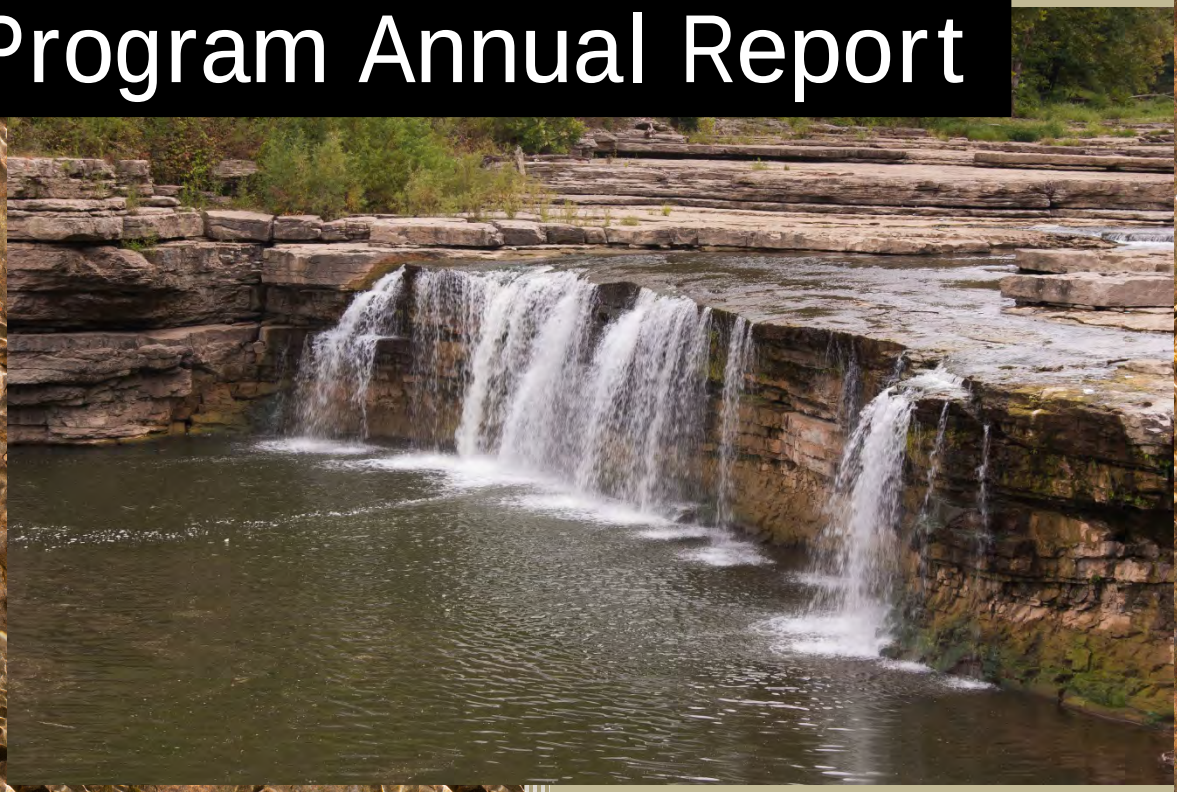
2017

Indiana Nonpoint Source Program Annual Report



Indiana Department of Environmental Management

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Introduction to the NPS Management Program

Nonpoint source (NPS) water pollution does not originate at single point sources, such as industrial or municipal wastewater discharge pipes, but comes from many diverse sources in the environment. When it rains or snow melts, water runs off streets, parking lots, lawns, and agricultural fields and carries with it pollutants such as motor oil, sediment, fertilizer (nutrients), bacteria and pesticides. These pollutants are then carried, untreated, to the nearest stream or lake through surface water runoff or storm sewers; or they infiltrate into ground water. Untreated runoff is a significant source of water quality problems in Indiana; and sediment, nutrients, and bacteria are the leading pollutants of concern. The *2016 Indiana Integrated Water Monitoring and Assessment Report* states that nonpoint sources impact 16,040 miles of Indiana's streams, and pathogens are the top cause of stream impairments. While some NPS pollution is naturally occurring, most of it is a result of human activities.

The federal Clean Water Act (CWA) was amended in 1987 to establish the § 319 NPS Management Program to control nonpoint sources of water pollution. § 319(h) provides the U.S. Environmental Protection Agency (EPA) with the authority to grant federal dollars to states to mitigate and prevent NPS pollution in accordance with the state's approved NPS Management Program. In Indiana, the *Indiana State Nonpoint Source Management Plan* (State NPS Management Plan) guides the usage of CWA §319 funds, which are administered by the Indiana Department of Environmental Management (IDEM), Office of Water Quality (OWQ), Watershed Assessment and Planning Branch (WAPB).

Environmental problems, such as NPS pollution, often cut across environmental media (land, air and water) land use types and political jurisdictions. Consequently, environmental mitigation and protection require a comprehensive and collaborative approach that works with a multitude of programs, agencies, and concerned citizens. A watershed approach provides a framework for coordinating and integrating these programs and resources. This approach directs the focus on water quality in a geographic area delineated by a watershed. A watershed is an area of land that drains to a particular waterway, such as a stream, lake, river, or wetland. Watersheds are delineated by the U.S. Geological Survey (USGS) using a national standard hierarchical system based on surface hydrologic features, and are classified into hydrologic units identified by a unique Hydrologic Unit Code (HUC). The HUC consists of two to twelve digits based on the level of classification (the longer the HUC code the smaller the watershed level). Indiana has thirty- eight 8-digit HUC watersheds (Figure 1). Each of these may be subdivided into smaller 10-digit and 12- digit HUC watersheds. By examining water quality issues on a watershed basis, problems can be observed in relationship to their sources so causes can be addressed in the most effective manner. The watershed approach is based on four basic principles:

1. Geographic focus based on hydrological rather than political boundaries;
2. Water quality objectives based on scientific data;
3. Coordinated priorities and integrated solutions; and
4. Diverse, well-integrated partnerships.

IDEM's ongoing effort to implement the watershed approach includes:

- Ensuring that internal resources continue to be focused on addressing the most significant water quality issues facing Indiana by conducting a periodic review of OWQ activities and making any necessary adjustments;

- Improving internal coordination between water quality assessment and watershed planning and implementation programs to facilitate an integrated watershed management approach to restoring impaired waterways; and
- Improving coordination with local watershed groups, community groups, and other state and federal agencies to better leverage efforts in ways that will achieve greater improvements in water quality.

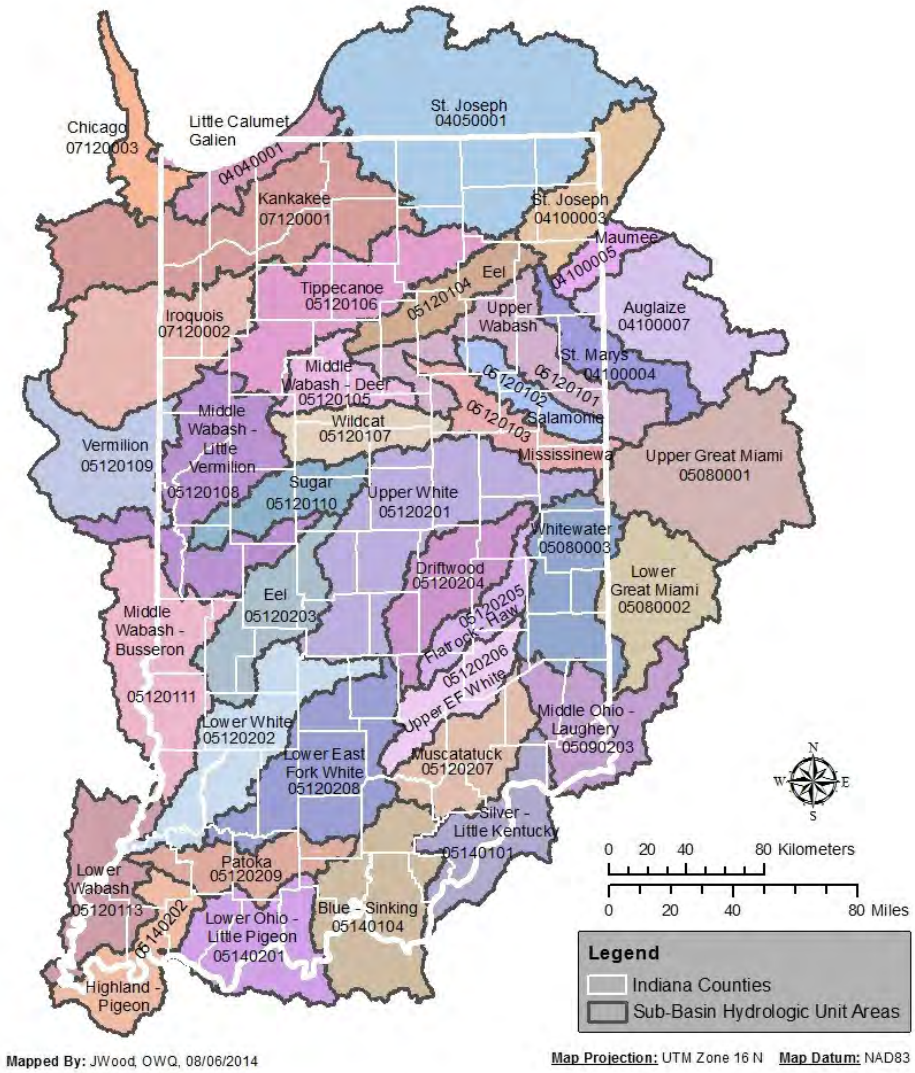


Figure 1 Indiana 8-digit HUC Watersheds

The 2017 Nonpoint Source Program Annual Report describes Indiana's progress towards meeting the goals, objectives, and milestones of the State NPS Management Plan during the Federal Fiscal year of October 1, 2016 through September 31, 2017, as well as the efforts and achievements of the many agencies, groups and individuals working at the state and local level to address NPS pollution in Indiana. It also describes how the §319 grant funds were utilized to help accomplish these goals.

Indiana's Nonpoint Source Management Plan

§ 319(b) of the CWA requires states to develop a NPS Management Program to control NPS pollution and guide the usage of CWA §319 funds. The NPS Management Program must be approved by EPA before §319 funds may be granted. EPA reiterated in its revised Nonpoint Source Program and Grants Guidelines for States and Territories, issued in 2013, that updating the NPS Management Programs helps states to identify strategic priorities, develop goals and milestones, work more effectively to address water quality problems, and engage partners to address statewide NPS priorities. Therefore, states must review and update their NPS Management Program every five years.

IDEM's approved *Indiana State Nonpoint Source Management Plan* (updated in 2014) is a vision and mission-driven strategy to address NPS pollution in Indiana. All goals, objectives, milestones, and measures of success are based upon the following two statements:

Program Vision:
The vision of Indiana's Nonpoint Source Program is to restore waters impaired by nonpoint source pollution and maintain water quality in healthy watersheds through locally led partnerships.

Mission:
To work with our partners to make measurable improvements in, and prevent degradation of, water quality by addressing nonpoint source pollution through education, planning, and implementation.

The State NPS Management Plan's five goals relate to: utilizing partnerships to define and address NPS issues; monitoring the status of those issues; providing outreach and education to citizens of the state to raise awareness of NPS issues; remediating the causes and sources of NPS pollution; and protecting areas already meeting water quality standards and those areas threatened by NPS pollution. The next revision of this Plan is expected to be completed in FFY 2018.

Nonpoint Source Management Goals and Progress

GOAL 1: UTILIZE PARTNERSHIPS TO LEVERAGE RESOURCES AVAILABLE FOR NONPOINT SOURCE MANAGEMENT

Cooperation with state, federal, local, and private partners is critical to Indiana's NPS Program's success. Coordinating with these partners optimizes the funds, staff, physical resources, and political capital available to work on NPS issues. IDEM's NPS Program utilizes multiple partnerships to reach diverse stakeholder groups and further NPS management goals in Indiana. Some of these partners and their achievements this year are highlighted below. A full accounting of progress made during FFY 2017 toward the objectives of Goal 1 in the State NPS Management Plan can be found in Appendix A.

Indiana Conservation Partnership

The Indiana Conservation Partnership (ICP) is comprised of eight Indiana agencies and organizations[1] who share a common goal of promoting conservation. To that end, the mission of the Indiana Conservation Partnership is to provide technical, financial and educational assistance needed to implement economically and environmentally compatible land and water stewardship decisions, practices and technologies. The ICP's soil health and nutrient management philosophies underpin its conservation initiatives in addressing the state's primary natural resource concerns.

The principles of soil health are to minimize disturbance, optimize soil cover, optimize biodiversity, and to provide continuous living roots. Nutrient management is best described by the 4 Rs- applying the right nutrient source at the right rate at the right time in the right place. Each ICP initiative has at least an element of it rooted in promoting the soil health philosophy and most have a direct effect on NPS management in Indiana. Some of these initiatives/programs include: the Conservation Cropping Systems Initiative, Infield Advantage, Pathway to Water Quality (2016 marked its 25th year as a permanent watershed exhibit at the Indiana State Fairgrounds), the State *Nutrient Reduction Strategy*, the Western Lake Erie Basin Interactive Story Map, and the Leadership Institute.

Many of these agencies also provide funding on a continuing or limited basis to address NPS pollution in Indiana, such as NRCS's Regional Conservation Partnership Program and ISDA's Clean Water Indiana (CWI) program. The ICP has committed to report load reductions of sediment, nitrogen, and phosphorus achieved by the practices installed under the agencies' various funding authorities as a partnership. Agency technicians were trained by IDEM NPS staff to use the U.S. EPA Region V model to calculate load reductions.

[1] IDEM, the Indiana State Department of Agriculture (ISDA), the State Soil Conservation Board, the Indiana Department of Natural Resources (IDNR), the Indiana Association of Soil and Water Conservation Districts (IASWCD), Purdue University Extension, the United States Department of Agriculture- Natural Resources Conservation Service (USDA-NRCS), and the USDA-Farm Service Agency (FSA).

2016 Key Highlights include[2]:

- Indiana landowners supported by the ICP installed nearly 18,000 new conservation practices in calendar year 2016. 10,780 of these practices had associated sediment and nutrient load reductions to Indiana waterways reducing:
  - 802,796 tons of sediment, enough to fill 8,029 fifty-foot freight cars stretching end to end from Terre Haute to French Lick
  - 1,672,067 lbs. of Nitrogen, enough to fill 8.25 fifty-foot freight cars
  - 823,929 lbs. of Phosphorus, enough to fill 4 fifty-foot freight cars
- Indiana landowners increased no-till acres on corn and soybean fields by 466% since 1990
- Indiana landowners increased conservation tillage acres on corn and soybean fields by 311% since 1990
- Indiana landowners increased cover crop acres on corn and soybean fields by 466% since 2011
- Indiana leads the nation in acres planted to cover crops, second only to Texas (which is more than 7 times the size of Indiana!)

2013-16 ICP Conservation Investment								
	Total Practices Installed	Total Public Conservation Investment	Total Private Landowner Conservation Investment	Total Investment	NLR Practices Installed	NLR Public Conservation Investment	NLR Private Landowner Conservation Investment	Total NLR Investment
CY2016	17,767	$44,353,735	$13,328,869	$54,023,763	10,602	$26,112,548	$9,588,988	$35,701,536
CY2015	19,296	$38,855,214	$12,726,470	$51,581,684	11,758	$26,713,414	$9,579,771	$36,293,185
CY2014	19,564	$30,106,330	$8,900,217	$39,006,547	12,958	$18,205,125	$5,904,048	$24,109,173
CY2013	26,042	$44,353,735	$12,408,434	$56,762,169	13,172	$24,907,442	$7,304,561	$32,212,003

Indiana State Nutrient Reduction Strategy

The latest version of *Indiana's State Nutrient Reduction Strategy* (SNRS) was submitted to U.S. EPA in November of 2016. It is the product of an inclusive effort of the ICP under the leadership of the Indiana State Department of Agriculture (ISDA) and the IDEM to capture statewide, present and future endeavors in Indiana which positively impact the State's waters as well as gauge the progress of conservation, water quality improvement and soil health practice adoption in Indiana. The SNRS represents Indiana's commitment to reduce nutrient runoff into waters from point sources and non-point sources alike. The objectives of this strategy include:

1.) Acknowledgment of the challenges facing the improvement of Indiana's impaired waters;
2.) Involvement and engagement of stakeholders in the state's efforts to reduce nutrient loads;
3.) Prioritization of HUC 8 watersheds and first-round HUC 12 watersheds;

[2] Indiana State Department of Agriculture. 2016. Indiana Conservation Partnership 2015 Conservation Accomplishments. Indianapolis (IN): ISDA, Division of Soil Conservation. 2017 March 31.

4.) Discussion of water quality monitoring and regulatory control of point sources;
5.) The inventory and utilization of resources to achieve their highest impact on nutrient reduction;
6.) Encouragement of voluntary incentive-based conservation through the many state and federal water quality related programs; and
7.) To illustrate the means by which the state will provide reports and accountability of assisted conservation practices reported by staff in the Indiana Conservation Partnership.

Indiana's *Domestic Action Plan for the Western Lake Erie Basin*

Indiana has been an active member of the Nutrients Annex 4 Binational Subcommittee (Subcommittee) of the Great Lakes Water Quality Agreement (GLWQZ) since its establishment in 2013. The Subcommittee is charged with coordinating actions to manage phosphorous loadings and concentrations in the Great Lakes, commencing with Lake Erie. One of the commitments under the Nutrients Annex is for each of the member states to develop a *Domestic Action Plan* (DAP) by February of 2018 that is designed to meet the nearshore and open water phosphorous objectives and loading targets for Lake Erie. Indiana's goal is to meet the spring-time flow weighted mean concentration (FWMC) targets of 0.23 mg/L and 0.05 mg/L for total phosphorus (TP) and dissolved reactive phosphorus (DRP) respectively in the Maumee River as it flows across the border into Ohio.

On August 14th, 2017 Indiana's draft DAP was put on public notice for a 60-day public comment period and a series of public information meetings. Founded on the principle of adaptive management, it is the product of a dedicated Advisory Committee comprised of representatives from different stakeholder sectors and led by the IDEM. The focus of Indiana's DAP is the Western Lake Erie Basin (WLEB) as Indiana's only tributary to Lake Erie is the Maumee River, which has its mouth in the WLEB at Maumee Bay near Toledo, Ohio. The DAP is informed by the intensive planning, research and steadfast work that is already underway in the WLEB. It is in keeping with the principles and approaches in Indiana's *State Nutrient Reduction Strategy.* Based on the comments received and a further refinement of small scale watershed prioritization, the Advisory Committee will revise the DAP after the public comment period ends and prior to the February 2018 deadline.

United States Department of Agriculture - Natural Resources Conservation Service

The NRCS mission statement is "Helping People Help the Land." Through financial and technical assistance, NRCS works with private landowners towards productive agriculture and a high-quality environment. The guiding principles of NRCS work are service, partnership, and technical excellence. NRCS' primary customers are people who make decisions about natural resource use and management on non-federal land. This includes governments with a responsibility for natural resource use and management.

NRCS assists landowners in Indiana to develop conservation plans and provides technical assistance for natural resource management, including helping to install conservation practices and systems that meet technical standards and specifications. NRCS also provides financial assistance through incentive programs, easement programs, grants, and stewardship payments. NRCS utilizes targeted initiatives to work with partners on protecting critical natural resources in areas of concern. NRCS' standards and specifications are utilized for many of the cost-share practices implemented through §319 grants, and NRCS Farm Bill conservation programs are utilized as one funding source for implementing local watershed management plans.

For Federal Fiscal Year (FFY) 2016[3], NRCS programs in Indiana that support NPS pollution reduction/amelioration efforts included:

Conservation Stewardship Program

The Conservation Stewardship Program (CSP) is a voluntary conservation program that encourages producers to address resource concerns in a comprehensive manner by undertaking additional conservation activities and improving, maintaining, and managing existing conservation activities. Indiana received over $1.5 million in CSP funding in FFY 2016. A total of 102 new contracts received funding to treat nearly 86,893 acres of cropland, pasture and forest.

Emergency Watershed Protection

The Emergency Watershed Protection Program (EWP) responds to emergencies created by natural disasters and is designed to help people and conserve natural resources by relieving imminent hazards to life and property caused by floods, fires, windstorms, and other natural occurrences. Two EWP contracts for approximately $850,000 were completed in FY16.

Environmental Quality Incentives Program

Indiana received over $23.8 million in EQIP funding in FY16. A total of 864 contracts were entered into that will address natural resource concerns on 124,132 acres of land over the life of the contracts. These contracts provided financial assistance to help plan and implement conservation practices that address natural resource concerns and for opportunities to improve soil, water, plant, animal, air and related resources on agricultural land and non-industrial private forestland. EQIP offered several targeted initiatives that provided funding to specific geographic areas and/or resource concerns. These included the On-Farm Energy Initiative, Organic Initiative, and State Specialty Crop.

Agricultural Conservation Easements Program

The Agricultural Conservation Easement Program (ACEP) provides financial and technical assistance to help conserve agricultural lands and wetlands and their related benefits. Under the Agricultural Land Easements (ALE) component, NRCS helps Indian tribes, state and local governments and non-governmental organizations protect working agricultural lands and limit non-agricultural uses of the land. Under the Wetlands Reserve Easements (WRE) component, NRCS helps to restore, protect and enhance enrolled wetlands. The Agricultural Conservation Easements Program consolidates three former programs - Wetland Reserve Program, Grassland Reserve Program, and Farm and Ranchland Protection Program. During FFY 2016, NRCS helped Indiana landowners protect and restore 1,645 acres of wetlands under WRE.

Regional Conservation Partnership Program

The Regional Conservation Partnership Program (RCPP) promotes coordination between NRCS and its partners to deliver conservation assistance to producers and landowners. NRCS provides assistance to producers through partnership agreements and through program contracts or easement agreements.

[3] Final program numbers for FFY 2017 are not available until after October

RCPP combines the authorities of four former conservation programs – the Agricultural Water Enhancement Program, the Chesapeake Bay Watershed Program, the Cooperative Conservation Partnership Initiative and the Great Lakes Basin Program. Assistance is delivered in accordance with the rules of EQIP, CSP, ACEP and Healthy Forests Reserve Program; and in certain areas the Watershed Operations and Flood Prevention Program.

Collectively, RCPP projects included 21 contracts for over $557,000 on over 4,400 acres in FY16.

For FFY 2016, NRCS funded the following projects that affect Indiana:

1. University of Notre Dame's "Preventing Nutrient Loss from Indiana Farms: Watershed-Scale Pairing of Cover Crops and the Two-Stage Ditch" project – The project will assist with adoption of cover crops on 85 percent of cropland, and two-stage ditches along the majority of channelized ditches, in two targeted 12-digit watersheds – the Shatto Ditch watershed (HUC 051201060401) and Kirkpatrick Ditch (HUC 071200020403). Through water quality monitoring, the project will quantify the soil and water quality/quantity benefits from the implementation of these practices in the watersheds. Based on preliminary research, 40 to 45 percent reductions in nutrient loss are achievable with this approach, which will be monitored at the watershed scale. A key component of the project is to accurately document the effect of these practices on environmental conditions (water and soil quality) and estimate the full costs and benefits for both public and private interests. In addition, the data will support modeling efforts that will allow for broader conclusions regarding the effectiveness of these conservation practices, regionally and beyond.

2. Tri-State Western Lake Erie Basin Phosphorus Reduction Initiative – A diverse team of partners will use a targeted approach to identify high-priority sub-watersheds for phosphorus reduction and increase farmer access to public and private technical assistance—including demonstrations of innovative practices that NRCS does not have approved standard for —in Michigan, Ohio, and Indiana. Identified actions are coordinated with the Ohio Phosphorus Task Force Report and will move Lake Erie toward goals developed in the Great Lakes Water Quality Agreement Annex 4 Nutrient Strategies. The partners will gauge success and monitor results using project-wide water quality monitoring and watershed modeling conducted by national experts from multiple scientific entities and institutions.

3. Michigan/Indiana St. Joseph River (Lake Michigan) Conservation Partnership – The partnership strives to find solutions to the increasing ground water withdrawals and sediment and nutrient loading that are economically good for the farmer but also have multiple conservation benefits, including optimizing ground water use, improving infiltration, and reducing nutrients and sediment while also improving wildlife and fisheries habitat. Innovative methods to target high- priority areas and appropriate conservation practices will take an already developed watershed management plan to the next level. Monitoring will be used to adaptively manage this project at various levels, from the field-scale to the entire watershed. Partners have a strong history of working with both NRCS and producers.

4. Big Pine Watershed- The Big Pine Watershed Partnership will engage the power of the supply chain and the trust of agronomy retailers to further conservation in Indiana's Big Pine watershed through the targeted implementation of nutrient and sediment reducing practices to achieve watershed water quality objectives. The Nature Conservancy, Benton County SWCD, Warren County SWCD, White County SWCD, and the Conservation Technology

Information Center (CTIC) are proud to partner with Ceres Solutions, Winfield and Land O'Lakes to scale targeted conservation in Indiana's Big Pine watershed. The Big Pine watershed, located in west-central Indiana, is a tributary of the Wabash River and part of the Mississippi River drainage.

5. Soil Health on Reclaimed Mine Lanes- The partners will work with farmers, landowners, and mine operators to implement a suite of soil health practices on reclaimed mine lands in order to improve the health of the soil, reduce the amount of sediment laden runoff reaching our streams and rivers, and improve wildlife habitat. The project will focus on the roughly 175,000 acres of reclaimed mine lands that are cropped in the Indiana counties of Vigo, Clay, Sullivan, Greene, Knox, Daviess, Gibson, Pike, Dubois, Warrick, and Spencer.

IDEM's NPS Program was involved in some way with each of these groups during the project development or application process for the award.

