehan, Program Coordinator, Volunteer Stream Monitoring

Another Great Monitoring Season

Another great monitoring season is coming to a close. And what a season it has been. This spring, I have had the pleasure to introduce the joys of stream monitoring to 70 prospective volunteers.

While my spring training schedule was hectic, I found it truly heartwarming to meet so many individuals committed to protecting our natural resources. Of course, I could not have accomplished all that I did this spring without the assistance of some awesome partners.

Anne Miller, Conservation Specialist with Rock County Land Conservation Department and Dave Hoffman, Community Coordinator with Rock County Parks, joined me for a beautiful training day on Turtle Creek near Clinton.

This year, we were joined by Therese Oldenburg, a member of the newly-formed Friends of Turtle Creek. Therese gave a short presentation about the amazing work this Friends group has accomplished in just a short time.

Find an online water trail map and other cool information about this Friends group by clicking: <http://www.friendsofturtlecreek.com/>.

Because of the support and dedication of many current volunteer stream monitors, I led a number of trainings this year with new partners, including the UW Arboretum, WI Master Naturalists Program, First Unitarian Society-Water Sentinels, the Catholic Multicultural Center, and Waunakee Village Center.

I have Marian Farrior, Steve Laubach, Kyna North and Liz Wessel to thank for promoting the stream monitoring program and inviting me to introduce others to stream monitoring.

More Citizen Monitoring News on Page 6.



A cold spring day on Pheasant Branch Creek, training Water Sentinels members and FUS Youth. Neal Gruber (first from left), Nancy Sheehan (fourth from left), and Liz Wessel (second from right)



Laura Green, Steve Laubach, Kyna North, Bradley Herrick, Benji Orcutt

2016 Turtle Creek Parkway Training Workshop



2016 Turtle Creek Parkway Training Workshop – Bottom right photo: The fashion trend among trainees this year was clearly pink hats. Participants Susan Sandford, Katie Udell, Christal and Sydney Campbell, and Therese Oldenburg

Good Reads For the Fall

Waters of Wisconsin

Shifting Currents: The State of Wisconsin's Waters in 2016.

<https://wisconsinacademy.org/initiatives/reports-and-resources>

River Voices, River Network Newsletter: This edition focuses on climate change and climate resilience.

http://www.rivernetwork.org/wp-content/uploads/2016/07/RiverVoices_Climate-Resilience_July2016.pdf

New Sightings

I had my first sighting of a burrowing mayfly on Otter Creek in Rock County. I also saw my first crayfish mud house on Spring Creek in Rock County. It's inspiring to see new streams and their unique biodiversity.



Lessons from “Testing the Waters”

Eric Compas, Department of Geography, Geology, and Environmental Science, University of Wisconsin-Whitewater

We learned a great deal from our eleven-day paddling trip down the Rock River with our water quality arrays (see accompanying article). With our new device, we gathered a tremendous amount of data – over 30,000 individual data points – that are allowing us to look at our river in a way that few, if any, rivers have been looked at before. Our metrics were basic – temperature, pH, dissolved oxygen, and conductivity – with a few phosphorous samples taken along the way, and we knew this wouldn't and couldn't tell us everything. So, besides learning that we should buy more comfortable kayak seats next time around, we learned quite a bit of detail about what our Rock River looks like in spring – a snapshot to be built upon in the future -- along with lessons about our testing system and what it can do. We also added to a list of questions about what else we'd like to know. The trip was the first step into a new way of learning about and monitoring change in our river.

Our setup combined off-the-shelf components in a novel way. We connected conventional water quality probes with Arduino microcontrollers, cell phones, and a web server to create testing arrays. We attached our arrays to the front of two kayaks which paddled sequentially down the river (usually within a mile of each other). Unit #1 stuck to the stream centerline while Unit #2 captured the centerline plus side trips into sloughs and the first hundred meters or so into tributaries. This gave us repeated measurements along the centerline plus insights into various habitats along the stream periphery.

You've seen the notice “provisional data subject to revision” on government websites such as USGS. We're in the same “boat” and need to process our data a bit before conducting our final analysis. So far, we've “linearized” the data along the stream centerline – moving each sample to the stream center and calculating how far it falls on that centerline yielding a consistent “x” coordinate for our graph – to generate a graphable profile along the Rock River.

