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EXECUTIVE SUMMARY

Nonpoint source (NPS) pollution continues to be, and is increasingly recognized by the public, as the largest remaining source of water quality impairments in the nation. The State NPS Management Plan, prepared by the Indiana Department of Environmental Management (IDEM) Office of Water Quality (OWQ), reflects the current goals and direction of Indiana's NPS Management Program. The report documents the methods the state will use to meet the criteria included in the United States Environmental Protection Agency's (U.S. EPA's) Nine Key Elements. The Nine Key Elements are outlined in the U.S. EPA's 2004 supplemental NPS guidelines, and are required for approval of this plan. The report includes the following sections, which address the Nine Key Elements.

Vision and Goals

The vision of the Indiana NPS Management Program is to restore waters impaired by NPS pollution and maintain water quality through locally-led partnerships. In order to achieve this vision, a long-term goal was established:

Make measurable improvements in water quality by addressing NPS pollution through education, planning, and implementation.

The key components of the long-term goal are:

1. identify gaps in knowledge concerning NPS pollution issues in Indiana;
2. characterize the extent and magnitude of NPS pollution in Indiana;
3. build partnerships to reduce NPS pollution and improve and/or restore water quality within all waterbodies in Indiana;
4. focus resources within IDEM to help educate, train, and assist stakeholders and partners as they work to address NPS pollution; and,
5. target resources to activities that will result in measurable improvements in water quality and reduce NPS pollution.

Corresponding program objectives (short-term, medium-term, and long-term) will guide the actions that IDEM and its partners will need to take in order to reach the long-term goals and program vision. Each objective includes a measure for tracking the success of the actions.

Priorities

IDEM has established a hierarchy of funding priorities, which recognizes the importance of successful watershed planning and continued focus on restoring waters impaired by NPS pollution. The current funding priorities are:

- watershed management planning and implementation in watersheds with waterbodies on the Section 303(d) list of impaired waters and where the impairment is a result of nonpoint sources;
- watershed management planning and implementation in watersheds with approved total maximum daily loads (TMDLs) for NPS pollution that address these sources with applicable load reductions; and,

EXECUTIVE SUMMARY

- implementation of watershed plans that meet the requirements identified in the IDEM checklist and include the U.S. EPA's Nine Key Elements.

A list of specific priorities and how NPS activities are ranked by IDEM is included in Chapter 3.

Implementation

The agency's methods and tools for efficiently managing and effectively implementing its NPS program are outlined in this report. The key components to successful implementation of the program are described and include:

- a list of the IDEM programs which are involved with NPS pollution and how they relate to the program;
- a description of how IDEM plans to strengthen working partnerships with other state, federal, local, and private entities involved with NPS pollution prevention and management;
- a description of how 319 grant funds are managed and distributed; and
- a description of how IDEM will educate its partners and the public on NPS pollution.

Monitoring

Monitoring and evaluation are essential for effective NPS pollution management. This report includes a description of IDEM's monitoring programs for surface and groundwater. The surface water monitoring program is designed to characterize the overall environmental quality of each major river basin and to identify those monitored waterbodies within each basin that are not fully supporting their designated beneficial uses. Waters that do not fully support one or more of their designated beneficial uses are placed on Indiana's 303(d) List of Impaired Waters. The 303(d) List defines the universe of priority watersheds for the NPS program. Impaired waters are targeted first for watershed-based projects such as TMDLs or 319-funded watershed plans to further characterize pollutant sources, loadings, and develop strategies for addressing NPS pollution.

Review, Revisions, and Reports

IDEM will review and evaluate the effectiveness of its NPS management programs through:

- evaluating environmental monitoring data to assess changes in environmental quality;
- reporting on activities through the 319 NPS Annual Report; and
- updating the NPS management plan at least every five years, or when new information or data become available, when deemed appropriate, or when directed by the U.S. EPA. Updates will be based on review and evaluation of NPS Program success and challenges.

EXECUTIVE SUMMARY

This plan is focused on the next five years and provides the foundation for future efforts. It will be reviewed using the measures of success outlined as part of the objectives to determine the effectiveness of the NPS programs.

