Indiana Department of Environmental Management

Riffles & Pools

Office of Water Quality

idem.IN.gov

HOOSIER RIVERWATCH VOLUNTEER NETWORK

Greetings Riverwatchers

As our workshop season comes to an end, I'm happy to say it was a huge success. The long-term goal of the program has been to conduct at least 20 workshops annually. Unfortunately, the pandemic during 2020 and subsequent staff turnover has caused workshop totals to fall short since 2019. In 2023, however, we not only hit our goal of 20 workshops, but went above and beyond with over 30! This is a result of hard work put forth by our volunteer instructors. Nine new instructors joined the program in 2023. As always, I am so thankful for our network of educators, both new and experienced, as they continue to spread knowledge and awareness to Hoosiers throughout the state.

If you are a Hoosier Riverwatch volunteer who is interested in teaching others, instructor trainings will be held in early 2024. Reach out to riverwatch@idem.IN.gov to learn more and join the team!

Enjoy your apple cider and pumpkin pie this Fall!

Dylan Allison

Hoosier Riverwatch Coordinator

Fall 2023

In this Issue:

Upcoming Workshops

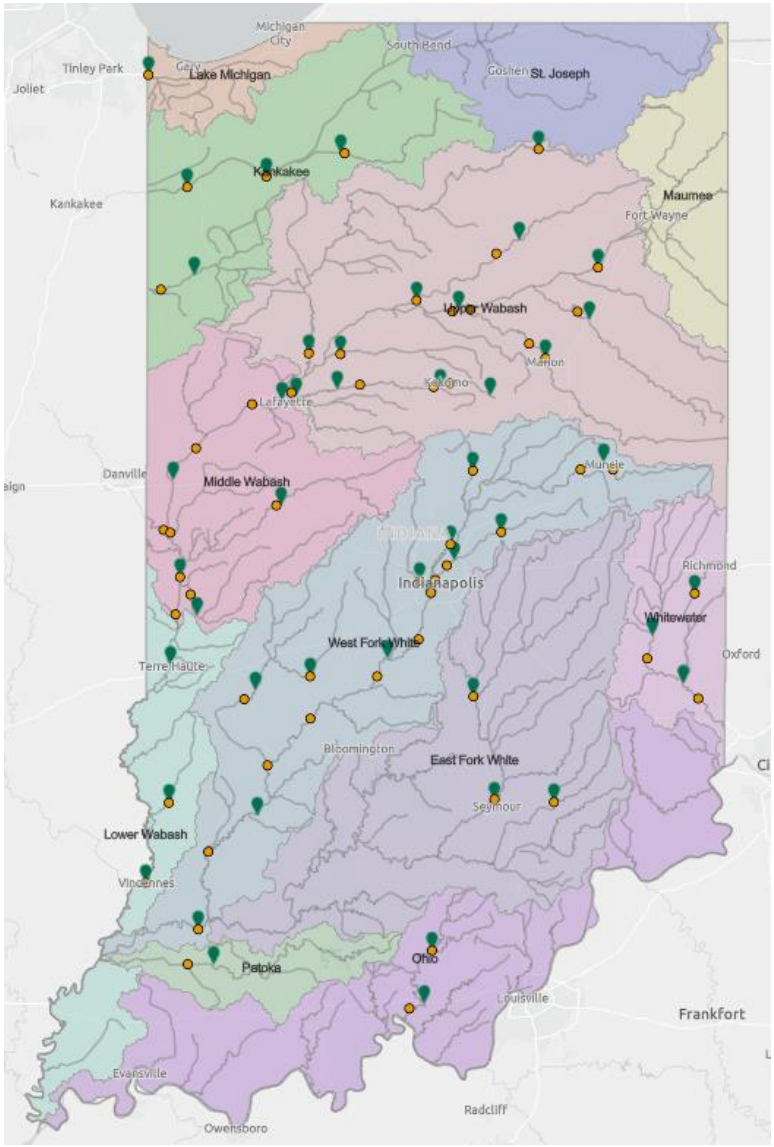
Dec. 14 – Evansville (*E. coli)*

Check back in 2024 for more workshops!