Later, we'll be conducting additional processing including: 1) filtering the data for known issues and spurious data points and 2) accounting for sensor calibration and drift throughout the day (most evident in the conductivity data). Our plan is to eventually publish the data collected during the trip. We're enlisting expertise from UW-Madison to review our analysis procedures and our final interpretation of the data.

So on to what we've learned so far. First of all, our water quality testing system worked almost flawlessly. We developed a novel and technologically complicated system and pilot tested it in a very public fashion. Personally, I was praying that the system would make it through the first day without

quitting. Our devices and mapping servers worked for the duration of the trip – our servers never quit and we only lost data twice when the GPS on one of the phones refused to update (missing a total of around 4 hours of data that the duplicate unit did not miss). We also identified issues with our calibration procedures that we believe we can partially fix with the process noted above. The data between the two units was very similar and where we had calibration issues (conductivity days 3, 7, and 8) both units measure similar relative change. Overall, we conclusively demonstrated the feasibility of the system and its future use and expansion.

Second, we collected a substantial amount of comparable data. Including

a preliminary (Day 0) trip through Horicon Marsh (the South Branch of the Rock River), we collected a total of 34,699 data points across 12 days of paddling. We were incredibly lucky with the weather throughout our trip. We received no substantial rain, which would have compromised our ability to compare across sample dates. According to the weather recorded at Watertown Municipal Airport (KRYV), we received only 0.02 inches of rain except for during the final day when we received 0.11 inches. This allows us to take the unique view of the river profile and compare across river segments – something that traditional sampling methods don't allow for.

While we're still working on the data, we're already noticing interesting

patterns. You can see the whole river profile for each metric from Mayville down to Beloit in Figure 1. Pause a moment and ponder. It's a lot to absorb, but this shows us data collected for each day as we paddled down the river (shown on a map in Figure 2). Overall, the data shows a springtime flow that's relatively healthy. Using Milwaukee Riverkeepers targets – dissolved oxygen > 5 mg/L, pH from 6 to 9, conductivity from 150 to 500 $\mu\text{S}/\text{cm}$, and temperature < 31.7 °C, the river met all of these targets except for high conductivity for the full extent of our paddle. High conductivity values, though, are likely more

