

Riffles & Pools

Office of Water Quality www.idem.IN.gov



Sunset over [Central Canal](#) from the West Street Bridge near downtown Indianapolis, Oct. 12, 2019. Visible are an aquatic art installation (center foreground), the [Indiana State Museum](#) (left background), the [Medal of Honor Memorial](#) (glowing green glass walls, center background), and Military Park to the right. Warm weather brings out bicycles, pedal surreys, kayaks, and paddle boats for rent; as well as concerts and festivals. Walkers, joggers, and a few hardy waterfowl enjoy it all winter long.

Photo by Dwayne Caldwell

Greetings Riverwatchers!

When the winter edition was penned a year ago I wrote here about change being inevitable. Today I ponder the dynamics of change concerning water quality. Sometimes, in first and second order streams or small, shallow lakes, water quality responses can occur quickly. These changes may be for better, such as with best management practices (BMPs) on the landscape, or for worse, as with a pollutant spill.

With larger, higher order streams and larger or deeper lakes, changes in water quality may take years, even decades. This is why it is important to manage expectations with regard to water quality data and use other social indicators such as surveys or photographs to document behavioral changes and the implementation of practices. Again, such changes may be positive or negative.

Dive into this issue with me while we walk through a few past, current, and future efforts in Indiana.

— Carol Newhouse, Hoosier Riverwatch Coordinator

Winter 2019

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MARK YOUR CALENDARS!

Stay tuned for more workshops next spring.

— OR —

Contact us for assistance in organizing and hosting one in your area during 2020.

Hoosier Riverwatch is administered by



Watershed Success Stories: Bull Run/West Creek

The 8th installment of the [stories of watershed success](#) efforts collected by IDEM staff and grant recipients over the years:

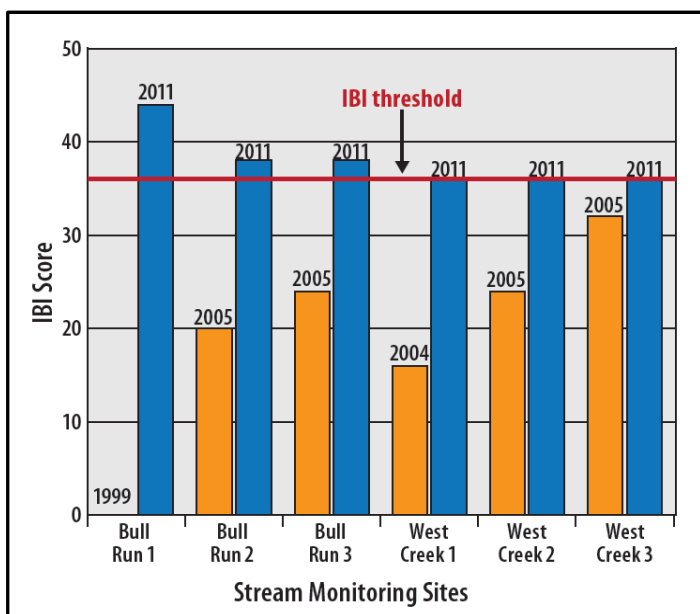
Bull Run is a 6.04-mile-long headwater creek flowing through an agricultural area of northwest Lake County, Indiana. It joins St. John Ditch in a predominantly urban area to form West Creek, after which the waters flow another 19.5 miles before emptying into Singleton Ditch.

IDEM data collected on Bull Run in 1999 revealed a fish Index of Biotic Integrity (IBI score) of 0 (zero), proceeded by a score of only 6 the following year. West Creek data from 2004-05 showed an IBI ranging from 16 to 32 (see figure below).



IDEM identified nonpoint source run-off as the main contributor to the biotic community impairment. Key sources of pollution identified at the time included run-off from row crops, improper manure spreading, livestock access to streams, leaking or failing septic systems, stream bank erosion and urban stormwater run-off. The contributing point source, a municipal separate storm sewer system (MS4), had no history of permit violations. It did, however, work within the local community to identify outfall locations and implement best management practices (BMPs) to address stormwater run-off issues that were outside of its permit requirements.