ACRONYMS AND ABBREVIATIONS

ABBSSS	Assessment Branch Biological Studies Section Staff
AIMS	Assessment Information Management System
BEACH	Beaches Environmental Assessment and Coastal Health
BEAP	Small Business Environmental Assistance Program
BMP	Best Management Practice
C	Condition
CAFO	Confined Animal Feeding Operations
CSO	Combined Sewer Overflow
CSREES	Cooperative State Research Education and Extension Service
CTAP	Compliance and Technical Assistance Program
CWA	Clean Water Act
CWI	Clean Water Indiana
CZARA	Coastal Zone Act Reauthorization Amendments
CZM	Coastal Zone Management
CZMA	Coastal Zone Management Act
DNP	Division of Nature Preserves
DOD	Department of Defense
DOW	Division of Water
DQO	Data Quality Objective
<i>E. coli</i>	<i>Escherichia Coli</i>
FFY	Federal Fiscal Year
FHWA	Federal Highway Administration
FSA	Farm Service Agency
GIS	Geographic Information System
GRTS	Grant Reporting and Tracking System
IASWCD	Indiana Association of Soil and Water Conservation Districts
IDEM	Indiana Department of Environmental Management
IDNR	Indiana Department of Natural Resources
IGS	Indiana Geological Survey
INDOT	Indiana Department of Transportation
IR	Indiana's Integrated Water Quality Monitoring and Assessment Report
ISDA	Indiana State Department of Agriculture
ISDH	Indiana State Department of Health
LARE	Lake and River Enhancement
LMCP	Lake Michigan Coastal Program
M	Management
MS4	Municipal Separate Storm Sewer System
NOAA	National Oceanic and Atmospheric Administration
NPDES	National Pollutant Discharge Elimination System
NPS	Nonpoint Source
NRCS	Natural Resources Conservation Service
OCRM	Ocean and Coastal Resource Management
OICS	Office of the Indiana State Chemist
OWM	Office of Watershed Management
OWQ	Office of Water Quality
QAPP	Quality Assurance Project Plan
QA/QC	Quality Assurance/Quality Control
RC&D	Resource Conservation and Development
RPD	Relative Percent Difference

ACRONYMS AND ABBREVIATIONS

S	Stressor
SPEA	School of Public and Environmental Affairs, Indiana University
SMART	Specific, Measurable, Agreed-Upon, Realistic, and Time-Specific
SRF	State Revolving Fund
SSCB	State Soil Conservation Board
STEPL	Spreadsheet Tool for Estimating Pollutant Loads
STORET	Storage and Retrieval
SWCD	Soil and Water Conservation Districts
TMDL	Total Maximum Daily Load
USDA	United States Department of Agriculture
U.S. EPA	United States Environmental Protection Agency
USFWS	United States Fish and Wildlife Service
USFS	United States Forest Service
USGS	United States Geological Survey
WebRIT	Web-Based Reach Indexing Tool
WMP	Watershed Management Plan
WQX	Water Quality Exchange

MISSION STATEMENTS

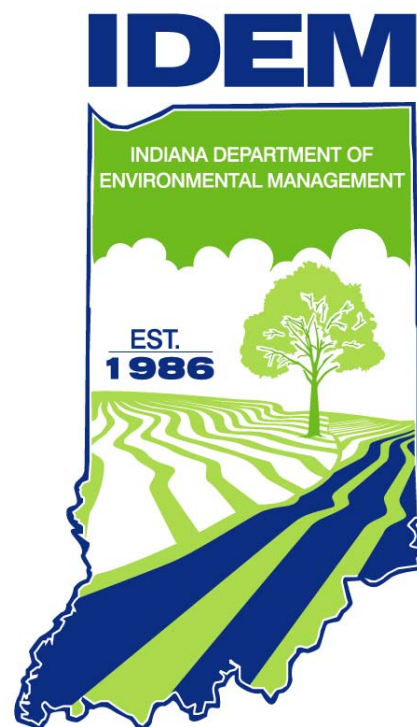
INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

The Indiana Department of Environmental Management's core mission is to implement federal and state regulations to protect human health and the environment, while allowing the environmentally sound operation of industrial, agricultural, commercial, and governmental activities vital to a prosperous economy.

OFFICE OF WATER QUALITY

The Office of Water Quality's mission is to monitor, protect, and improve Indiana's water quality to ensure its continued use as a drinking water source, habitat for wildlife, recreational resource, and economic asset.

