

Thank you to WE Energies for providing funding for this newsletter!

A Year in Review

By Suzanne Wade

This has certainly been an interesting year to be involved with citizen stream monitoring.

The Rock River Coalition held three training workshops in 2004. All were well attended and folks left ready to get their baseline data.

Then it rained, and rained and rained some more. Many groups were not able to get into their sites until July. An unfortunate side effect of this was a number of teams never did go out.

If you were one of those who just wasn't able to go due to high water, time or other circumstances, we hope your New Year's resolution is to rejoin our effort.

As the summer wound down so did the rivers. I'm very interested in whether you saw many changes due to this extreme fluctuation. If you did, send me your observations by mail or email.

As a program we've had a great deal of change this year. Dan Heim, DNR had to give up his duties as Local Coordinator for the headwaters region. We're hoping to work out an agreement with a group or individual to take over. Riveredge Nature Center is the new Local Coordinator for Washington County. This has meant, for some of our monitors, a bit of a disconnection from our group. We're working hard to turn that around.

In August Teri Holloway, one of our monitors, completed the first phase of a project to develop an online version of the citizen monitoring protocol instructions. The first version will be out mid-spring. Initially, it will be used to supplement classroom instruction. The site provides an overview of the tests that river monitors conduct, procedures for completing the tests, and links to forms that can be downloaded. The instruction will be continually improved, and we will count on our monitors for feedback. If anyone would like to be a usability test subject, please e-mail tharthol@indiana.edu.



Suzanne Wade teaches about stream ecology beside the Scuppernong as (foreground, right to left) RRC Board Member, Margaret Burlingham, Betty Jo Nelson, Teri Holloway (of Rock River Soap Company), and teacher Danelle Anderson, Columbia County, take note.

-Photo by Ellen Rulseh

DNR Secretary Committed to Citizen Monitoring

DNR Secretary Scott Hassett is making the use of citizen monitoring data by the DNR a priority. Currently a state team is working out the details of how citizens will be trained, for which protocols and how the data can be used.

Here are some of the immediate steps the DNR is taking to support citizen monitoring:

- Support the creation of a statewide monitoring network
- Create a river monitoring strategy
- Draft legislation creating an advisory board
- Identify support for a monitoring coordinator
- Establish a citizen monitoring grant program
- Identify DNR data gaps and how citizens can help fill the gaps
- Integrate citizen monitoring in conservation plans.

Our voice is being heard! I'm proud to say that input from many Rock River Basin monitors at the August Citizen Monitoring Conference helped influence these priorities.

Come to our March 5th Confluence to learn more about how your data can be more useful.

Rock River Basin Certification

We all understand the importance of good data. When we use good methodology, the right forms, and have good equipment we can be confident that the data we put into the system is useful and has a purpose. When we don't, bad data can cause our whole program to be questioned. Thus, our Rock River Basin steering committee began to use a certification process last year. Of course, any new idea takes a while to get everything working. Here we hope to clarify what our procedures are and what we still need to figure out.

Since, the Rock River Basin uses Wisconsin Water Action Volunteer Protocols, we expect all monitors to become proficient in the measurement of dissolved oxygen, temperature, turbidity and the biotic index.

Monitors with sites appropriate for flow are expected to be proficient in this parameter. Volunteers with sites not appropriate, due to water depth, water velocity, mucky sediment or water quality do not need to do this parameter. Also sites with a nearby USGS monitoring station can use flow data from their real-time website. <http://wi.waterdata.usgs.gov/nwis/>

As for habitat, monitors are expected to understand each of the habitat variables and be consistent year-to-year. It is suggested that monitors take annual photos as a permanent record of their location and keep them filed with their reports. Their local coordinator will work with the monitor on habitat during baseline establishment.

Monitors are not required to, but are encouraged to, maintain a reference library of macroinvertebrates in case their biotic index is questioned.

Dan Rambo, Riveredge New Coordinator for Washington County

By Dan Rambo

Riveredge Nature Center has taken on the administrative and training responsibility for the Washington County Adopt a Waterway Program. Washington County Land and Water Conservation Department had developed an extensive outreach and education program under the leadership and guidance of Sue Millin, including working with the Rock River Coalition's monitoring program in the Rock River Basin. However, overall budget considerations led to the decision not to continue the program beginning in 2004.

