

# Riffles & Pools

Office of Water Quality [www.idem.IN.gov](http://www.idem.IN.gov)



Sugar Creek (seen here in Montgomery County) is a lovely canoe venue. Home to some of the world's best crinoid fossils, as well as relic boreal forest trees in deep sandstone ravines, it is a great way to beat the summer heat. If memory serves correctly, it offers great autumn and early winter canoeing as well; whether using a commercial livery or your own craft.

## Greetings Riverwatchers!

2019 has proven to be a busy but good summer so far. We hope it has been just as enjoyable and/or productive for all of you as well.

Nineteen of our trained and enthusiastic instructors have taught 16 workshops in 11 counties to date. The numbers that are most telling, however, are that 131 participants from 33 different counties, one other state, and all walks of life have attended these trainings. These people are now better informed about a) watershed connections, b) impacts we as individuals, families, and communities can have on water quality both locally and downstream, and c) how to get involved in water quality monitoring and reporting in their area.

In addition to regular workshops, staff assisted in preparation of numerous bug collections; not only for HRW instructors, but for IDEM environmental education staff and teachers, as well as zoo personnel. Staff also got busy figuring out how to adjust workshop materials to teach a large group of teenagers our concepts. Check pages 7-9 to see just how much 36 teens can teach this middle-aged instructor!

– Carol Newhouse, Hoosier Riverwatch Coordinator

### Autumn 2019

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### **MARK YOUR CALENDARS!**

#### **Upcoming Basic Workshops**

Sept. 6 – Bristol

Oct. 7 – Winona Lake

Oct. 11 – Pine Village

#### **Advanced E. coli Workshop**

Oct. 12 – Zionsville

Hoosier  
Riverwatch is  
administered by



## Watershed Success Stories: Big Walnut Creek

The 7th installment in [stories of watershed success](#) efforts collected by IDEM staff and grant recipients over the years:

Big Walnut Creek is in a predominately agricultural area in west-central Indiana; namely Hendricks and Boone counties. It is formed by the confluence of the East and West Forks of Big Walnut Creek and flows into Putnam County where it joins other streams before joining the Eel River. IDEM listed portions of the creek as impaired in 1998 after testing revealed bacteria contamination from livestock, leaking septic systems, and wildlife were impacting the creek. In 2004, more monitoring was conducted, which led to the listing of additional portions of the creek for bacteria contamination. Although several point sources are located in these watersheds (three wastewater treatment plants and four confined feeding operations), IDEM records showed that none of these facilities had a history of violations, bolstering the assertion that nonpoint sources were causing the *E. coli* impairments.



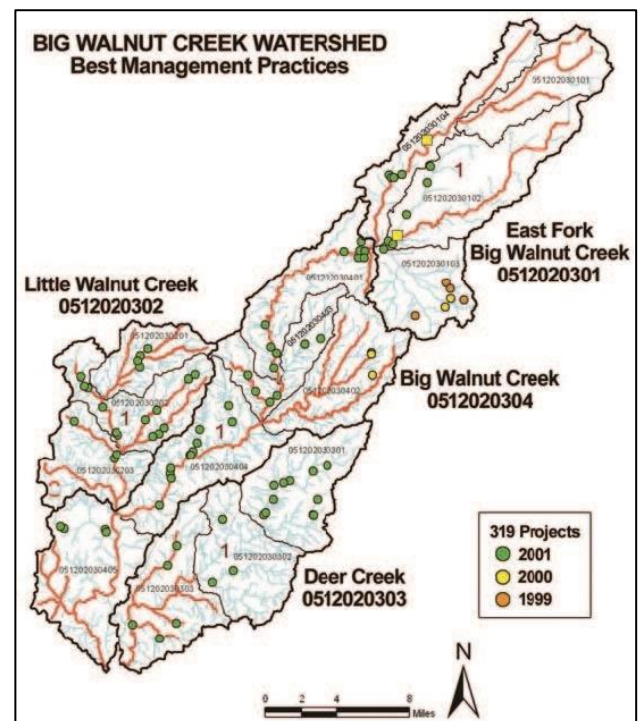
Big Walnut Creek in Putnam County.

