



WATER IN THE NEWS

SAVE THE DATE

The Indiana Water Monitoring Council (InWMC) will be holding its annual meeting of its members on June 22, 10:00-11:30 a.m., immediately preceding this year's Indiana Water Resources Association (IWRA) symposium at the Ball State University Alumni Center in Muncie.

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Middle Eel River Watershed Initiative Wraps Up Project, Set to Begin another

By: Terri Michaelis, Watershed Coordinator, Manchester University

For those of you unfamiliar with our work in the Eel River Watershed, a brief history may be beneficial.

The Middle Eel River Watershed Initiative (MERWI) began in 2009 when Manchester University (MU) was awarded an Indiana Department of Environmental Management (IDEM) Section 319 grant. IDEM Section 319 grants focus on non-point source water pollution, in-other-words, polluted run-off not originating from a pipe or single identifiable source. The MU Section 319 grant was for a four year period (2009-2012) and included the development and implementation of a collaborative, holistic approach to addressing non-point source pollution in the middle section of the Eel River in north central Indiana. The focus of the project was a 30 mile stretch of the Eel River from North Manchester to Mexico, IN, and included four main components:

- 1) Develop and implement a watershed management plan for the MERW
- 2) Develop and implement a rigorous, scientific, water quality monitoring program
- 3) Develop and implement an education and outreach program
- 4) Develop and implement a cost-share program

All components of the MU Section 319 grant were fulfilled and expectations were exceeded. We attribute this success to our strong partnerships and collaboration. MU was awarded an additional IDEM Section 319 grant in 2012 to continue implementing the watershed management plan through the cost-share program, water quality monitoring, and education and outreach program. Success has been realized through education and outreach activities such as: annual canoe floats, annual river clean-ups, and presentations to various groups (many of these experiences have been directly in or on the Eel River itself!). Educational events have involved over 1,000 people and provide opportunities to learn about not only water quality and non-point source pollution, but also expands their knowledge and understanding of the Eel River ecosystem. The water quality monitoring program led by MU faculty identified non-point source pollutants of concern in the Eel River and continues to guide our work and document water quality conditions in the watershed.

Eel River Watershed continued...

Additionally, water quality monitoring has captured data during both severe drought conditions (2012) as well as record historic high flow conditions (2009 & 2013) providing valuable information for not only current, but future generations. The cost-share program has partnered on 46 projects, with 43 producers in the watershed to implement 6,620 acres of best management practices in critical areas of the MERW. . Estimated load reduction calculations of non-point source pollutants of concern in the Eel River as a result of the cost-share program are shown in Table 1.

Table 1. MERWI Cost-Share Program (2011-2015) load reduction calculations.

Non-point Source Pollutant of Concern	Estimated Annual Load Reduction
Nitrogen	36,269 pounds/year
Phosphorus	12,930 pounds/year
Sediment	5,758 TONS/year

And last, but certainly not least, MU students are provided an opportunity to gain hands-on field experience in a real world project that prepares and equips them for employment opportunities beyond their college career; hopefully we are educating, inspiring, and training future natural resource leaders!

The MERWI will continue to strive to fulfill our mission statement: ***"To protect and enhance the water resources of the Middle Eel River Watershed through education and implementation of soil and water conservation practices"*** through the end of this year (2015) at which point our grant will expire. We are grateful to all our partners, volunteers, farmers, students, local, state and federal agencies and staff, for-profit and not-for-profit businesses, foundations and civic groups that have helped us be successful!

So, what's next? Water quality conditions in the Eel River were mostly unknown when our work began in 2009; now we have six and a half years of data to guide us into the next phase. Non-point source pollutants of concern identified through water quality monitoring in the MERW include: sediment, nutrients (nitrogen and phosphorus), and *E. coli*. We know that water in the Eel River is impaired before it reaches North Manchester; to be effective, we need to shift our area of focus upstream.

Manchester University applied for two new IDEM grants in 2014; one that will allow us to develop a watershed management plan for the 'Upper' Middle Eel River Watershed (UMERW), and one will allow us to continue implementing a cost-share program in the Beargrass Creek sub-watershed. The grants have been approved by IDEM and we are awaiting award notification from the USEPA. We hope to duplicate our success in the UMERW by modeling what has worked for us in the past: a holistic, collaborative, approach addressing non-point source pollution. Development of a watershed management plan will begin in January, 2016; the area of focus for this plan is 35 river miles from Columbia City to North Manchester, IN.