Continued on Page 5

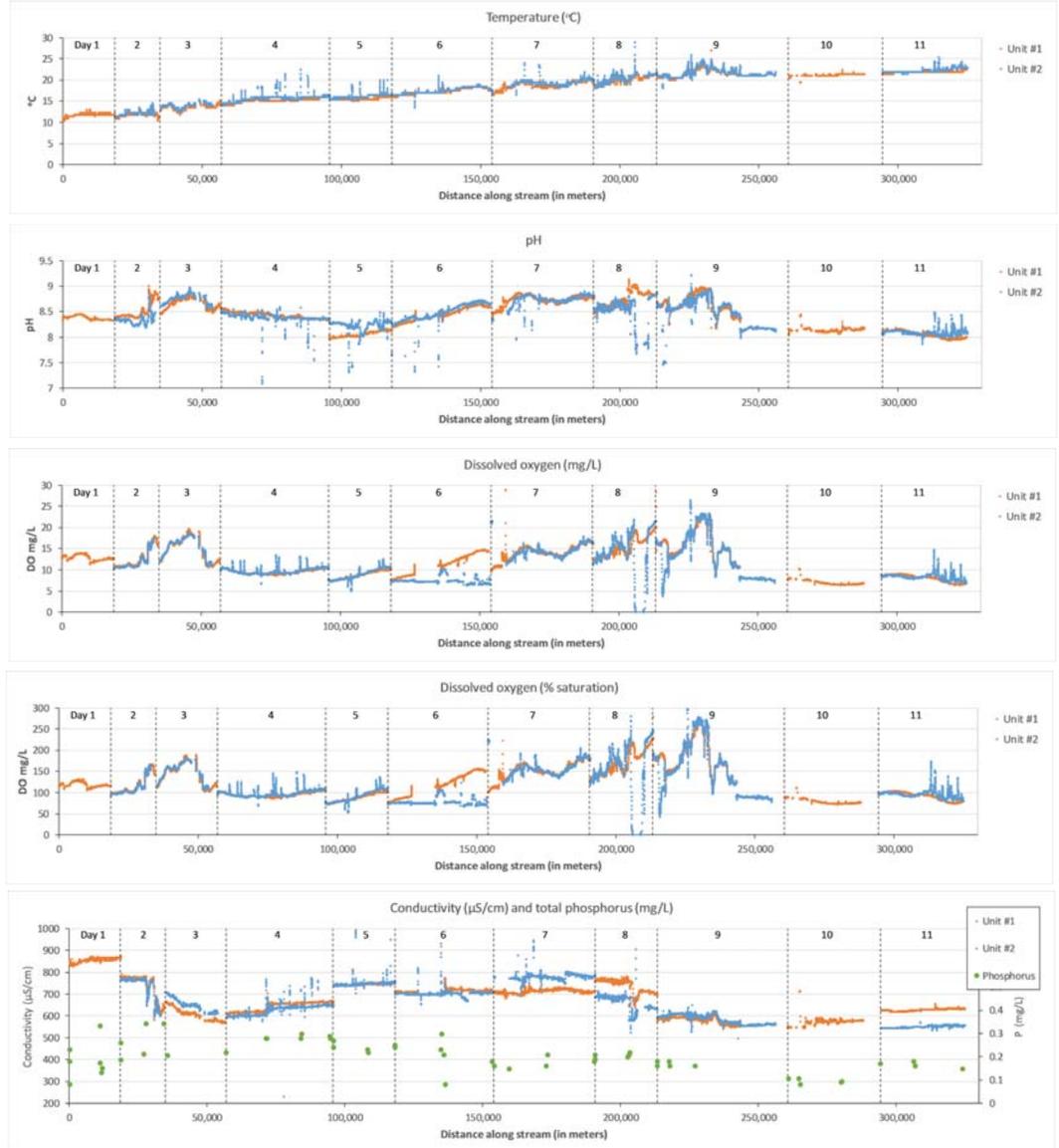


Figure 1. Water quality metrics by day and distance along Rock River from Mayville to Beloit. See map on next page for geographic context.

Testing the Waters – What Did We Learn? Continued

an indication of river's baseflow – water entering the stream through subsurface flow – through mostly carbonate rocks and are not an indicator of poor water quality. There's nothing in this flow data that indicates an overall issue with our river.

Specific metrics tell a similar story. Temperature values revealed a steady increase that anecdotally reflected the warming spring temperatures throughout the paddle. Spikes visible in the data are not errors – these mostly warmer temperatures are from the second boat paddling into warmer, shallower waters. Interestingly, the larger thermal masses of the lakes we paddled through, Lakes Sinissippi and Koshkonong, do not show up as colder stretches of water.

Our pH values were relatively high (indicating basic/alkaline conditions) throughout the river profile. Like conductivity, these alkaline conditions are likely due to the substrates that the river's water flows through and over – high calcium and magnesium content drawn from the river bed and the region's geology. Wisconsin fish, in general, can tolerate the high pH and that may protect them from absorbing mercury and other heavy metals into their bodies (Brown et al. 2010) – good news for anglers. Interestingly, one study documented that survival of common carp is decreased above a pH of 8 (Heydarnejad 2012). High pH may be helping to ameliorate the impact of carp on the river. Also, there is indication of a diurnal cycle of pH on days 2, 6, 7, and 8. Dissolved carbon dioxide generated by respiration of aquatic life can lower pH values and as this CO₂ is removed throughout the day through photosynthesis, pH values can rise (Fondriest Environmental 2013). These trends may indicate stream stretches with healthier aquatic plant communities. Again, the downward spikes in pH aren't flukes; those are from Unit #2 boat's forays into side streams where the pH dropped. While I'm not certain of the cause, it's likely due to the substrate these side streams flow through.

First glancing at dissolved oxygen (DO), I thought our sensors were either incorrect or had a bias at high dissolved oxygen (perhaps a non-linear inflation of higher values). Along our whole route, 60.7% of our readings are at or above 100% saturation. That's incredible. However, our units were consistent with one another. Supersaturated oxygen levels occur in two situations – stagnant water with abundant photosynthesizing plants or with rapid temperature changes. I believe that we mostly encountered the latter with warm days and relatively cool water. Cold water holds more oxygen and, as the surface of the water warms, becomes supersaturated for awhile until equilibrium concentrations at

that temperature are reached. This may also explain the relatively high DO readings we had in Lake Sinissippi (Day 3) and Lake Koshkonong (Day 9) – these larger thermal masses would have higher temperature gradients near the surface. Of note is general lack of the dissolved oxygen diurnal cycle (lowest in the morning and increasing with photosynthetic activity throughout the day) for several stream segments. In a stream with a healthy plant community, we might expect to see general daily trends such as those visible in Days 5, 6 (error in Unit #2), 7, 8, and the first half of 9. For Days 1, 4, 10, and 11 we see no visible increase in dissolved oxygen as the day progressed. This may be attributable to compromised aquatic plant communities – not something we explicitly observed or documented – in these sections of the river.