Photo courtesy of Putnam County Soil and Water Conservation District

Between 1999 and 2007, IDEM used \$163,000 in [Sec. 319 grants](#) to support watershed restoration through outreach and education, coordination with other partners, and targeted best management practices (see map to the right) that focused on manure management, conservation buffers, and other initiatives.

In addition, over \$928,000 from other funding sources were spent by project partners in either the Big Walnut Creek or the greater Eel Creek watersheds during this timeframe. Partners included the Putnam County Soil and Water Conservation District, Natural Resources Conservation Service regional and Sycamore Trails Resource Conservation & Development staff, DePauw University, local sportsmen, and community groups.

In 2007, IDEM staff stepped back into the watershed to assess if efforts toward developing a total maximum daily load was warranted for *E. coli*. Results from their surveys indicated that *E. coli* levels had dropped below state water quality standards enough to remove all six segments of Big Walnut Creek from Indiana's impaired waterbody list. The table below shows before and after sampling results.



Locations of best management practices in the Big Walnut Creek watershed (dot colors indicate the year restoration efforts began).

Stream Name	Water Quality Standard	2001 Average Geometric Mean	2007 Average Geometric Mean	Percent Reduction
East Fork Big Walnut Creek	< 125 MPN	1016.1 CFU	34.45 MPN	96.6%
West Fork Big Walnut Creek	< 125 MPN	152.3 CFU	27.65 MPN	81.8%

Bacteria monitoring data (i.e., most probable number [MPN] and colony forming units [CFUs])\* collected for Big Walnut Creek in 2001 and 2007.

\*CFUs and MPN units are essentially equivalent for comparison purposes.



## Unplug to Recharge!

If humans came with an instruction manual, I am certain it would contain this important warning for the proper care of your biological model: needs to be unplugged in order to be recharged.

Such inspirational people as John Muir and Henry David Thoreau knew the importance of disengaging from the constructed world in order to reconnect with the natural one. Doing so keeps us actively in touch with moments and things that are awe-inspiring and breathtakingly beautiful. This is not only good for our psyche, it can be had for free since it is as close as your own backyard.

A popular [Nature Connection Pyramid](#) (created by Darrin L. Haggard for the Nature Kids Institute) gives these guidelines for raising children well:



Brendan the adventurer explores a local creek.  
Photo by Anna Michaels

- **Daily** – Make time for unstructured outdoor play; include healthy doses of climbable trees, toe tingling grass, and dirt!
- **Weekly** – Plan a nature outing that focuses on exploration and discovery; work in a garden, watch birds, identify plants, explore water, collect rocks, etc.
- **Monthly** – Visit a regional, state, or national park. The illustrator mentions that the #1 reason parks close is because of under-utilization by the public. That is sad.
- **Yearly** – Go wild! Visit a place that is far away from buildings, pavement, city sounds, and human influences.

Other studies have shown that these activities are not only good for humankind, they are vital for the environment. For the ones who do (or do not!) play outside and connect with the natural environment today are the same ones who will be making important decisions regarding the use and protection of those precious resources tomorrow.



Lilly and friend discuss the finer points of fishing.

Photo by Myra McShane



Gwen, Gemma, and Gavin enjoy a river outing with their parents in summer 2019.

Photo by Kristen Arnold

## Signs of the Times

IDEM emergency response staff recently responded to a call about abandoned 5-gallon buckets containing unknown substances left roadside in Vigo County. Ironically, they had been dumped (as in out of the vehicle, not out of their containers) within clear view of a “No Dumping” sign (see right).

A Facebook post from earlier this year (photo below by Wabash River Defenders) shows household demolition material (complete with toilet) dumped below a sign clearly stating that there is a \$10,000 fine for dumping trash. It also informs citizens that the local solid waste management district now accepts old tires for free, avoiding the costly \$6 per tire fee. Good news, right?



