



# MONITORING NEWS & Notes



The Missouri Water Quality Monitoring Newsletter

Spring 2008

## Water Quality Data Recently Reviewed

By Priscilla Stotts, Volunteer Monitoring Program Coordinator

The Missouri Department of Natural Resources receives a constant flow of requests for data from many different entities and for many different reasons. Recently, the department used volunteer data to help assess the state's waters.

Below is a summary of the assessment of the volunteer data by John Ford, Chief of the Water Monitoring and Assessment Unit, including Stream Team numbers, location and trained monitors. Visit the Stream Team Web site at [www.mostreamteam.org/aims\\_wqmselect/mappingintro.htm](http://www.mostreamteam.org/aims_wqmselect/mappingintro.htm) to look up the sites by location number.

The department appreciates the years of care and dedication to monitoring that volunteers have provided to the program. If a stream is not listed below, it is a good sign that it is holding its own. If you believe that your stream is in trouble, make sure that you monitor chemical parameters four times a year and macroinvertebrates two times a year. If you have not attended a Level 2 Workshop, the department recommends that you do so next winter.

The department's Water Protection Program recently reviewed invertebrate and water chemistry data collected by Level 2, 3 and 4 volunteers between fall 2004 and spring 2007. All monitoring sites that had at least three samples for invertebrates or three samples for chemicals were included in the review. This resulted in the review of 36 streams for invertebrate data and 106 streams for water chemistry. Additional streams had only data from two sampling dates and would have qualified for review if the volunteers had provided one additional set of data. The department recommends invertebrate sampling at least twice per year and chemical sampling quarterly at each site.

As a result of this review, the department will schedule follow up water quality monitoring on six classified streams with low invertebrate scores.

These streams include:

- Clear Creek in Lawrence County at location 5207. This location is monitored by Phillip Witt of Stream Team 2867.
- Hominy Creek in Columbia at locations 1648 and 4825. These sites are monitored by Charles Laun, Scott Hamilton and Celeste Mazzacano of Stream Teams 523 and 2660.
- Kiefer Creek in St. Louis at locations 2157, 2305, 2308, 3541. These sites are monitored by Jacki Janovsky and Delwin Johnson of Stream Teams 1439 and 1549.
- Silver Fork in Boone County at locations 3057, 182, 5154, 5155, 5156. These sites are monitored by Carl Wingo, Jeff Carr, Betsy Blake and Betsy O'Day of Stream Teams 677, 1402, 1536 and 2645.
- Sugar Creek in Harrison County at location 937. This site is monitored by Charles Jennings of Stream Team 893.
- West Fork Niangua River at Marshfield at location 2257 and 5356. These sites are monitored by Kim Fields of Stream Team 1370.



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The department will also schedule stream classification reviews for four streams that are currently unclassified in state water quality standards but showed relatively high invertebrate monitoring scores. These streams include:

- Little Femme Osage Creek in St. Charles County monitored by Kathleen Thiele of Stream Teams 1979 and 1883.
- An unclassified portion of Mattese Creek in St. Louis monitored by Mike Lahm of Stream Team 1316.
- A tributary of the Osage Fork of the Gasconade River near Camp Arrowhead monitored by Kim Fields of Stream Team 1370.
- White Aloe Branch in Parkville monitored by Dave McCoy and Jim Reed of Stream Team 3552.

The department will also schedule follow up monitoring by department staff on three other streams based on chemical monitoring. These streams include:

- Brush Creek in Pacific, Saline Creek in Jefferson County and South River in Marion County.

### Review of Volunteer Water Chemistry Data Fall 2004- Spring 2007

Data Review: Chloride	Class	No. of Samples	No. Exceeding Standard	Comments
Elmwood Br. (Sullivan Co.)	U		0	some samples showed elevated levels
River des Peres (St. Louis)	U		0	some samples showed elevated levels
Trib. River des Peres (St. Louis)	U		0	some samples showed elevated levels
Deer Cr. (St. Louis)	U		0	some samples showed elevated levels
Trib to Boggs Cr. (Jefferson City)	U		0	some samples showed elevated levels
S. Fk. Grindstone Cr. (Columib)	U		0	some samples showed elevated levels