Fortunately, Riveredge Nature Center was able to secure funding through an EPA grant and has picked up the program. Additional partnering with other park



Teacher and students at TTW training 2004
—photo by Mollv Stoddard

Certification for New Monitors:

All new monitors are expected to attend a WAV-based training workshop.

Their first monitoring session of the year is a thorough baseline workup with either a local coordinator or another resource person.

Their certification card will be sent to them after two months of good data (good means that all of the numbers fit within acceptable limits), are received by their local coordinator.

Certification for Veteran Monitors:

Someone who has monitored for one - three years can be recertified for protocols covered at the Confluence, or a workshop. Their local coordinator can also certify them during baseline monitoring. As soon as they are certified, they can begin to monitor.

Veteran monitors who have participated consistently for three years and have provided good data, are considered permanently certified, as long as protocols do not change. However, they are still encouraged to attend the Confluence and workshops to refresh their knowledge, receive updated or replacement equipment and to share their experiences with newer monitors.

Database Certification:

We are working towards a data entry certification process. This will be one of the topics at the Confluence on March 5, 2005.

and planning offices and groups is anticipated to occur over the next year.

As of September 1st, Dan Rambo is the new coordinator, not only for the Rock River Basin Washington County monitors, but for all aspects of the Washington County Adopt a Waterway Program

Dan got his "feet wet" by participating in water monitoring training in Ozaukee County and at Riveredge's Testing the Waters (TTW) program training. This

has whetted (not dampened) Dan's interest in learning more about program development and citizen involvement and is pleased to be associated with the Rock River Coalition. Dan can be reached by email at Dan@riveredge.us or by phone at 262-675-6888.

USEPA Staff Participate in Volunteer Monitoring on Koshkonong Creek

By Pete Jopke

The Dane County Land Conservation Department (LCD) recently hosted a tour for staff from the United States Environmental Protection Agency (USEPA) Region V Office in Chicago. The tour, which took place in early November, involved various water quality and conservation initiatives throughout Dane County. The highlight of the tour was the staff from USEPA participating in a volunteer monitoring effort on Koshkonong Creek.

Janice Redford has been monitoring Koshkonong Creek in Rockdale since 2001. After a quick history lesson from Janice on the removal of the Rockdale Dam, EPA staff put on their waders and trudged into the stream to collect the data. Under the watchful eye of Janice and volunteer member Shirley Ellis, USEPA staff calculated temperature, dissolved oxygen, turbidity, and a biotic index.

Linda Holst, Chief, Water Quality Branch, USEPA had this to say about her day and the monitoring she did with her staff, "EPA is very impressed by the level of expertise and dedication of volunteer and citizen monitoring groups in Wisconsin. We were thrilled to be able to spend time sampling with the Friends of Cam Rock Park. States and other agencies will never be able to monitor every water within their jurisdiction, so it's critical that EPA and other regulatory agencies work together with volunteers to figure out what kind of gaps they can fill and how citizen monitoring data can be used."



Janice Redford and Shirley Ellis, Friends of Cam Rock Park Citizen Volunteer Monitors along with staff from USEPA Region V in Chicago monitoring Koshkonong Creek in Rockdale...

-photo by Pete Jopke

Monitoring Makes Good Neighbors

By Ellen Rulseh

As property owners on the shores of Lake Koshkonong, Charles and Evelyn Payson understand the importance of good water quality to real estate and the economy of Jefferson County, the Rock River Basin and Wisconsin. On their first monitoring expedition they learned that the farmer who owns land adjacent to their monitoring site understands that too.



Charles Payson (right) and his wife Evelyn learn the history of the farmland along Allen Creek from La Vern Amacher.
-Photo by Ellen Rulseh

Charles and Evelyn looked at several possible monitoring sites; the one they liked best was Allen Creek, where it crosses the bike path just south of Fort Atkinson. But their choice location would require driving their car into and parking it on private land.

They were pleased to find that, LaVerne Amacher, whose family had farmed the land for more than 70 years, not only gave them permission to test stream quality from his property but also joined them.

As Charles and Evelyn measured their site and studied its habitat, LaVerne provided a simply told historical synopsis of how the stream and surrounding landscape had changed since he was a boy. According to Amacher, Allen Creek, now two to three feet deep in most places, once had "swimming holes" six feet deep.