*Photo used by permission of Wabash River Defenders.*

Well, the sign also asks citizens to help keep the river clean. So what motivates people to illegally dump trash? Are they trying to be funny? Or did they not read, or perhaps misread, the sign? The dumping fee for a truckload cannot be so exorbitant that they cannot afford it, seeing that they can afford a bathroom renovation. It is perplexing, if not vexing.

Who knows why folks do this? Perhaps it is a lack of information or rather a matter of misinformation, as is pictured to the lower right; information that leads us in the wrong direction, intentional or not. I have at times seen an “S” curve sign posted on roads when it should clearly have been an “Z” instead. Thank goodness for alert drivers! I passed a

Hancock County intersection recently with the street name hung upside down above the road, making 600 look like 009. In a Henry County town, I recall once seeing Washington Street posted as “Wahsington,” but only on one of its street corners. The rest were spelled correctly.

There might still be good folks in Indiana who refer to Ouabache State Park as “Ka-ba-chee.” When naming the park, the Indiana Dept. of Natural Resources chose the French spelling “Ouabache” for the Indian name “Wabash.” Now, “O-ba-chee” I would understand if you did not know French, but “Ka-ba-chee”? It turns out the misunderstanding started when misprinted highway signs were posted along our roadways when the park was established. Someone had changed the “O” to a “Q.” Either way, I recall seeing the name misprinted on maps in the past. Some speculate a bug was on the artwork and the “O” was misread for a “Q,” with no one the wiser until after the signs were installed and maps printed—an honest mistake.



*Photo as seen on Facebook, with original source at me.me.*



*Photo by Carol Newhouse*

Not too long ago I was driving to a morning appointment. Traffic was heavy in Indianapolis, per usual, and I was running late. Still I thought to myself, “Why do I get so frustrated? Where did my happiness go some mornings?” As I rounded the next dogleg in the road, I saw the sign shown to the left for the very first time.

Now, this sign was installed by someone years ago and I have passed by it many times without ever seeing it—until the day I questioned my own happiness, that is, and received such a timely and apt reply. Now I never fail to notice the sign and enjoy the reminder each time I do. Thank you to whoever had the foresight to place this sign here!

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## Signs of the Times (cont.)

Our world contains good signs and bad signs ... too many signs or not enough signs ... signs we heed and those we do not.

Still, to those who work hard to communicate well with the rest of us in this world—and especially to those who clean up after themselves and even after others, who reach out to brighten other people's day by giving inspiration—I say a heartfelt, "Thank you!" (as illustrated well here by some goofy, yet equally sincere IDEM staff saying goodbye to a departing staff member.)



**Volunteers** are not paid – not because they are worthless, but because **they are priceless!**

— Sherry Anderson

## Hitting the Water in 2019



Indiana volunteer lake monitors sampling Lake Galbraith and Flat Lake in Marshall County.

*Photo by Adam Thada*



Nancy Brown orients volunteers for a sampling blitz.

*Photo courtesy of The Watershed Foundation*



One of three locations where supplies are ready for teams of volunteers.

*Photo courtesy of The Watershed Foundation*



Volunteer teams return to the office to set up *E. coli* samples from their assigned stream sites during a 2019 sampling blitz.

*Photo courtesy of The Watershed Foundation*



## Summer Workshops in 2019



Pictured at the June advanced workshop in Greenwood are (L-R): Mike Weaver, Debbie Palmer, Carol Newhouse, Meghan Moss, and Randy Weathers.

*Photo by Mike Weaver*



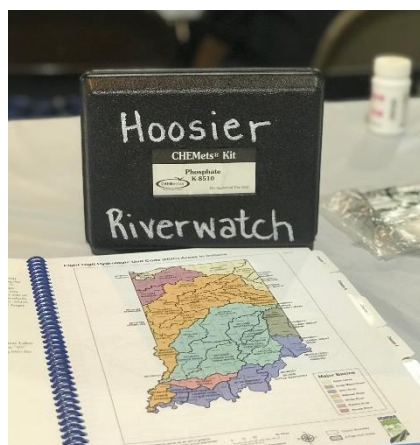
Trained HRW volunteer monitors learn to read and set up *E. coli* plates in an advanced workshop in Greenwood.