Hoosier Riverwatch is sponsored by

Water Quality Trends in Indiana Streams

At the beginning of 2023, IDEM published a StoryMap analyzing the water quality trends over a 10-year period (2011-2020). Data was collected through the Fixed Station Monitoring Program which has been active since 1957. As of 2022, there are 168 sites across the state where water samples are collected monthly for analysis. Parameters that were measured include concentrations of nutrients, metals, and ions. This study uses a model developed by the U.S. Geological Survey (USGS) that uses streamgages to cross reference concentrations. This is because stream flow directly affects the concentrations being measured. Goals of analyzing long-term data include identifying potential sources of contamination and informing management decisions regarding water resources. Additionally, the effectiveness of best management practices and restoration efforts can be assessed.



Twelve parameters were used in the analysis. These included nitrate, organic nitrogen, total phosphorus, total suspended solids (TSS), chloride, sulfate, hardness (as $CaCO_3$), total dissolved solids, total lead, iron, copper, and zinc. Lab analysis was conducted by the Indiana Department of Health (IDOH). Of the 168 fixed stations in the state, 56 were on the same stream reach as a USGS streamgage. These 56 sites were used in the study (see left). The green pins represent the nearest USGS streamgage and the yellow circles represent the fixed stations.

See below for graphs that represent the percent change for each parameter over the 10-year period. Red bars in the figures represent an increase in concentration and blue bars represent a decrease in concentration. Color-filled bars represent statistically significant trends. These are grouped by major watersheds listed at the top of the graphs.