He pointed to a commercial development, a not-so-distant farm-field away. He expressed concern about how this and more planned development, including a highway by-pass, would affect Allen Creek. On the bike path Amacher pointed out thickets of buckthorn, "That didn't used to be here and it's everywhere now."

By the time Charles and Evelyn waded into the stream to measure flow; LaVerne offered to assist by manning the stopwatch. After all the protocols were completed, data sheets noted and the equipment collected, Charles and Evelyn thanked LaVerne for joining them. "We really enjoyed having you with us," Charles said and asked, "Would you like to join us again, next time?" LaVerne gave an affirmative nod and said, "Anytime. Just give me a call."

Volunteer Help Needed for Monitoring Wetland Restorations

The Rock River Coalition needs interested citizens to help monitor invasive species and collect important baseline information about nesting birds, trees, frogs, animals, and water quality on two large Jefferson county farms that will be restored back into wetlands.

A 1500-acre muck farm just west of Rock Lake and Lake Mills will remain in agriculture through 2005 before being restored to a wetland in 2006 providing a great before and after opportunity.

While most of the monitoring will start during early spring 2005, one important study began this October. Volunteers helped identify and map invasive species—including buckthorn, wild parsnip, box elder, musk thistle and reed canary grass— around the perimeter of the marsh and along the ditches. Information gathered by volunteers will be used to develop a plan to control invasive species before restoration begins.

Important contact information

Local Coordinators:

Columbia, Jefferson, Walworth and Lower Dodge counties: Ellen Rulseh, 920-674-7443

Dane County: Pete Jopke, 608-224-3733

Rock County: Anne Miller, 608-754-6617 ext 118

Rock River Headwaters: Ellen Rulseh
920-674-7443 (temporary)

Washington County: Dan Rambo 262-675-6888

Waukesha County: Jayne Jenks, 262-896-8305

Project Director:

Suzanne Wade 920-674-8972

State WAV Coordinator:

Kris Stepenuck 608-265-3887

A second farm, east of Jefferson and south of the Jefferson Tamarack Swamp, is already being restored. Some volunteers will be needed at this site as well. Volunteers can choose the study or studies they wish to participate in and will receive training.

“We need help from volunteers to collect important baseline information about nesting birds, age and type of trees on the property, frogs and other amphibians, water quality and animals that are currently living on the land or in the water” says Suzanne Wade UW-Extension Rock River Basin Educator. “Without volunteers we can’t begin to collect all of the information that we want. This information will help us determine the value of restorations, how to best restore wetlands and will help us better prioritize areas to restore.”

Anyone interested in helping in the spring should contact Suzanne Wade, at 920-674-7297 or by email at suzanne.wade@ces.uwex.edu

Your Help Needed

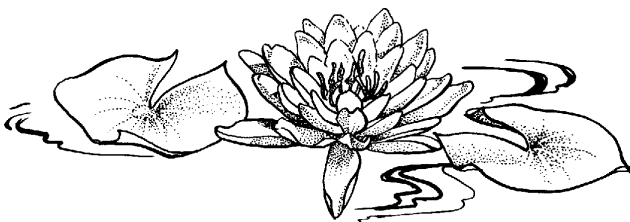
The Rock River Coalition has always been very frugal with the money we have received for citizen monitoring. We’ve nursed a donation from WE Energy for three years to support the Confluence and Dodge County monitors.

Thanks to a donation from the Quirk Foundation we have the funds to continue and expand the monitoring program in the Watertown area.

With Dan Heim, DNR unable to continue as our Rock River Headwaters Local Coordinator and other continuing costs more dollars are needed. Dan donated his time to the Rock River Coalition, which we greatly appreciated. Now it looks as though we will have to hire someone to take on this responsibility in the key northern portion of the basin.

If you know of a group or business that would be willing to donate to our cause, please send contact information to Suzanne Wade.

Soon, we will be sending out a letter to conservation and sporting groups asking for their support. If you are a member, please encourage them, at a minimum to become a RRC member, and when possible to send in an additional gift. Thank you.



Dissolved Oxygen

On the next two pages is an article by Phil Emmling. Phil works at the UW Water Chemistry lab and has been a member of the RRC Citizen Monitoring Steering Committee. Phil is always asking questions and then looking for the answer in the streams of southern Wisconsin. His article should help you understand more about your dissolved oxygen readings and why you can get such great swings in oxygen concentration over a 24 hour time period.