Mississippi River Basin Initiative

Through the Mississippi River Basin Healthy Watersheds Initiative (MRBI), NRCS and its partners work with producers and landowners to put in voluntary conservation practices that improve water quality, restore wetlands, enhance wildlife habitat, and sustain agricultural profitability in targeted watersheds in the Mississippi River Basin. Targeted watersheds must be identified on the State's list of 8-digit watershed priorities in the State Nutrient Reduction Strategy. IDEM cross-referenced eligible watersheds with approved watershed management plans and active watershed efforts to provide the Indiana State Technical Committee (ISTC) with a list of candidate watersheds with the capacity to implement the program and demonstrate success. The ISTC utilized that list, alongside information from other partners, to choose five 12-digit watersheds, three of which have IDEM-approved watershed management plans and groups ready to implement those plans: Little Wea Creek (HUC 051201080105), Prairie Creek (HUC 051202010601), and Tobin Ditch (051202010605). Two more watersheds are covered under the Big Pine Creek WMP: Big Pine Creek Ditch (HUC 051201080402) and Little Pine Creek (HUC 051201080403). In FFY 2016, 29 targeted MRBI contracts provided over $1,259,000 to landowners and treated 7,184 acres of land.

National Water Quality Initiative

The NRCS and the EPA collaborated in FFY 2012 on a national effort to increase agricultural BMPs in critical watersheds. This effort was called the National Water Quality Initiative (NWQI). Five percent of each state's Environmental Quality Incentives Program (EQIP) funds were to be dedicated to priority 12- digit watersheds with a goal of showing water quality improvement. In Indiana, NRCS coordinated with IDEM to choose four watersheds that met the following criteria: watershed is impaired (listed on the 2008 303(d) list) for pollutants associated with agricultural run-off; largely agricultural in land use; identified as critical areas in IDEM-approved watershed management plans; has a currently-active locally-led watershed group; there is a perceived willingness of producers to implement BMPs through EQIP; and there is a strong monitoring program in place to measure change. In addition, the NRCS State Technical Committee added a criterion for "drinking water source." The four 12-digit HUC watersheds chosen were Silver Creek (HUC 051201040501), Ell Creek (HUC 051202090405), Beargrass Creek (HUC 051201040509), and Eagle Creek (HUC 051202011108). In FFY 2016, NRCS contributed $310,080 under the NWQI to conservation efforts on 16 contracts in Indiana to treat 2,350 acres of land.

Under the national schema for the NWQI, monitoring for change at the stream/watershed level falls to

the state water quality agencies. In FFY 2014, IDEM partnered with the USGS, the Marion County Health Department, the Center for Earth and Environmental Science at Indiana University-Purdue University Indianapolis, and farmers to initiate monitoring at multiple scales on School Branch in Eagle Creek watershed (HUC 051202011108). IDEM began monitoring at its fixed station sites on School Branch in April 2014 and continued its monitoring through the 2016 federal fiscal year as well as providing funding to the USGS for its super gage. More information about monitoring for the NWQI can be found under Goal 2.

In addition, the IDEM NPS program has provided implementation funding for Silver Creek, Beargrass Creek, and Ell Creek watersheds through the §319 grant program. All of these watersheds are part of larger implementation efforts on a multiple 10-digit scale (Silver Creek and Beargrass – Middle Eel WMP; Ell Creek – Middle Patoka River Source Water Protection Plan).

Great Lakes Restoration Initiative

America's Great Lakes hold 21 percent of the world's surface fresh water, providing habitat for a variety of fish and wildlife and drinking water for more than 40 million people. Recreational and commercial fishing are one of the region's major industries, and the lakes facilitate transportation and commerce in the eight states that border the lakes. But the lakes suffer from pollution, caused by urban runoff and sprawl, sewage disposal, agriculture, industry and other sources. This pollution damages the aquatic ecosystems and poses risks to human health. In recent time, algal blooms in Lake Erie underscored the importance of continued conservation efforts in the region. Launched in 2010, GLRI helps NRCS accelerate conservation efforts on private lands located in targeted watersheds throughout the region. Through GLRI, NRCS works with farmers and landowners to combat invasive species, protect watersheds and shorelines from nonpoint source pollution, and restore wetlands and other habitat areas. Indiana received over $970,000 in GLRI funding in FY16. A total of 35 contracts were entered into that will address natural resource concerns on 8,601 acres of land over the life of the contracts.

Indiana Association of Soil and Water Conservation Districts

The mission of the Indiana Association of Soil and Water Conservation Districts (IASWCD) is to enable the conservation of the natural resources of Indiana. The IASWCD promotes the wise use of Indiana's natural resources by providing information and outreach in support of statewide efforts to develop and enhance Indiana's watershed programs that help address NPS pollution.

Indiana's Conservation Cropping Systems Initiative (CCSI) is a collaboration between the ICP organizations, the agriculture industry and Indiana farmers. With oversight from ICP representatives (including IDEM NPS Program staff) and administrative responsibility from the IASWCD, the CCSI promotes a systematic conservation approach to production agriculture through field days, seminars and one-on-one consulting. The systems approach to better soil health coupled with an innovative method for educating farmers, positively and directly improves soil structure, resulting in improved water infiltration, less runoff, decreased erosion, and reduced incidence of flooding – all impacting the sustainability and productivity of Indiana's soil and water quality. The program has grown to provide high level technical training for ICP staff and farmers so they can help provide technical assistance to others. Soil health measurements and economic case studies are also being conducted. A Director, Communications Manager, Program Manager, and Conservation Agronomist are current positions for this program.

Since its inception, CCSI partners have taken over 3800 samples in replicated strip trials with over 148

strips (data collected includes cover crop biomass and nitrogen (N) uptake, plant available soil N, soil moisture, soil temperature, basic soil fertility, corn leaf chlorophyll, stalk nitrate, and results from four soil health tests) and conducted over 200 educational events with audiences totaling over 7,000 farmers and agriculture professionals. In the fall of 2015, a survey was conducted and provided results of over 1.1 million acres of cover crops planted. This was an increase of 10% from the previous year. In 2016, just over 1 million acres of cover crops was once again planted.

Through the Annual Conference of the IASWCD, relevant sessions directly and indirectly address NPS pollution. This year the On the Ground, District Management, and Outreach and Education tracks provide a wide variety of topics. Expert presenters and facilitators shared their expertise and knowledge during this one-and-a-half-day event with designated sessions offering Continuing Education Units (CEUs). IDEM NPS staff participate on the planning committee for the conference and moderated two sessions of the 2017 Annual Conference. This annual event provides attendees with the opportunity to connect with other like-minded colleagues and hear inspirational speakers.

The IASWCD provides conference scholarships to qualifying SWCD supervisors. Twelve SWCD supervisor scholarships were awarded for the 2017 Annual Conference; thus, providing opportunities for additional supervisors to learn about the wise use and management of Indiana's natural resources, including NPS pollution prevention, and to bring this information back to their districts.

The IASWCD provides significant resources to the Pathway to Water Quality (PWQ) Exhibit; a popular fixture at the Indiana State Fairgrounds since 1993. The exhibit is an excellent watershed demonstration site, showing how proper management practices at home, on the farm and in business can protect our soil and water resources. The PWQ exhibit contains practical displays and information for anyone who uses the land. The PWQ exhibit is managed and maintained by the ICP. The IASWCD, through a 319 grant, provides a PWQ Coordinator to oversee the project and committee (about $12,000 total). Additional funds have been spent on upgrades to the exhibit such as pervious pavement, a green roof gazebo and a septic system display. IDEM participates on the PWQ Advisory committee and helps staff the exhibit during the Indiana State Fair each year.

The IASWCD *Conservation Update*, a biweekly electronic publication, communicates issues, events and resources in watershed management statewide. The *Conservation Update* is an excellent tool to acknowledge successful watershed practices through the Annual River Friendly Farmer Awards and the District Showcase Awards. The Indiana State Fair Farmer's Day provides an excellent setting for the award presentations. The Indiana Conservation Farmer of the Year and Friend of Conservation awards are presented annually during the Annual Conference of Indiana Soil and Water Conservation Districts. Acknowledgment through these venues, local and statewide media, and the *Conservation Update*, offer additional opportunities to increase public awareness and supports successful nonpoint pollution reduction practices.

The IASWCD Funding Resources web page can be accessed through the IASWCD web site. The web page is updated on a continual basis and provides pertinent development and education resources for Indiana's watershed groups, SWCDs and conservation partners. The web page features funding and grant information; organizational and professional development opportunities and a calendar of events.

The IASWCD is a member of the National Association of Conservation Districts (NACD), whose mission is to serve conservation districts by providing national leadership and a unified voice for natural resource conservation. The NACD, in partnership with USDA's NRCS, awarded in 2016, grants to two

Indiana districts (Hamilton County SWCD and Marion County SWCD) to help boost technical assistance for urban agriculture and conservation awareness and development. The Hamilton County SWCD hired two part time urban agriculture program associates. One associate is providing on-site technical assistance on how to develop and sustain an urban food plot and community gardens. The second associate position is focusing on education and developing partnerships within the county to encourage established or developing community gardens, as well as individual gardeners, to donate part of their yield to local food banks. The Marion County SWCD is working to develop the Urban Growers Exchange, which will be a catalyst for urban farming sustainability based on soil health.

Indiana State Department of Agriculture

The ISDA - Division of Soil Conservation (Division) works along with the State Soil Conservation Board (SSBC) to enhance the stewardship of Indiana's soil and water resources. This is done by providing face-to-face, on-the-land technical and financial assistance for implementing conservation practices, supporting Indiana's 92 Soil and Water Conservation Districts (SWCDs), and promoting the opportunities and benefits associated with caring for our soil and water resources.

The Division employs Resource Specialists throughout the state to directly assist landowners with the planning and implementation of conservation practices addressing specific soil and water resource concerns. Resource Specialists work with regional Conservation Delivery Teams (CDT) alongside staff from the NRCS and SWCDs. The ISDA Resource Specialists assist with the planning, survey, design, and construction of thousands of practices annually. The common practices that these professionals work on include but are not limited to filter strips, grassed waterways, forested and grassed buffers, water and sediment control basins, wetland restorations, and livestock watering systems. The Resource Specialists also work with the SWCDs to help them carry out Clean Water Indiana (CWI) programs, and assist with educational events for youth, adults and farmers/landowners.

The Division also employs District Support Specialists (DSSs) to work cooperatively throughout the state with the local SWCDs to develop conservation priorities, goals, and business plans, as well as assist in the design of programs that reach landowners and the general public on the husbandry and management of soil and water resources. They prepare and conduct trainings for SWCD supervisors and staff, assist SWCDs in expanding their capacity to fulfill their role in their communities, provide facilitation for strategic planning and similar sessions, and provide information, guidance and direct on-site assistance to SWCDs in carrying out their legal and operational responsibilities. The DSSs also provide guidance and assistance to the districts in applying for competitive CWI grants for implementing multi-district sediment and nutrient reduction projects.

Conservation Reserve Enhancement Program

The Conservation Reserve Enhancement Program (CREP) is designed to help alleviate some of the concerns of high nonpoint source sediment, nutrient, pesticide, and herbicide losses from agricultural lands by restoring buffers and wetlands to improve water quality, as well as protect land from frequent flooding and excessive erosion by planting hardwood trees in floodplain areas along rivers and streams. This program is possible through an agreement between the State of Indiana and the USDA-FSA. Program participants receive both state and federal incentives to voluntarily enroll in the program and install water quality and erosion prevention practices on environmentally sensitive land directly adjacent to eligible surface waters or land located in the floodplain. ISDA administers the CREP program on behalf of the State.

The program was first announced in 2005, covering three watersheds in Indiana with an acreage enrollment goal of 7,000 acres. The program expanded in August 2010 to include 11 priority watersheds touching 65 counties with an acreage enrollment goal of 26,250 acres. The expanded CREP area now includes Lower Wabash, Lower White, Lower East Fork White, Upper East Fork White, Middle Wabash-Busseron, Middle Wabash-Little Vermillion, Middle Wabash-Deer, and Upper Wabash Watersheds. Eligible practices through the CREP include permanent native grasses, hardwood tree planting, wildlife habitat, riparian forest buffers, filter strips, wetland restorations, and bottomland timber establishment.

CREP Progress to date includes over 11,690 acres of conservation practices installed utilizing $4,446,666 state dollars and protecting over 615 miles along Indiana's rivers, lakes, and streams. Enrollment in the CREP Program is over 14,479 acres. For every state dollar that is spent on CREP practices, the federal match is approximately $7-$10.

Clean Water Indiana Program

The Clean Water Indiana Program (CWI) was established by the Indiana Legislature to provide financial assistance to SWCDs, landowners and conservation groups. The financial assistance supports the implementation of conservation practices that reduce nonpoint sources of water pollution through education, technical assistance, training, and cost sharing programs. The CWI fund is administered by the Division of Soil Conservation under the direction of the SSCB.

The CWI Program is responsible for providing local matching funds as well as grants for sediment and nutrient reduction projects for Indiana's SWCDs. In 2017, 16 proposals were funded, totaling $938,651 and impacting 34 SWCDs. Applications for the 2018 CWI Grant cycle were accepted through September 15, 2017.

CWI also contributes critical state matching funds for Indiana's CREP, and supports the Indiana Conservation Cropping Systems Initiative (CCSI). The intent of CCSI is to promote a systematic approach to production agriculture focusing on continuous no-till/strip-till, cover crops, precision farming, nutrient and pest management, and conservation buffers resulting in improved soil quality, water quality, and profitability on Indiana cropland. The program carries out farm scale agronomic and economic research on soil health, and also educates farmers and those who interact with farmers on the benefits of soil health and conservation agricultural practices. There are regions throughout the state that include Hub Farms where research data is gathered, and demonstration sites exist for mentoring to producers that are interested in adopting new conservation measures on their farms.

INfield Advantage

INfield Advantage (INFA) is a proactive, collaborative opportunity for farmers to collect and understand personalized, on-farm data to optimize their management practices to improve their bottom line and benefit the environment. Participating farmers use precision agriculture tools, protocols, and technologies, such as aerial imagery and the corn stalk nitrate test to conduct in-depth nitrogen analysis on their own farms and to determine nitrogen use efficiency in each field that they enroll. This concept is considered adaptive management and generally results in changes that increase profitability of the producer and ultimately has a positive impact on water quality. This program was developed to address key challenges in advancing water quality goals in the state related to production agriculture. The adaptive management process has shown most growers can reduce their nitrogen rates by one-third while maintaining or increasing profitability. Field history information is also collected from every participating farmer – previous crop, manure history, manure applications, commercial N applications (including timing of application, form, and rate) and tillage. This information is combined with analysis

of results from the on-farm evaluation plots comparing different management practices (timing, form, application rate, etc.). All data collected through INFA are anonymous; reports can never be linked to a name or specific location. The data are reported back to the participating farmer as his/her individual farm data and as aggregate data results. The aggregate results can be used publically for educational purposes. INFA is funded through the Indiana Corn Marketing Council and the Indiana Soybean Alliance with checkoff funds, and is being offered at no additional charge to producers.

The program started in 2010 as a pilot project in Jasper County in northwest Indiana, and included 15 producers, 39 fields and 2,700 acres. It has expanded over the last 7 years to now include many areas of the state. In 2017, there are 36 groups including approximately 450 producers, approximately 1,080 fields, and about 75,000 acres.

Nutrient Load Reduction Modeling and Mapping

In 2013, the Indiana Conservation Partnership (ICP) began using the EPA Region 5 Sediment and Nutrient Load Reduction Model to determine the impact on Indiana's water quality achieved by conservation best management practices (BMPs) implemented on agricultural land. It is part of a collective effort to generate a comprehensive statewide picture of installed voluntary conservation practices. The model is used to analyze the sediment and nutrient load reductions achieved by conservation practices funded by state programs such as the CWI, CREP, IDNR's Lake and River Enhancement Program, as well as federally funded programs through § 319 administered by IDEM and the USDA's Farm Bill Programs like EQIP and CRP. The ICP utilizes the end products of this process to establish baselines and measure load reduction trends by watershed for each calendar year, allowing for prioritization of workload and staffing needs, all while serving as a tangible component of the Indiana Nutrient Reduction Strategy. Annual Accomplishment Reports that are generated as a result of this process can be found at http://www.in.gov/isda/2991.htm.

Cover Crop and Tillage Transects

To measure the impacts and trend of conservation tillage, Indiana begin conducting a Tillage Transect in the spring of 1990, which is a predetermined route and set of points on-the-ground survey, that measures the amount of residue left on the ground after planting. The ICP introduced a cover crop assessment to the spring survey in 2011 so that we could better tell the story of Indiana's conservation efforts. In 2014, a Fall Tillage and Cover Crop survey began to better assess the use of cover crops and the practice of conservation tillage in the fall after harvest. For more information, visit the Cover Crop and Tillage Transect Data page on the ISDA website.

Indiana Department of Natural Resources

Lake and River Enhancement Program

The Department's role in Lake and River Enhancement (LARE) is set forth in Indiana Code (IC 6-6-11). The Division of Fish and Wildlife administers the LARE program through financial grants to sponsors to reduce sediment and nutrient inflow to Indiana's lakes and rivers.

Since funding comes from the lake and river enhancement fee annually paid by boat owners when registering their boats with the Bureau of Motor Vehicles, the LARE program strives to insure the continued viability of Indiana's publicly accessible lakes and streams for multiple uses, including recreational opportunities. The IDNR Division of Law Enforcement also receives a portion of the

funds to conduct aquatic safety programs and maritime patrols.

Grants have been made available for technical and financial assistance to local and county agencies and non-governmental entities (such as a lake or homeowner association) for qualifying projects since 1989. In March of 2017, $1,203,165 in 53 grants was awarded to address control of invasive aquatic species and for sediment removal from publicly accessible lakes.

In July of 2017, 25 grants totaling $1,183,200 were awarded for new biological, diagnostic, design and construction projects on lakes and rivers as well as several new and continuing Watershed Land Treatment (WLT) projects with County Soil and Water Conservation Districts. These latter efforts include a partnering with willing land users working to put in place various measures to address NPS pollution such as the installation of filter strips, cover crops, and conservation tillage.

Several of the most recent projects include active measures to improve aquatic habitat. One of the LARE funded grants in 2017 will provide assistance in the removal of low head dams which will increase aquatic passages and enhance recreational opportunities. Some new projects will target streambank stabilization efforts and stabilization of shorelines on natural lakes. The end results of these efforts include enhanced opportunities for boating, fishing, and other recreational pursuits, as well as increased economic value for businesses, communities, and individuals who live on or use these water bodies.

Indiana Lake Michigan Coastal Program

The purpose of the Indiana Lake Michigan Coastal Program (LMCP), funded primarily through the National Oceanic and Atmospheric Administration (NOAA), is to enhance the state's role in planning for and managing natural and cultural resources in the coastal region and to support partnerships between federal, state, and local agencies and organizations. The IDNR is the lead agency implementing the LMCP and the program houses a full-time Coastal Special Projects Coordinator who provides technical assistance, education and outreach, and coordinates efforts toward the achievement of management measures that combat sources of NPS pollution.

The LMCP makes available approximately $600,000 annually through the Coastal Grants Program for projects to protect and restore natural, cultural, and historic resources in Indiana's Lake Michigan coastal region. Project categories include land acquisition (example: riparian corridors), low cost construction (example: natural area restoration and BMP installation), education and outreach, and planning/coordination/management (example: land use planning and ordinance development). In the 2016 grant cycle project applications were received and grants awarded to coastal communities and organizations that will result in NPS runoff reduction and water quality improvements. Examples include storm water and drainage management planning, green infrastructure planning, water quality education for adults and youth, septic system outreach and education, and natural area land acquisition. The annual Request for Proposals for the LMCP Grant cycle is issued in July of each year.

As part of the Coastal Zone Act Reauthorization Amendments of 1990 (CZARA), Congress created a stand-alone provision, Section 6217, which requires that states and territories with approved coastal zone management programs develop a Coastal NPS Pollution Control Program to address water quality impairment of coastal waters. The purpose of the program is to develop and implement management measures for NPS pollution to restore and protect coastal waters. The DNR LMCP and IDEM §319 Program staff work together to coordinate with other state and federal agencies such as state and local health departments, DNR, NRCS , local SWCDs, and not for profit organizations to meet the requirements of this program. The LMCP Special Projects Coordinator is responsible for 6217

development and implementation through collaboration with federal, state, and local partners. Only one 6217 Coastal Nonpoint Pollution Control Program measure, Operating Onsite Disposal Systems, remains unapproved. To meet the measure the state must ensure that operating septic system are inspected at a frequency adequate to ascertain whether the system is failing. In order to assist with meeting this measure, the LMCP provided funding to Save the Dunes, one of the NW Indiana Septic System Coordination Work Group partner organization to develop and pilot a locally focused Septic System Outreach and Education Program. The community based "Good Neighbor" outreach program promoting proper maintenance and inspection was successfully piloted during June Coastal Awareness Month in two NW Indiana septic served communities. The Coastal Outreach and Education Program also funded an IOWPA Inspector/Installer Certification training and initiated a NW Indiana Realtor continuing education program on septic systems provided by the Indiana Dept. of Health. A "Point of Sale" septic system inspection ordinance was passed by the LaPorte County Health Dept. which was reviewed by EPA/NOAA and determined to fully meet the inspection measure for septic systems in LaPorte County. LMCP also applied for, and received, a § 319 grant to move forward on the septic system management measure by: mapping OSDS located within 500 ft. of surface waters; document negative environmental and public health impacts that result from septic system failures in NW Indiana; to educate local decision makers; and communicate the impacts that OSDS have on water resources, health and property to targeted audiences via social and traditional media, community trainings, workshops, and literature designed to raise awareness. LMCP will continue to work with all partners to meet the inspection measure in the coastal counties of Lake and Porter.

In September 2016 the NW Indiana Septic System Coordination Work Group promoted the annual EPA SepticSmart Week in the coastal region through distribution of SepticSmart education materials, community resolutions, and print and radio/television outreach. NW Indiana's efforts to promote community outreach during SepticSmart Week have been featured on USEPA's SepticSmart website and on webinars conducted for the EPA National Onsite Systems Work Group.

In June of each year the LMCP and partners celebrate Coastal Awareness Month by developing a wide variety of events highlighting the natural, cultural, and historic resources of the Indiana Coastal region. Many of the over 30 events focus on the importance of water quality protection and restoration in the Lake Michigan Watershed.

Healthy Rivers Initiative (HRI)

The Healthy Rivers Initiative, led by the IDNR, is the largest conservation initiative to be undertaken in Indiana. The initiative includes a partnership of resource agencies and organizations who are working with willing landowners to permanently protect 43,000 acres located in the floodplain of the Wabash River and Sugar Creek in west-central Indiana and another 26,000 acres of the Muscatatuck River bottomlands in southeast Indiana. HRI partners include the IDNR, U.S. Fish & Wildlife Service, NRCS, and The Nature Conservancy of Indiana.

These projects involve the protection, restoration and enhancement of riparian and aquatic habitats and the species that use them, particularly threatened, endangered, migratory birds and waterfowl. This initiative will also be beneficial to the public and surrounding communities by providing flood protection to riparian landowners, increasing public access to recreational opportunities, and leaving a legacy for future generations by providing a major conservation destination for tourists.

At the conclusion of the first seven years of the HRI, in July of 2017, 35,968 acres of land are permanently protected, with 10,641 acres acquired by IDNR in the Wabash River and Sugar Creek Conservation Areas,

3,325 acres enrolled in the USDA Wetlands Reserve Program (WRP) that are not owned by IDNR to complement the existing 12,723 acres of state-owned land. In the Austin Bottoms Conservation Area along the Muscatatuck River, 4,405 acres were acquired; 2,385 acres were enrolled in WRP that are not owned by DNR, complementing the existing 2,489 acres of state-owned land. To date, a total of 13,663 acres are now open to the public for hunting, fishing, trapping, boating, and birdwatching through HRI.

Indiana State Revolving Fund Loan Program

The Indiana State Revolving Fund (SRF) Loan Program finances projects that abate or prevent NPS pollution of Indiana's waters. The SRF Program has traditionally provided low interest loans to Indiana communities for projects that improve wastewater and drinking water infrastructure. The program was expanded in 2004 to fund projects that meet the objectives in the State NPS Management Plan. The money loaned to these NPS projects is documented as match, when applicable, for the state §319 Grant Program. Eligible NPS projects must provide water quality benefits to their respective communities and may include one or more of the following:

- Wetland restoration/protection;
- Erosion control measures;
- Ground water remediation;
- Storm water BMPs;
- Source water and wellhead protection;
- Failing septic system - repair, replacement or connection to sewer;
- Brownfield remediation;
- Conservation easements; and
- Agricultural and waste management BMPs.

This reporting period, State Fiscal Year 2017 (July 1, 2016 - June 30, 2017), the SRF Program loaned $7.2 million to one regional sewer district on projects to reduce NPS pollution by extending sanitary sewers to areas with septic systems, thereby eliminating this potential source of pollution. Approximately 200 septic systems will be eliminated through this project. Throughout the life of the SRF NPS Program $252 million has been loaned for NPS purposes. Approximately 15,000 septic systems have been removed from service, eight Brownfield sites have been remediated and four communities completed storm water infrastructure projects.

The NPS Program has also made a specific effort to coordinate with the Clean Water SRF (CWSRF) Program to link loan applicants with local watershed groups. Each quarter, when the CWSRF's Project Priority List is made available, the NPS program identifies those applications that fall within an area covered by a watershed management plan (WMP) or a Total Maximum Daily Load (TMDL) report. The NPS program then determines, with the help of CWSRF staff, whether or not those applicants have taken advantage of the 0.5% interest break available for projects that include a NPS or green infrastructure project. If no such project has been identified, and a WMP includes a project that may help the applicant qualify for the reduced interest rate, the application is flagged for contact. However, over the last year or so, interest rates have dropped to 2%, which is the floor for the SRF Program. This means that no further interest rate cut is currently being offered for NPS projects. Interest rates are adjusted quarterly on the first of April, July, October and January.