Data Review: Dissolved Oxygen	Class	No. of Samples	No. Exceeding Standard	Comments
Gans Cr. (Columbia)		15	1	
L. Whitewater R. (Bollinger Co.)		9	1	
Sugar Cr. (Harrison Co.)	C	8	2	follow up monitoring by DNR needed
Brush Cr. (Pacific)	C	60	9	follow up monitoring by DNR needed
Logan Cr. (Lohman)	C	13	1	
Grand R. (Daviess Co.)	P	15	1	
Spring R. (Jasper Co.)	P	101	3	
N. Blackbird Cr. (Putnam Co.)	C	40	2	
Swan Cr. (Taney Co.)	P	109	3	
Rock Cr. (Jefferson Co.)	P	36	1	
L. Bonne Femme Cr. (Boone Co.)	C	10	1	
Saline Cr. (Jefferson Co.)	C	9	1	

Data Review: Ammonia-N	Class	No. of Samples	No. Exceeding 1 mg/L	Comments
Locust Cr. (Sullivan Co.)	P	28	1	
Saline Cr. (Jefferson Co.)	C	8	1	follow up monitoring by DNR needed
South R. (Marion Co.)	C	7	1	follow up monitoring by DNR needed
Brush Cr. (Pacific)	C	53	1	
Dardenne Cr. (St. Charles Co.)		75	3	
N. Blackbird Cr. (Putnam Co.)	C	35	1	
Grand R. (Daviess Co.)	P	13	1	

Data Review: Nitrate-N	Class	No. of Samples	No. Exceeding 10 mg/L	Comments
James R. (Springfield)	P	116	1	Stream not a public drinking water supply source
Wilson's Cr. (Springfield)	P	51	3	Stream not a public drinking water supply source
E. Locust Cr. (Milan)	C	20	11	Stream not a public drinking water supply source
Elmwood Br. (Premium Std. Foods)	U	14	12	Stream not a public drinking water supply source
W. Fk. Niangua R. (Marshfield)	P	8	1	Stream not a public drinking water supply source
Spring R. (Jasper Co.)	P	96	1	Stream not a public drinking water supply source

Data Review: pH	Class	No. of Samples	No. Less Than 6.5	Comments
Maries R. (Maries Co.)	P	5	1	
Sugar Cr. (Harrison Co.)	C	7	1	
Swan Cr. (Taney Co.)	P	111	6	
James R. (Springfield)	P	127	1	
Wilson's Cr. (Springfield)	P	60	2	
Finley Cr. (Christian Co.)	P	170	6	
Stinson Cr. (Fulton)	C	8	3	all 3 low pHs during early March
Pearson Cr.	P	4	1	
W. Fk. Niangua R. (Marshfield)	C	8	1	
L. Blue R. (Jackson Co.)	P	30	2	

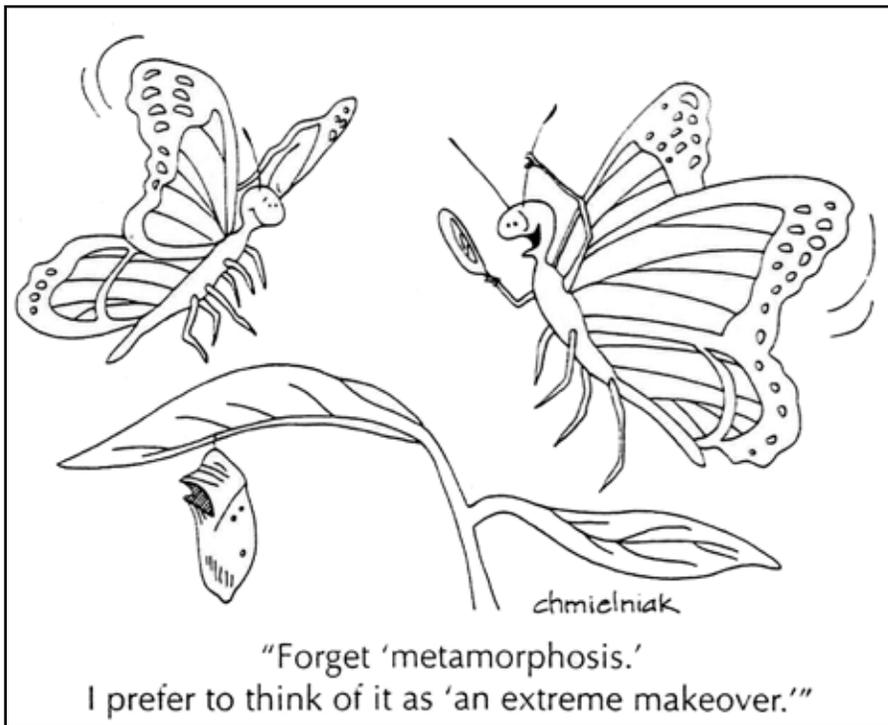
## Monitoring Tips

Measure stream discharge and do a visual survey after you have completed the macroinvertebrate survey. This way there will be no concerns about disturbing the critters or stirring up the stream bottom.