*Photo by Mike Weaver*



Learning to take turbidity readings in Greenwood.

*Photo by Mike Weaver*



Classroom session prepares citizens to hit the creeks running. The training manual is a most useful tool, as are test kits made available around the state.

*Photo by Mike Weaver*



Participants in Bloomington learn to identify macroinvertebrates on creek rocks with the aid of instructor Sandy Belth.

*Photo by Cathy Meyer*



Greenwood workshop participants find and identify macroinvertebrates washed off of their nets into white dish pans.



Greenwood participants like putting their learning into practice. Getting out in the creek is always the highlight of a workshop.

*Photo by Deanna Garner*



## 2019 Summer Camp Classes in Indianapolis

Retired chemist and Indianapolis resident Aster Bekele has long been engaged in working with inner city youth. She teaches them how to not only grow their own food, but to cook and eat it, or to market and sell it. Over several years, her property on the near northeast side of Indianapolis known as the [Felege Hiywot Center](#) and farm has hosted summer camps. These continue to grow and evolve, bringing ever more diverse exposure to science, technology, engineering and math (STEM) programs to camp participants. In Ethiopia, Felege Hiywot (pronounced Feh-LEH-geh HEY-what) means “looking for direction to life.”

In 2019 your HRW coordinator led 36 camp participants through three 2-hour sessions. The first (pictured on this page) detailed properties of water, the water cycle, watersheds, and pollution types and sources. The second focused on chemical testing and the third attempted to introduce biological monitoring concepts.

I tried some hands-on techniques found on the internet to demonstrate the nature of water molecules. Students paired up to add and count drops of water, vinegar, and olive oil to pennies. Although dirt on some pennies and table level beneath others affected outcome, overall the pennies held three times as many water droplets as they did vinegar, and half again as many as the oil.

Then students attempted to float a paperclip on water; which none could accomplish ... until they saw that it could be done via floating the clip on a piece of tissue (or thermal receipt paper) first! Thus they learned the adhesive nature of water molecules, one of several factors that make water uniquely suited to supporting life here on earth.

As interesting as this may have been, the Watershed Tarp Activity used by many HRW instructors was the icing on the cake. Divided into three teams of 12, they constructed watersheds; populated them with people, animals, trees, and machines; and added food grade pollutants. Armed with spray bottles they then made it rain. With the rainfall came light bulbs and understanding of how everything in water and watersheds connect!



This activity is always an eye-opener. But still I was pleasantly reminded that, for young people especially, movement and talking does not always preclude learning. Rather, those who are most physically and verbally animated during lessons are often the ones who can answer questions afterwards.

In addition, I was surprised by the worldly mindedness of others who could fire questions at me with as much deep insight as I hoped to impart. I think we are in good hands with such bright minds coming up in the world.

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## 2019 Summer Camp Classes in Indianapolis (cont.)

On day two (the second of three sessions at Felege Hiywot's summer camp) participants were introduced to the chemistry testing done by volunteer stream monitors trained in the Hoosier Riverwatch program.

They divided up into pairs and teams again to learn and practice taking temperature readings of various water samples, as well as use multiple methods to sample turbidity. They learned to properly handle testing supplies and dispose of waste material, while I learned to give clear and concise directions. They took pH readings on a diversity of samples (thanks to my ever handy vinegar and baking soda solutions).

The students then learned about nutrient pollution and took nitrate ( $\text{NO}_3$ ) and nitrite ( $\text{NO}_2$ ) readings using test strips. A discussion followed regarding the differences between using pH and  $\text{NO}_3$ - $\text{NO}_2$  strips; with thoughts about the amount of water needed to get accurate readings from the reagents on the two sets of pads on respective strips. Participants got a kick out of the samples and dilutions I supplied—taken fresh from the fish aquarium in the office that morning—and were interested that I gave them “P” (as in fish waste) in order to test and get color development for “N” (nitrogen).

With the HRW CHEMetrics testing for dissolved oxygen (DO) and ortho-phosphates, students learned to handle glass ampoules and chemicals safely. The breaking of the ampoule proves tough for many to learn at first. I enjoyed how quickly team members who picked up on it turned around to teach others the technique. I have not often seen this when teaching adult workshops. But how much better we all learn something by teaching it!