Since 1990 the following funding has been directed towards improving conditions in the Bull Run /West Creek watershed:



- \$484,787 in [Section 319 grants](#) from IDEM
- \$111,800 in [Section 205\(j\) funds](#) from IDEM
- \$121,196 in local in-kind and cash match
- \$120,000 per year from USDA Natural Resources Conservation Service (NRCS) and Farm Service Agency (FSA) funds
- \$1.01 million in Section 319 grants from IDEM to implement agricultural BMPs statewide and to fund IDEM staff working directly with farmers
- \$1.54 million in USDA [Conservation Stewardship](#) and [Wildlife Habitat Incentives](#) programs

The Northwest Indiana Regional Planning Commission worked closely with the Lake County Soil and Water Conservation District; NRCS regional conservation staff; and a number of state and local partners, including the Indiana Department of Natural Resources (IDNR), the Indiana State Department of Agriculture, and the Lake

County Health Department. Partners contributed resources to support educating landowners, identifying pollutant sources and critical areas for potential water quality improvement projects, and conducting outreach to stakeholders. Since 1996 U.S. Department of Agriculture NRCS and FSA funds in the Bull Run/ West Creek watershed have promoted conservation practices, particularly controlling tillage practices.

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Watershed Success Stories: Bull Run/West Creek (cont.)

Since 1990 IDEM has supported nine Clean Water Act (CWA) Section 319 and 205(j) projects in the greater Lake County area. Project funds were used to develop a comprehensive watershed management plan, identify critical areas and priority actions to improve water quality, and implement demonstration BMPs to control sediment loading and erosion in urban areas. The Indiana Department of Natural Resources hosted education events on urban run-off and its effects on water quality.

Between 1997 and 2004, IDEM staff used CWA Section 319 funds to help local farmers implement conservation tillage BMPs and identify additional federal funding opportunities to support BMP implementation. Since 2004 the U.S. Department of Agriculture's Natural Resources Conservation Service has funded staff

to provide this kind of support to local landowners. These combined efforts have led to an 80% rate of adoption of conservation tillage practices among farmers in the watershed. Furthermore, a number of farmers have adopted no-till cropping practices, in which agricultural fields are left largely undisturbed from harvest to planting.

In addition, the Town of St. John cleared silt from several ditches and reseeded the areas to prevent further erosion. The town continues to speak with homeowners' associations about how to enhance the stormwater management within their respective subdivisions. The town has improved stormwater quality by maintaining replanted native vegetation along the Dyer and St John ditches and the tributary to Turkey Creek. The St. John MS4 made a capital investment of three new global positioning system units, which will be used to enhance the existing outfall and BMP location data. More accurate and easily accessible information will help the Town of St. John make future decisions on identifying potential sites for BMP implementation.

These projects resulted in improvements throughout the watersheds in the county, especially in the Bull Run/West Creek watershed. Water quality monitoring data collected in 2011 (bar graph on previous page) show that IBI scores in Bull Run and West Creek have improved. The scores now meet or exceed an IBI score of 36, indicating that the biotic community is no longer impaired. These waterbodies have now been removed from Indiana's list of impaired waterbodies. Great job, everyone!

- An **Index of Biotic Integrity (IBI)** calculates stream health based on multiple measurements / metrics of resident fish population.
- A **Macroinvertebrate Index of Biotic Integrity (mIBI)** calculates a similar score based on macroinvertebrates that are found living in a stream.
- Scores below 36 for either index indicate stream impairment per the narrative criteria in the Indiana State Water Quality Standards.
- All pre-project data mentioned here was below supportive criteria level.
- Post-project data, on the other hand, showed streams were meeting or exceeding state criteria for biotic communities.

No amount of money, oil, or gold is worth more than the bees, trees, and clean water.

Popular meme online today

I like to envision the whole world as a jigsaw puzzle ... If you look at the whole picture, it is overwhelming and terrifying, but if you work on your little part of the jigsaw and know that people all over the world are working on their little bits, that's what will give you hope.

Dr. Jane Goodall

The best time to plant a tree is 20 years ago. The second best time is now.

Dr. Dambisa Felicia Moyo

Riverwatch 2019 Workshop Recap

The 2019 workshop participants took advantage of fair weather days and normal flow amounts later in the season to get their feet wet and hone their skills as stream water quality monitors.

Twenty-six public workshops were planned and advertised; three of which were cancelled due to conflicting activities, leaving 24 workshops completed this year. Of these, two were advanced *E. coli* workshops. Additional outreach days and events were joined by Hoosier Riverwatch (HRW) staff and instructors to further the message of stream water quality monitoring efforts.