Conductivity (or electrical conductivity or specific conductance), the measure of dissolved solids such as magnesium or calcium, proved to be our most temperamental probe. There was strong agreement between our two units on the change in conductivity, but their absolute values differed for several days (e.g. Days 3 and 7) indicating a difference in calibration. Due to these differences, we made a change to our calibration procedures, and once we apply these corrections and remove the "provisional" from our data title, we should see better alignment of the two units. The profile appears to highlight the role of the two lakes in conductivity. Values are highest before the lakes and drop through them (Lake Sinissippi on Day 3 and Lake Koshkonong on Day 9). Dissolved solids are ions like CA⁺⁺ in the water and are not the same as suspended solids (what a turbidity probe would measure), so we wouldn't necessarily expect the slowing water of the lakes to reduce dissolved solids. However, there may be a relationship between suspended solids and dissolved solids – clay and organic matter may be serving as a flocculent to which ions are binding and settling out of the water column. With conductivity, we did notice the impact of at least one side stream on the Rock. The Rubicon River (around 71,000 meters on the graph) showed a spike in conductivity that appears to have increased the overall conductivity levels of the river by around 40 µS/cm – an indication of at least one tributary whose influence was significant on the main stem that perhaps warrants further investigation.

Phosphorus, along with turbidity, is one of the key metrics for which the Rock River has been deemed "impaired" under the Clean Water Act. Unfortunately, it's a difficult and expensive test to make a measurement of total phosphorus. With the help of local municipal wastewater treatment facilities, we were able to take phosphorous readings at 55 locations

along the river with key measurements above and below major tributaries to gauge their impact. Overall, our levels were generally relatively low with 5 of our 55 samples (9%) falling below the Rock River Recovery target threshold of 0.1 mg/L. These results are not surprising for this time of year which typically holds the lowest P values in an annual cycle. Our paired samples did not reveal any significant impacts of side streams on the Rock. Of the paired readings (18 total), 6 led to increases in P levels (average of 0.04 mg/L) and 12 led to decreases in P (average of -0.04 mg/L) perhaps indicating that overall, tributaries had lower levels of P and may be helping to improve downstream quality. These changes may warrant further investigation and the addition of tributary flow to better gauge phosphorus loads both on tributaries and the main stem.

As you can tell, there's a lot of speculation here that needs further refinement. However, the potential relationships between pH and dissolved oxygen, the potential connection between conductivity and turbidity, the role of the lakes in "cleaning" the water, and the different chemistry of the Rock's tributaries all highlight the insights that our high spatial sampling allows us to explore that traditional point samples could not reveal.

I wouldn't be a responsible researcher if I didn't point out all the questions that this project raised (and why I'll have to do a lot more paddling). This snapshot captured the Rock in its spring condition and that's apparent particularly in the temperature and dissolved oxygen values. How do these change throughout the season? Which stream segments show a high degree of variability and which are more stable (hinting as to which stream segments may be more susceptible to extreme weather events or pollutants)? Why did we find lower dissolved oxygen levels the last two days? Ideally, we'd repeat this sampling for three or four times throughout the spring, summer, and fall to capture both spatial and temporal trends throughout the river. And, I'd give one of my rear molars for a turbidity sensor. Anecdotally we observed very distinct sections of the river in regards to turbidity (high turbidity above and below Lake



Figure 2. Map of paddled stretches by day

Sinissippi, moderate levels around Fort Atkinson, and very low levels below Lake Koshkonong). Since it, along with phosphorus, is one of the metrics identified in the Rock's "impaired" status, it would be great to know more about the turbidity patterns and speculate on causes of both high and low values. Finally, more phosphorus measurements, particularly seasonal trends, would help pinpoint sources of phosphorus and lead to more targeted actions for its reduction, and, in the long run, monitoring the success of phosphorus mitigation.