Nephelometric Turbidity Units or NTUs is a measurement for turbidity readings. It measures the amount of light scattered by suspended material in the water sample.

Volunteers collecting Chloride readings may keep the vial's water in the refrigerator up to two weeks before testing. Chloride is an element and does not break down.

If you have a monitoring tip to share, please send it to [priscilla.stotts@dnr.mo.gov](mailto:priscilla.stotts@dnr.mo.gov) to be added in the next issue of *Monitoring News and Notes*.



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## A Stream Team You Should Know



**So Happy Together...**Stream Team 967 has been monitoring the North Fork of the White River in Douglas County for over 10 years. Seen here standing in their stream are (left to right) Bob Kennedy, Clare Shannon, Clark Shannon, Janet Chapin, Elitta January, Joyce Kennedy and Sandy Chapin.

# Pharmaceuticals and Personal Care Products in Your Drinking Water

by Susan Higgins

## What's the issue?

Pharmaceuticals and personal care products disposal is a rapidly emerging concern. These products are being produced and used in increasing volumes every year. Any product consumed or applied by an individual for personal health or cosmetic reasons can be defined as a pharmaceutical or personal care product. They include prescription and non-prescription drugs, cleansing agents, fragrances, cosmetics, sunscreen agents, contact lens solutions, nutritional supplements, skin care products, and many others. All of these products, whether applied externally or ingested, have the potential to be released into sewage systems and possibly the environment. When ingested, not all medications are absorbed by the body. In fact, as much as 90 percent of a medication may pass through the body without being absorbed. Pharmaceuticals that have been identified in water bodies include birth control hormones, antibiotics, antidepressants, tranquilizers, caffeine and chemotherapy drugs.

## What are the concerns?

It is believed that even in small quantities, pharmaceuticals and personal care products, while having little effect on humans, can be harmful to the environment and wildlife. Sewage treatment plants and septic systems are not designed to treat all the substances found in medications and personal care products. When flushed down the toilet or washed down the sink, these chemicals can impact the environment by passing through and entering rivers, lakes and groundwater.

## What Can I Do?

Dispose of unwanted or expired medication or personal care products safely.

- Do not flush unused or expired medication or personal care products down sinks or toilets.
- Check to see if your community has a household chemical waste collection program where you can take these items for proper disposal.
- Ask your doctor or pharmacy if they have a take-back program for the return and disposal of unwanted expired medicines. If they do not have such a program, encourage them to start one.

If you must dispose of the waste in household trash:

- Keep products in their original bottle, but remove all identification labels. Pharmaceutical container caps are typically watertight and child proof.

- Add a small amount of water to a solid drug or some absorbent material such as kitty litter, sawdust or flour, to liquid drugs before recapping to discourage any unintended use of the drug.
- Double seal the bottle in another container or heavy bag to prevent easy identification of the drug container or to prevent a glass container from breaking.

## What Else Can I Do to Help?

Only purchase what you need. Large, economy packages are rarely a good deal if the contents expire before you can use them. Read the labels carefully. Do not buy products that contain unneeded ingredients such as antibiotics. For instance, soap by its very nature is antimicrobial. You do not need soap with added antibiotics. Purchase an inexpensive activated carbon filter for your faucets. Activated carbon filtration is thought to be one of the most effective methods of removing pharmaceuticals from drinking water. However, it is essential that you follow the manufacturer's recommended schedule for changing the filter. Finally, if you are interested in knowing what potentially harmful chemicals may be in the products you use, visit the Skin Deep Cosmetic Safety Database at [www.cosmeticsdatabase.com](http://www.cosmeticsdatabase.com).



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# Damselfly Gills

There are obvious gills on eight different insect species that are water quality indicators but none are as interesting as the Damselfly gills. Damselfly larvae have tracheal gills that absorb dissolved oxygen when there is a natural flow of water over them.