Eel River watershed continued...

which is adjacent and upstream from the MERWI and includes a watershed area of 163,033 acres in two 10-digit hydrologic unit codes (HUCs). See figure 1.

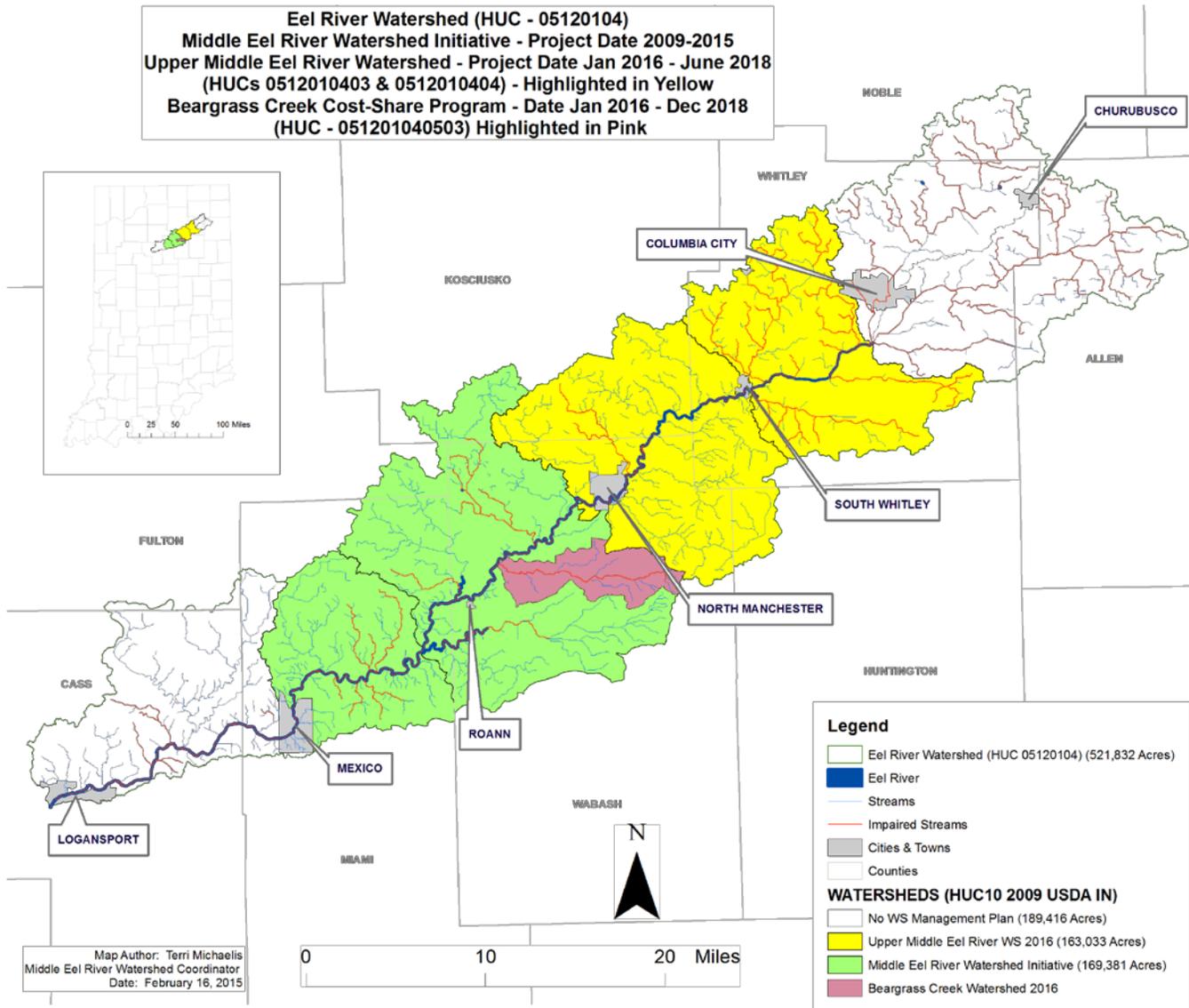


Figure 1. Eel River Watershed (HUC05120104) highlighting the current area of focus for the Middle Eel River Watershed Initiative (green), and two future IDEM grant project areas: Upper Middle Eel River Watershed (Yellow) and Beargrass Creek implementation (Pink).