THE DAILY CYCLE OF DISSOLVED OXYGEN IN A TYPICAL WISCONSIN AGRICULTURAL STREAM

by Phil Emmling

Dissolved oxygen (DO) is an important indicator describing the general health of water bodies. The current DO guidelines in Wisconsin for the well being of warm and cold water fishes are a minimum of 5mg/L and 6mg/L respectively. We know that cold water can hold more DO than warmer water and that water holds less DO for a given temperature at high altitudes and lower barometric pressures. For example, a container of distilled water at sea level can be 100% saturated with DO, but the same container of distilled water in Madison, Wisconsin at 860 feet above sea level would be 97% saturated at the same temperature.

What does all of this information about the solubility of DO mean to the volunteer stream or lake monitor? When you record your measurement of DO on a datasheet, there is usually a space to enter the %DO Saturation. The %DO Saturation is rarely 97%. Either the preceding paragraph is all wet (pun intended) or something else is controlling the concentration of DO in addition to the solubility at a recorded temperature and atmospheric pressure.

The measured DO of streams is affected by several factors in addition to temperature and pressure. The factors controlling the concentration and % DO Saturation in streams are 1) air-water exchange, 2) photosynthesis, and 3) respiration. The process of reaeration or the air-water exchange depends mostly upon the temperature, pressure, and the stream depth, flow, and roughness of the bottom and water surface. Waterfalls, small plunge pools, and riffles are places where reaeration from the atmosphere can efficiently maintain the DO at near 100% saturation. If reaeration or the air-water exchange of oxygen were affected only by temperature, pressure, and stream channel features, the DO concentration would cycle with the daily temperature and the % DO Saturation would remain near 100%. Photosynthesis and respiration are in-stream biological processes that affect the concentration and % saturation of DO in streams.

The daily cycles of temperature, specific conductance (dissolved solids), concentration of DO, pH (acidity), and %DO Saturation in most of the streams in Southern Wisconsin would look very similar to the graphs provided in Figure 1 for 8 summer days at Black Earth Creek, Dane County. These data were recorded at 15 minute intervals using a probe that records and stores the data. The temperature curve follows the daily air-water temperature exchange to the base flow inputs along the creek. The specific conductivity remains relatively constant. However, the temperature rises and the specific conductivity is reduced briefly by the addition of rainwater (storm water runoff from the Village of Cross Plains) from 3 storm events.

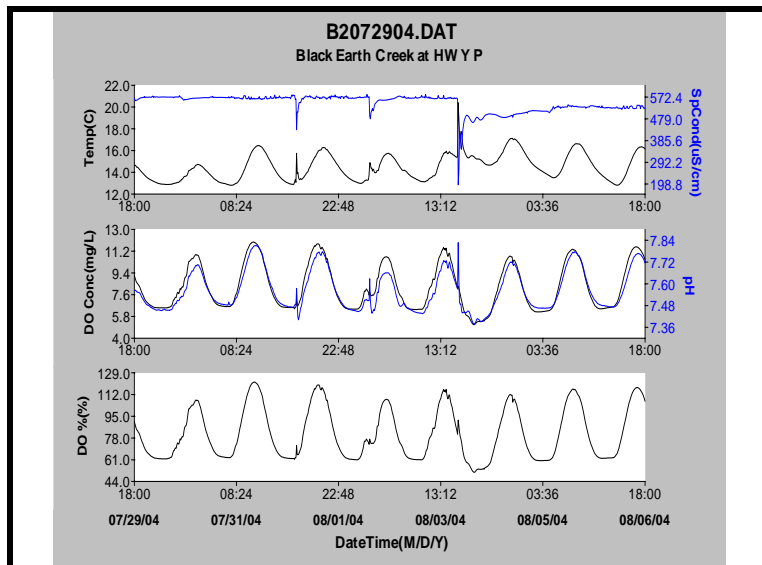


Table 1. Black Earth Creek at HWY P Statistical Report

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From 07/29/04 18:00 to 08/06/04 18:00

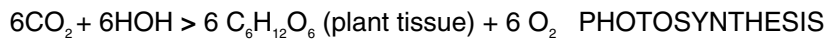
Number of samples: 769

Parameter	Min	Max	Mean	Std
Temp (C)	12.79	20.39	14.49	1.22
SpCond(uS/cm)	195.4	583.8	545.6	37.2
DO Conc (mg/L)	5.11	11.95	8.26	1.89
pH	7.38	7.83	7.56	0.11
DO %	51.2	121.6	81.4	20.1

Figure 1. Temperature (C), Specific Conductance (upper line), DO (mg/L), pH (lower line), and %DO Saturation in Black Earth Creek, Dane County, Wisconsin.