So, Suzanne Wade, I'll be looking forward to the funding and support to repeat "Testing the Waters" for three or four dates next year. It's the least we can do for our river and my paddling schedule.

Thanks to Peter Jacobs, Mark Riedel, Jane Carlson, and others who have contributed comments on the data collected. Thanks to the wastewater treatment labs of Horicon, Oconomowoc, Watertown, Jefferson, Fort Atkinson, Janesville, and Beloit for providing total phosphorus results for the project.

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Streamside Notes Continued

WAV Funded Total Phosphorus Sampling Program

In 2016, the Water Action Volunteers Program funded 155 total phosphorus sampling sites across the state. Twenty (20) of these sites are located in the Rock River Basin.

Thanks to everyone for increasing the sampling of total phosphorus across the Basin.

Privately-Financing Total Phosphorus Sampling

Not all volunteer applications for phosphorus sampling was covered by the 2016 WAV budget. The RRC agreed to work with a volunteer to test a new approach to augment phosphorus sampling across the Rock River Basin.



Gary Hermann and Dave Abel joined Larry Meyer and I to share their experiences and help with a stream side TP training. 2016 Spring Creek, Rock County. Larry Meyer, Dave Hermann, and Gary Abel

Volunteer Larry Meyer agreed to be our first “guinea pig” to test privately-financing total phosphorus sampling. Larry and I worked with several partners to ensure that the results from his phosphorus sampling efforts would be of use both at the local and state levels.

RRC facilitated the establishment of an account with the State Lab of Hygiene as well as with the WDNR. Larry communicated directly with his local county land conservationist.

Over the winter months, RRC will review the cost effectiveness of working directly with volunteers to increase nutrient sampling. This type of sampling falls outside the official WAV program.

Because of this fact, staff time is required to establish a non-WAV monitoring project with the WDNR to ensure that the data can be shared and

entered into the WDNR Surface Water Integrated Monitoring System database (or SWIMS).

The RRC continues to be committed to making all water quality data accessible to the public.

We will work with our partners at WDNR to explore options for increased TP sampling across the Rock River Basin.

Yahara WINS Funded Nutrient Sampling

533 Samples Collected Since 2013—And Still Counting!

Since 2013, volunteer stream monitors working in the Yahara River watershed have collected 533 water samples. Thanks to funding from the Yahara WINS, volunteers have been able to continue collecting samples and monitoring stream health.

This year, our volunteers are monitoring 50 stream sites in the Yahara River watershed at which monthly dissolved oxygen concentrations, water temperature and water clarity readings are entered into the WDNR SWIMS database.

Volunteers are sampling at 35 sites and delivering monthly these water samples to the Madison Metropolitan Sewerage District (MMSD) for analysis.

In addition, volunteers have established stream temperature data loggers at 26 stream sites. These small, data-logging devices record hourly water temperatures during the growing season.

MMSD and the WDNR are still working on creating a digital “hand-shake” to upload the nutrient sampling results to the WDNR SWIMS database. Until this upload happens, I will continue to track some of the results and showcase this data on our website.

Toward this end, I have taken advantage of new data visualization



Thanks go out to MMSD Nine Springs Lab Staff, especially Rhonda Riedner depicted here, who have supported our volunteers and performed all the analyses.