GOAL 2: MONITOR AND ASSESS INDIANA WATERS FOR NONPOINT SOURCE IMPAIRMENTS AND IMPROVEMENTS

Without monitoring and assessment, it would be difficult to quantify the magnitude of the NPS pollution problem and gains made in water quality through NPS actions. In order to grasp the extent and impacts of NPS pollution in the state, IDEM uses several water quality monitoring approaches, including targeted and probabilistic monitoring designs, as outlined in the *Indiana Water Quality Monitoring Strategy 2017-2021.* Assessment of the data obtained through monitoring follows protocols outlined in the *2016 Consolidated Assessment and Listing Methodology*. Highlights of significant progress in monitoring and assessment of Indiana's waters for NPS during FFY 2017 are included below. A full accounting of progress made this year toward the objectives of Goal 2 in the State NPS Management Plan can be found in Appendix A.

IDEM Water Quality Monitoring

The OWQ conducts water quality monitoring and assessments each year to determine statistically the degree to which waters within a given basin support aquatic life, human health, and recreational uses. Water quality monitoring is conducted in a different basin each year using a probabilistic approach. In 2011, IDEM implemented a new water quality monitoring strategy in which monitoring is conducted in one of nine basins each year (Figure 2). This will result in a statistically comprehensive and updated data set for the entire state in 2019.

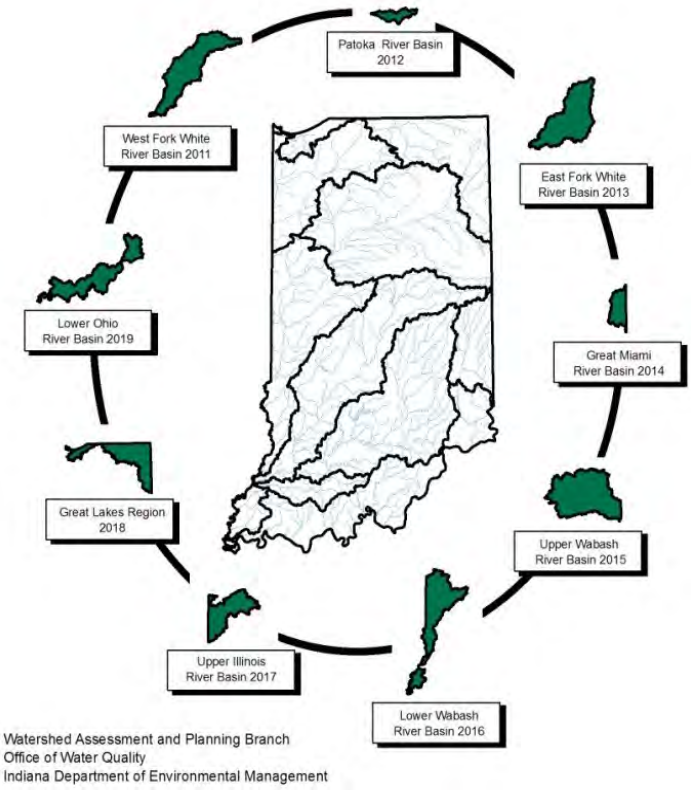


Figure 2 IDEM's 9-Year Rotating Basin Monitoring and Assessment Approach.

In 2017, IDEM sampled probabilistically in the Upper Illinois River Basin (HUCs 07120001, 07120002, and 07120003. The results of this monitoring effort will be used to:

1. Provide data on which to base statistical comprehensive assessments of state waters (305(b));
2. Provide data on which site-specific assessments can be made for the waterbodies' attainment of Indiana's designated uses (303(d));
3. Identify impairments for which TMDLs should be created for NPS and point sources; and
4. Provide baseline data for watershed management decisions, where possible.

IDEM's NPS monitoring also includes two types of targeted monitoring: performance measure monitoring (monitoring for success, measured under the EPA's SP-12 and WQ-10 measures) and baseline watershed characterization monitoring.

Performance Measures/Monitoring for Success (Measure W/SP-12 and Success Stories/WQ-10)

Part of EPA's strategy for showing improvement in NPS pollution impairment is through SP-12 and Success Stories submissions by the states. In order to show improvement, states must show that:

1) One or more of the waterbody/impairment causes identified in 2002 are removed, as reflected in EPA-approved state assessments, for at least 40% of the impaired water bodies or impaired stream miles/lake acres in the watershed; or
2) There is a significant watershed-wide improvement, as demonstrated by valid scientific information, in one or more water quality parameters or related indicators associated with impairments.

Targeted monitoring to measure water quality improvement as a result of NPS grant projects was initiated in 2009. Monitoring for success continued this period in the Headwaters Curtis Creek (HUC 071200020401), Elliot Ditch (HUC 051201080104), Kenny Ditch-Wea Creek (HUC 051201080106), Kilmore Creek (HUC 051201070306), Jenkins Ditch-South Fork Wildcat Creek (HUC 051201070308), and Ell Creek (HUC 051202090405) watersheds. Samples are still being processed and IDEM reserves judgment as to whether any of the sampling in these watersheds demonstrates improvement.

Baseline Monitoring/Watershed Characterization Studies

Two conditions led to the decision by IDEM to conduct baseline watershed characterization studies in a limited number of watersheds each year. First, many watershed groups in Indiana lack the expertise to set up and use equipment to conduct a monitoring program that will provide complete baseline data for their watershed management plans. Secondly, in order to meet the data quality objective of delisting, IDEM needs to have a scientifically-defensible baseline to compare with follow-up monitoring. Monitoring began in 2011 in the Plummer Creek watershed and has continued to the present for additional watersheds. In FFY 2014, it was further decided that all baseline projects would be conducted for the combined purposes of monitoring in order to prepare TMDLs and provide sufficient baseline monitoring to measure change after the preparation and implementation of a watershed management plan. Thus, the name of these studies has been changed to "Watershed Characterization" studies. Parameters sampled in watershed characterization studies from 2013 through 2017 include alkalinity (as $CaCO_3$), total solids, total suspended solids, total dissolved solids, sulfate, hardness (as $CaCO_3$), total phosphorus, nitrate+nitrite-nitrogen, ammonia nitrogen, total Kjeldahl nitrogen, water temperature, specific conductance, dissolved oxygen percent saturation, total organic carbon, chemical oxygen demand, turbidity, chloride, dissolved oxygen, pH, stream flow, *E. coli*, fish community, macroinvertebrate community, and habitat-related parameters (e.g. embeddedness, canopy cover).

Following is an update of all ongoing watershed characterization studies and studies closed in FFY 2017.

Salt Creek (HUC 0512020808) – During this reporting period twenty-eight sites continued to be monitored monthly for water quality parameters following a modified geometric design and targeted site selection as described in the *2016 Baseline Monitoring Workplan for the Lower Salt Creek Watershed.* Data collection began in November 2015 and was completed in October 2016.

Lower East Fork White River (HUC 0512020815) – Water quality monitoring in the Lower East Fork White River is scheduled to begin in November 2017, to be completed by October 2018. Eighteen sites will be monitored monthly for water quality parameters following a modified geometric design and targeted site selection. Specific site locations are currently being finalized.

Ground Water Monitoring

Ground water monitoring continues during the 2017 field season. The 2017 Ground Water Monitoring Network (GWMN) sampling season will focus upon determining the occurrence of naturally occurring arsenic found statewide. Across the State of Indiana GWMN sampling results for arsenic have been found at concentrations ranging from non-detect to levels well above the Maximum Contaminant Level (MCL) of 10 parts per billion (ppb) in over 11% of residential wells sampled. IDEM Ground Water Section staff will revisit sampled residents that have previously had reported levels of ½ the MCL of 5 ppb, and greater, to gain a better understanding of the statewide distribution of arsenic. The focus of the resampling will be to determine the specific concentration of two forms of arsenic, arsenic III and arsenic V, which are within a residential well to better understand this drinking water contaminant. Likewise, arsenic speciation is intended to assist residents in choosing appropriate treatment options for arsenic removal. In addition to arsenic speciation, wells tested during the 2017 field season will continue to be analyzed for over 400 point and NPS parameters, including nitrate, pesticides and pesticide byproducts. Ultimately, this type of sampling can provide the information needed to characterize causes, sources, and magnitude of NPS pollution in ground water.

Additional Water Quality Monitoring

Entities other than IDEM are conducting water quality monitoring programs around the state that are important to the NPS Program. Many §319 projects conduct monitoring as part of their work to reduce NPS pollution. These monitoring efforts and the subsequent data generated are shared and used by IDEM and others for many different purposes.

Hoosier Riverwatch Volunteer Monitoring Program

Hoosier Riverwatch (HRW), a program of IDEM's Watershed Assessment and Planning Branch, is a volunteer water quality monitoring initiative designed to increase public awareness of water quality issues and concerns by training volunteers to monitor stream water quality. The mission of HRW 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." This mission is accomplished through the following goals:

- Educate citizens on watersheds and the relationship between land use and water quality.
- Train citizens on the basic principles of water quality monitoring.
- Promote opportunities for involvement in water quality issues.
- Provide water quality information to individuals or groups working to protect water resources.
- Support volunteer efforts through technical assistance, monitoring equipment, networking opportunities, and educational materials.

HRW accomplishes its mission through providing monitoring equipment, supporting workshops to train volunteers, distributing water quality news to volunteers and stakeholders, and managing an online database as a repository of data collected by volunteers. In FFY 2017, HRW supported 20 (19 Basic and 1 Advanced) local workshops and will have educated and trained 180 water quality monitoring volunteers throughout Indiana. The program has distributed nine equipment packages to a variety of schools, non-profit, and government organizations. There are about 30 instructors currently with plans to train six more during the next FFY. The HRW Program maintains about 24 loaner trunks throughout the state, which contain all the equipment needed to monitor water quality. These trunks may be

borrowed by trained HRW volunteers for varying lengths of time.

The Hoosier Riverwatch Volunteer Stream Monitoring Internet Database was developed in the summer of 2000, about 4 years after the HRW Program became fully staffed. The online database was upgraded in 2016 (using §319 funds to contract with the developer) to update coding and allow the database to continue to function online. HRW monitoring groups utilize the database to enter data collected from their habitat, chemical, biological and flow sampling. Only volunteers who have completed a HRW training workshop may enter data. Anyone can view and download stream data entered into the database. This provides a unique opportunity for volunteers to share data; not only with one another, but also with others interested in the quality of Indiana's rivers and streams. This year, approximately 143 stream sites were sampled during approximately 400 sampling events and entered into the online database by volunteers.

Indiana Clean Lakes Program

The School of Public and Environmental Affairs (SPEA) at Indiana University (IU) has been working with IDEM through §319 funds to administer the Indiana Clean Lakes Program (CLP) since 1989. The Indiana CLP is a comprehensive, statewide public lake management program that includes public information and education, technical assistance, volunteer lake monitoring, and lake water quality assessment. Indiana has over 1,400 lakes, reservoirs, and ponds; many of which are under pressure from human activities like poorly managed land disturbing activities, suburbanization of lakeshores, boating impacts, and septic system discharges. These activities can result in erosion, sedimentation and excessive nutrient concentrations reaching lakes. This can lead to accelerated eutrophication and related undesirable effects including nuisance algae, excessive plant growth, murky water, odor, and fish kills.

Indiana's CLP is coordinated by IU-SPEA staff and students. The current grant agreement, which is in effect from March 2015 through January 2019, includes the following components:

- Annual sampling of 80 lakes and reservoirs (selected via a randomized approach) at one site for a variety of parameters;
- Training and support of a corps of volunteer lake monitors to collect water transparency data using a Secchi disk. A select volunteer group also collects Chlorophyll-a and total phosphorus data. Volunteers are also trained to identify aquatic macrophytes and aquatic invasive species, including Zebra mussels;
- Education and outreach through the production and distribution of the quarterly newsletter, *Water Column;* maintenance of the Indiana Clean Lakes Program website; preparation of brochures and fact sheets; and participation in the annual Indiana Lake Management Conference; and
- Providing technical assistance and expertise on lake-related issues.

§ 314 of the CWA charges IDEM with responsibility for assessing and reporting the trophic status and trend in trophic condition of Indiana's public lakes. The State of Indiana began assessment of lake nutrient levels and effects in the early 1970s. Continued monitoring is necessary to:

- Report the status of lake eutrophication levels to the U.S. EPA in the State's Integrated Water Quality Monitoring and Assessment Reports;
- Determine and track trends in eutrophication levels of lakes and reservoirs to inform restoration priorities and activities;
- Provide data needed to support development of nutrient water quality criteria, as required by

U.S. EPA; and

- Provide data needed to determine if lakes and reservoirs are meeting water quality criteria and supporting the beneficial uses designated in Indiana's water quality standards.

Over the years, the Indiana CLP has continually provided IDEM a wealth of data for its CWA § 314 and 305(b) assessments and for the development of its 303(d) List of Impaired Waters, which identifies waterbodies in need of restoration. These data are not only used to make waterbody-specific assessment and listing decisions, but the data set as a whole provided the foundation for the development of IDEM's assessment methodology for lakes and reservoirs. IDEM is currently evaluating Indiana CLP data for the development of its methods to assess drinking water use support for those lakes and reservoirs that serve as a public water supply. This work is ongoing. The Indiana CLP data, collected over more than three decades, have also been analyzed extensively by IDEM for the purposes of developing numeric nutrient water quality criteria for lakes and reservoirs. Although this work continues, the data set provided by the program and IDEM's analyses have helped inform the Agency's current approach to reducing nutrient loading to Indiana lakes and reservoirs.

Monitoring for the National Water Quality Initiative

IDEM is currently working with several partners to monitor at various scales in the School Branch watershed, part of the Eagle Creek watershed (HUC 051202011108), in Hendricks County, Indiana. This watershed is the focus of a collaborative, public-private partnership tied to the national initiative for agricultural conservation cropping systems (see National Water Quality Initiative discussed previously). IDEM has provided the USGS with §319 grant funds to investigate three reaches of School Branch to determine if differences in physical, chemical, and biological indicators of stream water quality and quantity are related to long-term agricultural conservation cropping systems in the watershed. USGS will collect and interpret scientific data about water quality and water quantity in the School Branch watershed for the first three 3 years of a 6-year study (the project began on January 11, 2016 and will end on January 10, 2019). The USGS will operate three monitoring stations to continuously measure stream discharge. Real-time water-quality sensors and representative sampling will be used to measure continuous and synoptic concentrations and loads of nitrogen, phosphorus, and suspended sediment in stream water at these stations. Continuous ground water levels and synoptic ground water quality will also be measured. Chemical indicators of water quality and hydrologic data will be used to understand the sources and transport of nitrogen, phosphorus, and sediment in the watershed. Biological inventories will be used as additional indicators of water quality. Data from the study will be communicated by the USGS through internet webpages, presentations, and publications. A second phase of the project is in planning to begin in 2019 and end in 2022.

The USGS will also be completing a Tile Drain Synoptic Study in which three tile drain synoptic surveys will be performed. Two will be performed during elevated flow events and one during stable flow. The USGS will measure flow, collect field parameter measurements, and collect a water quality sample from each flowing tile. Field parameters to be measured include dissolved oxygen, pH, specific conductance, temperature, and turbidity. The USGS laboratory will analyze the water quality sample for ammonia, nitrate +nitrite, nitrite, total nitrogen, orthophosphate, total phosphorus, *E. coli*, and total coliforms. The USGS will prepare and submit an electronic copy of a tile drain study report to the State based on the surveys by the close of the project.

In addition, IDEM will continue monitoring two fixed station sites on School Branch monthly; an effort that began in April 2014 and continued through FFY2017. IDEM and USGS data (as well as data collected by other project partners) will be evaluated to determine whether goals of the project have

been met.

External Monitoring and the External Data Framework

IDEM recognizes that numerous universities, municipalities, watershed groups and grassroots organizations throughout the state participate in water monitoring activities. There are also regulated facilities that conduct monitoring above and beyond their permit requirements. § 303(d) of the CWA requires that states consider all existing and readily available water quality data and related information in developing their 303(d) List of Impaired Waters. IDEM is required to actively solicit this information from external organizations for potential use in its 305(b) water quality assessments. Water quality data and information received from external organizations are reviewed for their usability in making assessments.

In 2015, OWQ began implementation of the External Data Framework (EDF) to provide a systematic, transparent and voluntary process for external organizations to submit their water quality data for consideration in various OWQ programs. The EDF describes OWQ policy regarding the agency use of external data, the guidelines for submitting data and the technical assistance necessary to facilitate greater collaboration between OWQ and external parties.

The EDF website is now active and available to the public. The website provides general information on the EDF along with a frequently asked questions (FAQ) page, data solicitation schedules and timelines, and a technical assistance page. OWQ has also developed a number of presentations and other outreach materials to promote participation in the EDF. The website offers two guidance documents: The *General Guidance for the Office of Water Quality External Data Framework,* which provides an overview of the EDF and addresses some of the more common questions regarding its structure, policies and participation; and the *Technical Guidance for the Office of Water Quality External Data Framework*, which provides more specific information regarding the requirements and recommendations of the EDF that external organizations can use to develop their monitoring plans, improve the quality of the data they collect, and determine whether data sets they obtain from others are suitable for use in their projects.

OWQ's EDF website also includes a page that describes three options for data submittal through OWQ's Secondary Data Portal. All participants in the EDF will enter the system through a single Secondary Data Portal where they may select to 1) enter their data online via user-friendly forms into a database that will produce a Microsoft (MS) Excel file formatted for upload into OWQ's Assessment Information Management System (AIMS) database, 2) use a MS Excel template provided by OWQ that can be directly upload into AIMS, or 3) request the development of an electronic data interchange that will automatically feed their data into OWQ's AIMS database. Once data are in the AIMS database, they will be reviewed and ranked based on their data quality and made available to OWQ staff for use in their programs and by request to the public.

Data may be submitted to the EDF at any time for consideration by the OWQ for potential use in its programs. OWQ programs can access data submitted through the EDF at different times depending on their varying needs. Two OWQ programs – the Integrated Reporting and TMDL Programs have more specific timelines in which they review the data submitted through the EDF. Regardless of when they are submitted, all data sets are reviewed by OWQ and evaluated for their potential use by OWQ programs. These data and their associated quality assurance information can be accessed by other programs within IDEM or the public by request to the Secondary Data Coordinator.

The OWQ recently secured funding through CWA Supplemental 106 (also called “Monitoring Initiative Funds”) to develop an online tool to help improve the data quality documentation that EDF participants provide with their data submittals. This tool will facilitate the design of water quality monitoring projects and the development of associated quality assurance project plans (QAPP) by participants in the EDF. The content needed for this technical assistance was developed with CWA Supplemental 106 funds in 2013. In addition to the development of technical assistance content, the contractor for the 2013 project provided a matrix to help IDEM choose the best platforms and software to use in delivering content to participants in a cost-effective way. IDEM has determined that this content will be best delivered online through an interactive interface that will benefit both OWQ and EDF participants.

With the proposed system, EDF participants will be able to:

- Fill out OWQ’s QAPP template online through a self-paced, guided process through a series of online forms;
- Access learning and other support materials in a variety of formats (video, downloadable documents, links to outside sources, etc.), tailored to their unique needs for a given section of the QAPP;
- Upload additional materials if needed to append to their QAPP; and
- Print their completed QAPP and/or deliver it to an OWQ employee to facilitate review of data they submit through the EDF.

Benefits for OWQ’s internal EDF processes include:

- The ability to deliver a large variety of technical assistance, tailored to individual user needs in a very streamlined way;
- The ability to check on the status of any QAPP in the system and to access the QAPP live on their computers to provide direct, real-time support to specific users when needed; and
- The ability to offer highly targeted technical, yet streamlined assistance to individual users via a “Help” section that will allow OWQ staff to embed responses to their questions within the sections of the QAPP to which they pertain.

OWQ has entered into an agreement with the developer and will begin this project in the third quarter of 2017. The project timeline provides a year in which to complete the work. However, OWQ anticipates it will be ready for participants to begin using much sooner.

GOAL 3: DEVELOP AND CONDUCT A STRATEGIC OUTREACH AND EDUCATION PROGRAM

There is a need to provide outreach and education to citizens of the state to raise awareness of NPS issues. Many citizens still do not have the basic knowledge or understanding of NPS pollution, living in a watershed, or behaviors that lead to water quality impairments. Without this understanding, they are less likely to change their behavior or support NPS reduction efforts. There is opportunity to work with partners on unified messaging regarding NPS pollution. IDEM realizes that any NPS messaging campaign undertaken by the agency should be consistent with partners across the state.

In the past year, IDEM's NPS Program refreshed its website to include updated information as a means to educate citizens on NPS pollution; provide grantees with information and guidance to successfully complete their NPS grant projects; share information about NPS grant projects and their successes; and communicate with stakeholders and partners on NPS efforts. IDEM has also continued to provide technical and/or financial support to education/outreach and training initiatives such as the Indiana Watershed Leadership Academy (IWLA) sponsored by Purdue University, the ICP's Training and Certification Program, and citizen monitoring training through Hoosier Riverwatch and the Indiana Clean Lakes Program. IDEM NPS staff continues to engage interested groups and communities, through direct contact, conference attendance, involvement in statewide and regional committees, and webinar and other training opportunities. A full accounting of progress made this year toward the objectives of Goal 3 in the State NPS Management Plan can be found in Appendix A.

Watershed Specialists

The Watershed Specialists work with watershed-based efforts throughout the state, providing financial, organizational and technical assistance to local watershed groups, while also continuing to serve as grant Project Managers. Key accomplishments for FFY 2017 are:

- Assisted approximately 62 active and developing watershed projects, 47 of which were (at some time) § 319/205j grant funded.
- Participated in the planning and conducting of the 2017 IASWCD Annual Conference, including moderating several sessions. Planning has begun for the 2018 IASWCD Conference.
- Assisted Purdue University with the Indiana Watershed Leadership Academy by participating in its steering committee, meeting the participants and explaining the Watershed Specialists' role, reviewing 20 participant assignments and providing feedback to participants, and attending their graduation to evaluate the class projects presented that day.
- Worked with others in the Watershed Assessment and Planning Branch to develop watershed characterization studies and SP-12/WQ-10 targeted monitoring sites.
- Worked with other agencies in the ICP to continue developing a Training and Certification program for partner employees, including training in the design and implementation of best management practices for water quality improvement and a possible watershed coordinator certification program.
- Continue to work with the IDNR Lake Michigan Coastal Program, NPS Coordinator to gain interim approval on the final outstanding element of the LMCP's Coastal NPS Management Plan, including creating a proposal that would help to move the program

forward on its final measure.

- Continued to participate in the ICP's Pathway to Water Quality advisory committee to improve this Indiana State Fair exhibit that reaches tens of thousands of Hoosiers each year. Also staffed the exhibit during the State Fair.
- Provided extensive support to the committee, led by IDEM, that is dedicated to creating the Domestic Action Plan for Indiana under Annex 4 of the Great Lakes Water Quality Agreement.
- Coordinated actions between the watershed characterization/TMDL project staff and the watershed group.
- Provided input on National Fish and Wildlife Foundation applications to the Sustain Our Great Lakes program.

Indiana Watershed Leadership Academy

IDEM is continuing to partner with Purdue University to conduct the Indiana Watershed Leadership Program to meet the needs of watershed coordinators, agency staff, and others that want to become more effective watershed leaders. Leading the development of a scientifically-sound watershed management plan that actively involves, engages, and is supported by the community requires people who have broad skills, and know how to employ diverse tools and strategies related to watershed management.

In the past 12 years, 325 people have participated in the Academy through which they have learned skills in organization and communication, watershed technology, geographic information systems, policy, watershed science, and leadership. Thirty-one participants attended the IWLA in 2017. Applications are currently being accepted for the 2018 IWLA class.

The IDEM NPS program participates in the IWLA in several ways. An IDEM Senior Watershed Planner is on the steering committee for the Academy. In 2017, the steering committee met once to discuss the success and future of the Academy. Staff from the NPS program reviewed twenty student assignments and provided feedback. NPS staff also attended one face-to-face session as a group to introduce IDEM's NPS program (particularly the Watershed Specialists) and network with potential new contacts. Watershed Specialists and the Senior Watershed Planner attended graduation and facilitated a small group activity to discuss how to make Academy projects useful to other watershed leaders in the state. In FFY 2017, IDEM forwarded a §319 proposal made by the IWLA to EPA for funding consideration.

Indiana Conservation Partnership Training and Certification Program

Since September 2009, IDEM has participated with other members of the ICP in developing a Training and Certification Program (TCP) to meet staff training and certification needs across the partnership. The ICP TCP operates as a volunteer planning team. In FFY 2017, the ICP TCP held the following trainings:

- May-June 2017 - Cropland Weed ID Workshops
- September 2017 – Prescribed Grazing and Pasture Plants ID
- Scheduled for October 2017 – Wetland Training

A partnership-wide survey was conducted in April 2011 to determine training needs across the ICP. This original survey was updated and redistributed in FFY 2017. These surveys will continue to guide

the ICP's Training and Certification Program.

Nonpoint Source Reduction Efforts Recognized

Individuals and watershed groups in Indiana work hard to improve water quality in their watersheds and educate others about NPS pollution. It takes the efforts of many people, many of them volunteers, to achieve the goals of the group and their watershed management plan. Most of the time, these efforts go unrecognized. Sometimes, however, an individual or a group will receive recognition for their efforts and achievements. Recognizing these people not only acknowledges the importance of their work and a job well done, it also educates others about NPS and watershed issues and hopefully encourages them to help make a difference in their watershed. This year, several watershed organizations/partnerships were recognized by different organizations for their efforts to reduce NPS pollution and improve water quality. IDEM also recognizes these groups for their work in education/outreach, BMP implementation, and leadership in reducing NPS pollution in their watersheds.