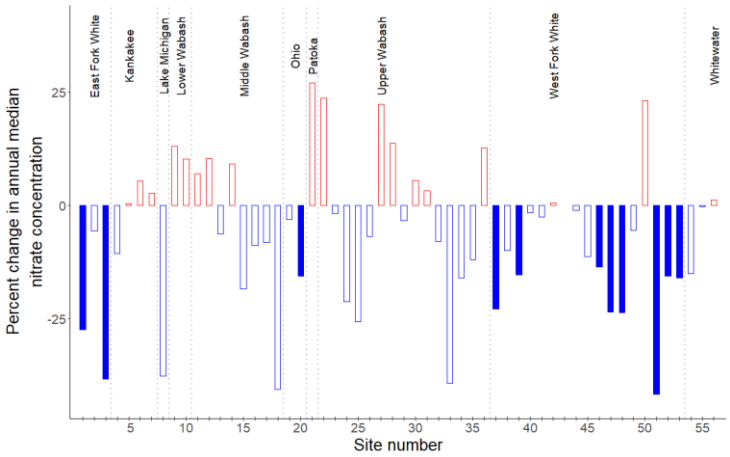


Fig. 1 Nitrate

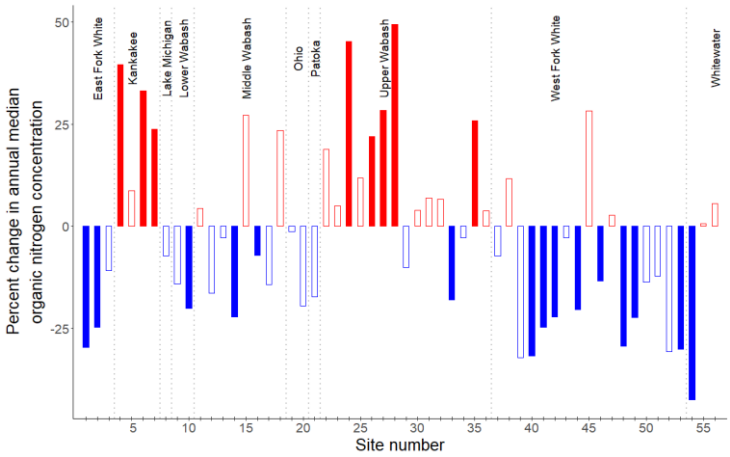


Fig. 2 Organic Nitrogen

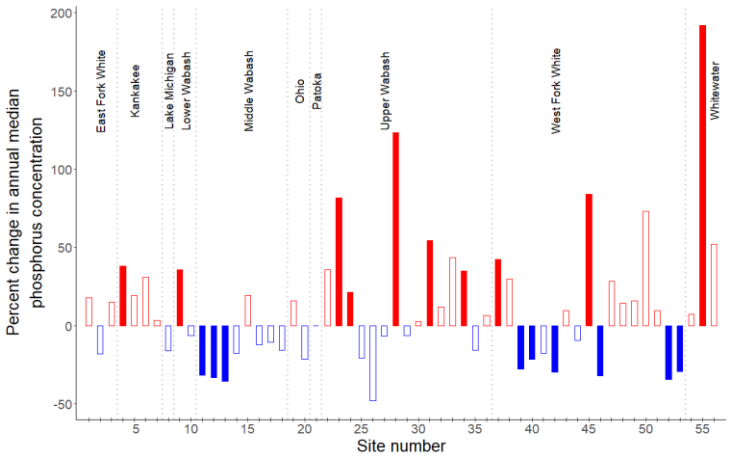


Fig. 3 Phosphorus

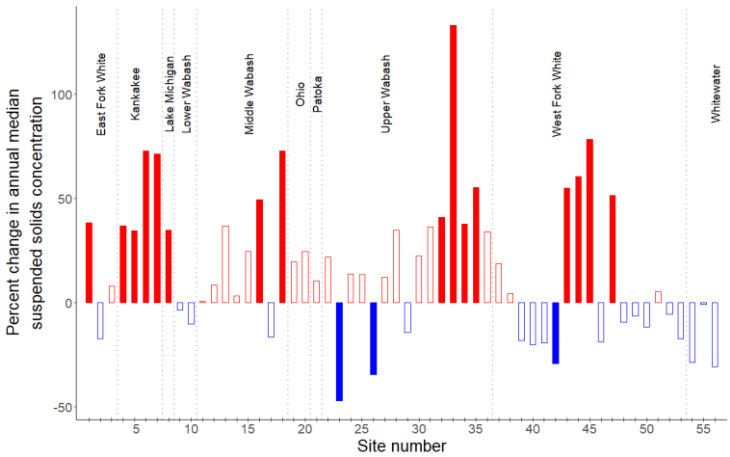