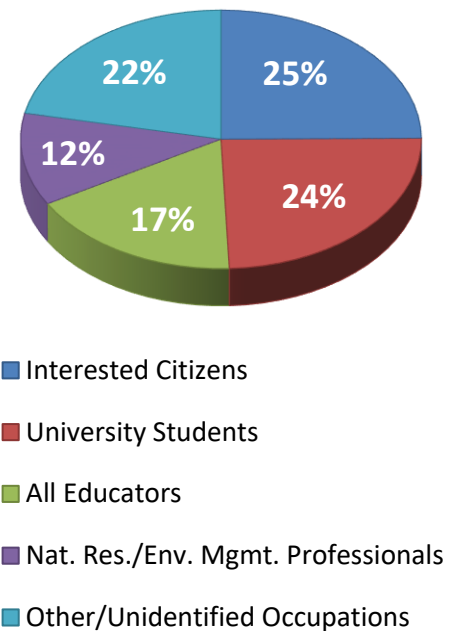
The **24** workshops conducted in 2019 consisted of:

- 22 basic workshops held in **15** counties
- 2 advanced workshops (in two counties)

Participation in HRW training workshops included **225** participants from **41** Indiana counties and three other states; Illinois, Tennessee and Michigan.

Of those participating this year, their self-reported occupations included: Interested Citizens – 25%, University Students – 24%, All Educators – 17%, Natural Resource/Environmental Management Professionals – 12% and Other/Unidentified Occupations – 22%. *See pie chart to the right.*

Percentage of Participants by Occupation, 2019



Staff and students of Columbus Signature Academy-New Tech High School received some hands-on experience with water testing thanks to HRW, September 2019.

Photo and training by Julia Lowe

Many lake/cottage owners' associations were among the early adopters of the Hoosier Riverwatch program owing to the fact that lakes were already being actively monitored by citizen volunteers. Being able to measure what was coming into and out of Indiana lakes added to the understanding of lake impacts within a watershed.

Of the handful of national environmental and/or conservation organizations participating in Hoosier Riverwatch, the Sierra Club is the oldest having been started in 1892 by John Muir. The Izaak Walton League (1922), the National Wildlife Federation (1936) and The Nature Conservancy (1951) are also active in Riverwatch stream monitoring efforts.

Another undertaking this year included sorting and curating nearly 100 sets of aquatic macroinvertebrate collections from old IDEM collections. The sets will be used by IDEM's environmental education staff, staff of the Indianapolis Zoo and, of course, current and future Riverwatch instructors.

Looking Back: 20 Years Ago

It just so happens I was in the office that December day in 1999 when the call came in about a [massive fish kill](#) on the White River. Within moments, staff here were notified and mobilizing to drive out and inspect the damage. They were then quickly outfitted to collect samples of water and fish.

Only those fish lucky enough to squeeze upstream in crowded tributaries had made it. Could they return to the river quickly enough to not run out of oxygen in the tribs? We hoped so.

Days turned into weeks while staff braved the winter cold to assist in the cleanup of tons of fish carcasses. They ferried contractors and carcasses alike with as much speed and safety as the situation warranted; with the swamping of only one boat and no loss of human life, limb, or property.

My time in the river came when I accompanied my coworker (and late husband) to the site of the spill in Anderson, Indiana to see if any macroinvertebrates had survived. We were delighted to find that they had buried themselves deep enough into the sediment to survive and therefore would provide enough food base for the proposed restocking (pictured here) by the Indiana Department of Natural Resources and others.

While initially devastating, the long-term effect of this fish kill was the outpouring of love for, and ongoing protection of, this valuable natural resource, our White River; something we hope will never be taken for granted again.

And to the dear gentleman who spoke to two IDEM biologists from the bridge that late winter day, I say, "I am so glad that the 'smallies came back' and I hope that you have enjoyed many more days teaching those grandkids to fish!"

White River Nonprofit Organizations Continue to Inspire



Boats line up in the White River for the start of a heat during Sept. 28, 2019 Dragon Boat Races.



The late Governor Frank O'Bannon (and then First Lady Judy) stock the first bass back into the White River in spring 2000 following a 50+-mile fish kill that occurred months earlier.



IDNR Division of Fish and Wildlife staff assist school children in the placement of hatchery-reared pan fish into the White River in central Indiana, spring 2000.

There are many local, regional, and statewide organizations in Indiana concerned with and working towards the improvement of Indiana waters. A handful or so have been at work for decades along the only river contained exclusively within the boundaries of the state of Indiana.

That river is the White River (both the West and East forks), and two of the groups active along its multicounty corridor are [Friends of the White River](#) and [White River Alliance](#); both of which formed in 1985.

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White River Nonprofit Organizations Continue to Inspire (cont.)

Friends of the White River (FoWR) was instrumental in supporting citizen science efforts in the state and helped set the stage for the formation of Hoosier Riverwatch through communication and cooperation with staff from multiple state agencies.

Along with other important efforts, we are grateful for FoWR's foresight, impetus, and continued interest in educating the public and school children.

Like FoWR, the White River Alliance (WRA) has also been a great shaker and mover in Indiana. Its efforts to draw attention to the benefits of living in a riverfront community are exciting and commendable.