The office achieves this by developing rules, guidance, policies, and procedures; assessing surface and ground water quality; regulating and monitoring drinking water supplies and wastewater treatment facilities; and protecting watersheds and wetlands. The office also provides outreach and assistance to the regulated community and the public, while supporting environmentally responsible economic development.



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INTRODUCTION

Nonpoint source (NPS) pollution is the largest single source of water quality impairments nationally and in Indiana. Land disturbing and hydromodification activities, such as agriculture, forestry, construction, and urbanization, sub-surface drainage, and channel alteration are some of the leading nonpoint sources of pollution.

In 1987, the U.S. Congress recognized the need for greater federal assistance to help focus state and local NPS pollution efforts. To address this need, the U.S. Congress amended the Clean Water Act (CWA; <http://www.epa.gov/owow/nps/cwact.html>) to establish the Section 319 NPS Management Program. Under Section 319, states receive grant money to support a wide variety of activities including technical assistance, financial assistance, education, training, technology transfer, demonstration projects, and monitoring to assess the success of NPS implementation projects.

NPS programs, originally developed and approved under Section 319 of the CWA in 1989-1990, have enhanced states' technical tools and capabilities, and strengthened and increased their partnerships. The NPS programs have also encouraged the development of a watershed approach to NPS pollution, and developed stronger financial bases and legal support for the states' NPS programs. Despite these improvements, the states continue to face challenges related to implementing NPS programs that protect existing water quality in unimpaired waters and restore impaired waterbodies. As a result, in 1997, the United States Environmental Protection Agency (U.S. EPA) issued a supplemental *NPS Program and Grants Guidance*. These guidelines were designed to focus attention on waters that have been listed by states under Section 303(d) of the CWA as needing a total maximum daily load (TMDL). They also addressed the need to improve the U.S. EPA's and states' abilities to account for any accomplishments, as well as shortcomings, in implementing the national NPS program.

U.S. EPA's 1997 guidance presents a list of Nine Key Elements, agreed to by the U.S. EPA and state-led NPS agencies, that characterize an effective and dynamic state NPS program designed to achieve and maintain beneficial uses of waters. In 2004, supplemental guidelines were released that focused on NPS projects and established the nine-element watershed management plan (WMP). Consequently, Section 319 grant funds above the \$100 million authorized level are only available for states with a U.S. EPA-approved, upgraded NPS management plan that complies with the requirements of the 2004 supplemental guidelines.

IDEM is providing this update to the state's NPS plan to more accurately reflect the current goals and direction of Indiana's NPS program, describe the program implementation, and document the methods Indiana will use to meet the criteria included in the Nine Key Elements. This plan describes the program that IDEM will implement over the next five years and into the future. The plan will address water quality initiatives and provide guidance in the management of NPS impacts to water resources throughout the state of Indiana.

This document outlines goals for IDEM that will help build a stronger and more focused NPS program. Funding priorities identified for IDEM's NPS Program support these goals with a strong focus on watershed planning, education, and implementation of measures to address more critical sources of NPS pollution. Many goals will require IDEM to take action by building partnerships and leading efforts to coordinate NPS programs. The implementation section of the report emphasizes IDEM's various roles in addressing NPS pollution through both regulatory and non-regulatory programs.

THE NINE KEY ELEMENTS

The U.S. EPA's required Nine Key Elements, which are addressed in Indiana's updated NPS management plan, are listed below. Where these elements are addressed in the plan is also noted.

Key Element No. 1. The state program contains long-term goals, short-term objectives, and strategies to protect surface and ground water.

a. <i>The state program includes a vision statement.</i>	Chapter 2 Page 23
b. <i>The state has specific long-term goals that are linked to its vision and are directed towards the expeditious achievement and maintenance of beneficial uses of water.</i>	Chapter 2 Page 24
c. <i>The state has specific short-term, medium-term, and long-term (e.g., 1-10 year) objectives, expressed as activities, that are linked to its goals.</i>	Chapter 2 Pages 25-32
d. <i>The state has identified measures and indicators that will be used to assess the state's success in achieving its goals and objectives.</i>	Chapter 2 Pages 25-32
e. <i>The state has identified specific, expeditious milestones for its activities.</i>	Chapter 2 Pages 25-32
f. <i>The state has identified implementation steps and the expected effects of those steps on its water resources.</i>	Chapter 2 Pages 25-32 Chapter 4 Pages 45-48 Appendix D