- The partners making up the Big Pine Creek watershed management effort (including Land O'Lakes, Inc., Winfield US, Ceres Solutions, Field to Market: the Alliance for Sustainable Agriculture, the Conservation Technology Information Center, and The Nature Conservancy) were highlighted in Land O'Lakes Inc.'s blog, "H2O so clean" for their work to improve Big Pine Creek and, by extension, the Wabash River. The partners are using a variety of methods and tools to educate farmers and influence agricultural practices in the watershed.
- The Huntington, Wells, Wabash, Blackford and Grant County SWCDs were selected by the Indiana Association of Soil and Water Conservation Districts as a District Showcase award winner for their project in the Lower Salamonie River Watershed area. The ICP group met with the Districts on November 2 to hear about their project and tour a portion of the watershed area.
- The Wabash River Enhancement Corporation was recognized by the Hoosier Chapter of the Soil and Water Conservation Society with a Certificate of Achievement for its work in engaging landowners in positive change along the Wabash River, resulting in significant load reductions (nitrogen, phosphorus, and sediment) to the river.
- The Washington County SWCD was selected for a 2016 District Showcase Award. The SWCD showcased the Mill Creek – Blue River project. A YouTube video describes the project at https://www.youtube.com/watch?v=1m4Jx_5_TpQ&t=12s.

GOAL 4: IMPROVE INDIANA'S WATER QUALITY, INCLUDING SURFACE AND GROUND WATER, BY REDUCING NONPOINT SOURCE POLLUTANTS SUCH AS NUTRIENTS, SEDIMENT, AND BACTERIA; RESTORING AQUATIC HABITATS; AND ESTABLISHING FLOW REGIMES THAT MIMIC NATURAL CONDITIONS

The heart of Indiana's NPS Program is its effort to restore waterbodies impaired by NPS pollution. A primary focus of IDEM's NPS Program is on-the-ground work to reduce NPS pollution and improve water quality. The Watershed Planning and Restoration Section (WPRS) administers two federal pass-through grant programs aimed at improving water quality in the state: CWA §319(h) and §205(j). Funding from these grants is predominantly used for the development and implementation of comprehensive WMPs that guide efforts to restore water quality on waterways impaired for NPS pollution. This has resulted in measurable improvements, especially in terms of stakeholder involvement and estimated pollutant load reductions. More work remains to fully restore and protect water quality. The WPRS also administers the TMDL program and the new 303(d) Vision, and efforts are underway to revisit and integrate both the NPS and TMDL program priorities. More information about the §319 and §205(j) grant programs and the TMDL program may be found on IDEM's website. A full accounting of progress made in FFY2017 toward the objectives of Goal 4 in the State NPS Management Plan can be found in Appendix A.

§ 319 Grant Program

The §319 Grant Program is a major resource for reducing NPS pollution in Indiana. FFY 2017 Indiana anticipates receiving $3,608,000 in §319 funds that will be used for NPS Program support (technical staff and administration) and ten NPS projects. As a result of our non-federal partnerships discussed under Goal 1, the Maintenance of Effort (MOE) level requirement under §319(h)(9) has been met this year.

Federal § 319 grant funds require a 40% non-federal match. Match for the NPS projects is provided by the project sponsor and its partners. Match for IDEM's staffing and program support activities is provided by the Indiana SRF Loan Programs administered by the Indiana Finance Authority. The SRF Loan Programs provide low-interest loans, funded by federal capitalization grants, to Indiana communities for projects that improve wastewater and drinking water infrastructure, including NPS projects that are tied to a wastewater loan. The federal funds loaned by the state and subsequently repaid by the borrower to the state are considered state funds. These funds are "recycled" to provide loans for other projects, and can be used as match for the NPS Program. To date, all of the SRF projects used for NPS Program match involve extending sewers to areas with failing and aging septic systems. Removing these septic systems eliminates NPS pollutants including pathogens and nutrients. Since extending sewers is considered a point source activity, only the homeowners' cost to decommission the septic tank and hook up to the lateral is documented as match.

§ 319 Funding Priorities

EPA recently placed an even stronger emphasis on using §319 funds to restore NPS impaired waters through implementation of watershed-based (i.e., watershed management) plans. States must use at least 50% of their annual appropriation of §319 funds (called watershed project funds) to implement WMPs in watersheds containing one or more impaired waters. States may use a limited amount of these funds to protect identified unimpaired/high quality waters if doing so is identified as a priority in the updated State NPS Management Plan. Protecting sensitive, vulnerable, and high quality

waters of the state is Goal 5 of Indiana's updated State NPS Management Plan. The other 50% (or less) of the total appropriation may be used for other activities that support the goals of the NPS Management Program including education, watershed planning, and program support.

Each year, IDEM solicits applications for projects that will reduce NPS pollution in Indiana's rivers, streams and lakes and meet our NPS Program goals. In an effort to more efficiently meet our goals and focus §319 funds on restoration activities that will make measurable improvements in water quality and protect water quality designated uses (recreation, aquatic life, and public water supply), IDEM established the following four priorities for FFY 2017 funds. Projects focusing on these priorities through planning and implementation activities are considered a priority for funding:

A. Develop a WMP or implement an IDEM approved WMP that will reduce nutrient loads within the following 8-digit Hydrologic Unit Code (HUC) watersheds (prioritized in Indiana's State Nutrient Reduction Strategy). See the NPS Priority Watersheds (FFY 2017) map for these HUC8 Priorities.

    1. Upper Wabash (05120101)
    2. Middle Wabash-Deer (05120105)
    3. Middle Wabash-Little Vermillion (05120108)
    4. Middle Wabash Busseron (05120111)
    5. Lower Wabash (05120113)
    6. Upper White (05120201)
    7. Lower White (05120202)
    8. Maumee River (04100003, 04100005, 04100007, 04100004)

B. Develop a WMP or implement an IDEM approved WMP that includes a 10-digit HUC watershed with a surface water drinking water intake and waters identified in Category 4A and 5A of the Draft 2016 §303(d) List of Impaired Waterbodies. This priority derives from Goal 5, Objective 5.2 of the Indiana State Nonpoint Source Management Plan. See the NPS Priority Watersheds (FFY 2018) map for the Drinking Water Priority watersheds.

C. Develop a WMP or implement an IDEM approved WMP that includes a 10-digit HUC watershed that impacts outstanding state resource waters and/or waters with endangered, threatened, or rare species. This priority derives from Goal 5, Objective 5.4 of the Indiana State Nonpoint Source Management Plan. See the NPS Priority Watersheds (FFY 2017) map for the Protection Watersheds.

D. Implement a WMP that meets the IDEM 2009 Watershed Management Plan Checklist.

§ 319 Grant Projects

Grant applications are submitted each year by project sponsors, reviewed by a committee of WPRS staff, and selected for funding based on the NPS Program's priorities and the quality of the proposal and project. Projects are administered through grant agreements that spell out the tasks, schedule and budget for the project. Projects are normally two to three years long and work to reduce NPS pollution and improve water quality in the watershed through: development of watershed management plans that meet IDEM's WMP Checklist (and EPA's required nine elements); implementation of approved WMPs via a cost-share program to implement BMPs in critical areas that address the water quality concerns outlined in the WMP; and education and outreach designed to bring about behavioral changes and encourage BMP implementation. IDEM Project Managers work closely with the project sponsors to

help ensure that the project runs smoothly and the tasks of the grant agreement are fulfilled. Site visits are conducted at least quarterly to touch base with the project, provide guidance and technical assistance as needed, tour the watersheds and see the BMP installations, and work with the grantee on any issues that arise to ensure a successful project close-out.

All ten projects funded in FFY 2017 address one or more of the NPS Program priorities. These projects will be developing or implementing WMPs in watersheds with impaired waterbodies. Currently, there are thirty-seven open or pending §319 projects, of which twenty-seven are implementing watershed management plans and installing BMPs in critical areas of the watershed. Table 1 (page 39) lists some of these BMPs. These implementation projects are doing "on-the-ground" work in their watersheds that leads to NPS pollutant load reductions (as shown in Table 2, page 40), and improved water quality. A list of all §319 projects open or pending during this fiscal year is located in Appendix B. A map showing the watersheds throughout Indiana where water quality improvement projects (both §s 205(j) and 319, planning and implementation) are currently underway, ready to begin, or recently completed (2013-2017) is located in Appendix C.

Project information for all §319 projects is entered and maintained in EPA's Grant Reporting and Tracking System (GRTS) database. SRF or other projects used as match for the NPS Program are also entered here. GRTS enables EPA and states to demonstrate the accomplishments achieved with the use of §319(h) grant funds. The data is also used by EPA to respond to inquiries received from Congressional committees, the White House, and various constituent groups. Project information in GRTS includes the project schedule, budget, description, type of BMPs implemented, location of BMPs, estimated pollutant load reductions, and progress reports. Final reports and deliverables for all projects are also entered into GRTS. The public may view this information on the GRTS Home Page. § 319 projects that closed this fiscal year are summarized in Appendix D, along with a description of compliance with the Programmatic §319 Grant Conditions.

The NPS Program is continually working to update and improve guidance for grantees to help them as they work towards implementing their NPS grant project. Most information needed can be found on the IDEM web site; much of it in the NPS Grants Compendium, which is comprised of all the guidance, instructions and requirements for § 319/205(j) grantees. This year the NPS Program worked on drafting a guidance document for groups developing watershed management plans to help them select appropriate critical and protection areas in their watersheds it was finalized in 2016, and made available to watershed groups on an as-needed basis. A final version will be added to the NPS website in fall of 2017.

Project Highlights

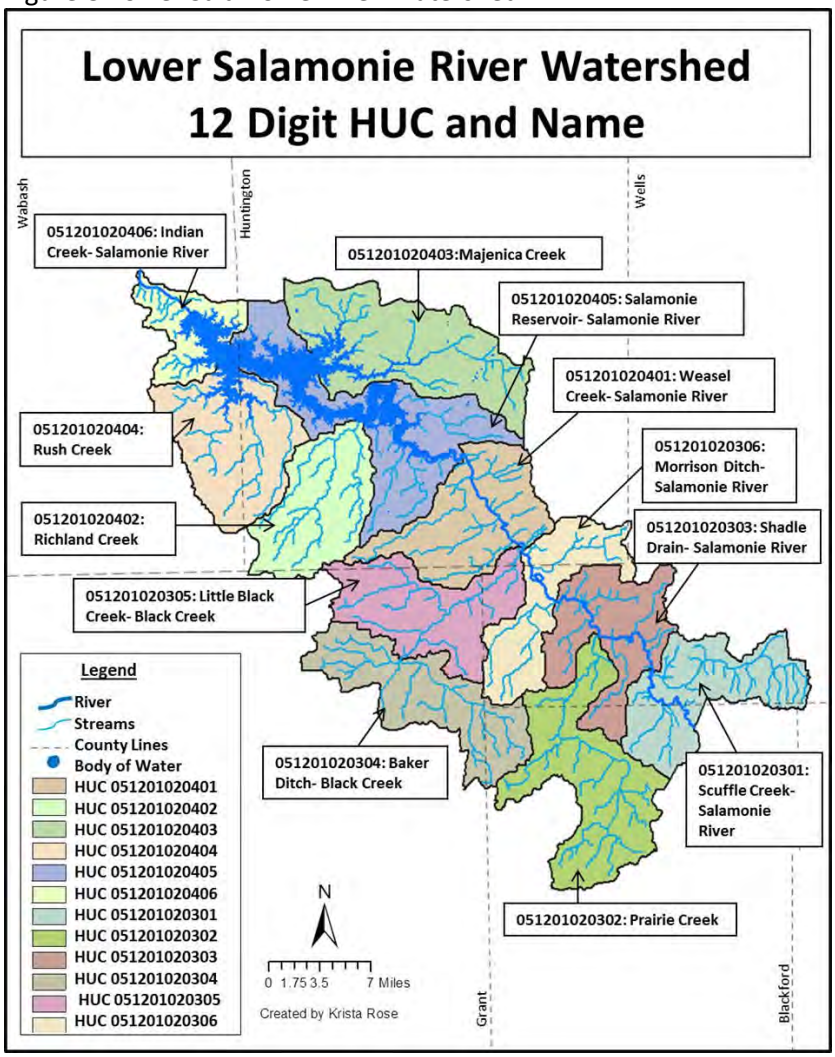
Three grant projects that were completed in FFY 2017 year are being highlighted here as examples of successful NPS projects working in different regions of the state to improve water quality through watershed planning, implementation of BMPs, and education/outreach. The information below was taken primarily from the projects' final report and watershed management plan.

Lower Salamonie River Watershed Management Plan and Implementation

The Salamonie River Watershed is an eight-digit HUC (05120102) that covers just over 352,900 acres. It encompasses portions of six different Indiana counties and is divided into 23 sub-basins. The Salamonie River originates near the Indiana-Ohio border in Jay County, Indiana, and flows to the northwest for approximately 60 miles before discharging into the Wabash River upstream of Lagro, Indiana. The focus

area for this WMP is the Lower Salamonie River (LSR) watershed which covers approximately half of the entire Salamonie watershed, including the Salamonie Reservoir. The LSR watershed consists of approximately 196,494 acres in Huntington, Wabash, Grant, Wells, and Blackford counties (Figure 3). The LSR watershed area extends from Montpelier in Blackford County to where it discharges into the Wabash River upstream of Lagro, Indiana. Twelve HUC 12 sub-watersheds fall within the LSR watershed.

Figure 3 Lower Salamonie River Watershed



The motivation behind preparing a watershed management plan for the LSR stems from known water quality problems within the Salamonie Reservoir. Sampling conducted by the Army Corps of Engineers (USACE) has indicated that excess nutrients are entering the reservoir via the Salamonie River and its tributaries. Sampling since 2009 has shown particularly high levels of phosphorous, nitrogen, sulfates, total organic carbon, and total suspended solids. These elements increase the turbidity and fertility of the waters flowing into the Salamonie Reservoir, where blue-green algae blooms occur 2 to 3 times per year. The following local agencies worked with the USACE on the project: Soil and Water Conservation Districts (SWCD) of Huntington, Wells, Blackford, Wabash, Jay, and Grant Counties, Huntington County Commissioners, County Health Departments, Indiana Department of Natural Resources (IDNR), Taylor University's Department of Earth and Science, Purdue Extension, Indiana Department of Environmental Management (IDEM), The Nature Conservancy, and Natural Resource Conservation Service (NRCS).

The Huntington County SWCD sponsored this 48-month project with the goals to: produce a Watershed Management Plan for the Lower Salamonie River (HUC 0512010203 and 0512010204). Develop, promote, and implement a cost-share program for best management practices (BMPs) that address the water quality concerns identified in the watershed management plan. Conduct a water quality monitoring program to identify chemical, biological, and physical conditions, define areas of concern, and monitor changes over time. Conduct an education and outreach program designed to bring about behavioral changes that lead to reduced nonpoint source pollution in the watershed.

Accomplishments

A comprehensive analysis of the Lower Salamonie River Watershed was conducted with guidance from the steering committee and stakeholders. In addition to a watershed inventory, a water quality monitoring program was conducted to establish a baseline of water quality. The Lower Salamonie River Watershed Group was selected by the Indiana Conservation Partnership as one of the District Showcase award winners for 2016. The group was recognized at the 2017 Indiana Association of Conservation Districts Annual Conference. The monitoring program included water quality chemistry at 13 sites from the summer of 2013 through 2016. Macroinvertebrate sampling and habitat analysis was conducted also following Hoosier Riverwatch protocols following the approval of the WMP by IDEM and EPA (October 2015).

Upon completion of the watershed management plan, the details of the $76,700 cost-share program were developed by the steering committee and project staff and submitted to IDEM for approval. Due to the diversity of the watershed, the cost-share program was designed for agricultural and urban participants. During the nine months of BMP implementation, nineteen people participated in the cost-share program. Twenty-seven producers installed cover crops on over 5,000 acres. Total load reductions from the project are estimated to be:

Sediment	5,526 tons/yr.
Nitrogen	15,254 lbs. /yr.
Phosphorus	7,642 lbs. /yr.

Education and outreach to stakeholders in the watershed was ongoing during the project and included: quarterly press releases and newsletters to educate the public on the project and water quality issues; public meetings to gather stakeholder concerns, discuss the WMP, and promote BMPs; an urban rain garden workshop; two agriculture field days focusing on agriculture issues and low impact design projects BMPs; and participation in many community events to educate the public on water quality issues.

Funding and Partnerships

The Lower Salamonie project utilized $260,900 in § 319 funds and $192,501 in match was provided. Partnerships in the project included the Wabash, Blackford, Grant and Wells County SWCDs, Taylor University-Department of Earth and Environmental Science, Indiana Department of Natural Resources, the Upper Wabash River Basin Commission along with Huntington County's Health Department, Tourism Bureau, Commissioners and Drainage Board.

Future Activity

A partnership with Taylor University has been very successful, and has been advantageous for both Taylor and the LSRW. Both parties are eager to continue the association. The University brings a lot of unique resources to the watershed, and discussions are already underway as to possible future projects in the watershed. Future projects will be aimed at better understanding the physical and societal aspects of the watershed, and how to best affect positive change.

Both the LSRW and Upper Salamonie River Watershed Group (USRW) began the process of watershed planning and implementation in response to the same problem; harmful algal blooms in the Salamonie Reservoir. Although there are differences in the individual watersheds, there are many issues in common. Therefore it is important that the two watersheds continue to work in cooperation, and join forces when practical. The two watersheds will continue their partnership to increase the efficiency, quality, and effectiveness of implementation efforts in the Salamonie River Watershed.

More Information

For more information on the Lower Salamonie Watershed Management Plan and Implementation project, please visit the Huntington County SWCD website at http://www.huntingtonswcd.org.

Lost River Watershed Implementation

Lost River is part of the Mississippi River Basin. Lost River Watershed Project area is comprised of two 10-digit hydrologic unit code (HUC) watersheds. They are Lost River Watershed (0512020813) and Dry Branch Lost River Watershed (0512020812). These two watersheds make up land that is comprised of 234,162 acres. Fourteen HUC 12 sub-watersheds fall within the Lost River Watershed. It encompasses portions of five Indiana counties. The headwaters of Lost River originate in western Washington County, Indiana. Lost River generally flows west into Orange County to a point where it sinks underground into the karst caverns below. Lick Creek and French Lick Creek join Lost River once it reemerges from the cave system through a series of springs. The water movement continues in the westward direction where it bisects the landscape with narrow meandering valleys through Martin County. Many small side tributaries contribute to Lost River as it traverses this terrain. Lost River completes its journey to the East Fork of White River. (Figure 4).

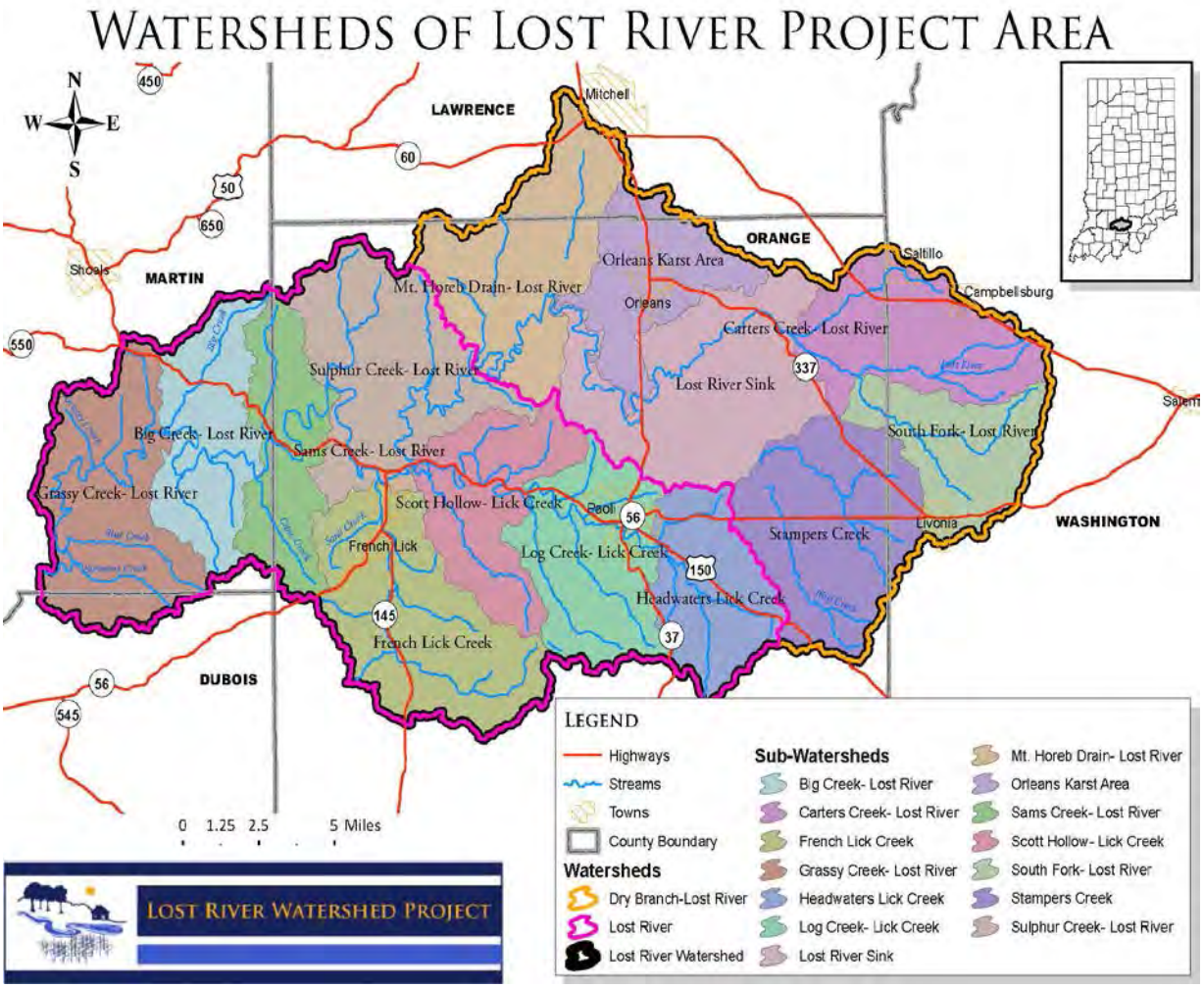


Figure 4 Lost River Watershed

Natural area including forest, scrub/shrub areas, and grassland comprise 48.4% of the total watershed area. Cultivated cropland is the next most predominant land use type comprising just over 26.2% of the total watershed area. An additional 15.7% of the watershed is pasture or hay fields making the total agricultural land use percentage almost 42% of the watershed. A total of 5.6% of the watershed is developed commercial, industrial, and residential areas as well as developed open space such as parks and golf courses. Lost River Watershed is seeing an increase in development due to the revitalization of French Lick. Tourism in the area is also increasing with this revitalization and the draw to Hoosier National Forest in the area.

In 2006, a water quality study was performed within Orange County for a LARE grant. Another study was completed for a LARE grant in 2011 within Martin County. The data from these studies were combined with the data collected through a 205j grant in 2011-2013 to provide a complete assessment of the cause of pollutants, prevention methods needed and educational resources needed in the watershed. The WMP produced through the original 205j grant in 2013 was used as the basis to direct cost share funding to critical areas of the Lost River Watershed for the duration of this current grant, in an effort to reduce the amount of pollutant overloading. A total of $248,217.45 of federal cost share dollars were spent on practices such as cover crops, conversion to no-till equipment, heavy use area protections, exclusion fencing and much more. Over $73,000 of state Clean Water Indiana, LARE and matching landowner funds were also spent in the Watershed during the reporting period on similar cost share practices.

In addition to the WMP and water quality studies, an education and outreach program was developed. Field days and workshops, visits to the classrooms of local elementary and high schools, visits to town councils, farmers markets and other organizations, Hoosier Riverwatch volunteer water monitoring trainings, as well as many other events, provided an avenue for educating a diversified group of people. Surveys were given out during some of these events to gain knowledge about the awareness of water quality issues among local landowners.

Future Activity

The three-year implementation project began in December 2013. The goals of the project were to reduce *E. coli* concentrations to below the state standard, reduce sediment and nutrient loads to below the water quality targets, increase public awareness of water quality issues, improve aquatic life, increase stream buffers, and decrease stormwater runoff.

More Information

For more information on the Lost River Watershed Management Plan and Implementation project, please visit the Orange County SWCD website at http://www.orangeswcd.org/.

Best Management Practices and Pollutant Load Reductions

Best management practices are structural, nonstructural and managerial techniques that are recognized to be the most effective and practical means to control NPS pollutants that are compatible with the productive use of the resource to which they are applied. BMPs are used in both urban and agricultural areas. A project that is implementing a WMP administers a cost-share program to help landowners implement needed BMPs in critical areas to reach the overall WMP goals. If the planning process was successful, landowners will be aware of the water quality problems in the watershed and the ways to reduce the NPS pollution and will be ready to participate in the cost-share program. When applicable and appropriate, IDEM encourages grantees to consider BMPs that will provide positive impacts to meet

multiple objectives. For example, in the waters of the Coastal Zone, restoration activities undertaken with §319 funds will also be in accordance with the CZARA § 6217(g) measures. IDEM is currently modeling this "bigger bang for the buck" concept through its TMDL/NPS Program. TMDLs are being written on the TMDL-WMP template that allows watershed groups to incorporate TMDL data into their WMPs and streamline the watershed planning process. In addition, IDEM is encouraging a systems approach to implementing BMPs. During a project's initial application and/or cost-share program development, IDEM encourages the project to work with landowners and prioritize cost-share recipientsthat implement a conservation cropping system (such as a nutrient management conservation system or a conservation cropping system for soil health and water quality) rather than a single BMP.