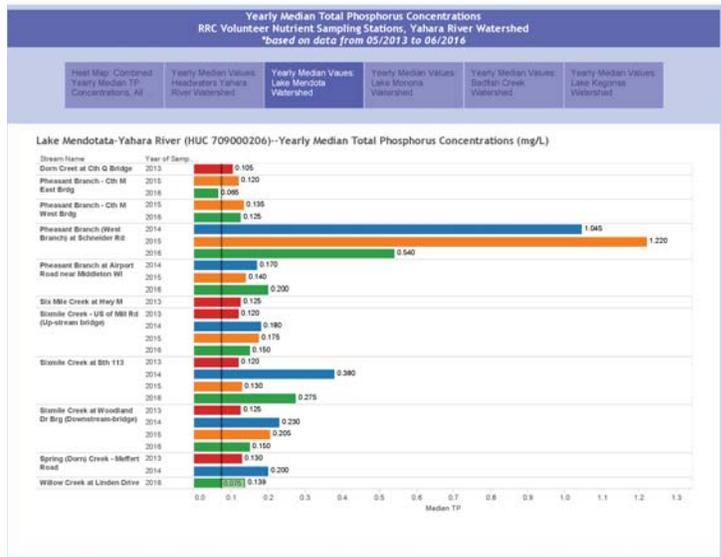
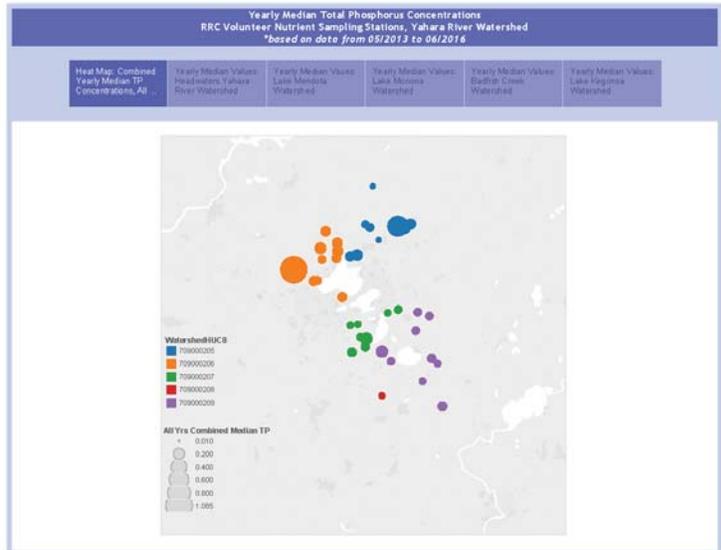
“freeware” now available for free download.

Check out the map and graphs of total phosphorus concentrations using Tableau Public© on our stream monitoring webpage, a map and one graph is shown below:

Also available on our stream monitoring webpage are the monthly concentrations as well as the

maximum, minimum and median concentrations for each site for three parameters: total phosphorus, total suspended solids and total Kjeldahl nitrogen.

(Editor’s note: click on the link in the upper right hand corner of the citizen monitoring page: Citizens Help To Monitor Nutrients In The Yahara River Watershed)



In the first graphic: a map of the Yahara Watershed, the relative size of the circles indicates amount of phosphorus, and the colors show different sub-watersheds.

The second graphic shows the annual phosphorus totals for for Lake Mendota. The colors represent years, and each set of colors is for a specific monitoring location.

Also available on the website are the headwaters, Lake Monona, Badfish Creek and Lake Kegonsa.

First Phosphorus Trade in Wisconsin

By Carl Korfmacher, Midwest Prairies, RRC Board Member

As most readers know, phosphorus in our lakes and streams has a very negative effect on water quality. Those algae blooms you see every summer are mostly caused by excess phosphorus in the water. In some lakes, it gets so bad that many recreational opportunities are lost. At its worst, a lake can turn "eutrophic," resulting in the death of fish and many other aquatic creatures.

The largest contributor to phosphorus in most watersheds in Wisconsin is agriculture. It is applied to farm fields in the form of synthetic fertilizer and animal manure and can run off into local streams and lakes. Because the application of phosphorus is diffused across many thousands of acres, it would be very difficult to regulate. Thus, in order to achieve improved water quality, the Wisconsin Department of Natural Resources (DNR) and US Environmental Protection Agency (EPA) are lowering the amount of phosphorus that can be discharged by "point-sources" such as wastewater utilities and factories. Unfortunately, current technological methods of removing phosphorus are struggling to get the last increments out of discharged water at a reasonable cost. Trading is a more cost effective method. Even better, trading has the potential to create meaningful habitat in agricultural landscapes where it may otherwise be scarce.

In December of 2015, DNR issued the first water quality trading permit in the state. Water quality trading allows entities such as city sewer districts and factories to offset their phosphorus discharges by restoring natural cover to erodible agricultural lands rather than invest in expensive engineered systems.

Legislation allowing for water quality trading was promulgated by the state several years ago, but it was not until last year that the DNR issued its first water quality trading permit to the Baker Cheese Company in St. Cloud, Wisconsin. In order to satisfy their permit requirements, Baker converted 20 acres of erodible farm land into a perennial native prairie.