Fig. 4 Suspended Solids

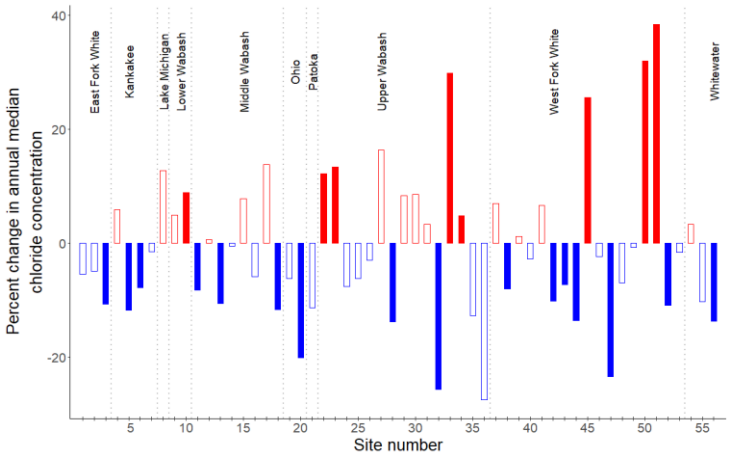


Fig. 5 Chloride

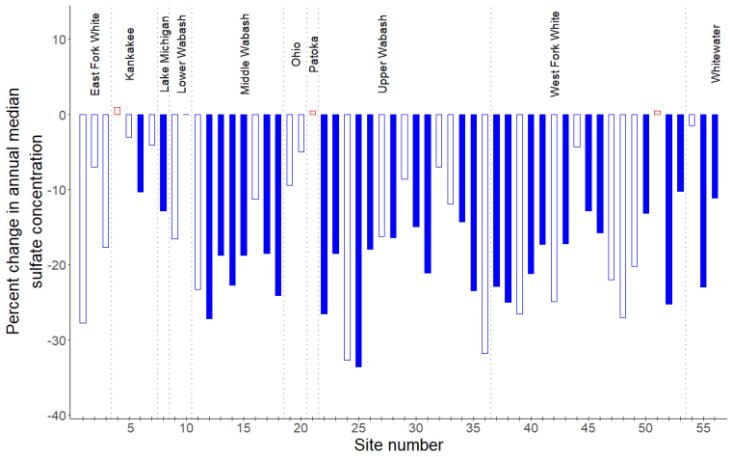


Fig. 6 Sulfate

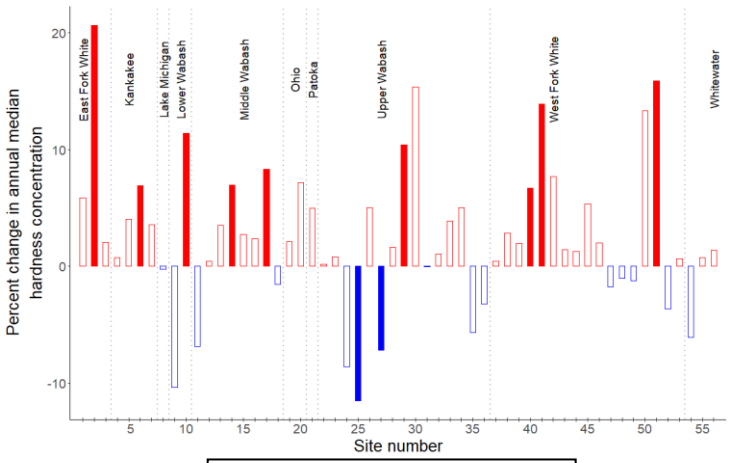


Fig. 7 Hardness ($CaCO_3$)