Key Element No. 2. The state strengthens its working partnerships and linkages with appropriate state, tribal, regional, and local entities (including conservation districts), private sector groups, citizens groups, and federal agencies.

a. <i>The state proposes to use a state-wide collaborative team NPS task force advisory group, or other appropriate process, to provide for input and recommendations from representatives of federal, state, tribal, and local agencies, private sector groups, and citizens' groups regarding NPS program direction, project selection, and other similar aspects of program administration.</i>	Chapter 4 Pages 49-50
b. <i>The team, task force, or advisory group meets regularly and promotes collaborative and inclusive decision-making.</i>	Chapter 4 Page 49-50
c. <i>The state program specifies procedures to provide for periodic public input into the program.</i>	Chapter 4 Pages 49-51
d. <i>The state effectively incorporates a variety of organizations and interests into its implementation of NPS activities and projects.</i>	Chapter 4 Pages 49-50 Appendix B

THE NINE KEY ELEMENTS

e. <i>The state uses its partnerships effectively to avoid the transfer of problems among environmental media.</i>	Chapter 4 Page 53
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Key Element No. 3. The state uses a balanced approach that emphasizes both statewide NPS programs, and on-the-ground management of individual watersheds where waters are impaired and threatened.

a. <i>Annual or multi-year work plans contain NPS implementation actions directed at both specific priority watersheds, and activities of a statewide nature.</i>	Chapter 4 Page 51
b. <i>The state tracks both statewide activities and watershed projects.</i>	Chapter 1 Pages 17-21
c. <i>The state has institutionalized its program beyond the annual implementation of 319-funded activities and projects.</i>	Chapter 4 Pages 45-48
d. <i>The state uses an integrated watershed approach for assessment, protection, and remediation that is well integrated with other water or natural resource programs.</i>	Chapter 1 Page 21

Key Element No. 4. The state program (a) abates known water quality impairments from NPS pollution and (b) prevents significant threats to water quality from present and future activities.

a. <i>Based on the information that IDEM currently has, the state has characterized water quality impairments and threats in streams throughout the state, which are caused or significantly contributed to by nonpoint sources.</i>	Chapter 1 Pages 17-20
b. <i>The state has comprehensively characterized reasonably foreseeable water quality impairments and threats that are likely to be caused by NPS pollution in the future.</i>	Chapter 1 Pages 17-20
c. <i>The state program addresses all significant NPS categories and subcategories.</i>	Chapter 1 Pages 17-20
d. <i>The state program has identified specific programs to abate pollution from categories of nonpoint sources, which cause or substantially contribute to the impairments identified in its assessments.</i>	Chapter 4 Pages 45-48 Appendix B
e. <i>The state has identified specific programs to prevent future water quality impairments and threats that are likely to be caused by NPS pollution.</i>	Chapter 4 Pages 45-48 Appendix B

Key Element No. 5. The state program identifies waters and their watersheds impaired by NPS pollution, and also identifies important unimpaired waters that are threatened or otherwise at risk. Further, the state establishes a process to progressively address these identified waters by

THE NINE KEY ELEMENTS

conducting more detailed watershed assessments and developing watershed implementation plans, and then by implementing the plans.

a. <i>The state water quality assessments (including those performed under Section 305[b], 319[d], 314, and others), along with analysis of changing land uses within the state, form the basis for the identification of the state's planned NPS activities and projects.</i>	Chapter 1 Pages 17-20 Chapter 5 Pages 55-64
b. <i>The state activities focus on remediating the identified impairments and threats, and on protecting the identified at-risk waters.</i>	Chapter 3 Page 35
c. <i>The state has provided for public participation in the overall identification of problems to be addressed in the state program, and in the establishment of a process to progressively address these problems.</i>	Chapter 4 Page 53
d. <i>The state revises its identification of waters and revisits its process for progressively addressing these problems periodically (e.g., updated as part of the state's Integrated Report).</i>	Chapter 6 Page 68

Key Element No. 6. The state reviews, upgrades, and implements all program components required by Section 319(b) of the Clean Water Act, and establishes flexible, targeted, and iterative approaches to achieve and maintain beneficial uses of water as expeditiously as practicable. The state programs include:

- a) A mix of water quality-based and/or technology-based programs designed to achieve and maintain beneficial uses of water; and
- b) A mix of regulatory, non-regulatory, financial, and technical assistance, as needed, to achieve and maintain beneficial uses of water as expeditiously as practicable.