Northern Indiana Lakes Festival

June 5-20th

Dr. Nate Bosch, Director, Center for Lakes & Streams

The Northern Indiana Lakes Festival is this June 5-20. The Center for Lakes & Streams at Grace College organizes and plans this annual festival to educate the Kosciusko County community about its more than 100 local lakes and waterways.

The Lakes Festival is not only an event devoted to education, but an event also dedicated to entertainment as the community celebrates its lakes and streams. Admission is free, and several free workshops and activities are provided over the festival weeks.

The Northern Indiana Lakes Festival began as a community collaboration in 2009 to provide water education through family fun. The Festival has since grown as additional organizations and volunteers partner to join in this educational endeavor and over 5,000 community members attend on average each year.

While activities are planned for the duration of two weeks, June 5-20, the most popular Lakes Festival days take place at Winona Lake and Center Lake. Entertaining activities, workshops, and exhibits at Winona Lake are scheduled for Saturday, June 13 and at Center Lake Saturday, June 20. Festival activities will also take place during First Friday in Downtown Warsaw on June 5.

This year, several Lakes Festival favorites will return to both Center and Winona lakes. A live animal show, display tanks, arts and crafts booths, educational workshops, a business expo, and live music will all be present on these dates. Other planned activities include canoeing, fishing, and swimming. Community members can also participate in competitions, including a 5K race at Winona Lake, the Warsaw Aqua Mile Swim Race, and a youth art contest. Drawings and prizes will be awarded throughout the days of the festival and vendors will sell food at each location.

The Northern Indiana Lakes Festival is sponsored each year by local businesses. The Center for Lakes & Streams collaborates with businesses around the county to further educate the community about taking care of local waterways. This year's top sponsors include Toyota Motor Sales, U.S.A., Silveus Insurance Group, DePuy, Zimmer, Biomet, Louis Dreyfus Commodities, Maple Leaf Farms, and Tippecanoe Watershed Foundation.

The Center for Lakes & Streams at Grace College conducts applicable research, engages and educates residents, and collaborates with other organizations in efforts to make the lakes and streams of Kosciusko County cleaner. For more information or to support their efforts, visit www.lakes.grace.edu.



Indiana water-resource issues: Flooding

By: InWMC Board Members

According to the Federal Emergency Management Agency (FEMA), “Floods are one of the most common hazards in the United States. Flood effects can be local, impacting a neighborhood or community, or very large, affecting entire river basins and multiple states.” Some floods develop slowly, sometimes over a period of days. But flash floods can develop quickly, sometimes in just a few minutes and without any visible signs of rain. Flash floods often have a dangerous wall of roaring water that carries rocks, mud, and other debris and can sweep away most things in its path. Flooding can occur behind levees and floodwalls when those structures are overtopped or breached, and dam failures can cause particularly devastating floods. Overland flooding from heavy rainfall can occur away from a stream or river, such as when road underpasses are flooded by torrential rains. Floods cause human casualties and damage by inundating structures and roads, they can also cause substantial damage through bank erosion and movement of the stream channel – this particular hazard is called the “fluvial erosion hazard.”



In order to limit flood-related injuries and property damage, surface-water hydrologists study stream flow patterns and areas prone to flooding. You've probably heard someone refer to a 50-year or 100-year flood - these numbers called "recurrence intervals" indicate the statistical chance of a flood occurring in any one year. For example, a 100-year flood has a 1/100 or 1% chance of occurring in any year. People sometimes misunderstand this

terminology, and think that once a 100-year flood has happened, another will not happen for 100 years - this is not true, and there are areas that have seen multiple 100-year or greater floods in the same year - sometimes, within a month of each other! The interval is based on a statistical analysis of streamflow data, which highlights the importance of maintaining gaging stations and establishing long-term data sets. Other flood-related information includes high-water marks that establish the elevations of flood waters. These records are used in conjunction with recurrence intervals to map floodplains that FEMA uses to administer the National Flood Insurance Program and that state and local agencies use to regulate development in floodplains. The information also helps developers and city planners to build structures in such a way that minimizes damages linked to flood events. The Indiana Department of Natural Resources has developed an online tool to disseminate floodplain mapping information, the Indiana Floodplain Information Portal (INFIP).