Baker Cheese's wastewater consultant, The Probst Group, introduced the idea of water quality trading as an effective, environmentally-friendly phosphorus compliance measure for their new wastewater treatment plant discharge. Implementation of the water quality trading project was led by attorneys John Clancy and Emily Ertel of Godfrey and Kahn, SC and the project was designed and implemented by RRC board member Carl Korfmacher of Midwest Prairies, LLC.

Since water quality trading is a new program in Wisconsin, there was a lot of uncertainty in the state about whether it could be used successfully as a reliable compliance option for permittees. The Baker Cheese project has demonstrated that water quality trading can be a very effective compliance option for permittees facing low phosphorus limits.

The farm fields that have been planted to prairie were awash in wildflowers this summer, particularly black-eyed Susan. In coming years more flowers will emerge and the site will be managed with prescribed fire. Deer, turkey and innumerable songbirds are making their home in the prairie and will be for generations to come.

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:

Name _____

Title _____

Affiliation _____

Address _____

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I am a member of _____ Chapter.

Memberships Fees

Individual	\$ 25
Family	\$ 35
Student/Senior Citizen	\$ 15
Classroom	\$ 25
Affiliates*	\$ 50
Municipal**	\$125
Corporate	\$ 200

*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

Donors of \$500 or greater will receive an ad in this newsletter. Check out our website for more information.

Wisconsin Department of Natural Resources update

WDNR has been undergoing a review of agency communications relating to TMDL's to insure consistency of format and content across the state. The next issue of the Rock River Recovery TMDL Newsletter will be published in October. The Education and Outreach Sector Team is reviewing the Quarterly Networking Forums and soliciting input from our community of basin partners. Along with UW Extension, we've been conducting the forums for two years and attendance has declined significantly. A survey has been sent out to our community to provide feedback and suggestions on how the forums might be improved. If you would like to participate in the survey, please visit the following link: https://uwex.qualtrics.com/SE/?SID=SV_8J8AVQODJWeBoAB

Exciting updates on TMDL Implementation – nearly 90% of point sources within the Rock River basin now have WPDES permits consistent with TMDL limits and the TMDL Permit process! In addition, county partners in the Rock River Basin are making excellent progress on nonpoint implementation. Speaking of which, the next Ag Sector Team meeting is scheduled for October 19th. County partners are also working closely with our farmers and agricultural producers to plan soil health workshops – one each in the northern and southern halves of the Rock River Basin. As always, stay tuned to our Rock River Recovery newsletter for the most recent updates. Past issue are available here: <http://dnr.wi.gov/topic/tmdls/rockriver/Newsletters.html>

Tax Deductible Donations

Amount	Purpose
	General Support
	Citizen Monitoring
	Other:

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

Please mail this completed form with check to:

Rock River Coalition
 864 Collins Rd
 Jefferson, WI 53549

or register and pay online with PayPal at:
www.rockrivercoalition.org/membership.asp

New Mountain Bike Park

The 18-acre Jefferson County Glacial River Mountain Bike Park is located at the southeast corner of County Rd W and Hwy 26 in the City of Jefferson. The vast majority of the park is on sloped terrain. The majority of the hillsides provide viable side slopes and a wide range of trail experiences. The park is conveniently located off of the paved hiking and biking Glacial River Trail and is easily accessible by foot or bike.



The trail system is intended to be a bike-optimized, multi-use, and human powered network focused on stacked loops that allow flexibility in outing length and exertion. The majority of trails are designed to flow optimally in one direction.

Meet the New RRC Board Members

Karl Brandstaetter



I'm a 22 year old student at UW-Whitewater. Taking on a student board position with the Rock River Coalition this fall is something that I'm very excited about. At UW-Whitewater, I've been involved in organizations such as Students Allied For A Green Earth (SAGE),

served as the president of Whitewater Water Council this past year, and also recently started as an intern with the Sierra Club. Advocating for the environment is something that I enjoy, and find very important.

As I write this, I'm returning via plane from a 2,600 mile cross country bicycle tour. Before my semester begins, I will be traveling to Baton Rouge to help with disaster relief. The unprecedented flooding that occurred, is the worst "natural" disaster to occur since Hurricane Sandy.

I have found volunteer work to be one of the most important and satisfying activities in life. The sustainability office at UW-Whitewater brings volunteers to Whitewater and Bluff Creek, this is where my relationship with the RRC began. Observing the unique ecological characteristics of these diverse sites has allowed me to always reconnect with nature on a regular basis.