This FFY watershed groups continued working to implement WMPs and utilized approximately $702,396 to install BMPs in critical areas of Indiana's watersheds. Table 1 lists some of the BMPs implemented this FFY compared with the last two fiscal years based on data from IDEM's Access database. The number of acres of cover crops has continued to rise since FFY 2015, due in part to IDEM changing the cover crop policy to reduce the five year maintenance commitment to one year, as well as increased focus on this BMP within the agricultural community.

Table 1 BMPs Implemented in Indiana FFY 2015 – 2017

BMP	Approximate Number FFY 2015	Approximate Number FFY 2016	Approximate Number FFY 2017
Cover Crop (acres)	17,851	29,175	27,575
Fence (feet)	32,221	41,006	13,968
Grassed Waterway (feet)	18.9*	0	2,573
Heavy Use Area Protection (sq. feet)	159,042	53,140	43,918
Nutrient Management (acres)	6,794	515	4,108
Pasture and Hay Planting (acres)	374	465	21
Residue Management, No-Till (acres)	2,575	2,472	515
Tree and Shrub Establishment (acres)	91	352	17
Two Stage Ditch (feet)	0	6,968	2,868
Watering Facility (each)	21	13	9
Rain Barrels (each)	4	11	5
Rain Gardens (sq. feet)	26,573	20,305	392
Septic System Removal (each)**	0	250	***

*Reported in acres
**Septic systems eliminated as a result of SRF project(s) used as match for the NPS Program.
***Septic system removals totals for FFY will be reported after October 1, 2017.

Additional BMPs implemented this year include: access road, bioswale, conservation cover, critical area planting, diversion, forest stand improvement, forest trails and landings, grade stabilization structure, mulching, native plants, riparian herbaceous cover, roof runoff structure, subsurface drain, underground outlet, and water and sediment control basin. The number of BMPs implemented in a given year varies depending on many factors including the weather, the focus of current NPS projects' implementation efforts based on their watershed management plan, the change in focus and availability of other federal and state program grant funds, and changes in BMP promotion and recommendations in the agricultural community.

One important indicator of NPS program and project success is the quantity of pollutants that were

prevented from entering waterbodies as a result of BMPs implemented. Pollutant load reductions, in most cases, are estimated using the Region 5 Load Estimation Model. This simple Excel model provides a general estimate of pollutant reductions (sediment, phosphorus, and nitrogen) at the source level from structural and agricultural field practices and urban BMPs. Reductions achieved through practices related to nutrients (not tied to sediment), bacteriological, and pesticide management are not captured through this estimation method; another model or method for estimating these load reductions must be used. In addition to the Region 5 Model, the Spreadsheet Tool for the Estimation of Pollutant Load (STEPL) model also is available and is used by some groups in Indiana. This model uses simple algorithms to calculate nutrient and sediment loads from different land uses and the load reductions that would result from the implementation of various BMPs. For each watershed, the annual nutrient loading is calculated based on the runoff volume and the pollutant concentrations in the runoff water based on factors such as the land use distribution and management practices.

Estimated load reduction data for each BMP implemented as a result of the project (including BMPs not funded with §319 funds and used as match) is submitted by the project sponsor with their invoice and entered by the IDEM Project Manager into an Access database at IDEM and the EPA GRTS database. Estimated load reductions vary depending on factors including the type of BMP implemented, the number of acres treated, land use, soil type, and in some cases, rainfall amounts. Urban BMPs generally provide lower estimated load reductions than agricultural BMPs.

Reported estimated load reductions for BMPs implemented this FFY compared with the last two years are shown in Table 2. All load reduction data were obtained from IDEM's Access database. Estimated load reductions for nitrogen continue to improve each year as more projects are implementing WMPs and putting more BMPs on the ground. However, total phosphorus reductions this year and last year are lower than FFY 2015's exceptionally high number, which was a result of a couple of large nutrient management practices focused on phosphorus reduction.

Table 2 Reported Estimated Load Reductions for BMPs Implemented FFY 2015-2017

Nonpoint Source Pollutant	Estimated Reduction FFY 2015	Estimated Reduction FFY 2016	Estimated Reduction FFY 2017
Sediment (tons/yr.)	79,100	94,151	85,707
Phosphorus (lbs. /yr.)	188,590	118,781	92,510
Nitrogen (lbs. /yr.)	191,588	220,453	258,435
Biological Oxygen Demand (lbs. /yr.)	273	8,788	49
Chemical Oxygen Demand (lbs. /yr.)	1,555	701	282
Ammonia (lbs. /yr.)*	0	1,878	0
Suspended Solids (lbs. /yr.)	82,633	30,151	995
Pathogens/Coliform (CFU)*	0	7.79E+09	0
Lead (lbs. /yr.)	2	1	0
Zinc (lbs. /yr.)	4	1	0
Copper (lbs. /yr.)	0	0	0
TKN (lbs. / yr.)	256,197	0	2

*Estimated using a modified STEPL model and the OH Septic Load Reduction Spreadsheet

Cumulative total estimated load reductions reported in Indiana from §319 projects since FFY 2000 are shown in Table 3.

Table 3 Cumulative Total Estimated Load Reductions in Indiana

Nonpoint Source Pollutant	Total Estimated Reduction
Sediment (tons/yr.)	750,254
Phosphorus (lbs. /yr.)	1,156,197
Nitrogen (lbs. /yr.)	2,072,097

BMPs and Load Reductions in FFY 2017 by Major Basins

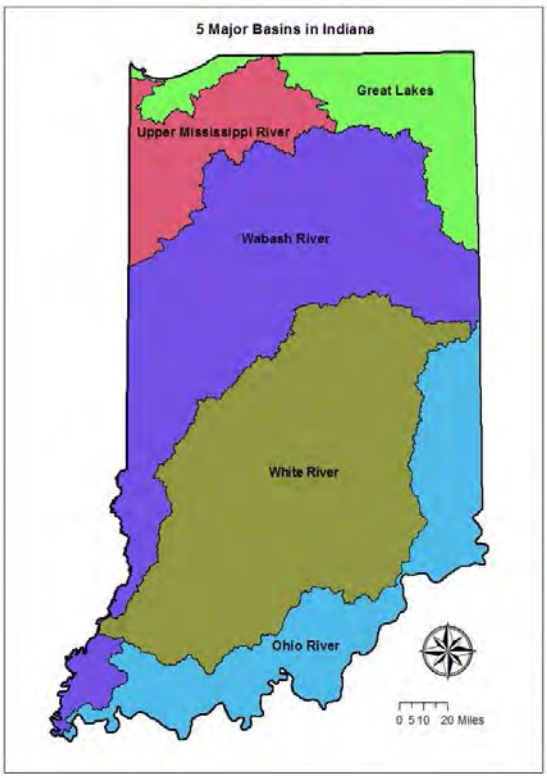


Figure 5 Major Indiana Basins

This map is intended to serve as an aid in graphic representation only. This information is not warranted for accuracy or other purposes. Data Source: Indiana Geographic Information Office Library. Map Projection: UTM Zone 16 N Map Datum: NAD83. Mapped By: J Wood, Office of Water Quality. Date: 08/06/2015

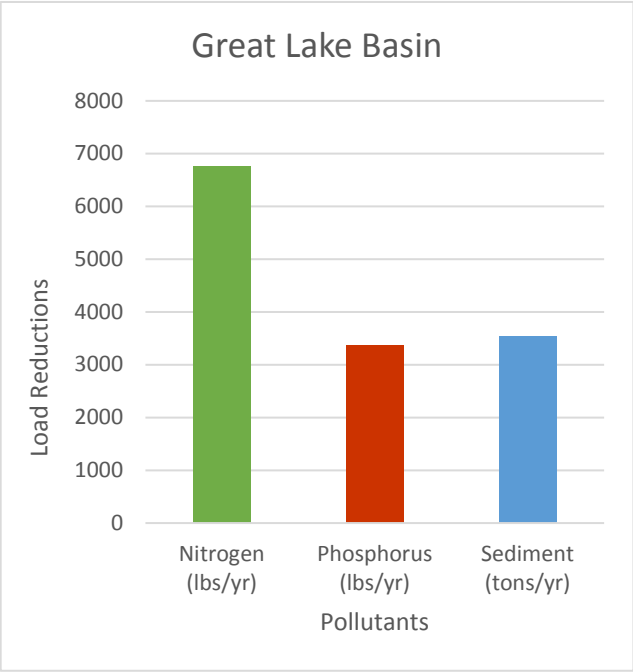
In an effort to the show the work that is being done in the different basins of the state and help target future resources, the load reductions achieved and the types of BMPs implemented have been broken down and shown within the following five major basins: Great Lakes, Upper Mississippi River, Wabash River, White River, and Ohio River (Figure 5). Almost 82 percent of Indiana (including the Wabash River and the White River basins) drains to the Ohio River and ultimately to the Mississippi River and Gulf of Mexico. Approximately 10 percent of Indiana drains to the Great Lakes (Lake Michigan and Lake Erie), and 8 percent drains (through Illinois) to the Upper Mississippi River.

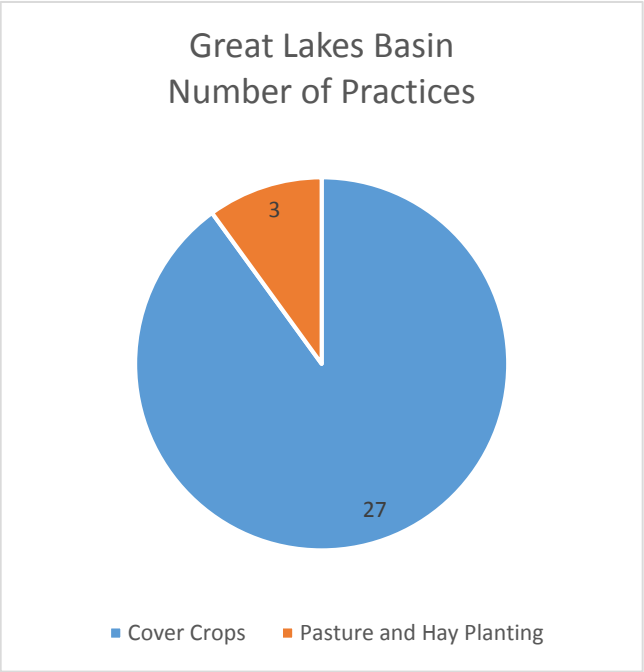
The charts on the following pages show the number of best management practices installed and the load reductions achieved in FFY 2017 in each of the five basins.

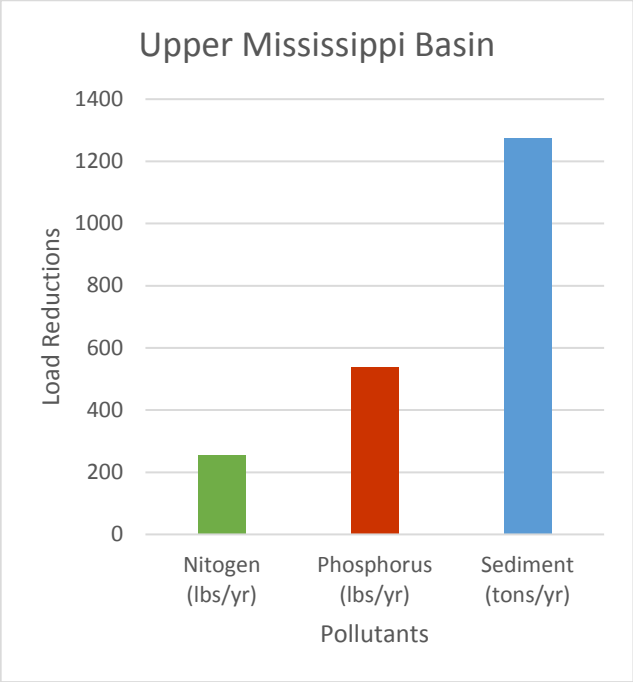
The BMPs implemented and load reductions achieved in the Great Lakes basin are the result of three projects working there this fiscal year; one project working in watershed draining to Lake Michigan and two in watersheds draining to Lake Erie. As seen from the charts below, many different BMPs implemented in this basin did a good job of reducing nutrient runoff, especially nitrogen.

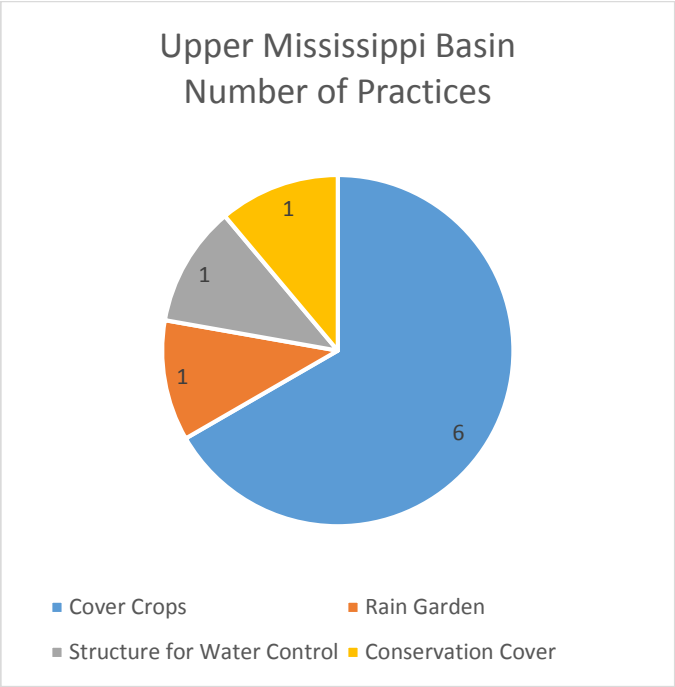
Any nutrient reduction to the Great Lakes is important because excess nutrients can result in algal blooms. Because of the recent problems resulting from large algal blooms in Lake Erie, phosphorus reduction to the lake has become a focus at the state and national level. Many

efforts are currently underway to target harmful algal blooms and reduce the amount of phosphorus entering Lake Erie. To that end, U.S. EPA Region 5 awarded $336,391 of FFY 2014 §319 funds to IDEM to initiate a Phosphorus Risk Reduction Pilot Project in the Upper Maumee River watershed in Indiana. IDEM awarded the money to the Allen County Soil and Water Conservation District to implement the project, which is modeled after a portion of Ohio EPA's FFY 2011 GLRI project "Lake Erie Nutrient Reduction Demonstration Watershed", based on a modified Ohio NRCS Phosphorus Index scoring system. The project started in early 2016 and will work for three years to reduce phosphorus runoff from an estimated 3,500 acres of agricultural land within five 12-digit HUC watersheds in the Upper Maumee watershed. Best management practices are expected to include filter strips, riparian forested buffer, pasture/hay planting, constructed wetland, grassed waterway, nutrient management, residue management and drainage water management.



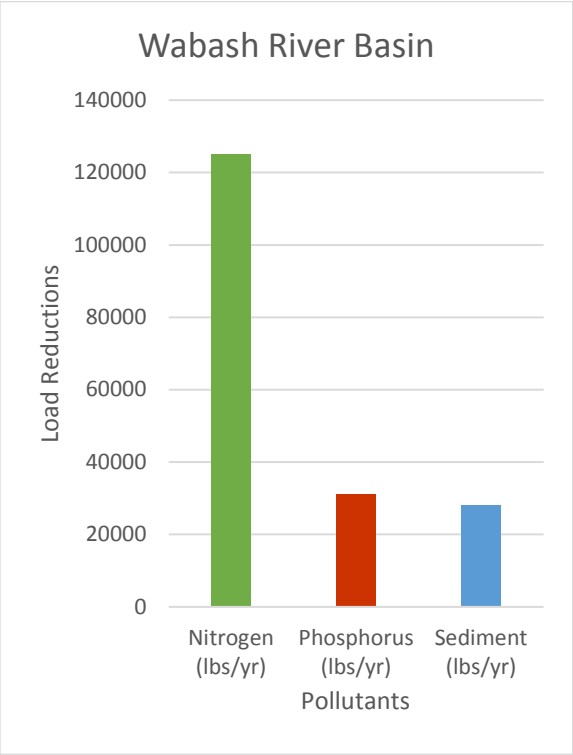


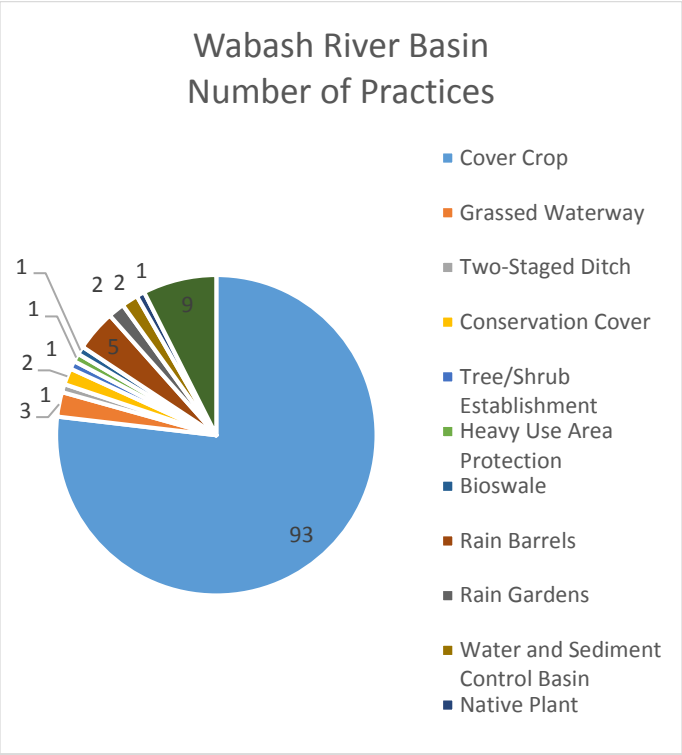




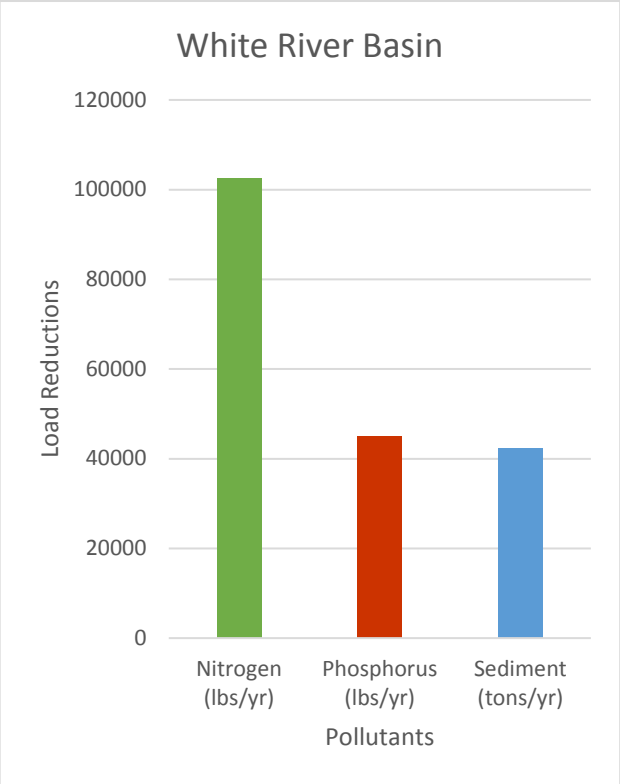
As part of the Mississippi River watershed, Indiana is involved in the Mississippi River/Gulf of Mexico Hypoxia Task Force and the strategy for eliminating the annual dead zone (or hypoxia zone) in the Gulf of Mexico. Nutrient loads from the Mississippi/Atchafalaya River Basin are contributing to eutrophication and harmful algal blooms in the Gulf. The development of *Indiana's State Nutrient Reduction Strategy* will benefit not only our state's local water resources, but ultimately the Gulf of Mexico and the Great Lakes.

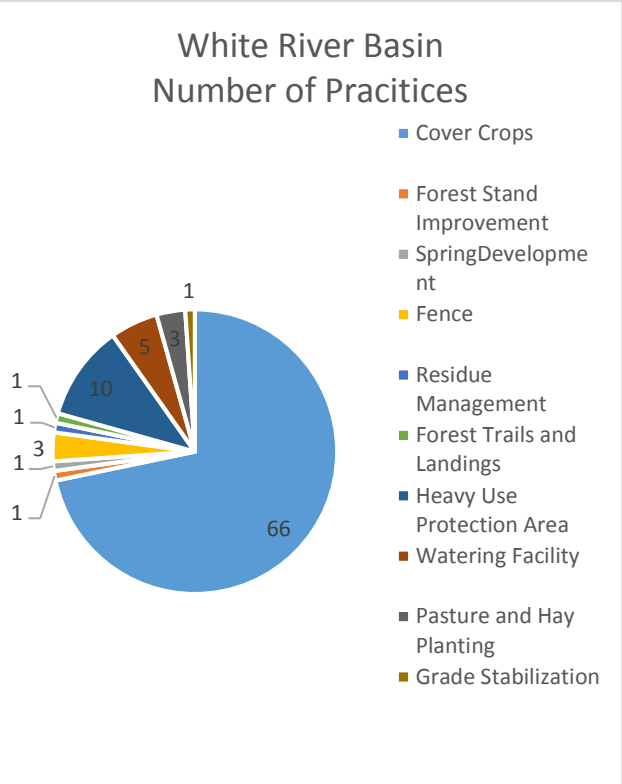
Eleven projects working in the Wabash River Basin this year reduced nutrient loads to the river as shown below. Although the number of BMPs implemented this year are less than last year, the estimated load reductions achieved for nitrogen nearly doubled.



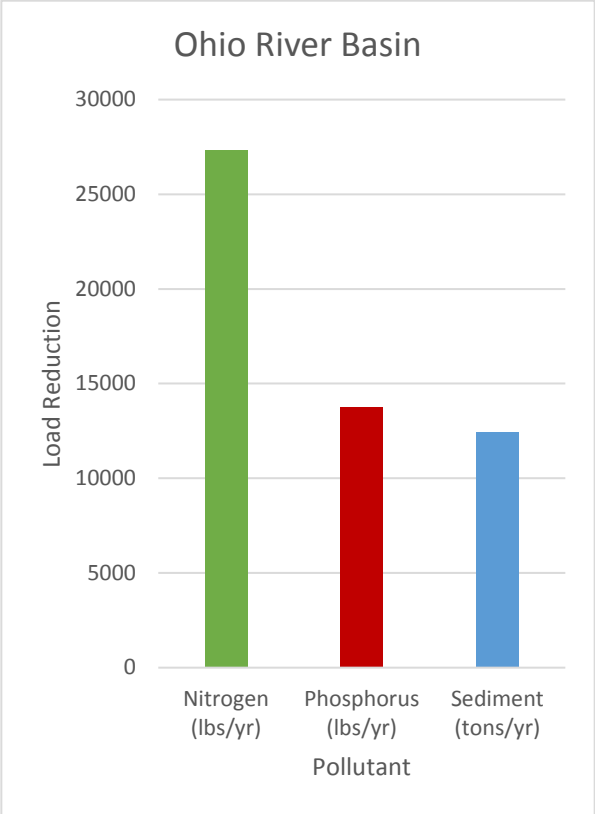


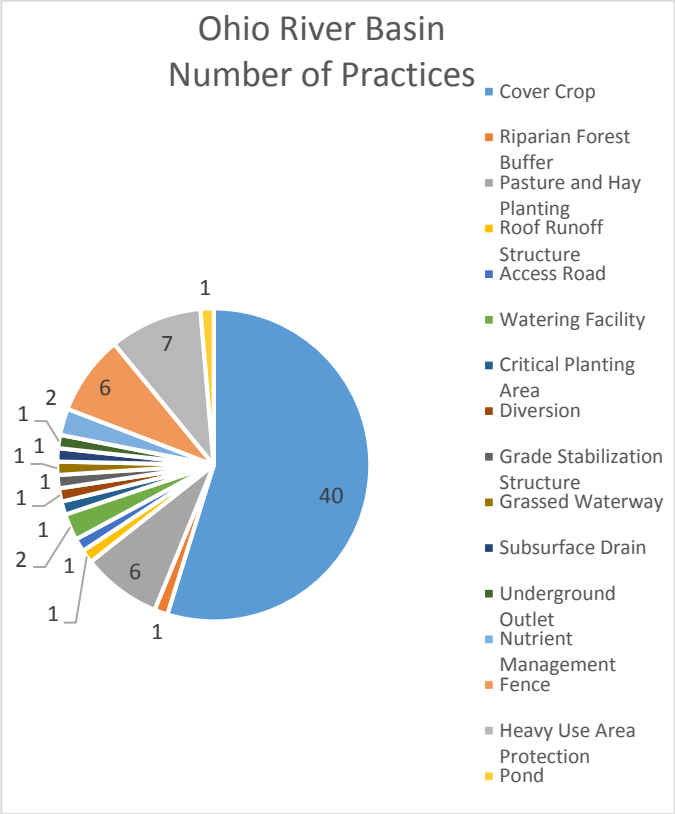
Five projects in the White River Basin worked to reduce nitrogen, phosphorus and sediment in the watershed. Most of the load reductions in this basin were due to the implementation of cover crops. The number of BMPs implemented and the estimated load reductions are similar to last year.





Six projects worked in the Ohio River Basin to reduce nitrogen, phosphorus and sediment. These reductions came primarily from implementation of cover crops and livestock- related BMPs.