Another proven way to help reduce damages and save lives is early flood warnings. The U.S. Geological Survey (USGS) maintains more than 220 streamgages across Indiana that provide emergency managers and the public with real-time water level data 24/7/365. The National Weather Service uses the streamgage data and advanced predictive techniques to provide flood forecasts at many streamgage stations. These forecasts can provide estimates of flood water levels up to 7 days in advance. The National Weather Service also has other ways of giving people "heads up" about flooding, such as issuing flood watches and warnings. For additional resources go to:

<http://www.inwmc.org/page-1840606>

Bluegill fishing returning to Kunkel Lake after 2013-2014 renovation

By: Jed Pearson, Indiana Department of Natural Resources

Bluegill fishing is picking up at Kunkel Lake in Ouabache State Park due to a successful DNR fish eradication and restocking project. Before the renovation, the 25-acre impoundment in Wells County was overrun by carp, small bluegills and crayfish. The water was muddy and aquatic plants were sparse.

To remove the unwanted fish and improve fish habitat, DNR officials lowered the water level in September 2013 and treated the remaining pools with rotenone, a fish toxicant. The lake was then refilled and stocked in March 2014 with 19,000 bluegills and 5,200 largemouth bass. An additional 2,600 channel catfish were added last fall. The project was funded through fishing license revenue.

According to Mike Miller, Ouabache assistant park manager, anglers are catching some 7-8 inch bluegills, but most are smaller and should reach keeper-size this summer. Bass anglers will have to wait longer before they can keep a legal-size bass. A proposal is in the works to impose an 18-inch minimum size limit on largemouth bass at Kunkel Lake and limit the daily catch to two bass per angler.

The regulation was approved by the Natural Resources Commission on May 19 and will go into effect next year. Currently a bass must be 14 inches long if taken, and the daily catch limit is five.

During a survey last summer, DNR biologists captured 28 bass in 15 minutes of sampling with an electrofishing boat. The bass were 5-6 inches long. Although they are expected to grow rapidly, bass may not reach the 18-inch limit for five years.

The size limit is to protect the majority of bass from harvest so that they can prey on small bluegills and keep bluegill spawning in check.

A dense bass population also will help control other fish species that may eventually get into the lake and prevent the build-up of a large population of rusty crayfish.

Crayfish numbers were so high before the renovation that they, along with carp, muddied the water.

Since the renovation, water clarity at Kunkel Lake has doubled and aquatic plants have returned.

Park personnel will monitor expansion of vegetation and take control measures if needed.

Biologists from the Division of Fish & Wildlife will also conduct a follow-up fish survey in mid-June.



Photo provided by Erin Basiger, IDNR

Save the Date!

Wetland Workshop, June 4, 2015 10am-2pm

Interested in creating a wetland on your land? Wetlands provide habitat for wildlife, clean water, and beautiful scenery. Come and see restored wetlands created by The Nature Conservancy at the Douglas Woods Nature Preserve near Hamilton, and find out how you can do this on your land. You'll hear about assistance programs for wetland restoration from the Natural Resources Conservation Service and U.S. Fish and Wildlife Service and see recently restored wetlands, as well as natural wetlands in a mature forest.

To register, go to:

<http://stewardshipnetwork.net/restoring-wetlands-field-day-lakes-country-cluster>

Back-story in the Back-water: Cultural History Paddling Trip (Monroe Lake: Pine Grove SRA)

The first trip, "Back-story in the Back-water," on Saturday, June 13, at 8 a.m., will focus on the lake's cultural history. This tour is limited to 15 people, ages 15 and older, with intermediate or better paddling skills. Advance registration is required by noon on June 10 at bit.ly/backstoryjun2015

- Cost is \$10 per person
- Limited to 15 people, minimum age of 15.
- Bring your own canoe/kayak, or rent a kayak from us for an additional \$25.
- Preregistration required by noon on June 10.