The DO concentration varies with the time of day, however the DO does not remain near 97% of saturation. The % DO Saturation varies from 51.2 to 121.6% with a mean value of 81.4% for 769 samples recorded at 15 minute intervals (Table. 1).

The large range of values for % DO Saturation is being produced through the biological reactions of photosynthesis and respiration. Collectively these two processes can be called the metabolism of the stream. Photosynthesis is the process that provides oxygen to our atmosphere (22% oxygen) and accounts for most of the DO greater than 97% saturation in the stream. The process of photosynthesis combines the elements carbon and oxygen from the gas carbon dioxide and dissolved carbonate plus the hydrogen ions from water and the energy of sunlight to form plant tissue and DO in the stream. **The DO does not leave the stream as quickly as photosynthesis produces the DO during daylight hours, therefore, the stream water becomes supersaturated (>97%) with DO. The respiration rate or consumption of oxygen in streams remains relatively constant during the daily cycle. At night photosynthesis stops producing oxygen and respiration becomes the dominant stream metabolic process.** The curves of DO concentration and % DO Saturation reach the highest value of the day at about 3pm and the lowest value of the day at about 6am.



pH measurements provide information about the acid and base characteristics of the stream. The pH scale (0-14) represents the concentration of acid (H+) and base (OH- and other chemicals) in a solution or stream. A pH of 7 is considered neutral. A pH less than 7 is acidic and a pH more than 7 is basic. The graph (Figure 1) shows that the values for pH follow the same daily trend as the values for DO. The pH rises during the day because the uptake of carbon dioxide gas or bicarbonate and hydrogen ions (H+) from water (H₂O or HOH or H⁺OH⁻) produces excess base (OH⁻) and raises the pH. The pH falls at night because carbon dioxide is produced during respiration and carbon dioxide combines quickly with water to form carbonic acid, bicarbonate, and carbonates that donate hydrogen ions (H⁺) into the water and lower the pH. The cycling of pH in the stream provides further evidence that biological activity is modifying the chemistry of the ground water supply to the creek.

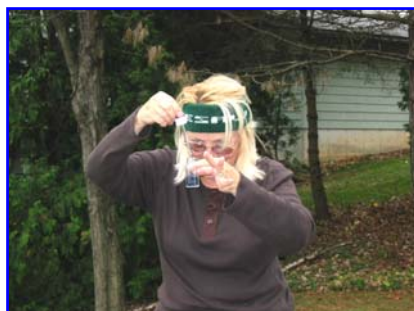
It is important for volunteer stream monitors to appreciate the daily cycle of DO in their streams. According to scientists (Wang et al., 2003; Wilcock, 1986) "Typically, a fluctuation of DO near saturation with daily variation due to temperature and metabolism, implies relatively healthy waters. By contrast, a marked depression of DO below saturation indicates the stream is receiving untreated waste water or an excessive amount of nutrients from non-point source pollution." It would be interesting for you to take DO and temperature readings during base flow at 6am and 3pm after 3 days of sunny, dry weather. It would be interesting for you to take DO and temperature readings at 6am and 3pm during a storm event (be careful of rising water) when the water is murky. Calculate the % DO Saturation and take note of the range of values (121.6-51.2= 70.4% in Table 1). You may find that the values for % DO Saturation on a cloudy day will vary less than the readings taken on a sunny day as illustrated by the reduced 1st and 4th peaks in Figure 1. What happens when it pours at 4am and the stream stays dark all night, murky all day, and dark again for another night? The hot, sunny months of June, July, and August should be the most critical for fish survival in the stream. How low can the concentration and % DO Saturation go in your stream? You will need to answer that question for yourself; I don't have the data.

An understanding and appreciation of these dynamic processes of stream metabolism and a close eye on the weather and runoff conditions should help you understand the daily and seasonal variation in your DO data provided that your chemicals are good and your technique is scientific.