The state includes in its program and implements the following eight items:

a. <i>Identification of the measurements to be used to control nonpoint sources of pollution, focusing on those measures that will be most effective to address the specific types of NPS pollution prevalent within the state. These measures may be individually identified or presented in manuals or compendiums, provided they are specific and are related to the category or subcategory of nonpoint sources. They may also be identified as part of a watershed approach towards achieving water quality standards, whether locally, within a watershed, or statewide.</i>	Chapter 2 Pages 25-32 Appendix A
b. <i>Identification of programs to achieve implementation of the measures.</i>	Chapter 4 Pages 45-50 Appendix B
c. <i>Processes used to coordinate and, where appropriate, integrate various programs used to implement NPS controls in the state.</i>	Chapter 4 Pages 45-48

THE NINE KEY ELEMENTS

d. <i>A schedule with goals, objectives, and annual milestones for program implementation; legal authorities to implement the program; available resources; and institutional relationships.</i>	Chapter 2 Pages 25-32
e. <i>Sources of funding from federal (other than 319), state, local, and private sources.</i>	Appendix C
f. <i>Identification of federal programs and projects that the state will review for their effects on water quality and their consistency with the state program.</i>	Chapter 5 Pages 49-50 Appendix D
g. <i>Monitoring and other evaluation programs to help determine short-term and long-term program effectiveness.</i>	Chapter 5 Pages 55-64 Appendix D
h. <i>The state program also incorporates or cross-references existing baseline requirements established by other applicable federal or state laws to the extent that they are relevant.</i>	Chapter 4 Pages 49-50 Appendix B

Key Element No. 7. The state identifies federal lands and activities, which are not managed consistently with state NPS program objectives. Where appropriate, the state seeks U.S. EPA assistance to help resolve issues.

a. <i>The state reviews federal financial assistance programs, development projects, and other activities that may result in NPS pollution for consistency with the state program.</i>	Chapter 4 Page 50 Appendices B and C
b. <i>The state works with federal agencies to resolve potential inconsistencies between federal programs and activities and the state programs.</i>	Chapter 4 Page 50
c. <i>Where the state cannot resolve federal consistency issues to its satisfaction, it requests U.S. EPA assistance to help resolve the issues.</i>	Chapter 4 Page 50
d. <i>The state coordinates with federal agencies to promote consistent activities and programs, and to develop and implement joint or complementary activities and programs.</i>	Chapter 4 Page 50

Key Element No. 8. The state manages and implements its NPS program efficiently and effectively, including necessary financial management.

a. <i>The state's plan for watershed projects and statewide activities are well designed, with sufficient detail to assure effective implementation.</i>	Chapter 4 Page 45-51
b. <i>The state's watershed projects focus on the critical areas and critical sources within those areas that are contributing to NPS problems.</i>	Chapter 4 Page 51

THE NINE KEY ELEMENTS

c. <i>The state implements its activities and projects, including all tasks and outputs, in a timely manner.</i>	Chapter 4 Page 51
d. <i>The state has established systems to assure that the state meets its reporting obligations.</i>	Chapter 6 Pages 67-69
e. <i>The state utilizes the Grants Tracking and Reporting System effectively.</i>	Chapter 4 Page 52
f. <i>The state has developed and uses a fiscal accounting system capable of tracking expenditures of both 319 funds and nonfederal match.</i>	Chapter 4 Page 52
g. <i>The NPS projects include appropriate monitoring and/or environmental indicators to gauge effectiveness.</i>	Chapter 5 Pages 58-62

Key Element No. 9. The state periodically reviews and evaluates its NPS program using environmental and functional measures of success, and revises its NPS assessment and its management program at least every 5 years.