I would encourage everyone to get involved with stream monitoring, or the RRC, or any volunteer/community organization in some capacity.

Carl V. Korfmacher

Owner, Midwest Prairies, LLC

Carl Korfmacher is the owner of Midwest Prairies, LLC, a natural resources contracting and consulting firm located in Edgerton, Wisconsin. He has been



involved in natural resources for over 20 years beginning with graduate studies in landscape architecture at Kansas State University and continuing through nearly 18 years at Applied Ecological Services where he eventually became President and CEO. In 2014, he purchased Midwest Prairies from Ron and Marti Martin and continues to build on their reputation for integrity and quality work.

Mr. Korfmacher currently serves on the Board of Visitors for the University of Wisconsin's Nelson Institute for Environmental Studies and sits on the board of directors of the Rock River Coalition. He has served on several corporate boards of directors and has worked internationally on projects related to the environment and sustainability.

His work at his former employer, Applied Ecological Services, included ground-breaking projects related

to wetland banking and wetland mitigation. He also managed the Flambeau Mine reclamation project in Ladysmith, Wisconsin as well as The Nature Conservancy's Kankakee Sands project south of Gary, Indiana. As owner of Midwest Prairies, he completed the first phosphorus water quality trading project in the state of Wisconsin in 2015.

Apart from his family, his core passion is bringing life and health back to the land through direct action. He takes great pride in helping all those interested in natural resources formulate goals to improve the land and see them through to fruition.

Midwest Prairies, LLC restores and improves prairie, savanna, woodland, and wetland habitats using the best techniques and practices available. Midwest Prairies' customers include private landowners, state, county, and local governments, land trusts, and utilities.

Andy Selle

Andy has always been influenced by rivers. He pursued an undergraduate degree in Fisheries Biology at Purdue University and worked for a few years as a fisheries biologist in Indiana before pursuing a Master's Degree in Civil Engineering (hydraulics).



After moving to Wisconsin with his family he worked for over a decade analyzing, designing, and constructing river restoration projects across the United States. He made a career change last year and became the City Engineer in Fort Atkinson but still manages to be involved with the river through the management of stormwater improvements for the City.

He has lived in Fort Atkinson, on the river, for the last 12 years with his wife and three kids. He joined the Rock River Coalition board this past spring.

Lindsey Schreiner

Lindsey grew up in Jefferson and spent a lot of her time hunting and fishing the Rock River.

Her passion for the outdoors lead her to pursue a degree in Environmental Science-Natural Resource Management at the University of Wisconsin Whitewater.

She is currently employed as a property appraiser for the City of Janesville and is planning to stick around the area.

She is excited to work with the organization and is looking forward to participating in preserving and improving the Rock River Basin! Pictured here with a Rock River walleye.



Event Demonstrates the Land-Water Connection

RRC has welcomed a partnership with UW Discovery Farms. The UW Discovery Farms® Program is a Wisconsin-based resource for research and water quality information. Research happens on farms around the state, including 9 farms in the southeast.

Since 2014, UW Discovery Farms staff have participated in several of our volunteer stream monitoring trainings. This summer, the RRC had the opportunity to lead a demonstration on stream water quality during a field day event hosted by UW Discovery Farms.

Over 100 farmers attended this field day held on Awesome Acres, a farm owned by Bill and Rhonda Rohloff and located near Fort Atkinson. Farmers discussed nitrogen use efficiency and cover crops with experts. Participants also learned how they can monitor the health of their local streams by becoming volunteer stream monitors.

The RRC is excited to continue strengthening our partnership with UW Discovery Farms as well as with farmers like the Rohloffs who are protecting their local waterways by using cover crops, filter strips adjacent to water, and no-till farming.



Patricia Cicero, RRC board member and Jefferson County Land and Water Department staff, demonstrated how our volunteers monitor stream health.

Photo by Erica Olson UW Discovery Farms.

Time to Renew

The Rock River Coalition membership is by calendar year, so this November the board will be sending membership renewals out.

You can increase the value or your donation by going to the website today, or by mailing in the membership form in this newsletter and renewing today.

You can also sign up for an emailed rather than mailed newsletter by sending a request to info@rockrivercoalition.org.