Explore a portion of Monroe Lake's backwater with a knowledgeable guide! Our focus will be on the lake's fascinating cultural history.

Name: Paynetown Activity Center

Phone: 812-837-9967

Recent News Releases

EPA and U.S. Steel Provide \$3.5 Million for Spirit Lake Cleanup Plan. See entire article here:

<http://yosemite.epa.gov/opa/admpress.nsf/a5792a626c8dac098525735900400c2d/a08f9041e218c285257e430042932e!OpenDocument>

University of Illinois at Chicago and University of Illinois at Urbana-Champaign Win Top Prizes in EPA's Campus RainWorks Challenge. See entire article here:

<http://yosemite.epa.gov/opa/admpress.nsf/a5792a626c8dac098525735900400c2d/c524febd92caa5d485257e2f0058f115!OpenDocument>

EPA Awards Great Lakes Restoration Initiative Grants to Reduce Runoff that Contributes to Algal Blooms. See entire article here:

<http://yosemite.epa.gov/opa/admpress.nsf/a5792a626c8dac098525735900400c2d/0cb04d77d6725dda85257e14005ecf4f!OpenDocument>

Groups jockeying to shape EPA water rule. See entire article at: <http://thehill.com/policy/energy-environment/242614-groups-jockeying-to-shape-epa-water-rule>

EPA Directs DuPont to Remove Mercury from Pompton Lake in Pompton Lakes, New Jersey. See entire article at: <http://yosemite.epa.gov/opa/admpress.nsf/0/2428917F949A47E785257E4B005E3B5E>

Work on Greenwood's \$7M water park kicks into high gear. See entire article here:

<http://www.indystar.com/story/news/local/johnson-county/2015/04/13/work-greenwoods-water-park-kicks-high-gear/25577811/>

New watercraft laws take effect in Illinois, aimed at safety. See entire article here:

<http://www.chicagotribune.com/suburbs/lake-county-news-sun/news/ct-illinois-watercraft-laws-20150521-story.html#navtype=outfit>

Flood Hydrology and Archeology

Meet

Paraphrased by Shawn Naylor, Indiana Geological Survey

Recent research indicates that the long-debated demise of the ancient city Cahokia was likely caused by intense flooding along the Mississippi River. The pre-Columbian city existed near St. Louis and thrived during a short period between 1000 and 1200 AD, but the civilization essentially vanished by 1350 AD.

Drought, overdevelopment, and war have been considered as likely culprits, but a team of researchers from the University of Wisconsin analyzed floodplain sediments to finally unravel the mystery. The researchers used laser diffraction particle size analysis to investigate sediments deposited at a nearby oxbow lake to elucidate the flood history of the area. Several flood events were identified over the past 2,000 years and one occurred around 1200 AD, coinciding with the fall of the Cahokia settlement.

The research was funded by a grant from the National Geographic Society and a recently released National Geographic article summarizes the findings in more detail (see <http://www.nationalgeographic.com/> for more information).



Cahokia Mounds today

Become a Member!

The Indiana Water Monitoring Council (InWMC) invites you to [become a member](#) today!

The InWMC addresses the full range of water resources, physical, chemical, and biological, including ground and surface waters.

We invite you to become a part of the InWMC -- a diverse and interesting group of individuals and organizations that collect, use, or study water monitoring data in Indiana.

Visit our [website](#) to learn more or click [here](#) to join today!

InWMC serves as a broad-based collaborative body to help achieve effective and efficient collection, interpretation, and dissemination of basic data and processed information for use in addressing issues of Indiana waters.

Membership Types:

General Members. General members are dues-paying members with voting privileges and may participate in all InWMC activities, including the chairmanship of subcommittees. Dues are \$10/year.

Affiliate Members. Affiliate members pay no dues and do not have voting privileges, but may participate in InWMC activities, including participation on subcommittees, except subcommittee chairpersonship.

Join the InWMC today at:

<http://www.inwmc.org/page-303780>

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