REFERENCES

Wang H., M. Hondzo, C. Xu, V. Poole, and A. Spacie, Dissolved oxygen dynamics of streams draining an urbanized and an agricultural catchment. *Ecol. Model.* **160** (2003), pp. 145-161.

Wilcock, R.J., Agriculture runoff: a source of water pollution in New Zealand. *N.Z. Agric, Sci.* **20** (1986), pp. 98-103.



Janice Redford, Friends of Cam-Rock at the 'end point' of the DO test.
-photo by Pete Jopke

Don't Miss the 2005 Citizen Monitoring Confluence

A Gathering of Monitors

March 5, 2005

Jefferson County UW-Extension
864 Collins Rd
Jefferson WI 53549

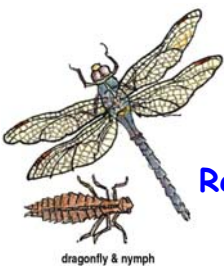
This is your opportunity to meet each other, learn about river and stream ecology and get your 2005 certification for selected protocols. This is the one time each year we bring all who monitor in the Rock River Basin together. We appreciate all of the time you already take to gather your data, but hope you add this date to your calendar and attend.



Jefferson County Board Supervisor Sheri Walz, right, and UW-Whitewater student Tania Kane test the waters of Bluff Creek in Walworth County.
-photo by Ellen Rulseh

- 8:30 – 9:00 Registration
- 9:00 – 9:15 Welcome plus WAV and Basin Update: E Coli, crayfish, wetland monitoring
Kris Stepenuck and Suzanne Wade
- 9:15 – 10:15 Keynote: Citizens can Make and Must Make a Difference
George Meyer, Executive Director Wisconsin Wildlife Federation
- 10:15 -10:45 Data use in Wisconsin: update on the proposed Wisconsin tiered approach to data use, monitor certification for data entry, plus help interpreting your data: Kris Stepenuck, Jim Petersen
- 10:45 - 11:00 Break
- 11:00 – 11:45 Breakout Session
1. Crayfish in Wisconsin (tentative)
 2. Aquatic plants and the stream ecosystem: Stan Nichols, UW-Extension emeritus
 3. Rock River fishery, the good news and the concerns: Don Bush, DNR
 4. Subdivisions and streams can they coexist: Pete Jopke, Dane County
- 11:45 – 12:15 Meet with your Local Coordinator and monitors from your area.
- 12: 15 – 1:00 Lunch and door prize drawing
- 1:00 – 3:00 Certification Round Robin (four stations)
- a. Dissolved Oxygen: Anne Miller and Janice Redford
 - b. Temperature and Turbidity: Jim Peterson and Ellen Rulseh
 - c. Biotic Index Jayne Jenks, Dan Rambo
 - d. Refill chemicals and equipment replacement: Suzanne

Bring your thermometer and dissolved oxygen kit so we can calibrate your thermometer and replace chemicals.



Registration materials will be sent in early February - please hold the date.

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Friends of Cam-Rock monitors on
Koshkonong Creek during the EPA visit.
-photo by Pete Jopke

Put it on your calendar: 2005 Confluence: A Gathering of Rock River Monitors
March 5, 2005

(See inside, page 7, for details!)

**The Rock River Coalition thanks the organizations, businesses and groups
who help make this program a success.**

Key sponsors: University of Wisconsin-Extension, Wisconsin Department of Natural Resources, and the Land Conservation Departments from Dane, Rock, and Waukesha counties and Riveredge Nature Center. Other groups involved with the monitoring effort include: Friends of Cam-Rock Park, Friends of Starkweather Creek, Friends of Pheasant Branch Creek, Friends of McCarthy Park and Friends of Lake Wingra

Key funders: Department of Natural Resources, Greater Milwaukee Foundation, WE Energies, the University of Wisconsin-Extension, Quirk Foundation and many gifts from organizations, businesses, and individuals.

Again thank you!

Want to view this newsletter in color? Go to <http://www.rockrivercoalition.org>.

If you are not a member of the Rock River Coalition, please consider joining. The only way we can provide good programming is with support from people like you. Membership dues are: \$25 for individuals and schools, \$35 for families, \$15 for seniors and students, \$50 for Affiliates (organizations, agencies and small businesses) and \$200 for corporations. Targeted donations for specific programs are also welcome (hint, hint, citizen monitoring). Go to www.rockrivercoalition.org/membership or call 920-674-7443 to receive a brochure in the mail.