For instance, WRA's 3rd annual [dragon boat race](#) (pictured here) at White River State Park in downtown Indianapolis this past Sept. 28 was a real crowd pleaser.

While I do not know the head count for this event, the enthusiasm on the faces of the 25 teams entered and those assisting with the logistics of the event indicate it was a delightful and successful day.

Kudos to the winning boat in each division and to all of the teams who competed, the staff and volunteers, and the vendors and spectators who showed up and made the day great!



Crowds line the riverbanks, east and west, to enjoy the dragon boat races.



Casting for Recovery team tent signs.



And they're off!

Paddling crews gather at the river on Sept. 28, 2019.



Painting dragon eggs was a crowd pleaser.



Awards ceremony.



Enthusiastic dragon boat crews spur each other on.



Happy staff and volunteer enjoying a successful day!

All photos on this and the bottom of page 5 courtesy of the White River Alliance.

Volunteer Monitors Rock Indiana Streams



Staff and students from Bethel University and elsewhere participated in a workshop at St. Patrick's County Park, St. Joseph County in September and October 2019.

Photo by Shelley Chaffee



Students from the Columbus Signature Academy (CSA) New Tech High School enjoy collaborating on water quality testing of a Bartholomew County stream in autumn 2019.

Photo by Julie Lowe



Volunteers Rebecca Lorenz and Joseph Bronnert testing creek water near Anderson Falls, Bartholomew County.

Photo by Julie Lowe



CSA New Tech High School staff and student head out to practice and collect macroinvertebrates using a kick seine.

Photo by Julie Lowe



CSA New Tech High School students and staff inspect a net for captured macroinvertebrates.

Photo by Julie Lowe

LEED Building Impresses with its Urban Know-How

Check back here next edition to learn more about an amazing find in Indianapolis: an office building occupying an urban lot and housing a thriving global nonprofit organization while having virtually no impact on the use of resources or discharge of wastes. Way to go in tackling not only nonpoint and stormwater run-off, but also reducing downstream point sources and overall carbon footprint, and for helping to protect our valuable Indiana resources!

So ... who do YOU think it is? (*HINT: They are mentioned elsewhere in this newsletter.*)

Not sure what LEED means? Come back next quarter for more info. Or better yet, do some Googling and see if you can sleuth it out for yourself.

IDEM Biologists Enjoy Educating Hoosiers



Posters, photos, and jars of preserved specimens are great teaching tools. But picking out live bugs is just about everyone's favorite part!



IDEM staff Maddie Genco identifies macroinvertebrates collected in Versailles State Park, Ripley County waters in early November 2019.



Benton County students enjoy a late October field day. Here IDEM staff Ross Carlson (yellow shirt) shows them how to sift through aquatic plants and debris to find macroinvertebrates.



A sampling of live aquatic macroinvertebrates is always popular during a demo day with IDEM staff.



An aquarium outfitted with aerator pump holds locally captured fish long enough for a student demo in Benton County. Fish are handled minimally and quickly released again.



IDEM staff Kayla Werbianskyj discusses sampling techniques with Benton County students.



(L to R) Lindsay Hylton Adams, Kayla Werbianskyj, and Caleb Rennaker (IDEM) demonstrate backpack electrofishing and other techniques at Versailles State Park in early November.

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IDEM Biologists Enjoy Educating Hoosiers (cont.)



Kayla Werbianskyj sets up live displays of just-caught critters to show local residents what was caught and how it can be used to determine water quality.



Maddie Genco sweeps vegetation along the shoreline where Fallen Timber Creek enters Versailles Lake, November 2019.



Limnology students from Indiana University's School of Public and Environmental Affairs (IU/SPEA) enjoyed an electrofishing outing / demonstration with IDEM biologists in late November 2019.



Fish caught and then released during IU/SPEA electrofishing demonstration. Proper (and limited) handling is key to fish survival.



Following a long-standing tradition, IU/SPEA instructor Melissa Laney (front row, third from left) brings her morning and afternoon limnology classes out to gain valuable field experience with IDEM biologists each semester.