§ 319 projects in Indiana continue to work to reduce nutrients, sediment, and other nonpoint source pollutant runoff into waters of the state, and ultimately into our larger national fresh and salt water resources. Each BMP installed by each project in each basin adds up to NPS pollution reduction and improved water quality. The efforts of these projects help create nonpoint source success stories in Indiana each year. Following is the NPS Success Story for this year.

Nonpoint Source Success Stories

§ 319 NPS Success Stories are stories about NPS-impaired waterbodies where restoration efforts have led to documented water quality improvements. Many stories are about waterbodies that have achieved water quality standards for one or more pollutants and/or designated uses after having been previously included on the state's 303(d) List of Impaired Waters.

In 2016, IDEM submitted Flowers Creek as a success story under WQ-10(a). This occurred after the 2016 NPS Annual Report for 2016 had been presented to U.S. EPA. Flowers Creek (AUID INB0461_T1005) is proposed for delisting in 2018 for dissolved oxygen, impaired biotic communities, and nutrients. EPA has accepted the three impairment/AUID combinations as successes under WQ-10(a) and has posted this Success Story online at https://www.epa.gov/polluted-runoff-nonpoint-source-pollution/nonpoint-source-success-stories (also summarized and shown below).

Watershed Effort Restores Aquatic Community in Flowers Creek

Waterbody Improved

Nonpoint source pollution from agricultural sources caused increased nutrient levels in Flowers Creek. As a result, the Indiana Department of Environmental Management (IDEM) added this waterbody to its 2006 Clean Water Act (CWA) § 303(d) impaired waters list for nutrients, dissolved oxygen, and biological impairment. Implementing a variety of best management practices (BMPs) in the watershed improved nutrient and dissolved oxygen levels in Flowers Creek. As a result, Indiana is proposing to remove Flowers Creek from its 2018 CWA § 303(d) list of impaired waters.

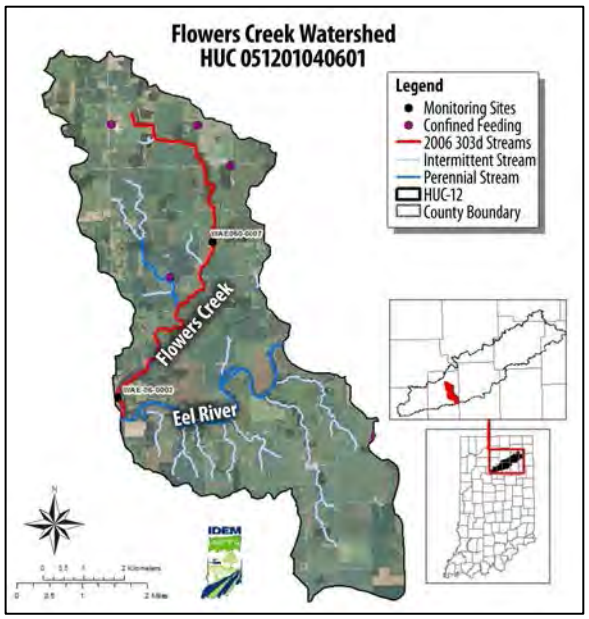


Figure 6. Flowers Creek is in rural northern Indiana.

Problem

Flowers Creek is a 12.72-mile-long tributary of the Eel River (HUC 05120104) in eastern Miami County in north-central Indiana (Figure 1). The Eel River, which is well-known for its smallmouth bass fishery, is designated as an outstanding river for 63 river miles. The Flowers Creek watershed is rural and highly agricultural (92 percent row crops and grazing lands). It contains four confined animal feeding

operations with a total of 600 dairy cows and 26,800 hogs. The watershed is underlain with subsurface drainage tiles that deliver percolated water to the streams after precipitation events (Figure 7). Biological communities in the streams are expected to be that typical of warm water

Figure 7. Subsurface drainage tile in Wilson Rhodes Ditch, part of Flowers Creek watershed.

stream habitats.

Applicable water quality criteria include: (1) daily average concentrations of dissolved oxygen must be at least 5.0 milligrams per liter (mg/L), and may not fall below 4.0 any time; (2) nitrogen concentrations may not exceed 10 mg/L; (3) total phosphorus levels may not exceed 0.3 mg/L; (4) pH may not exceed 9.0 or be consistently at/close to the standard (i.e., in the range of 8.7- 9.0); and (5) algae may not be deemed "excessive" based on field observations by IDEM scientists. To be classified as impaired for nutrients, a segment must fail to meet two or more of the above criteria on the same date. In addition, biological indices (index of biotic integrity [IBI] and macroinvertebrate IBI) scores must be at least 36 to meet aquatic life use support requirements.

Monitoring conducted by IDEM in 2003 on Flowers Creek showed elevated levels of total phosphorus and ammonia in conjunction with low dissolved oxygen and impaired biotic communities. On the basis of these data, Flowers Creek assessment units [AUs] INB0461_ T1001 and INB0461_T1002 were listed as impaired for nutrients, dissolved oxygen and biological impairments in 2006. (Note: in 2012 these two AUs were combined [AU INB0461_T1005] for assessment purposes.)

Project Highlights

Manchester University's Department of Environmental Studies obtained a CWA § 319 grant in late 2008 to support the Middle Eel River Watershed Initiative, which included developing a watershed management plan for the Middle Eel River and its tributaries, promoting and implementing a cost-share program for BMPs, and conducting water quality monitoring and public outreach. The university hired a watershed coordinator and formed a steering committee to lead development of

the watershed management plan. Implementation efforts began after the watershed management plan was completed in early 2011.

CWA §§ 319 funding was supplemented with financial support from the Lake and River Enhancement program within the Indiana Department of Natural Resources' Division of Fish and Wildlife, Clean Water Indiana, and the local soil and water conservation district (SWCD). The Indiana State Department of Agriculture (ISDA) also obtained a CWA § 319 grant to hire three technicians to help install BMPs in several watersheds, including the Middle Eel River. U.S. Department of Agriculture (USDA) Farm Bill dollars were used as well. Manchester University obtained a second CWA § 319 grant to continue implementation throughout the Middle Eel River watershed in early 2013.

Federal, state and local funding was used to install a variety of BMPs, including 214.5 acres of conservation tillage; 22,793.4 acres of cover crops; 96.9 acres of pest management; nutrient management on 4,503 acres; 22.03 acres of grassed waterways; 0.3 acre of heavy use area protection; 32.45 acres of filter strips; 10.7 acres of riparian buffers; 3,540 linear feet of livestock exclusion; one animal mortality facility; one roof/ cover; 105.2 acres of forage/biomass planting; one grade stabilization structure; 11.0 acres of hardwood tree planting; and 12.20 acres of pollinator habitat.

Results

IDEM resampled Flowers Creek in 2015 at two sites: at both the original site midway up the stream reach and at an additional site near the mouth of Flowers Creek. (Biological communities were sampled only at the mouth of the watershed.) Post-project sampling showed that the biological communities had recovered (fish went from IBI = 24 to IBI = 44; macroinvertebrates maintained a passing score of mIBI = 44). Additionally, the streams were no longer impaired for nutrients or low dissolved oxygen (Figure 3). On the basis of these data Indiana is proposing to remove Flowers Creek (AU INB0461_T1005) from its impaired waters list in 2018.

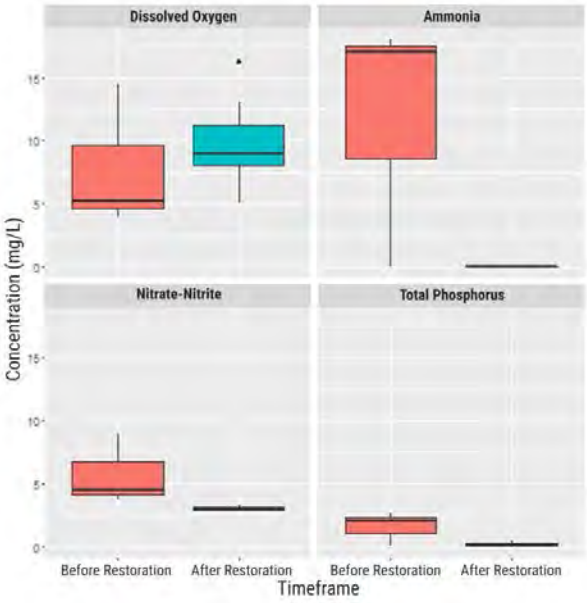


Figure 8. Water quality improved after watershed restoration was conducted: dissolved oxygen levels increased and nutrient concentrations decreased.

Partners and Funding

Federal, state and local partners supported restoration efforts. The USDA provided $968,585 through the Conservation Reserve Program, Environmental Quality Incentives Program and the Wildlife Habitat Incentives Program. CWA § 319 funding was provided by IDEM ($668,932.50) and ISDA ($430,250). Manchester University provided $733,333 in local match funding. Miami County SWCD provided $5,436.65 in cost share. Indiana Department of Natural Resources' Lake and River Enhancement program provided $22,102.50. Lastly, ISDA and Miami County SWCD provided $106,500 in state Clean Water Indiana funding.

In 2017, IDEM submitted Pendleton Branch of Indian Creek as a success story under WQ-10(a). The Pendleton Branch (AUID INV0392_02) was delisted for *E. coli* in 2014 and is proposed for delisting of impaired biotic communities in 2018. IDEM is awaiting EPA's

decision as to whether or not this waterbody will be approved under WQ-10(a). A draft story has been included below.

Aquatic Life Use, Recreational Use Impairments Removed in the Pendleton Branch of Indian Creek

Waterbody Overview

Indian Creek is a 22-mile tributary to the Ohio River located in western Switzerland County, Indiana. Its watershed is made up of two 12-digit watersheds with the Pendleton Branch located midway between upper Indian Creek and the mouth of the creek in HUC 050902030902. The river and its tributaries flow southward through hilly terrain before its confluence with the Ohio River just west of Vevay, IN. The watershed is highly forested, with 61.5% of the watershed in forested land use, 22% in pasture/hay land use and 7.6% in cultivated crops. Livestock kept within the watershed include goats, chicken, cattle, horses and donkeys. The watershed plan notes that several homes within the watershed are serviced by outhouses instead of septic system or sewer.

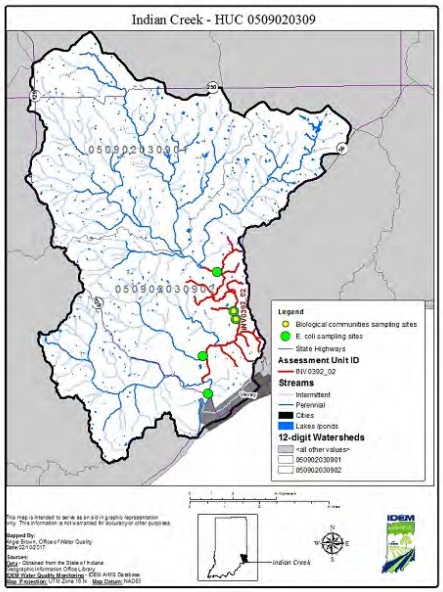


Figure 9. Indian Creek Watershed.

Water Quality Problem

A 6.17-mile reach of Indian Creek known as the Pendleton Branch (AUID INV0392_02) was listed on Indiana's 2008 303(d) List of Impaired Waters for having levels of *E. coli* (217 MPN/100 mL) well above Indiana's standard (geomean ≤125 MPN/100 mL to be considered supporting) that impaired recreational use. Later sampling also indicated that aquatic life use was impaired, as evidenced by a low macroinvertebrate index of biotic integrity score (mIBI scores ≥ 36 are considered supportive of biological integrity). In 2010, the mIBI score on the stream reach was 30, leading the Indiana Department of Environmental Management to list the reach on its 2014 303(d) List of Impaired Waters for impaired biotic communities.

Project Highlights

A watershed management plan (WMP) for the Indian Creek watershed was sponsored by the Switzerland County Soil and Water Conservation District (SWCD), funded through a § 319 grant, and was completed in May 2008. Between the sampling event in 2005 that impaired the watershed and post-implementation sampling in 2015, the following activities took place in the larger watershed.

Switzerland County SWCD used county funds and Clean Water Indiana funds to put up educational signage, hold a field day, and cost-share on soil testing, pasture seeding, cover crops, exclusion fencing, and heavy use area protection (HUAP). At least 74 acre cover crops, 58 ft. exclusion fence, 2143 sq. ft. HUAP, 130 ft. pipeline, 1 roof runoff structure, 1 underground outlet, 3 watering facilities, and 80 acre of pest management were installed.

Historic Hoosier Hills RC&D (HHH) received two § 319 grants from IDEM to develop a cost-share program and provide outreach and education to land owners and operators in the watershed. As a result of these grants, the following BMPs were installed: 611.4 acre cover crops, 2.7 acre critical area planting, 66,866 ft. fencing, 4.55 acres Heavy Use Area Protection (HUAP), 711.2 acre pasture and hay planting, 8.6 acre pesticide management, 2 ponds, 1 pumping plant for water control, 660 ft. pipeline, 93 acre prescribed grazing, 1 trough or tank, 1 water well, and 14 watering facilities.

USDA also contributed to BMP implementation in the watershed. The Natural Resources Conservation Service (NRCS) provided technical and financial assistance through their EQIP and Wildlife Habitat Incentive Program (WHIP) to install 2.5 acres conservation cover, 679 acres cover crops, 3.3 acres of critical area plantings, 5 ponds, 70,033 ft. fence, 5 access control projects, 434 acres of forage and biomass plantings, 12,088 ft. livestock pipeline, 442 acres prescribed grazing, 9 roof runoff structures, 8.4 acres heavy use area protection, 1 spring development, 2 stream crossings, 175 acres integrated pest management, 6 watering facilities, 1 underground outlet, 51 acres upland wildlife habitat management, 37 acres early successional habitat development/management, 0.5 acre wetland enhancement, and 32 acres of forest stand improvements. The Farm Services Agency provided financial assistance through their Conservation Reserve Program (CRP) to install 19.8 acres establishment of permanent native grasses, 1.5 acres grassed waterways, and 24.3 acres hardwood tree planting.

Monitoring Data and Results

IDEM resampled the reach for *E. coli* in 2011 and found geomeans of 15 MPN/100 mL and 47 MPN/100 mL, well below the water quality standard of geomean ≤125 MPN/100 mL to be considered supporting for recreational use. In 2015, after significant restoration work had taken place, IDEM sampled the aquatic community, finding macroinvertebrates had recovered, with mIBI scores of 40 and 44 along the stream reach, and fish community scores retaining a supporting score (IBI = 48 and 42) for aquatic life use.

Partners and Funding

A variety of federal, state, and local partners contributed to restoration in the watershed. Historic Hoosier Hills coordinated the WMP planning and implementation events. The Indiana Department of Environmental Management awarded $916,167 in 319 funding to the effort. Switzerland County SWCD sponsored the 319 grant for the WMP, obtained a Clean Water Indiana grant to put towards the project, obtained and administered funds from Switzerland County to put towards implementation of best management practices (BMPs), and was the technical service provider during implementation. Switzerland County provided $28,678 in local funds for cost-share to install BMPs. The Indiana State Department of Agriculture awarded Switzerland County SWCD a $122,983 Clean Water Indiana grant that was used for outreach and to install BMPs. The Natural Resources Conservation Service provided BMP promotion, design and installation at a cost of $1,024,471 through both its EQIP and its WHIP. The Farm Services Agency contributed $6,824 toward BMP design and installation through its CRP.

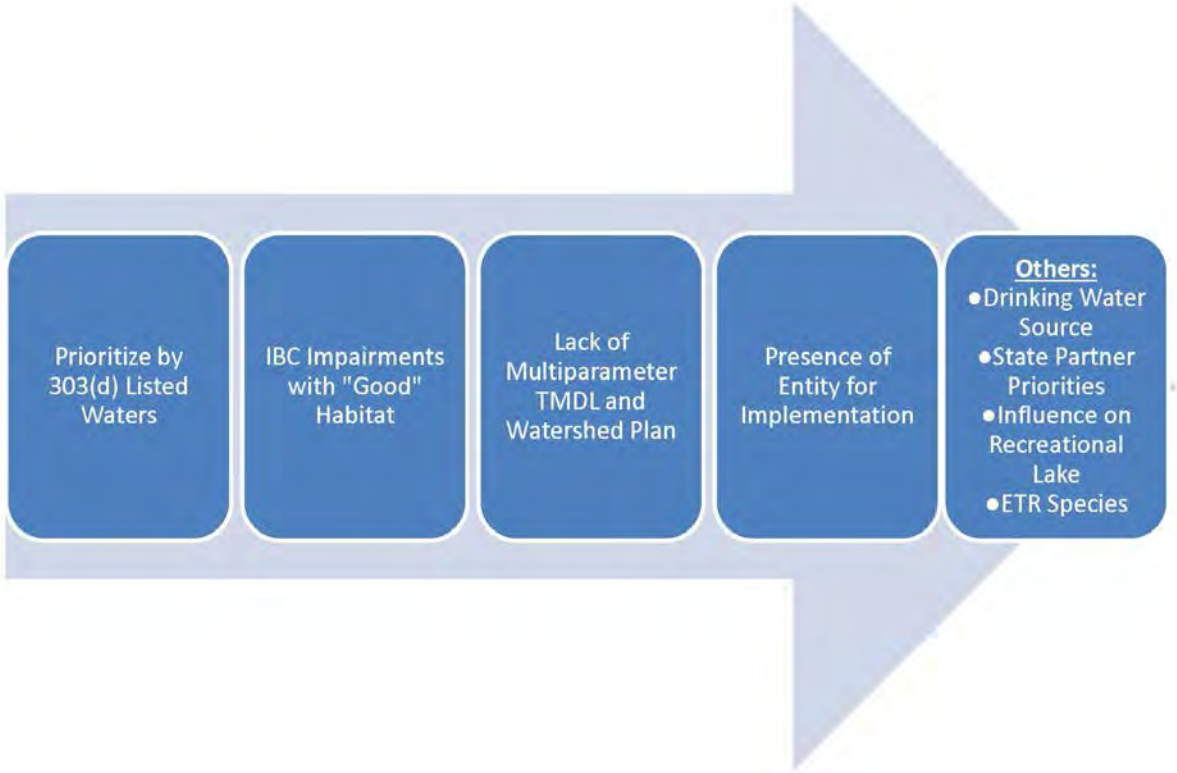
§ 205(j) Grant Program

The § 205(j) Grant Program is dedicated to water quality management planning. Funds are used to determine the nature, extent, and causes of point and NPS pollution problems and to develop plans to resolve these problems. There is no match required for these funds. This year IDEM anticipates receiving $323,000 in FFY 2017 funds. These funds will be used for two watershed management plan development projects: Lower Patoka and Big Blue River. A list of all 205(j) projects open or pending during this fiscal year is in Appendix E of this report.

Integrating the NPS Program with the 303(d) Vision

In FFY 2014, U.S. EPA announced that it was working with states to develop and implement a new framework to achieve the goals of CWA § 303(d). This framework is known as the Long-Term Vision for Assessment, Restoration, and Protection under the Clean Water Act § 303(d) Program. In FFY 2015, IDEM NPS worked with the TMDL program to identify priorities according to the TMDL visioning process that would complement NPS program efforts. In FFY 2016, IDEM TMDL continued to

implement the vision by monitoring for watershed characterization in priority 10-digit watersheds, working with local watershed groups to raise awareness of water quality issues, and completing TMDL reports for submission to U.S. EPA.



The NPS program continues to work with groups following TMDL completion to write 9-Element watershed management plans that can be implemented using §319 funds (examples include Deep River, Southern Whitewater, Mississinewa, South Fork Blue River, and Salt Creek). The TMDL program is currently working to revise its TMDL template so that the TMDL documents can be directly implemented with §319 funding.

GOAL 5: PROTECT SENSITIVE, VULNERABLE, AND HIGH QUALITY WATERS OF THE STATE SO THAT THEY MAY CONTINUE TO MEET THEIR DESIGNATED USES

Prior to FFY 2013, IDEM's NPS Program emphasized the restoration of impaired waters, while the issue of protecting sensitive, threatened, or high-quality waters was largely unrecognized. For the purposes of this goal, the NPS Program considers "sensitive, vulnerable and high quality waters" to include water quality assessment Category 1 waters, watersheds including karst landscapes, outstanding state resource waters (OSRWs), outstanding national resource waters (ONRWs), drinking water source waters, cold/coolwater/salmonid waters, and waterbodies harboring endangered species.

The WPRS first attempted to address protection issues under this State NPS Management Plan starting in FFY 2014. In November 2013, IDEM embarked on a watershed characterization study in the Southern Whitewater watershed (HUCs 0508000205, 0508000306, 0508000308), an OSRW. The purpose of this study was to provide the data to complete a TMDL (for *E. coli*, total nitrogen, total phosphorus, and sediment) that would then be passed on to the local watershed group (a §319 planning grant recipient) for additional public involvement and BMP decision-making for a portion of the watershed. This TMDL includes two sections of river with Indiana endangered species (the variegate darter, *Etheostoma variatum*, Family: Percidae and the cobblestone tiger beetle, *Cicindela marginipennis*, Family: Cicindelidae, which is also globally imperiled). These species are sensitive to sedimentation, a primary result of nonpoint source pollution. A 9-Element watershed management plan was approved. Potential propriety implementation areas (PPIAs) and associated BMP recommendations were identified as having a high likely degree of effectiveness to achieve the *E. coli*, nutrients and sediment load reductions allocated to sources in each subwatershed. These subwatershed rankings are based on the results of the Recovery Potential Tool (RPT), while the implementation activities are recommended based on potential point and nonpoint sources of pollution in the subwatershed.

The South Fork Blue River TMDL and WMP project is another example of NPS work being done on vulnerable landscapes. This watershed is in the karst region of southern Indiana – an area rife with sinkholes, springs, caves, and disappearing streams. In this type of geologic system, ground water and surface water are often directly connected, allowing pollutants to bypass the filtering capacity of the soil. The TMDL project for this watershed is complete, with a final draft of the WMP undergoing review by U.S. EPA. The TMDL and WMP include protection elements for the South Fork Blue River which empties into the Blue River, the last- remaining Indiana refuge of the state-endangered eastern hellbender (*Cryptobranchus alleganiensis*).

Big Pine Creek is another example of a group that is actively pursuing protection strategies. The Big Pine WMP outlines several priority areas for habitat protection in order to maintain high quality, and regionally rare, aquatic communities through additional conservation and restoration in uplands and floodplains near the stream. Though §319 funds have thus far not been used to institute protection measures, the group has nevertheless purchased land for protection and is pursuing funds to install additional vegetative measures that will protect the stream.

In 2017, the IDEM NPS program encouraged its applicants to work in these sensitive, vulnerable and high quality waters by making these waters a priority of the solicitation. Ninety-eight watersheds were defined under this priority. Six applications addressed these watersheds and all six were proposed to U.S. EPA for funding under the §319(h) grant program.

Adaptive Management

The State NPS Management Plan states that IDEM will work with EPA to correct any deficiencies that might become apparent in the program through the NPS Annual Report. Since the completion of the State NPS Management Plan, several errors, omissions, or the need for simple changes have come to light. Table 4. Revisions to Reportable Activities for 2017 (updates in bold) outlines changes (in bold) that should be made to two objectives of the State NPS Management Plan, with justification.

Table 4. Revisions to Reportable Activities for 2017 (updates in bold)

Obj. #	MM	Objective	FFY Start	FFY End	Rationale for Change
3.3	c	Work with partners on consistent messaging surrounding sediment and nutrients.	2015	**2018**	This work will be a long-term coordination versus a one-time event, as originally conceived. IDEM would like to propose work on this topic will continue through 2018.
4.10	a	Investigate and adopt a standard method to estimate *E. coli* reductions	2014	**2018**	Indiana continues to struggle with this objective and has asked for assistance from Region V. The last word on this has been that Region V is working to update the STEP-L and Region V models to include *E. coli*. Until further assistance is received from Region V, Indiana will likely not be able to move forward on this issue.