Once we had DO readings to add to our earlier temperature readings, students learned to use the nomogram (covered in the HRW training manual) to determine percent saturation of dissolved oxygen for their sample. Due to various locations of team sample buckets in the shade versus sun, each team got various readings for temp and DO (thus % saturation) and a brief discussion ensued about the usefulness of this data for assessment and management decisions regarding water resources.



Students quickly gloved and goggled up to take phosphate readings and were curious about the variety of blue colors they received compared to other team members' results; especially those sampling the rainwater collected on-site for watering garden plots. The samples made for them from just a few grains of trisodium phosphate (TSP) from a local paint store produced ample color and—when diluted—allowed the use of both the high and low color comparators in

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## 2019 Summer Camp Classes in Indianapolis (cont.)



their kits (1-10 ppm and 0.0-0.9 ppm, respectively). They learned how phosphates and other nutrients quickly cause undesirable conditions due to plant overgrowth and subsequent die-offs. They learned about Indiana's statewide ban on phosphates in household detergents, due to the abundance of septic tanks causing overfed lakes in the middle of the last century and how those lakes have improved since.

They learned that their immediate water source (collected rainwater) for watering garden plots was devoid of phosphates and produced no color whatsoever; and that the lack of color when monitoring streams was not an undesirable thing. They learned they could set up samples or blanks to test the effectiveness of their supplies should they question them when no color developed from an environmental sample. It was a successful session.

The third and final camp session (for me, that is) had to do with biological monitoring of streams. The Riverwatch program has good identification guides and nice bug collections. Still, no amount of pictures or jarred bugs will pack as much "Wow!" as getting your feet wet in a stream to actually collect and observe live critters. Sadly, I could not outfit the class with boots or waders. And, while I had plenty of nets available for stream work, extra field hands would be needed to get this large of a group effectively and satisfactorily working in a stream. Since a local park does offer stream access within walking distance of Felege Hiywot, proper timing and additional planning could provide a better experience with this session in the future!

Otherwise, borrowing some of the gaming equipment IDEM uses to engage the public at the Indiana State Fair or playing the Macroinvertebrate Mayhem game I have seen taught by DNR environmental education staff could also make a biology lesson more engaging, especially for competitive teams. Those who will really grasp the concepts will do so in any setting. And such an activity might do more for engaging a large group of energetic youth into learning how pollutants effect aquatic macro-invertebrates than paper and pen can. Imagine that. Even a middle-aged biologist-turned-instructor like me can learn new tricks! Thanks, everyone, for three great days!

*All photos in the above article by Aster Bekele*

## A Study in Blue



Close-up of great blue heron feathers by Karen Becraft.



On my way to a meeting at IDEM offices downtown. The Indiana Historical Society takes center stage with the water canal in the foreground.



Part of the Pathway to Water Quality display at the Indiana State Fair.



## IDEM Health and Safety Training 2019



IDEM Office of Water Quality field staff learned that tourniquets are once again a part of first aid training when 'stopping the bleed' is of primary importance.



Summer interns Payton Kittaka and Cameron Yeakle practice putting approved tourniquet devices on each other.



Staff member Ross Carlson demonstrates the most effective way to dump water from flooded waders.



Staff member Ali Meils demonstrates what to look for with regard to hazardous plants.



Staff members Ali Meils and Kassie Groszewski discuss plant particulars.



Staff members also learned about survival kits, using a compass, and (later in the day) reading and dealing with loose dogs.



Kind of a fun way to find and learn your lessons!



Staff member Maddie Genco adds insights to the hazardous insect lessons.



Yep, definitely think this is a fun way to find and learn your lessons.