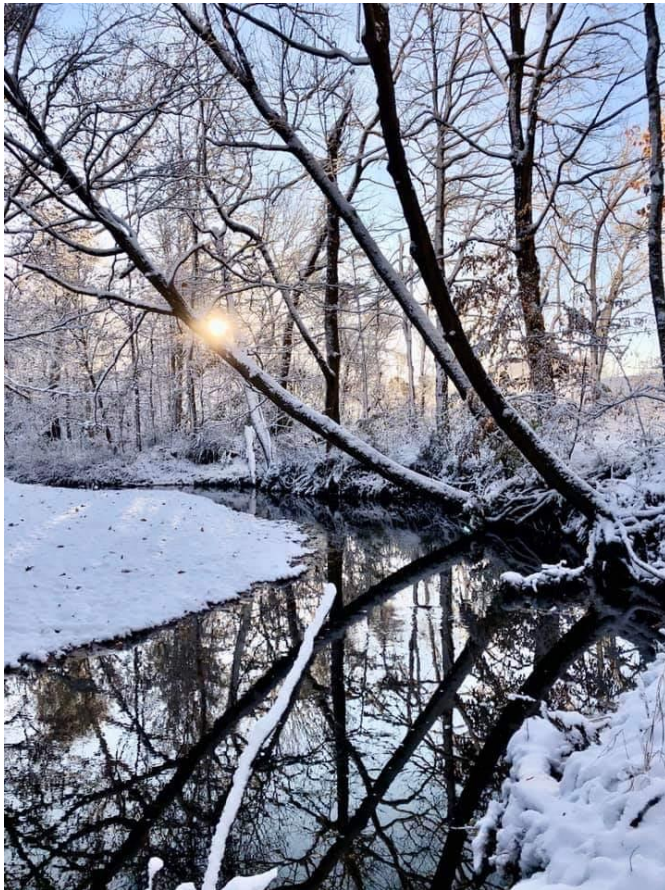
Mark Your Calendars

Hoosier Riverwatch training workshops have concluded for the year.

Welcome to all who joined us in 2019! Thanks to those who served as host and/or helped with recruiting and training! It is so very rewarding to see so many citizens interested in becoming Riverwatchers for their local communities!

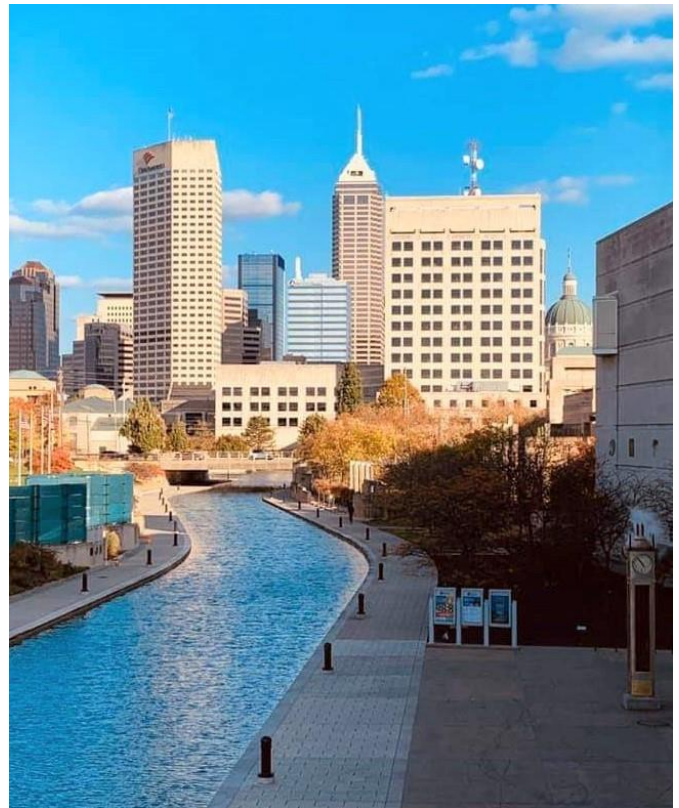


Check the next [newsletter](#) in March 2020 to see what [workshops](#) are lined up for early spring. We also invite you to review the steps for *What it Takes to Host a Workshop* (page 6 of the [Spring 2017](#) newsletter) for reminders on how to organize and hold a successful workshop. You may also wish to contact a [Hoosier Riverwatch instructor](#) near you to discuss a workshop for your area in 2020! We look forward to hearing from you.



Cikana State Fish Hatchery staff reported working in a winter wonderland in Morgan County on November 12, 2019

Photo by Jeff Malwitz



Indianapolis canal walk looking eastward on the afternoon of Nov. 5, 2019; 24 days after the cover photo for this edition was snapped and seven days before the Martinsville photo to the left was taken. I just love Indiana's diverse and ever-changing weather.

Photo by Dwayne Caldwell



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Frosted Virginia creeper, sunrise halo on compound leaf, and bedewed puffballs on a morning hike

– Kriste Lindberg

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 groundwater 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.



Sunrise over Mongo Millpond in LaGrange County, Nov. 3, 2019

Photo by Doug Newhouse