Appendix A

Reportable Activities for 2017*

*Items grouped together by color, denoting sub-objectives of the same parent objective

Reportable Activities for 2017

Goal 1: Utilize partnerships to leverage resources available for NPS management.						
Obj. #	MM	Objective	FFY Start	FFY End	Frequency	Complete
1.1		Assist Indiana Department of Natural Resources, Lake Michigan Coastal Program to obtain full approval of all outstanding measures on the LMCP CNPC plan. **Progress: The Indiana Lake Michigan Coastal Program has received interim approval for all measures except the measure requiring inspection of existing OSDS. In FFY 2017, IDEM forwarded an application from the LMCP to address this measure using FFY 2017 §319 funds. 319 staff continue to communicate with the LMCP to track progress and discuss future plans.**	2014	2018	ongoing	Ongoing – some progress
1.1	a.	NPS NW WSS will assist the LMCP with on-site disposal systems measures as needed/requested. **Progress: NW WSS attended Septic System Coordination Work Group meetings on 12/19/16, 3/23/17, 5/25/17, 6/21/17, and 7/27/17. The prep sheet for the LMCP grant has been completed and the grant project is expected to start on time. The Septic work group continues to plan, host, and hold outreach events including rebranding, signage, and realtor trainings.**	2014	2018	ongoing	Ongoing – significant progress
1.2	c.	Complete ongoing TMDLs and WMPs in the Coastal Zone: *Salt Creek*. **Progress: Reported as completed in FFY 2016.**	2010	2018	ongoing	Complete
1.3	b.	Restore and protect water quality in critical areas of coastal WMPs: Deep River. **Progress: The project completed its Watershed Management Plan and the plan was approved by IDEM and EPA on November 30th, 2016. Since then, the group has developed a cost share program which was approved by IDEM on January 30th, 2017. As of the last quarterly progress report (5/2/17), 2 applications have been received but no conservation practices have been installed. The Little Calumet- Galien Collaborative**	2015	2017	ongoing	Ongoing – some progress

Goal 1: Utilize partnerships to leverage resources available for NPS management.						
Obj. #	MM	Objective	FFY Start	FFY End	Frequency	Complete
		(of which the Deep River group is a part) has submitted an NOI for FY2018 and has been meeting regularly to discuss restoration projects in the area.				
1.4		Support the Conservation Reserve Enhancement Program (CREP), Mississippi River Basin Initiative (MRBI), Great Lakes Restoration Initiative (GLRI), Lake and River Enhancement (LARE), Clean Water Indiana (CWI), and other Indiana Conservation Partnership (ICP) and statewide initiatives as they become available by:	2014	2018	ongoing	Ongoing – significant progress
1.4	a.	Forwarding solicitation or information as it becomes available. **Progress: The WSS share funding opportunities with groups and stakeholders in their regions as notices become available. Examples of funding that have been passed on include Regional Conservation Partnership Program from the Natural Resources Conservation Service and LARE watershed land treatment and diagnostic studies funding.**	2014	2018	ongoing	Ongoing – significant progress
1.4	b.	Participating in ICP planning meetings to determine priorities for funding/initiatives that align with WMP critical areas, water quality, and/or TMDL priority areas (every other month). **Progress: IDEM management attended ICP leadership meetings on 11/15/16, 1/17/17, 3/21/17, 5/16/17, 7/11/2017, and 9/12/17. IDEM management is also highly involved in the development of the State Nutrient Reduction Strategy. NE WSS is heavily involved in developing the Annex 4 Domestic Action Plan. Annex 4/DAP meetings/conference calls held 10/14/16, 11/17/16, 2/15/17, 3/10/17, 3/20/17, 4/28/17, 6/5/17, 6/7/17, 6/27/17, 7/20/17. NE WSS involved in choosing proposals for Sustain Our Great Lakes (National Fish and Wildlife Foundation) funding.**	2014	2018	ongoing	Ongoing – significant progress
1.4	c.	By promoting the programs through the watershed specialists (WSS) and work with watershed groups to identify/recommend projects that would fit well under the priorities for each funding source. **Progress: The WSS continue to promote the programs whenever possible. The Mill Creek – Blue River project is one example of a watershed group that has applied for, and received, LARE funding for the 2016-2017 and 2017-2018 funding years.**	2014	2018	ongoing	Ongoing – significant progress
1.4	d.	By including them in relevant TMDLs as methods for implementation. **Progress: Included in Section 9 of Upper Mississinewa River TMDL (submitted October 14, 2016.) and South Fork Blue River (submitted August 8, 2017).**	2014	2018	ongoing	Ongoing – significant progress

Goal 1: Utilize partnerships to leverage resources available for NPS management.						
Obj. #	MM	Objective	FFY Start	FFY End	Frequency	Complete
1.5		Utilize the ICP as an advisory group for priority state NPS policies and updates by participating in bimonthly leadership meetings. **Progress: IDEM management attended ICP leadership meetings on 11/15/16, 1/17/17, 3/21/17, 5/16/17, 7/11/2017, and 9/12/17.**	2014	2018	ongoing	Ongoing – significant progress
1.6		Continue to provide technical assistance to local watershed groups through the WSS or project manager as documented through quarterly site visit reports and the § 319 Annual Report. **Progress: WSS provided technical assistance to at least 62 distinct groups in FFY 2017. Site visit reports are on-file with related project documents.**	2014	2018	ongoing	Ongoing – significant progress
1.7		Utilize the TMDL-WMP template for 2014 TMDLs and beyond. **Progress: The TMDL template is in the process of being updated to reduce redundancies and to align it more closely with U.S. EPA's 9 Elements of a Watershed-Based Plan. The TMDLs currently being written are using a revised version of the 2009 template.**	2014	2018	ongoing	Ongoing – some progress
1.8		Continue to partner with the IN-USDA-NRCS on the National Water Quality Initiative (NWQI) for as long as the Initiative remains a national priority. **Progress: Monitoring for NWQI continues on School Branch in Eagle Creek watershed, with monitoring at multiple levels by various partnership agencies (IUPUI - edge-of-field monitoring at Starkey property; IDEM - fixed station monitoring above and below Starkey; and §319 funded USGS - sentry gage for watershed monitoring). Partners continue to meet regularly to discuss current results and the future of the project. IDEM NPS continues to fund USGS to monitor using a sentry gage, 2 additional streamflow gages, 4 monitoring wells and provide additional monitoring and laboratory analysis through a § 319 joint funding agreement (EDS# A305-6-5). IDEM is also providing § 319 funding for implementation and education/outreach in Bear Grass Creek, an NWQI watershed.**	2014	2018	ongoing	Ongoing – significant progress
1.8	b.	Coordinate with NRCS on at least an annual basis to share in the decision-making on next steps for the Initiative (annually). **Progress: IDEM attended meetings and/or conference calls with NRCS on 10/5/16, 6/21/17, 7/17/17, and 8/15/17.**	2014	2018	annually	Complete for 2017
1.9		Support implementation of the State Nutrient Reduction Strategy once approved. **Progress: A revised version of the strategy was submitted to U.S. EPA in November 2016. At that time, it was decided that Indiana's State Nutrient Reduction Strategy would be updated every two years to reflect continuous improvement and adaptive management. In 2017, IDEM NPS aligned solicitation priorities with the priorities outlined in the SNRS.**	2014	2018	ongoing	Complete for 2017

Goal 1: Utilize partnerships to leverage resources available for NPS management.						
Obj. #	MM	Objective	FFY Start	FFY End	Frequency	Complete
1.10		Dedicate an average of $100,000 in 319 funds to the Coastal Zone (Little Calumet-Galien watershed, HUC 04040001) annually until all of the remaining conditions of the LMCP CNPCP are met. **Progress: The NPS program's coastal allocation commitment continues to be met by the Deep River project into 2017. Even so, the NPS program forwarded an application from the LMCP Coastal Program to U.S. EPA for funding out of FFY 2017 §319 funds. This project will move the group toward approval on its last remaining management measure, OSDS.**	2014	until full approval	ongoing	Ongoing – significant progress
1.11		Coordinate with CWSRF to link loan applicants and local watershed groups. **Progress: It has come to the attention of IDEM NPS that the CWSRF loan rates for most communities are at basement interest rates and that the addition of a NPS project will not lower the rate further, providing little incentive for communities to add a NPS project to their CWSRF loan.**	2014	2018	ongoing	ongoing – no additional progress to date
1.11	a.	IDEM NPS will cross-reference the monthly SRF project status report with active 319 projects and/or other known watershed efforts to identify watershed opportunities and meet quarterly (March, June, September, December) with CWSRF Loan Program to communicate those that may benefit from SRF funding. **Progress: IDEM continues to keep tabs on communities that have applied for CWSRF funding. However, given that the addition of a NPS project will not lower interest rates further, no communities have been approached this federal fiscal year to add a NPS project to their loan.**	2014	2018	ongoing	ongoing – no additional progress to date
1.11	b.	Annually, the NPS program will notify the CWSRF and DWSRF program of the 319 projects that are approved for funding, upon notice from EPA. **Progress: The NPS program notified the SRF programs of the 319 projects that were approved for funding for FFY 2016. As of the writing of this report, IDEM has not yet received the grant award, including approved projects, from U.S. EPA for 2017. IDEM NPS will communicate awarded projects to CWSRF and DWSRF upon receipt of the FFY 2017 grant award.**	2014	2018	annually	Complete for 2017
1.11	c.	Where there are potential projects, the appropriate NPS staff participates with the CWSRF staff in the community orientation or planning meeting. A fact sheet describing the potential NPS project(s) opportunity is included in the SRF packet to the community, and the NPS staff promotes the potential project(s), provides contacts for technical assistance, and provides information on other funding sources active in the watershed (such as NRCS, Clean Water Indiana, 319, 205(j) etc.) **Progress: The CWSRF**	2014	2018	ongoing	ongoing – no additional progress to date

Goal 1: Utilize partnerships to leverage resources available for NPS management.						
Obj. #	MM	Objective	FFY Start	FFY End	Frequency	Complete
		loan program always promotes NPS projects to its applicants. Since no potential projects were identified this fiscal year, no additional contacts/fact sheets were provided to CWSRF applicants.				
1.11	d.	The CWSRF program communicates to the NPS program those NPS project BMPs funded through CWSRF that were identified in the approved 319 WMPs. NPS staff ensures that this information is input into GRTS. This information is included in the Annual 319 Report to U.S. EPA. **Progress: The majority of CWSRF NPS BMPs are septic system removals. This information is uploaded into GRTS on a regular basis. Between 9/13/17 and 10/7/17, SRF replaced 256 units in 4 neighborhoods. Numbers for the remainder of FFY 2017 septic removals will not be available until October 2017.**	2016	2018	annually	Complete for 2017
1.12		Work with partners to model, assess, and prioritize critical watersheds in the state. **Progress: Reported as complete in FFY 2015.**	2015	2018	ongoing	complete
1.13		Utilize IDEM WSS to assist partners with NPS planning and implementation activities. **Progress: As a whole, the IDEM WSS provided watershed planning and implementation assistance to at least 62 distinct groups in FFY 2017. The NE WSS has been heavily involved in the creation of the Domestic Action Plan for the Western Lake Erie basin and sampling on School Branch for the National Water Quality Initiative.**	2014	2018	ongoing	Ongoing – significant progress

Goal 2: Monitor and assess Indiana waters for NPS impairments and improvements.						
Obj. #	MM	Objective	FFY Start	FFY End	Frequency	Complete
2.1		Require the use of the Environmental Monitoring for Watershed Groups handbook for 319 grantees. **Progress: The Handbook is provided to all grantees as guidance during QAPP development and core parameters must be included in the monitoring program. All grant agreements executed in FFY 2016 included the core parameters outlined in the Handbook.**	2014	2018	annually	Complete for 2017
2.3		Import 319 grantee data meeting appropriate data quality criteria into NPS-AIMS or the Hoosier Riverwatch Database to be uploaded into STORET on a routine basis. **Progress: A total of 91, 545 records have been imported into WQX from NPS projects, with**	2014	2018	ongoing	Ongoing – significant progress

Goal 2: Monitor and assess Indiana waters for NPS impairments and improvements.						
Obj. #	MM	Objective	FFY Start	FFY End	Frequency	Complete
		15,854 of them having been entered in 2017. Another 6000 or so will be entered in the near future.				
2.4		Invite the participation of local project leaders when conducting 305(b) CWA assessments on baseline monitoring data. **Progress: Assessment of the Salt Creek baseline characterization occurred on 5/24-5/25/17. Though local project leaders were unable to attend the official assessment meetings, TMDL staff and the WSS are working with them to schedule a local meeting to review water quality assessment results.**	2014	2018	ongoing	Complete for 2017
2.5		Evaluate results of the monitoring program and make adaptive management decisions on an annual basis. **Progress: A monitoring program assessment meeting took place on 2/1/17. At the meeting it was determined that, due to resource limitations, IDEM would sample for only one watershed characterization/TMDL project in 2017, beginning in the fall.**	2014	2018	annual	Complete for 2017
2.7		Continue to fund the Clean Lakes Program (volunteer and professional) data collection for use in Clean Water Act 305(b) and 314 assessments and 303(d) listings. **Progress: Indiana University continues to sample for the Clean Lakes Program under a FFY 2014 §319 grant. This grant will fund the program through the 2018 sampling season. In the 2017 sampling season, 80 lakes were sampled for assessment. IDEM is working with IU on a FY 2018 application to secure funding for the next round of monitoring.**	2014	2018	ongoing	Ongoing – annual progress made
2.8		Direct IDEM resources to perform baseline characterization monitoring of at least one watershed annually to support TMDL and watershed planning efforts. **Progress: Monthly sampling for the Salt Creek watershed TMDL and WMP began on 11/16/15 and was completed in October 2016. Monthly sampling for the Lower East Fork White River watershed is scheduled to begin in November 2017 and end in October 2018.**	2013	2018	annually	Ongoing – significant progress
2.9		Utilize IDEM resources to monitor waterbodies identified as targets of the National Water Quality Monitoring Initiative (NWQI) as described in the sampling design developed by IDEM and NRCS. **Progress: IDEM continues to monitor the School Branch watershed of Eagle Creek though its fixed station monitoring program. IDEM has also contracted with USGS (using FFY 2016 §319 funds) to bolster its discreet and continuous monitoring of School Branch. All of the data collected (including IDEM**	2015	2018	annually	Complete for 2017

Goal 2: Monitor and assess Indiana waters for NPS impairments and improvements.						
Obj. #	MM	Objective	FFY Start	FFY End	Frequency	Complete
		data) will be evaluated at regular intervals during the study. In 2017, IDEM also sampled Ell Creek watershed at the request of the NRCS.				
2.10	b.	Provide support for 20 Hoosier Riverwatch workshops (volunteer trainings) and maintain current loaner/teaching trunks. **Progress: As of 9/30/17, the HRW Program has met its goal of scheduling at minimum 20 workshops each year. Twenty workshops have been held to-date, with four more workshops planned for this calendar year and one postponed till spring of 2018. Of these 24 workshops held, one was an advanced *E. coli* training and another was a combined advanced *E. coli* & database training.**	2014	2018	annually	Complete for 2017
2.10	c.	Provide support for maintenance and upgrades of the Hoosier Riverwatch water quality monitoring database and associated websites. **Progress: Efforts continue to be successfully made in receiving feedback from users and, when needed, working with the contractor to tweak the coding and functionality of the online database. As time allows, staff are also working with contractor to tweak the Administrative side of the database to make our own queries and fixes more efficient and timely.**	2014	2018	ongoing	Ongoing – significant progress
2.11	c.	Accept, review and rank water quality data provided by external organizations and, if appropriate, using the data to make 305(b)/303(d) water quality assessment and listing decisions. **Progress: Staff have developed draft review processes for both chemical and biological data and will test them with data submissions from the Marion County Health Department (MCHD) and the U.S. Army Corps of Engineers (USACE). A Supplemental 106 Grant has been secured for the development of a tool that will help Secondary Data users develop quality assurance project plans and is now in the contracting phase. Work on this project is expected to begin in September/October of 2017. Staff are currently working on customizing the AIMS Results Upload Template (ARUT) for MCHD to use when submitting its macroinvertebrate and habitat data. An Electronic Data Interchange (EDI) will be developed for use by MCHD in submitting its field and chemistry data pending completion of its new data management system.**	2014	2018	annually	Ongoing – significant progress

Goal 2: Monitor and assess Indiana waters for NPS impairments and improvements.						
Obj. #	MM	Objective	FFY Start	FFY End	Frequency	Complete
		Staff will be working with the database contractor to better understand the back end of the HRW/Secondary Data database. They will be meeting for this purpose sometime in September 2017.				
2.12	a.	Evaluate water quality data submitted through the EDF process, as well as grantee monitoring, to identify watersheds that should be surveyed for possible NPS water quality improvements. **Progress: In FFY 2017, staff reviewed a data set provided by MCHD to determine the best methods for data submittal. These decisions have been made (see Objective 2.11c). Actual data submittals are expected to begin later this year. Staff has entered the USACE sites entered into AIMS and are now awaiting data submittal on the customized templates provided to them. USACE monitoring is currently underway and is expected to be complete later this year.**	2014	2018	annually	Ongoing – significant progress
2.12	b.	Use additional resources (e.g., staff, funds, and technical support) to monitor water quality in watersheds where NPS restoration activities have occurred. The monitoring data will be compared to baseline information, if available, to gauge the efficacy of the work. **Progress: Six watersheds where NPS restoration activities have occurred were sampled in 2017: Headwaters Curtis Creek (HUC 071200020401), Elliot Ditch (HUC 051201080104), Kenny Ditch-Wea Creek (HUC 051201080106), Kilmore Creek (HUC 051201070306), Jenkins Ditch-South Fork Wildcat Creek (HUC 051201070308), and Ell Creek (HUC 051202090405).**	2014	2018	annually	Complete for 2017
2.13		Continue the Ground water Monitoring Network (GWMN). **Progress: Ground water monitoring continues at 300 wells during the 2017 field season. Wells tested during the 2017 field season continue to be analyzed for over 400 point and NPS parameters, including nitrate, pesticides and pesticide break-down products. Ultimately, this type of sampling can provide the information needed to characterize causes, sources, and magnitude of NPS pollution in ground water.**	2013	2018	ongoing	Ongoing – significant progress

Goal 3: Develop and conduct a strategic outreach and education program						
Obj. #	MM	Objective	FFY Start	FFY End	Frequency	Complete
3.1	d.	Publicize septic system care/repair/replacement water-quality success stories through multiple media applications. **Progress: No major success stories have come to light in FFY 2017, therefore, no stories have been publicized.**	2014	2018	ongoing	ongoing – no additional progress to date
3.1	e.	Support technical events (such as IEHA annual conference), to exchange information between government partners, watershed groups, and citizens. **Progress: Three NPS/TMDL staff attended the Agricultural Conservation Planning Framework workshop at Purdue University to learn about the new tool. Several staff attended/presented at the 2017 IWRA conference. Several NPS staff also attended the 2017 Indiana Lakes Management Society meeting held March 2-3, 2017.**	2014	2018	ongoing	Ongoing – some progress
3.1	f.	Assist in providing outreach on septic systems in the Lake Michigan Coastal Zone. **Progress: IDEM awarded the LMCP a §319 grant in FFY 2017 to assist them in developing methods and materials for septic system outreach that would assist them in meeting their final condition on the 6217 measures. The prep sheet for the LMCP grant has been completed and the grant project is expected to start on time. The Septic work group continues to plan, host, and hold outreach events including rebranding, signage, and realtor trainings.**	2014	2018	ongoing	Ongoing – significant progress
3.1	f.iii	Promote the use of the Revolving Loan Fund for Septic upgrades and repairs. **Progress: WSS promote the SRF for these types of BMPs whenever possible.**	2014	2018	annually	Complete for 2017
3.2	d.	Publicize hydromodification/stream restoration success stories through multiple media applications. **Progress: No major success stories have come to light in FFY 2017, therefore, no stories have been publicized.**	2014	2018	ongoing	Ongoing – no additional progress to date
3.2	e.	Continue outreach to the community of County Surveyors to become involved in water quality improvement through the IWLA, the Indiana Association of County Surveyors, local watershed groups, and county contacts. **Progress: More and more county surveyors are becoming aware of the IWLA program. In 2017, the White Co Surveyor was originally signed up to be a part of the IWLA, but did not complete the course.**	2014	2018	ongoing	Ongoing – some progress

Goal 3: Develop and conduct a strategic outreach and education program						
Obj. #	MM	Objective	FFY Start	FFY End	Frequency	Complete
		Other contacts with county surveyors are made when they are a part of a local watershed group.				
3.3	d.	Publicize success stories through multiple media applications. **Progress: Flowers Creek was added to the NPS website as a success story. IDEM NPS highlighted Flowers Creek during a presentation at the 2017 Indiana Water Resources Association summer symposium. Information was provided to Miami Co SWCD regarding the Flowers Creek Success Story, which they intend to write up as a press release/newsletter article.**	2014	2018	ongoing	Ongoing – significant progress
3.3	e.	Work with other ICP organizations to strategize about outreach to absentee landowners. **Progress: NPS Section Chief attended a presentation at The Nature Conservancy in Indianapolis regarding social dynamics of getting absentee landowners to consider conservation.**	2015	2018	ongoing	Ongoing – some progress
3.4		At least annually review print and electronic materials for updates and republish as needed. **Progress: NPS participated in an IDEM agency-wide refresh of its website. Webpages were updated and reorganized as need in the final quarter of calendar year 2016. Staff have begun internal meetings to discuss updates of other outreach materials.**	2014	2018	annually	Complete for 2017
3.5		Continue to provide citizen monitoring training through Hoosier Riverwatch and the Clean Lakes Program. **Progress: In 2017, HRW trained 180 water quality monitoring volunteers throughout Indiana. The HRW coordinator has been working with IDEM's Media and Communications Services to update the River Cleanup Manual for online posting. This manual will be an IDEM version of the former Adopt-A-River manual Riverwatch used for a time while with the DNR.**	2014	2018	ongoing	Ongoing – significant progress
3.6	a.	Produce 5 "Success Stories" (EPA WQ-10 Strategic Measure) by 2017 and publicize widely within Indiana. **Progress: Flowers Creek was accepted and published by U.S. EPA as a Success Story for Indiana. Under the new measure (WQ-10a), this story counts for 3 "successes" (nutrients, DO, IBC). Pendleton Branch Indian Creek was submitted to U.S. EPA on 2/18/2017 as a success story for FFY 2017. The program is still awaiting notification as to whether or not this story has been accepted by U.S. EPA.**	2014	2017	N/A	Complete for 2017

Goal 3: Develop and conduct a strategic outreach and education program						
Obj. #	MM	Objective	FFY Start	FFY End	Frequency	Complete
3.6	b.	Publicize any awards given to watershed groups related to their water quality efforts in Indiana. **Progress: Four watershed groups were recognized by outside groups for their efforts and are highlighted on pages 34-38 of this annual report.**	2014	2018	ongoing	Ongoing – some progress
3.7	a.	Utilize social media to provide up-to-the minute information to followers of IDEM's social media outlets. **Progress: Reduction in public information officer staff has thwarted this objective in FFY 2017. No NPS-specific posts have gone out in 2017.**	2014	2018	ongoing	Ongoing – no additional progress to date
3.7	b.	Continue to participate in the Pathway to Water Quality at the Indiana State Fairgrounds. **Progress: watershed specialist attended PWQ steering committee meetings on 12/7/16, 1/11/17, 2/1/17, 3/1/17, 5/3/17, 6/7/17 and workdays on 11/2/16, 4/26/17, 6/7/17, 7/5/17. IDEM management participated in presentation for the new green roof. SE WSS compiled resources to update the fact sheet for the green roof and many IDEM staff (both NPS and non-NPS) volunteered to work the Pathway during the State Fair.**	2014	2018	ongoing	Ongoing – significant progress
3.8	b.	Initiate meetings with partners to discuss IDEM's goal of strategic messaging for the state on hydromodification. **Progress: IDEM continues to participate in the Silver Jackets' Lowhead Dam subcommittee.**	2014	2016	ongoing	Ongoing – some progress
3.9	a.	Continue to provide technical assistance to Purdue University's Indiana Watershed Leadership Academy. **Progress: The Senior Watershed Planner continues to be on the IWLA steering committee and provide technical assistance to the IWLA as needed. The Senior Watershed Planner attended a Steering Committee meeting on 11/29/16. All NPS staff attended the IWLA graduation ceremony in May 2017 and facilitated small group discussions on making IWLA projects relevant statewide.**	2014	2018	ongoing	Ongoing – significant progress
3.9	b.	Continue to support the ICP's Training and Certification Program on watershed related issues by sitting on the Technical Research Board and the advisory team. **Progress: NPS staff continue to be on the advisory team for this group.**	2014	2018	ongoing	Ongoing – some progress

Goal 4: Improve Indiana's water quality, including surface and ground water, by reducing NPS pollutants such as nutrients, sediment, and bacteria; restoring aquatic habitats; and establishing flow regimes that mimic natural conditions						
Obj. #	MM	Objective	FFY Start	FFY End	Frequency	Complete
4.1	a.	Utilize the TMDL-WMP template for TMDLs sampled for and written in 2014 and beyond so that they are implementable using 319 funds. **Progress: All TMDLs are written using the template. The Mississinewa River TMDL was submitted to U.S. EPA on October 14, 2016. The South Fork Blue River TMDL was submitted to U.S. EPA on August 8, 2017 and approved September 15, 2017.**	2014	2018	ongoing	Ongoing – significant progress
4.1	c.	Link TMDLs with baseline water monitoring projects for § 319 watershed management planning applications. **Progress: In 2017, IDEM completed monitoring for the South Fork Blue River TMDL. A local watershed group has written a watershed management plan for the South Fork Blue River utilizing 319 funds that is currently waiting for EPA approval. IDEM will begin sampling for the Lower East Fork White River Watershed Characterization project (monitoring to support creation of a TMDL and WMP) in November 2017.**	2014	2018	ongoing	Ongoing – significant progress
4.3		Promote integration of WMPs with local comprehensive plans. **Progress: WSS continue to promote WMP and comprehensive plan integration. This FFY no plans were integrated.**	2014	2018		Ongoing – no additional progress
4.4	c.	Develop database. **Progress: The Watershed Assessment and Planning Branch continues to search for funding for this database. NPS staff has discussed potential cost breakdowns with Technical staff to ascertain whether it is feasible to fund this project in smaller pieces to move it forward. However, as no funding has been obligated to this objective, work to develop the database has not yet begun.**	2016	2018	ongoing	Ongoing – no additional progress
4.5		Use § 319 funding to support implementation of WMPs that meet the U.S. EPA'S 9 Key Elements of a Watershed Plan (including staff support and outreach as well as the placement of BMPs in critical areas as identified in the WMPs). **Progress: In 2017, twenty-six §319 projects were open exceeding $8.5 million to implement WMPs or to create a WMP, then implement it. As of the writing of this report, Indiana's FFY 2017 §319 grant has not been awarded. The above reported projects are all funded through monies awarded prior to FFY 2017. Eight implementation projects were chosen to receive FFY 2017 funding and were proposed to U.S. EPA, including South Fork Blue River implementation project, Deer Creek-Sugar Creek implementation project, South**	2014	2018	ongoing	Ongoing – significant progress