## Mark Your Calendars

### 2019 Training Workshop Schedule

- Friday, September 6**     **Bristol, IN** – Baldwin Schoolhouse, Bonneyville Mill County Park (9 AM – 4 PM). Instructor will be Krista Daniels. Contact Krista at 574-875-7422 or [kdaniels@elkhartcounty.com](mailto:kdaniels@elkhartcounty.com) to register *by September 3*. You may also register online at [www.elkhartcountyparks.org/events/?y=2019&m=09](http://www.elkhartcountyparks.org/events/?y=2019&m=09).
- Monday, October 7**     **Winona Lake, IN** – Jefferson Elementary School (8:30 AM – 4:30 PM). Intended audience comprised of STEM teachers from Warsaw area schools. Workshop is expected to be full with 25 teachers planning to attend so far. Instructor will be Darci Zolman (574-267-7445, ext. 5374).
- Friday, October 11**     **Pine Village, IN** – Pine Creek Camp, 2218 E. 700 N. (9 AM – 5 PM). Instructor will be Seth Harden. Contact Seth at [seth.harden@tnc.org](mailto:seth.harden@tnc.org) or 765-414-4861 to register.

### 2019 Advanced *E. coli* Workshop

Advanced workshops are typically half-day in length. Participants must have completed a full-day, basic training workshop prior to signing up for an advanced workshop.

- Saturday, Oct. 12**     **Zionsville, IN** – SullivanMunce Cultural Center (9 AM – Noon). Instructor will be John Ulmer. Contact John at [hoosierwatersheds@gmail.com](mailto:hoosierwatersheds@gmail.com) or 317-769-3500 to register. Workshop will include background and hands-on practice with *E. coli* sampling, as well as an introduction to the Hoosier Riverwatch online database.

## Caring for People and Pets

Keep informed about how and where IDEM scientists actively monitor and report on [blue-green algae](#) blooms before you and your pets go on recreational outings.



Linus retrieves a throwing (water training) dummy. Many Hoosiers (IDEM employees included) enjoy life with our dogs, sometimes working, sometimes playing, always hopeful for the next good time with our animal companions.

*Photo by Leanne Whitesell*

Learn [how to identify harmful algal blooms](#) and report a bloom or associated human or animal illness.

To find out if your pond or lake has blue-green algae, hire a pond and lake management company.

Keep waters healthy for fish, animals, and humans. Turn [unwanted prescription medicines](#) and [household hazardous wastes](#) over to the professionals.



Fun day at Chain O'Lakes State Park with Terrence Michael, Linus, and friends.

*Photo courtesy of Leanne Whitesell*

If headed to Lake Michigan, consult the [Beach Monitoring and Notification Program](#) for updates on beach water quality along our precious 40 miles of shoreline. To prevent pollution in any of our large waterbodies, use [pumpout stations](#) at marinas.



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**Hoosier Riverwatch Database:**  
[www.hoosierriverwatch.com](http://www.hoosierriverwatch.com)



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IDEM Office of Water Quality, Watershed Assessment and Planning Branch staff received spot bonus awards in 2019 for their efforts to remove the Beneficial Use impairment for phytoplankton and zooplankton populations on the Grand Calumet River. Pictured here (left to right) are: Todd Davis, Joel Armstrong, Paul McMurray, Jim Stahl, Kevin Gaston, Tim Fields, and Michelle Ruan. A warm congrats to staff. A walloping hoorah for all whose efforts have led to the cleanup of this area of concern.

## ***IDEM Office of Water Quality Mission***

The Office of Water Quality's mission is to monitor, protect, and improve Indiana's water quality to ensure its continued use as a drinking water source, habitat for wildlife, recreational resource, and economic asset. The office achieves this by developing rules, guidance, policies, and procedures; assessing surface and ground water quality; regulating and monitoring drinking water supplies and wastewater facilities; protecting watersheds and wetlands; and providing outreach and assistance to the regulated community and the public while supporting environmentally-responsible economic development.

## ***Hoosier Riverwatch Mission***

The mission of Hoosier Riverwatch is to involve the citizens of Indiana in becoming active stewards of Indiana's water resources through watershed education, water monitoring, and cleanup activities. [Hoosier Riverwatch](http://www.hoosierriverwatch.com) is a water quality monitoring initiative sponsored by the Indiana Department of Environmental Management's *Office of Water Quality*.



Canoeists on Sugar Creek in Montgomery County, Indiana