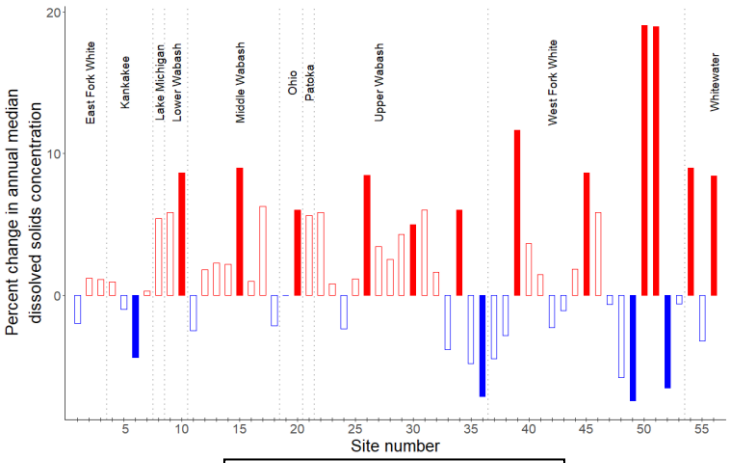


Fig. 8 Dissolved Solids

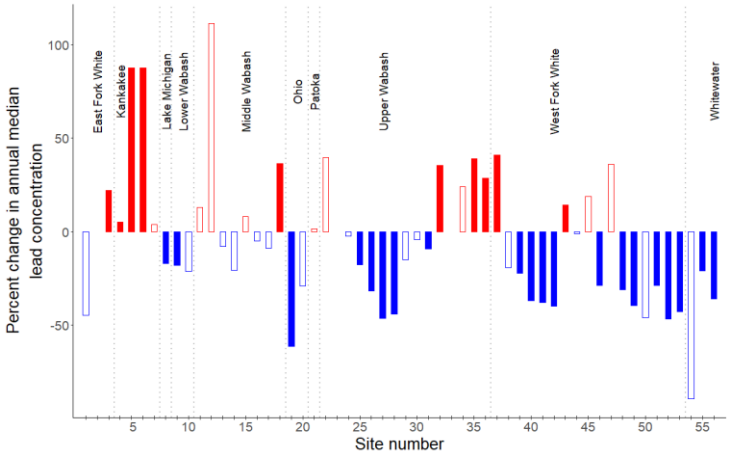


Fig. 9 Lead

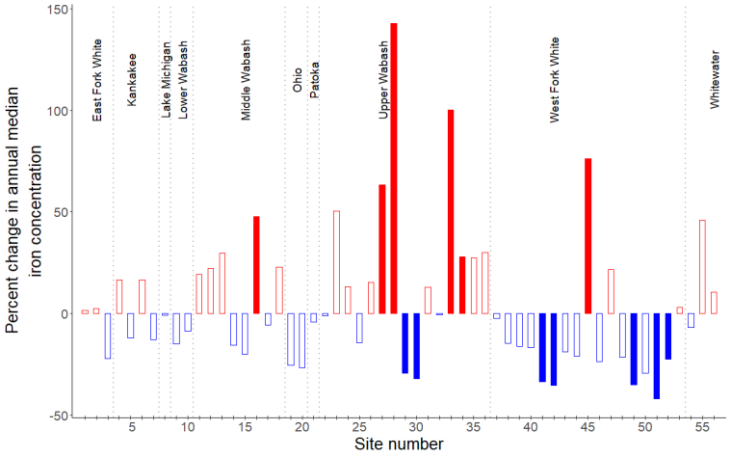


Fig. 10 Iron

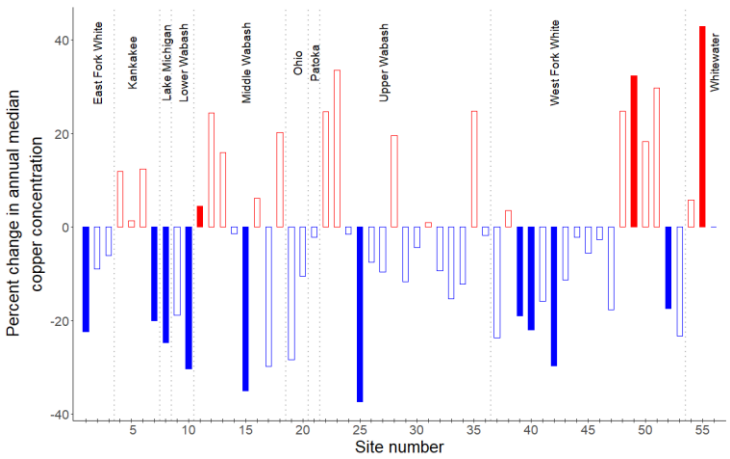


Fig. 11 Copper

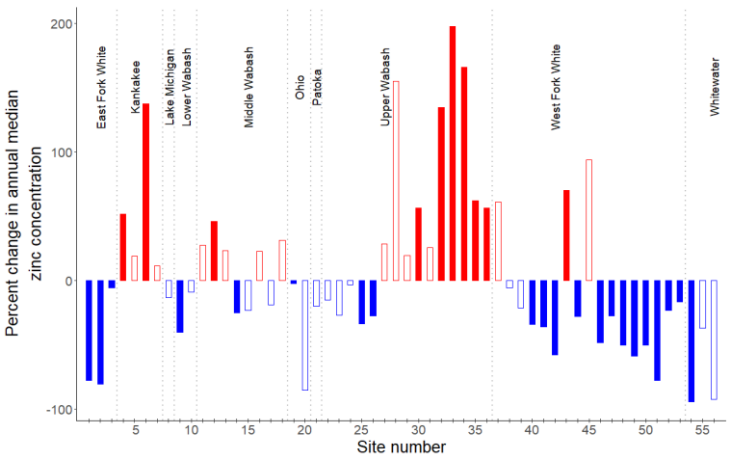


Fig. 12 Zinc

The StoryMap includes an interactive map that allows a closer look at site specific data. The attribute data associated with each fixed station site includes the percent change and trend for each of the 12 constituents in this report. The streams layer includes many of the major rivers and streams in Indiana but is not all-inclusive. The delineation of drainage basins is formed by grouping multiple sub-basins (HUC 8) into a larger drainage area for major river basins in Indiana.

White River Report Card

A first of its kind was published in Indiana this summer- a report card assessing the health of the White River. The report was the effort of the White River Report Card Partnership, a group of organizations based in central Indiana including The Nature Conservancy, Tourism Tomorrow Indy, Flatland Resources, and the White River Alliance. “The White River Report Card Partnership engaged more than 500 stakeholders, including municipalities, organizations and business owners in 16 central Indiana counties located along the White River watershed” (WRTV Indianapolis, 2023). The project is defined as “a stakeholder-developed assessment and communication tool to measure community progress, align partners and activities, and inspire change that improves our river and its watershed and protects our economy and way of life”.

The report card assesses three major categories: land, water, and community. Indicators within each category were selected to be measured and graded (see graphic). These indicators were selected to represent a wide variety of uses and stakeholders. For detailed information on indicators and the grading scale, visit whiteriverreportcard.org/grades.

The grade provided to the White River watershed was a moderate score of 51%, considered a ‘C’ on the report card. Community scored highest in *Education* (71%) and lowest in *Environmental Burden* (29%). Land scored highest in *Wildlife Diversity* (61%) and lowest in *Wetland Change* (7%). Water scored the highest in *Aquatic Life* (64%) and lowest in *Bacteria* (33%). A detailed assessment of the grades and regional grades can be found on the White River Report Card Booklet.