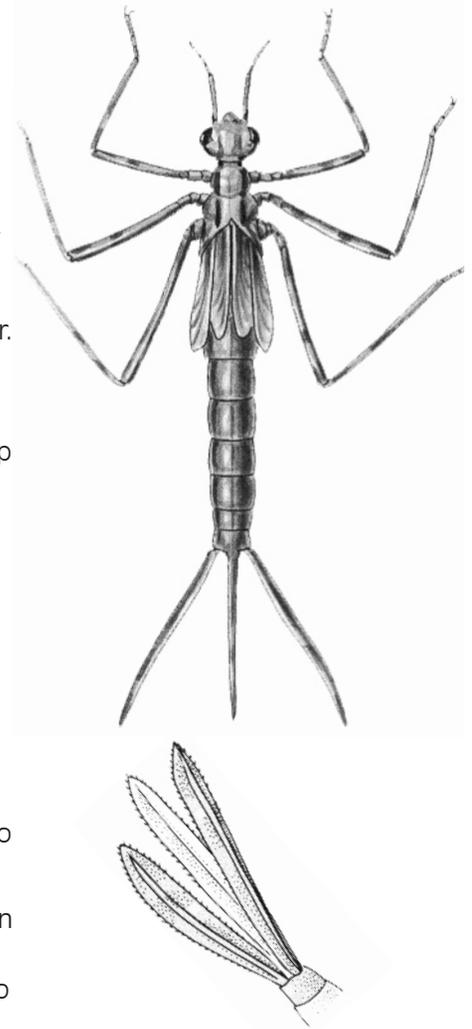
Since it is one of the critters that volunteers can identify relatively early in training, many volunteers may enjoy finding them more than other tiny critters. Young students are fascinated by their flying skill. And just like adults, kids find it hard to believe that the critter can emerge into a brightly colored darting mosquito catcher.

While Darlene Haun, a St. Louis Region Stream Team Assistant, visited with Nancy McClintock's fourth grade class, a student, Akshay, wanted to know when the lungs develop for the nymphs that start out as aquatic animals with gills and then develop into flying insects.

Have you every wondered about this transition? Paul Calvert, Streams Services Program Supervisor for the Missouri Department of Conservation, answered this very technical question.

"All insects use a tracheal system to breathe, rather than lungs. Oxygen is transported through tubes throughout the body and transferred to the cells through diffusion. The tracheal system can be either an open system or a closed system depending on the insect. Most terrestrial insects have open tracheal systems, which include tracheal tubes and openings on the surface of the insect's body, known as spiracles. Aquatic insects that have closed tracheal systems have no functioning spiracles. In closed systems, oxygen is absorbed through the cuticle.

Tracheal gills are present in many aquatic insects to assist in this diffusion of oxygen into the insect while they are in the aquatic stage. Gills Have thin walls through which diffusion into a tracheal system occurs easily. Upon emerging, the gills are no longer needed because there is sufficient oxygen available for the insect to absorb through its cuticle. If the insect pupates in the aquatic environment, the gills are not needed because the pupae have a self-contained oxygen supply that is sufficient until emergence occurs.



Reprinted with permission of *A Guide to Common Freshwater Invertebrates of North America*.



## The New Volunteer Water Quality Monitoring Coordinator

Hi, My name is Susan (Suzy) Higgins and I am the new Volunteer Water Quality Monitoring Coordinator working at the Department of Natural Resources with Priscilla Stotts. I am really delighted to be here and can't wait to jump right in and "get my feet wet."

I grew up in northwest Arkansas, so the Ozarks feel like home to me. During my husband's military career we spent several years south of Ft. Leonard Wood in the Mark Twain National Forest area around Evening Shade, Plato and Houston, so I am especially eager to visit the water quality monitors in that area.

I earned a Master of Science degree in Animal Science/Veterinary Science at the University of Arkansas. I like to say that now I have traded "feet and fur for fins and gills." Prior to this, I spent seven years at the Secretary of State's Office serving people with disabilities. Now I am turning my attention and skills to Missouri streams and loving every minute of it.

One of my goals is to travel a lot in the future so that I can meet all of you who monitor water quality. I am sure you will bump into me sooner or later if you attend our workshops. In the meantime, feel free to call me at (573) 526-1002 or e-mail me at [susan.higgins@dnr.mo.gov](mailto:susan.higgins@dnr.mo.gov) if there is any way I can help you.



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*Monitoring News and Notes*  
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