a. <i>The state has and uses a process to periodically assess both improvements in water quality and new impairments or threats.</i>	Chapter 6 Page 69
b. <i>The state uses a feedback loop, based on monitoring and other evaluative information, to assess the effectiveness of the program in meeting its goals and objectives, and revises its activities and tailors its annual work plans, as appropriate, in light of its review.</i>	Chapter 6 Page 68
c. <i>Using its feedback loop, the state periodically reviews and assesses the goals and objectives of the NPS Management Program, and revises the program, as appropriate, in light of its review.</i>	Chapter 6 Page 68
d. <i>The state's annual report successfully portrays the state's progress in meeting milestones, implementing Best Management Practices (BMPs), and achieving water quality goals.</i>	Chapter 6 Page 69

Note: Throughout this plan, “the state” refers to IDEM, unless otherwise described. IDEM has certain mandates and charges related to the CWA and cannot presume to speak for other agencies or organizations and their NPS goals and objectives. Many partners implement NPS projects in compliance with the CWA and applicable state laws, or voluntarily implement programs and initiatives that complement IDEM NPS program activities. For the future, IDEM will strive to coordinate these diverse approaches to more effectively address statewide NPS issues.

NONPOINT SOURCE POLLUTION

NPS pollution, unlike pollution from industrial and sewage treatment plants, comes from many diffuse sources. NPS pollution is caused by rainfall or snowmelt moving over and through the ground. As the run-off moves, it picks up and carries away natural and human-made pollutants, finally depositing them into lakes, rivers, wetlands, coastal waters, and even underground sources of drinking water. These pollutants include:

- excess fertilizers, herbicides, and insecticides from agricultural lands and residential areas;
- oil, grease, and toxic chemicals from urban run-off and energy production;
- sediment from improperly managed construction sites, crop and forest lands, and eroding stream banks;
- salt from irrigation practices and acid drainage from abandoned mines; and,
- bacteria and nutrients from livestock, pet wastes, and faulty septic systems.

Atmospheric deposition and hydromodification are also sources of NPS pollution.

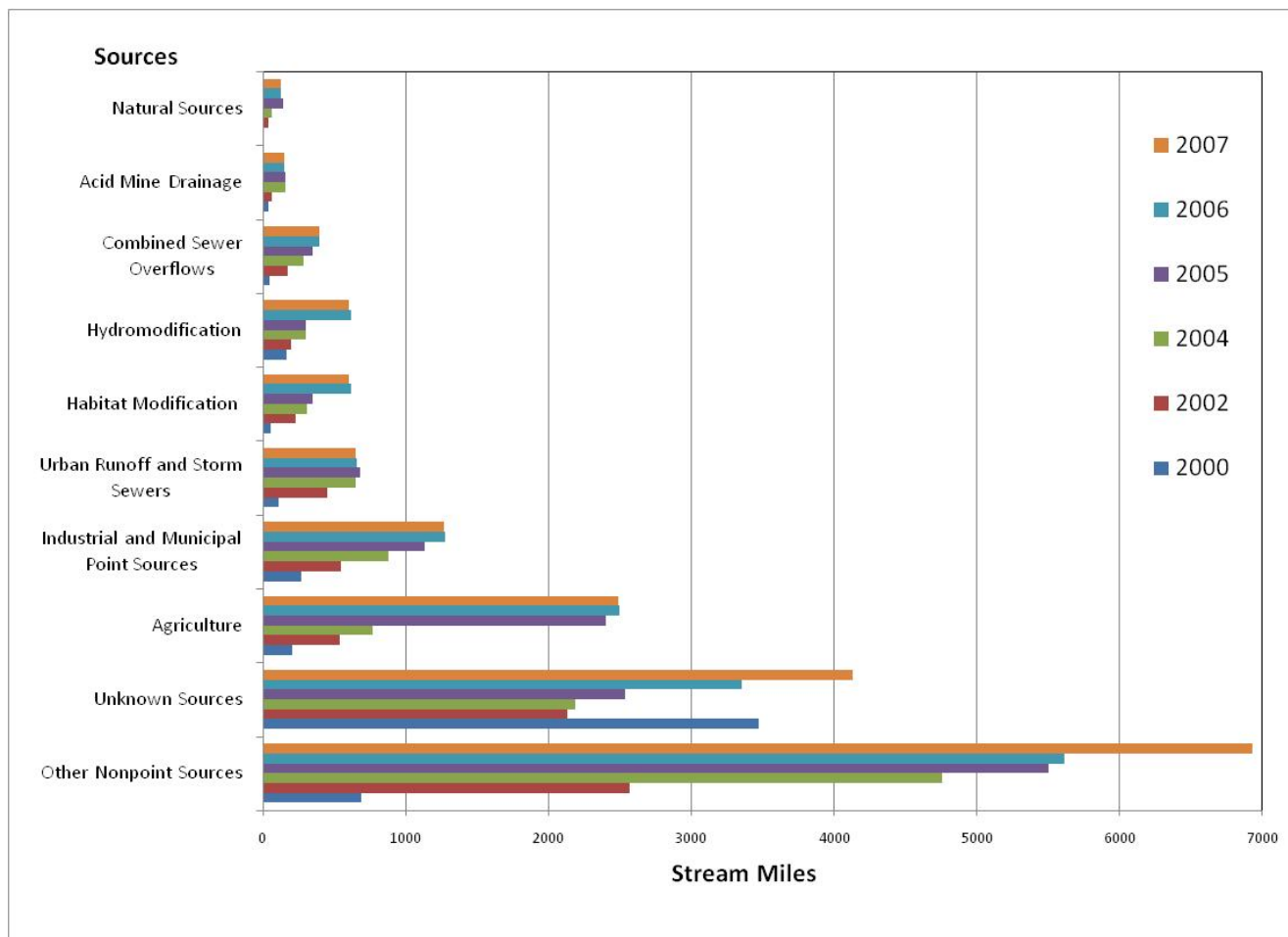
The origins of NPS pollutants are diffuse and often difficult to trace. Human-related origins of NPS pollution that have been identified as most prevalent in Indiana include:

- animal production operations and feedlots;
- agricultural activities;
- stream bank and shoreline erosion;
- timber harvesting;
- land development;
- on-site sewage disposal units;
- solid waste disposal landfills;
- transportation-related facilities;
- coal mining;
- oil and gas production;
- non-energy mineral extraction; and,
- atmospheric deposition.

NONPOINT SOURCE POLLUTION

As noted in Figure 1-1, agriculture and other NPS pollution are the major stressors to Indiana's impaired streams.

Figure 1-1
Sources of Stressors and Responses Impairing Indiana's Streams



From IDEM, 2008 *Integrated Water Quality Monitoring and Assessment Report*

To place this information in context, the following section provides an overview of Indiana's water resources and a summary of current water quality conditions in Indiana, based on the 2008 *Integrated Water Quality Monitoring and Assessment Report*.

The data represents total stream miles assessed in each year. This includes all stream sizes, from the smallest to the largest river systems. Since IDEM is assessing more streams each year, these numbers represent running totals and do not, per se, indicate trends.

Indiana has monitored 55.7 percent of its streams to determine whether they are capable of supporting a well-balanced, warm water aquatic community. Of the streams monitored, 79.4 percent were supporting their designated aquatic life use. Indiana has

NONPOINT SOURCE POLLUTION

monitored 38.1 percent of its streams for recreational uses. Of the streams monitored, 31.1 percent fully support recreational uses, while 68.9 percent of its streams were found to be impaired.

INDIANA'S WATER QUALITY – AN OVERVIEW OF CONDITION

Indiana is located on the eastern edge of the North American great interior plains. The North-South continental divide traverses through northern Indiana, draining watersheds into the Great Lakes basin and the Mississippi River and Ohio River systems. Surface water in the northern one-quarter of the state flows north into the Great Lakes and then through the St. Lawrence River to the Atlantic Ocean. The southern three-quarters of the state drain into the Ohio River or Illinois River and flow into the Mississippi River, then south to the Gulf of Mexico. There are 35,673 miles of rivers, streams, ditches, and drainage ways in Indiana (Table 1-1).

Table 1-1

Description	Number	Unit of measurement
Indiana population – (2006 estimated) ¹	6,313,520	people
Indiana surface area ²	36,291	sq. mi.
Total miles of rivers and streams ³	35,673	miles
Number of publicly-owned lakes/reservoirs/ponds ⁴	575+	
Publicly-owned lakes/reservoirs/ponds ⁴	106,205	acres
Great Lakes ⁴	154,240	acres
Great Lakes shoreline ⁵	59	miles
Fresh water wetlands ⁶	813,000	acres

Sources: ¹U.S. Census Bureau ²State Information Center ³Horizon Systems Corporation 1994
⁴U.S. EPA 1993 ⁵Indiana Reach Index ⁶Rolley 1991

Based on current information, 79 percent of the 17,535 stream miles assessed for aquatic life use were found to be fully supporting. Approximately 30 percent of the 12,073 stream miles assessed for recreation use were found to be fully supporting. Almost all of Indiana's 59 miles of Lake Michigan shoreline outside the Indiana Harbor fully supports aquatic life use, while almost none of the Lake Michigan shoreline waters support full body contact recreational use.