The White River Report Card has completed the first two phases of the process and is now focused on ‘Raising the Grade’. There are opportunities for individuals, business owners, and community leaders to help raise the grade. For ideas on how to take action, visit whiteriverreportcard.org/solutions.

Indian Creek Teen Volunteers

by Hoosier Riverwatch Volunteer Eden Ransdell

Eleven teen volunteers visited Indian Creek to test water quality for the Hoosier Riverwatch program. The teens used a dip net and kick seine to collect macroinvertebrates (insect larvae and other tiny aquatic animals) that cling to rocks and plants in the creek's riffles. The species found included damselfly nymphs, stoneflies, riffle beetles, and water pennies, all of which can only survive in clean water. Despite murky conditions caused by a recent drought, this diversity of insects scored a Pollution Tolerance Index of 25, which is considered Excellent Water Quality.

The teens also conducted a range of chemical tests. Here are the results:

- *Dissolved Oxygen: The amount of oxygen available in the water for fish and other animals to breathe. DO is reduced by excessive algae growth, which is in turn caused by fertilizer pollution. Indian Creek scored 11.5 mg/liter. The state average is only 9.6 mg/liter (higher=better).*

- *5-Day Biochemical Oxygen Demand: The amount of oxygen used up by algae and bacteria over five days. Indian Creek scored 4.5 mg/liter due to excessive algae. The Indiana average is 2 mg/liter (lower=better).*

- *pH: The acidity of the water. Indian Creek scored excellent at 7.25 pH (the state standard is 6-9).*

- *Orthophosphates: A type of fertilizer pollution. The teens found no trace of orthophosphates in the water.*

- *Nitrate: Another fertilizer pollutant. Indian Creek scored 2.2 mg/liter. The Indiana average is over 12 (lower=better).*

- *Turbidity: The murkiness of the water. Indian Creek scored 17 NTUs. The state average is 15 (lower=better), but the EPA recommends a limit of 10.4. Indian Creek is usually much clearer than this.*

Although the drought caused poorer conditions than are typical, Indian Creek still earned a Water Quality Index of 80/100, a rating of Good. These results have been submitted to Hoosier Riverwatch, where the data will be freely available to scientists and the public. Thanks to our teen volunteers for helping protect Indiana's precious waterways!