Goal 4: Improve Indiana's water quality, including surface and ground water, by reducing NPS pollutants such as nutrients, sediment, and bacteria; restoring aquatic habitats; and establishing flow regimes that mimic natural conditions						
Obj. #	MM	Objective	FFY Start	FFY End	Frequency	Complete
		Fork Wildcat Creek implementation project, Upper Mississinewa implementation project, Lower Salamonie implementation project, Lower Eel River watershed implementation project, Central Muscatatuck River implementation project, and Hogan Creek implementation project.				
4.6		Repair previously-installed BMPs with the caveats outlined in the program policy. **Progress: No BMPs required repair during FFY 2017.**	2014	2018	ongoing	Ongoing – no need for this FFY
4.7		Continue to leverage LARE and CWI funds to address erosion, sedimentation and nutrient input concerns as long as the General Assembly continues to approve appropriations. **Progress: As the opportunity arises, LARE and CWI projects are used as match for NPS projects. The following watersheds with §319 staff contacts or funding history were awarded LARE funds for implementation in 2017: Blue River (Washington Co), Cedar Creek (DeKalb Co), Deep River (Lake Co), Eel River (Wabash Co), Iroquois River and Carpenter Creek (Jasper Co), Mississinewa River (Delaware and Randolph Co), Spy Run Creek (Allen Co), Sugar Creek (Clinton Co), Trail Creek (LaPorte Co), Turtle Creek (Sullivan Co), and Upper Tippecanoe River (Kosciusko Co).**	2014	2018	ongoing	Ongoing – significant progress made
4.8		Develop guidance for the identification of critical areas. **Progress: This guidance is complete.**	2014	2014	one-time	complete
4.9		Show partial or total restoration in at least 5 12-digit watersheds (at least 5 SP12 and 5 WQ-10; watersheds identified may count for both measures) in the five-year cycle 2013-2017. **Progress: IDEM has shown successful restoration in 5 waterbodies/watersheds since 2014: Jenkins Ditch, Emma Creek, Devils Backbone Indian Creek, Flowers Creek, Pendleton Branch Indian Creek, and Buck Creek/Robbins Creek. This equates to 5 WQ-10(a) and 3 SP-12s. The number of SP-12s turned in to U.S. EPA has fallen short of the goal, despite the fact that IDEM has monitored water quality in twenty-two 12-digit watersheds with nonpoint source restoration having taken place since 2013. The main reasons for this is that 1) Indiana's 2002 list contains many large rivers where restoration will take decades; 2) many of the standards used in 2002 have been revised and impairments administratively removed; and 3) Indiana has gathered much more data since 2002, indicating nonpoint source problems on**	2013	2017	ongoing	Ongoing – some progress

Goal 4: Improve Indiana's water quality, including surface and ground water, by reducing NPS pollutants such as nutrients, sediment, and bacteria; restoring aquatic habitats; and establishing flow regimes that mimic natural conditions						
Obj. #	MM	Objective	FFY Start	FFY End	Frequency	Complete
		many more waters with local interest and restoration work has been focused on those additional waters. IDEM continues to raise concerns with U.S. EPA Region V on its ability to continue using 2002 as the baseline for the SP-12 measure.				
4.11		Geolocate all BMPs installed through the § 319 grant program in order to enhance the BMP GIS layer located in the NPS program. **Progress: BMPs are mapped upon receipt of the invoice and location information from the local project.**	2014	2018	ongoing	Ongoing – significant progress
4.12		Solicit for proposals to use § 319 funding to support implementation of WMPs that meet the U.S. EPA'S 9 Key Elements of a Watershed Plan (includes staff support as well as BMPs). **Progress: The FFY 2017 solicitation went out on April 1, 2016, with NOIs due June 1, 2016, and final applications due Sept 1, 2016. 15 full proposals were received on or before September 1, 2016 and reviewed by NPS staff. 8 implementation proposals and 2 programmatic proposals were forwarded to EPA for funding consideration, with an additional 3 planning proposals requested to be funded by CWA §205j monies. FY 2018 solicitation was published on March 15, 2017. Twenty notices of intent to apply were received on or before June 1, 2017. Full proposals were due September 1, 2017 and 17 applications were received**	2014	2018	annually	Complete for 2017
4.12	a.	Provide financial and technical support to install agricultural BMPs in critical areas identified in the plan. **Progress: A list of the BMPs installed using §319 funding during FFY 2017 is available in Table 1 and on page 39-45 of this report.**	2014	2018	annually	Complete for 2017
4.12	b.	Provide financial and technical support to install urban and/or residential BMPs in critical areas identified in the plan. **Progress: A list of the BMPs installed using §319 funding during FFY 2017 is available in Table 1 and on pages 39-45 of this report.**	2014	2018	annually	Complete for 2017
4.12	c.	Provide financial and technical support to install forestry BMPs in critical areas identified in the plan. **Progress: A list of the BMPs installed using §319 funding during FFY 2017 is available in Table 1 and on pages 39-45 of this report.**	2014	2018	annually	Complete for 2017
4.12	d.	Provide financial and technical support to install abandoned mine BMPs in critical areas identified in the plan. **Progress: A list of the BMPs installed using §319 funding during FFY 2017 is available in Table 1 and on pages 39-45 of this report**	2014	2018	annually	Complete for 2017

Goal 4: Improve Indiana's water quality, including surface and ground water, by reducing NPS pollutants such as nutrients, sediment, and bacteria; restoring aquatic habitats; and establishing flow regimes that mimic natural conditions						
Obj. #	MM	Objective	FFY Start	FFY End	Frequency	Complete
4.12	e.	Provide financial and technical support to install hydrological and aquatic habitat BMPs in critical areas identified in the plan**. Progress: A list of the BMPs installed using §319 funding during FFY 2017 is available in Table 1 and on pages 39-45 of this report.**	2014	2018	annually	Complete for 2017

Goal 5. Protect sensitive, vulnerable, and high quality waters of the state so that they may continue to meet their designated uses.						
Obj. #	MM	Objective	FFY Start	FFY End	Frequency	Complete
5.1		Encourage watershed planning activities in watersheds with Category 1 waters (including those waters identified in Table 15 and in subsequent Integrated Reports) **Progress: In 2017, IDEM prioritized work in 98 HUC10 watersheds impacting outstanding state resource waters and/or waters with endangered, threatened, or rare species; including the following HUC10 watersheds with Category 1 waters: Salt Creek (HUC 0508000305), Hayes Branch-Laughery Creek (HUC 0509020306), South Fork Wildcat Creek (HUC 0512010703), and Dry Branch-Lost River (HUC 0512020808). The WSS are available to discuss watershed planning with all watershed groups, including those with Category 1 waters.**	2015	2018	ongoing	Ongoing – progress made
5.3		Participate as requested in Phase II wellhead protection planning. **Progress: No request was made for NPS assistance in this endeavor due to a lack of staff in the Ground Water Section.**	2014	2018	ongoing	Complete for 2017
5.4		Develop priorities for plans and implementation in watersheds that impact Outstanding State Resource Waters (OSRWs) and waters important for aquatic habitat. **Progress: In 2017, IDEM prioritized work in 98 HUC10 watersheds impacting outstanding state resource waters and/or waters with endangered, threatened, or rare species.**	2015	2018	annually	Complete for 2017
5.5		Fund 319-eligible protection strategies identified in critical areas of IDEM-approved 9-Elements watershed management plans proposed by **§** 319 grant applicants whose implementation applications rank high enough for funding. **Progress: No protection strategies were funded in 2017.**	2015	2018	annually	Complete for 2017
5.6		Work with IDEM's Ground Water section and watershed groups, as well as Drinking Water SRF, to identify wells in need of proper decommission. **Progress: No wells have**	2015	2018	ongoing	Complete for 2017

		been decommissioned to date. Ground Water staff did have conversations with SRF about well abandonment, but the project was not funded.				

Appendix B

319 Projects 9/1/16 - 8/31/17

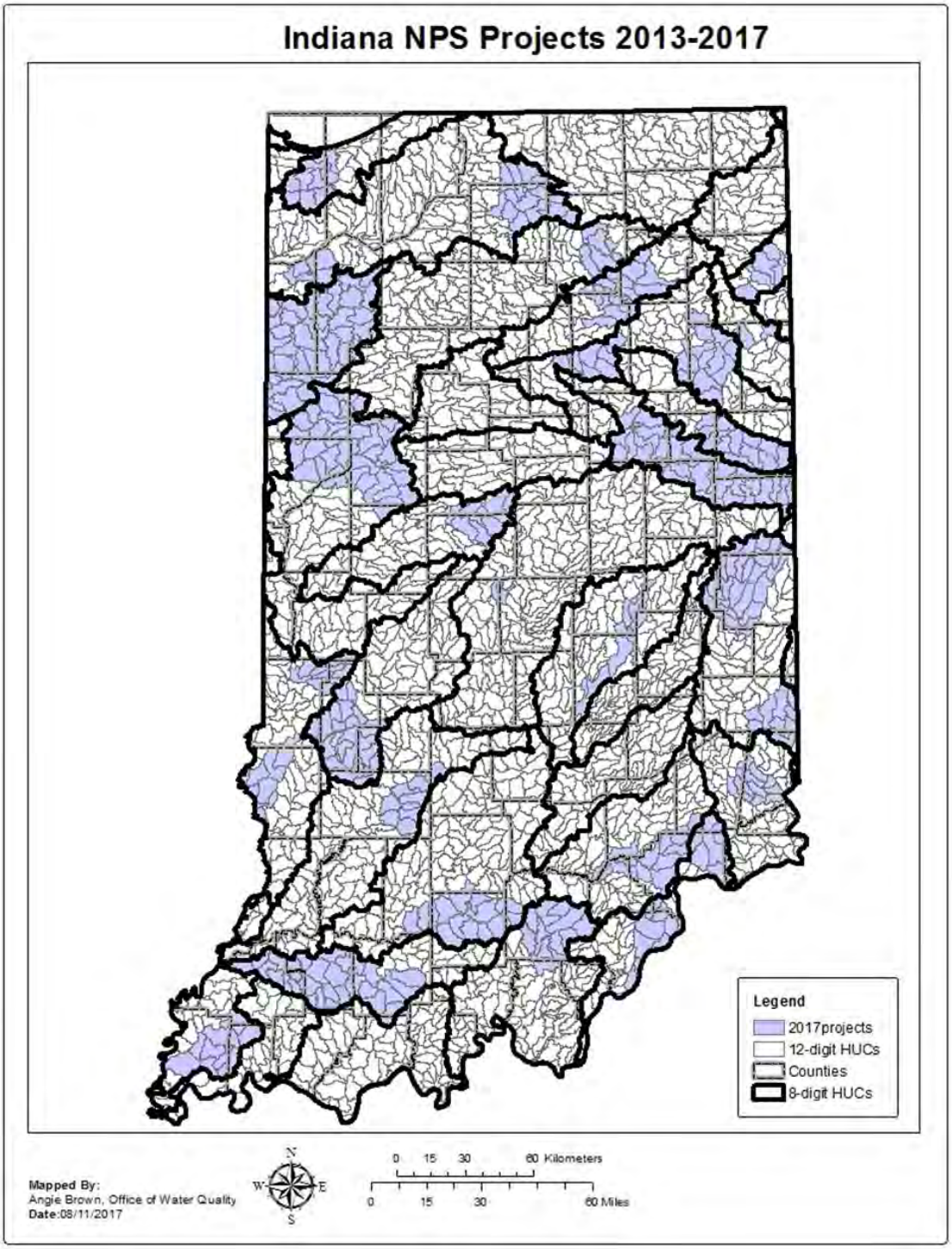
FFY	ARN/ Contract	Contractor	Project	Status	Start	End	Type
2012							
	3-119	Dearborn County SWCD	Whitewater River WMP	Closed	12/9/2013	1/31/2017	Planning
	3-77	Sullivan County SWCD	Turtle Creek-Turman Creek-Kelley	Closed	8/23/2013	1/31/2017	Combo
	3-8	Steuben County SWCD	Pigeon Creek WMP Revision and Implementation	Closed	1/17/2013	1/16/2017	Combo
	3-9	Huntington County SWCD	Lower Salamonie River WMP and Implementation	Closed	1/18/2013	1/17/2017	Combo
2013							
	3-120	Washington County SWCD	Mill Creek-Blue River Watershed	Closed	10/10/2013	11/9/2016	Restoration/Implementation
	3-125	Northwestern Indiana Regional Planning Commission	Deep River-Portage Burns Waterway Watershed Initiative	Open	1/1/2014	12/31/2017	Combo
	4-159	Gibson County SWCD	Lower Patoka Implementation	Open	12/9/2013	12/8/2017	Restoration/Implementation
	4-162	Orange County SWCD	Lost River Watershed Implementation	Closed	12/19/2013	12/18/2016	Restoration/Implementation
	4-163	Wabash River Enhancement	Region of the Great Bend of the Wasbash River Implementation	Closed	12/9/2013	12/8/2016	Restoration/Implementation
	5-9	Marshall County SWCD	Headwaters Yellow River WMP	Open	1/1/2015	12/31/2017	Planning
2014							
	4-216	Indiana University	Indiana Clean Lakes Program	Open	3/1/2015	1/31/2019	Assessment
	4-215	Jasper County SWCD	Upper Iroquios Implementation	Open	11/8/2014	11/7/2018	Restoration/Implementation
	5-10	Upper Wabash River Basin	Upper Wabash River Implementation	Open	1/15/2015	1/14/2018	Restoration/Implementation
	5-3	Dearborn County SWCD	Hogan Creek Implementation	Open	11/16/2014	2/15/2018	Combo
	5-5	Wayne County SWCD	Whitewater River Initiative	Open	10/2/2014	4/1/2018	Restoration/Implementation
	5-6	Historic Hoosier Hills	Central Muscatatuck Implementation	Open	9/24/2014	9/23/2017	Restoration/Implementation
	6-9	Allen County SWCD	Phosphorus Risk Reduction Pilot in the Upper Maumee River Watershed	Open	1/20/2016	1/19/2019	Restoration/Implementation
2015							
	6-5	U.S. Geological Survey	School Branch NWQI Study	Open	1/11/2016	1/10/2019	Assessment
	6-184	Indiana Association of Soil and Water Conservation District	Pathway to Water Quality	Open	1/11/2016	4/10/2018	Education
	6-7	Tippecanoe Watershed Foundation	Upper Tippi-Walnut Creek WMP	Open	1/1/2016	9/30/2018	Planning
	6-1	Historic Hoosier Hills	Indian-Kentuck Implementation	Open	1/11/2016	10/10/2019	Restoration/Implementation
	6-183	Clay County SWCD	Lower Eel WMP Implementation	Open	1/12/2016	7/11/2018	Restoration/Implementation
	6-224	Sullivan County SWCD	Turtle Creek-Turman Creek-Kelley Implementation	Open	4/21/2016	4/20/2019	Restoration/Implementation
	6-226	Greene County SWCD	Plummer Creek Implementation	Open	5/19/2016	5/18/2019	Restoration/Implementation
	6-4	Manchester University	Middle Eel-Beargrass Creek Implementation	Open	1/11/2016	1/10/2019	Restoration/Implementation
	6-8	Posey County	Big Creek WMP Implementation	Open	1/15/2016	4/14/2019	Restoration/Implementation
2016							
	21678	Ouabache Land Conservancy	Otter Creek WMP	Open	8/18/2017	8/17/2019	Planning
	6-245	Wabash River Defenders	Treaty Creek-Wabash River Planning	Pend			Planning
	19146	Purdue University	St. Mary's Initiative	Open	6/6/2017	6/5/2021	Assessment
	18273	Jay County Commissioners	Upper Salamonie River WMP Implementation	Open	2/27/2017	2/26/2020	Restoration/Implementation
	19223	Benton County SWCD	Big Pine Creek Watershed Implementation	Open	5/1/2017	12/31/2019	Restoration/Implementation
	6-240	Dearborn County SWCD	Whitewater River WMP Implementation	Open	11/10/2016	2/9/2020	Restoration/Implementation
	6-242	Orange County SWCD	Lost River Watershed Implementation	Open	12/19/2016	12/18/2019	Restoration/Implementation
	20403	Pike County SWCD	Middle Patoka River Source Water Protection Plan	Open	8/7/2017	8/6/2020	Restoration/Implementation
	6-246	Wabash River Enhancement	Great Bend of Wabash River Implementation	Open	12/9/2016	12/8/2018	Restoration/Implementation
	6-247	Washington County SWCD	Mill Creek-Blue River WMP Implementation	Open	12/6/2016	2/5/2020	Restoration/Implementation
2017							
		Carroll County SWCD	Deer Creek-Sugar Creek Implementation	Pending			Restoration/Implementation
		Clay County SWCD	Lower Eel River Watershed Implementation Project	Pending			Restoration/Implementation

Appendix B

319 Projects 9/1/16 - 8/31/17

Clinton County SWCD	South Fork Wildcat Creek Stewardship Initiative Phase 2	Pending	Restoration/Implementation
Dearborn County SWCD	Hogan Creek Watershed	Pending	Restoration/Implementation
Delaware County SWCD	Upper Mississinewa River Watershed Project Implementation	Pending	Restoration/Implementation
Historic Hoosier Hills RC&D	Central Muscatatuck Watershed	Pending	Restoration/Implementation
Huntington County SWCD	Lower Salamonie River Watershed Implementation Project	Pending	Restoration/Implementation
Indiana Lake Michigan Coastal Program	On Site Disposal System Outreach and Education/Targeted Source Track	Pending	Restoration/Implementation
Purdue University	Indiana Watershed Leadership Academy	Pending	Program Support
Washington County SWCD	South Fork-Blue River Watershed Project	Pending	Restoration/Implementation

Appendix C



Map Projection: UTM Zone 16 N; Datum: NAD83. Data obtained from the State of Indiana Geographical Information Office Library and the IDEM's Nonpoint Source Program. This map is intended to serve as an aid in graphic representation only. This information is not warranted for accuracy or other purposes.

Appendix D

Project Summaries for Closed § 319 Projects

FFY 2012

Turtle Creek-Turman Creek-Kelly Bayou WMP (EDS# A305-3-77) The Sullivan County SWCD produced a WMP for the Turtle Creek, Turman Creek, and Kelly Bayou watersheds, HUCs 0512011112, 0512011113, and 0512011116. After the WMP was completed, the SWCD developed and implemented a cost-share program for BMPs such as conservation tillage, precision agriculture, cover crops, and others that address the water quality concerns outlined in the Turtle Creek, Turman Creek, and Kelly Bayou WMP. The SWCD implemented an appropriate BMP from the WMP to address pollutants in a critical area as a demonstration project to educate the public on improving water quality through BMPs. A chemical, macroinvertebrate, and habitat monitoring program was conducted to establish a baseline pollutant load and to show general trends in water quality. The SWCD conducted an education and outreach program that included public meetings, updating the West Central Indiana Watershed Alliance (WCIWA) page, WCIWA quarterly newsletters, regional water quality related workshops, and releases to local newspapers, radio stations, and/or TV stations about the project.

Whitewater River WMP (EDS# A305-3-119) The Dearborn County SWCD produced a WMP for the Whitewater River watershed, HUC 0508000308. The District conducted a monitoring program to obtain baseline data for the watershed that assist with the development of the WMP and to identify critical areas. The District also conducted an education and outreach program that included public meetings to inform the public about the project and its progress, news releases to local newspapers, field days or workshops that educated watershed residents about nonpoint source pollution and/or BMPs, a storm drain marking program, stream clean-up events to encourage public involvement and awareness to improve water quality, signs identifying the watershed tributaries and/or boundaries throughout the watershed and youth presentations to educate students about the importance of preventing nonpoint source pollution and the benefits of improving water quality in their watershed.

Lower Salamonie River WMP and Implementation (EDS# A305-3-9) The Huntington County SWCD produced a WMP for the Lower Salamonie River, HUCs 0512010203 and 0512010204. After the WMP was completed the District developed and implemented a cost-share program for BMPs that addressed the water quality concerns outlined in the Lower Salamonie River Watershed Management Plan. The District conducted a monitoring program that identified chemical, biological, and physical conditions and areas of concern for purposes of critical area identification and WMP development, as well as future WMP implementation success and water quality trends. The District also conducted an education and outreach program that included steering committee meetings, a field day for stakeholders that focused on agricultural BMP implementation, a workshop focusing on rural/residential septic operation and maintenance, updates to local news outlets to promote the project, newsletters to landowners in the watershed providing planning/implementation updates, and brochures.

Pigeon Creek WMP Revision and Implementation (EDS# A305-3-8) The Steuben County SWCD developed and implemented a cost-share program for BMPs such as rain gardens, bio-swales, riparian buffers, pasture/hayland improvement, livestock exclusion, rain barrels, cover crops, and others that address the water quality concerns outlined in the Pigeon Creek Watershed Management Plan, HUC

0405000110. At the same time, the District updated the Pigeon Creek WMP and added subwatersheds not included in the original WMP: the headwaters of Turkey Creek (040500011004), Big Turkey Lake-Turkey Creek (040500011005) and Little Turkey Lake-Turkey Creek (040500011008). The District promoted the updated cost-share program to implement BMPs that address the water quality concerns outlined in the updated Pigeon Creek Watershed Management Plan. The District conducted a monitoring program to establish a baseline of water quality and help determine critical areas for continued BMP implementation. The District also conducted an education and outreach program that included quarterly steering committee meetings, public meetings, quarterly newsletters, news releases to local media, educational sessions promoting the project, septic education, and water quality, and three field days promoting BMPs.

FFY 2013

Mill Creek-Blue River Watershed Implementation (EDS# A305-3-120) The Washington County SWCD developed and implemented a cost-share program that implemented BMPs such as riparian buffers, forage and biomass plantings, residue management, drainage water management, nutrient management, cover crops, permeable pavement and others that address the water quality concerns outlined in the Mill Creek – Blue River Watershed Management Plan. The SWDC implemented one agricultural BMP and one urban BMP as demonstration projects to educate the public on improving water quality through BMPs. The SWCD also conducted a monitoring program for educational purposes and to collect trend data using Hoosier Riverwatch methods. An education and outreach program was conducted including steering committee and public stakeholder meetings; brochures; media releases; watershed newsletters; field days and/or workshops that educated landowners and managers about nonpoint source pollution and/or the importance of incorporating BMPs into their management programs; Hoosier Riverwatch training for new water quality monitoring volunteers; and community volunteer stream clean-up days to promote positive behavior changes in the community towards water quality and reducing nonpoint source pollution.

Region of the Great Bend of the Wabash River Implementation (EDS# A305-4-163) The Wabash River Enhancement Corporation (WREC) developed and implemented a cost-share program for BMPs such as riparian buffer, cover crops, nutrient management, livestock exclusion, conservation tillage, rain gardens, green roofs, and others that address the water quality concerns outlined in the Region of the Great Bend of the Wabash River Watershed Management Plan. WREC monitored one site in each of the paired watersheds (Little Wea Creek, Elliot Ditch, and Little Pine Creek) in years two and three of the grant term. WREC submitted a report on the paired monitoring and trend monitoring conducted from 2008 to 2014. WREC also conducted an education and outreach program designed to bring about behavioral changes and encourage BMP implementation during years two and three of the grant term, that included conducting committee meetings; conducting Hoosier Riverwatch monitoring; conducting the Spring and Fall Wabash Sampling Blitz; submitting press releases to the local media; hosting a booth at the Wabash Riverfest and other events; maintaining the program's website as part of www.wabashriver.net; and hosting demonstration workshops and field days to highlight urban and agricultural BMPs.

Lost River Watershed Implementation (EDS# A305-4-162) The Orange County SWCD developed and implemented a cost-share program for BMPs such as waste management, nutrient management, cover crops, conservation tillage, riparian buffers, forest management practices, urban filtration practices, and others that address the water quality concerns outlined in the Lost River Watershed Management Plan. The District also conducted an education and outreach program designed to bring about behavioral changes and encourage BMP implementation including public steering committee meetings; field days

and/or workshops focusing on BMPs; news releases to the local media; articles to local SWCDs for inclusion in their newsletters; fact sheets, brochures, or flyers that address water quality BMPs and non-point source pollution; presentations for local students and parents on the subjects of watersheds, water quality, and BMPs; and volunteer monitoring using Hoosier Riverwatch methods monthly from April to October in the watershed for the duration of the project.

Programmatic § 319 Grant Conditions Met

√ Progress reports and the Final Report entered in GRTS for all projects
√ All mandated elements entered in GRTS for all projects
√ QAPPs completed and approved prior to reimbursement for all projects collecting data
All water quality monitoring data collected will be entered into STORET. Progress on this condition may be found in Appendix A, Goal 2, Objective 2.

Appendix E

205 Projects 9/1/16 - 8/31/17

FFY	ARN/ Contract	Contractor	Project	Status	Start	End	Type
2013							
	4-179	Delaware County SWCD	Mississinewa River WMP	Closed	1/30/2014	1/29/2017	Planning
	5-189	enfoTech and Consulting, Inc	AIMS II Expansion, Enhancements and Maintance	Closed	8/11/2015	8/10/2017	Program Support
2014							
	5-1	Clinton County SWCD	Browns Wonder-Sugar Creek Watershed Planning	Closed	9/2/2014	5/1/2017	Planning
	5-180	Washington County SWCD	South Fork Blue River Watershed Project	Open	11/7/2014	11/24/2017	Planning
2015							
	5-240	U.S. Geological Survey	Kankakee Continuous Water Quality Monitoring	Open	11/20/2015	11/19/2018	Assessment
	6-3	Kosciusko County SWCD	Upper Middle Eel River WMP	Open	1/2/2016	6/30/2018	Planning
2016							
	19207	Gibson County SWCD	Lower Patoka WMP Rewrite	Open	3/3/2017	3/3/2019	Planning
	7-211	Shelby County SWCD	Big Blue River Watershed	Open	12/7/2016	6/6/2019	Planning
2017							
		Decatur County SWCD	Salt-Pipe Creek	Pending			Planning
		Huntington County SWCD	Upper Wabash River Phase 3 WMP	Pending			Planning
		Putnam County SWCD	Big Walnut Watershed Plan Re-Write	Pending			Planning