Teen Volunteers meet most Tuesdays at 5 p.m. at the library. Call 812-738-4110 for more information.

Photo courtesy of Harrison County Public Library

White River Rock Ramp

Hoosier Riverwatch volunteers within the Upper White River watershed may be interested to learn of a project completed last summer. Citizens Energy Group constructed the White River Rock Ramp adjacent to Taggart Riverside Park in Indianapolis. The project was a response to the 2018 failure of the Emrichsville Dam which caused water levels in the White River to fall six feet. As an alternative to a potentially dangerous low-head dam, large stones were arranged in an arcing pattern to form a gradual step structure. “The rock ramp is constructed out of approximately 380 large stones, each roughly the size of an armchair and weighing around five tons. To create the newly sloped streambed, 1,400 truckloads delivered 43,000 tons of stone” (Discover White River, 2022).

Graphic courtesy of Citizens Energy Group

Photo courtesy of Discover White River

The primary goal of the project was to increase the water levels upstream of the structure to allow for water intake north of 30th Street to replenish the Central Canal during periods of drought. Additionally, this design also allows for the movement of fish up and downstream, year-round use of the Riverside Boat Ramp, and is aesthetically more natural looking than a low-head dam. Recreational users should refrain from climbing on the structure. Canoers and kayakers should portage their boats around the ramp using the designated path.

Riverwatch Hosts PPHS

One year ago, Hoosier Riverwatch Coordinator Dylan Allison led an outreach event for the Intro to Agriculture class as Purdue Polytechnic High School in Indianapolis. The program was a success, and the high school is turning the outing into an annual event. In fact, an additional class was hosted this fall. Both classes were able to participate in sampling techniques used by Hoosier Riverwatch volunteers.

The sampling site was Fall Creek at the Millersville Preserve in Indianapolis. During this time of year, the flow was low enough for students to safely wade into the creek. First, the classes demonstrated a habitat evaluation via the Citizens Quality Habitat Evaluation Index. This allowed for some in-depth discussion on substrate embeddedness, meandering vs straightened stream channels, and riparian zones.

Chemical testing was conducted by the students. This allowed for discussion on dissolved oxygen saturation, the role of nutrients in our waterways, and how sedimentation affects the transparency of the water.

Finally, students were able to sample for macroinvertebrates in small groups. Using dip nets and seine kick nets, students surveyed an assortment of organisms, including damselflies, mayflies, caddisflies, predacious diving beetles, and more. This allowed a discussion on the tolerance levels of our macroinvertebrates and the scoring of a stream via the Pollution Tolerance Index.

Photos on this page courtesy of IDEM

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Hoosier Riverwatch looks forward to hosting Purdue Polytechnic High School again next year! If your school or organization would like to set up an outreach event with Riverwatch staff, please reach out to riverwatch@idem.IN.gov.

Mark Your Calendars

Thursday, December 14
(Advanced *E. coli* workshop – basic training required)
Darmstadt – Vanderburgh County Fairgrounds (10 a.m. –2 p.m.)
Instructor: Dylan Allison
Register at https://forms.gle/S3vU5mUWkkGHt2oX6.

Check Back in 2024 For More Workshops!

Call Out for Instructors!

Are you a Riverwatcher who likes to get your feet wet? Do you enjoy educating others with a shared interest in water quality? Join our team of Hoosier Riverwatch instructors to lead your very own workshops! Trainings will take place in late winter/early spring 2024. Reach out to riverwatch@idem.IN.gov for more details.

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 clean-up activities. Hoosier Riverwatch is a water quality monitoring initiative sponsored by the **Indiana Department of Environmental Management's** *Office of Water Quality*.

For more information, go to **idem.IN.gov/riverwatch.**