NONPOINT SOURCE POLLUTION

Table 1-2 summarizes use supports assessed and reported from 1998 through 2007.

**Table 1-2
Summary of Use Support - Assessed and Reported 1998 through 2007**

Designated Use	Support	Threatened ¹	Non Support	Assessed	Not Assessed
Rivers (miles)					
Aquatic Life Use	13,913	--	3,622	17,535	14,606
Fishable Uses	1,044	--	3,420	4,465	27,705
Drinking Water Supply	--	--	1	1	101
Recreational Use (Human Health)	3,700	--	8,374	12,073	20,100
Great Lakes Shoreline (miles)					
Aquatic Life Use	59	--		59	--
Fishable Uses	--	--	59	59	--
Drinking Water Supply	33	--		33	--
Recreational Use (Human Health)	--	--	59	59	--
Lake Michigan (acres)					
Fishable Uses	--	--	154,176	154,176	--
Lakes and Reservoirs (acres)					
Aquatic Life Use	3,690	--	6,625	10,315	21,826
Fishable Uses	7,820	--	63,663	71,483	5,084
Drinking Water Supply	230	--	16,615	22,905	12,926
Recreational Use (Human Health)	21,922	--	983	22,905	104,662
Recreational Use (Aesthetics)	29,035	--	8,006	37,041	90,526

Source: IDEM's Assessment Database

IDEM does not currently assess the water quality and use support of wetlands. IDEM utilizes the work of Indiana University's Clean Lakes Program (funded by a Section 319 grant), to gather data needed to assess lakes. The overall assessment of NPS categories and subcategories for streams is addressed on a watershed-by-watershed basis. This approach is also reflected in IDEM's programmatic NPS activities, such as grant activity prioritization and development of TMDLs.

THE WATERSHED APPROACH

Protecting our water resources from the impacts of NPS pollution is a complex challenge. Indiana uses a watershed approach as its water quality management strategy to protect and restore water quality. The watershed approach is used by IDEM and others to examine and address water quality concerns in each waterbody in the context of its watershed, thereby attempting to address all the potential sources of pollution within the watershed.

Environmental problems, such as NPS pollution, often cut across media and political jurisdictions. Consequently, environmental mitigation and protection requires a comprehensive and collaborative approach that works with a multitude of programs and agencies. The watershed approach is a coordinating framework for management that focuses public and private sector efforts to address the highest priority, water-related problems within geographic areas, considering both surface and ground water flow. By examining water quality issues on a watershed basis, problems can be observed in relationship to their sources so that the causes can be effectively addressed.

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

- ensuring that IDEM resources are focused on addressing water quality issues affecting waters identified in the Indiana 303(d) List of Impaired Waters. This will be performed by conducting semi-annual reviews of Office of Water Quality activities and making necessary adjustments to program priorities and activities;
- improving internal coordination between water quality assessment, watershed planning, and implementation programs to facilitate an integrated watershed management approach to restore impaired waterways; and,
- improving coordination with and leverage efforts of local watershed groups, community groups, and other state and federal agencies to achieve greater improvements in water quality and protect waters not identified as impaired by NPS pollution. The large number of nonpoint sources and the fact that they are difficult to regulate make the voluntary efforts of citizens, businesses, service organizations, and other groups an essential part of the overall effort to address NPS pollution in Indiana.

Two key steps needed to solve NPS problems within a watershed context are the development of a watershed-based plan that addresses a waterbody's water quality problems (including the incorporation of any TMDLs that have been developed) and the actual implementation of the plan. Careful analysis of the sources of water quality problems, their relative contributions to the problems, and alternatives to solve those problems, provide the best basis for sound decision-making and implementation that will actually solve those water quality problems. For this reason, IDEM will emphasize using watershed-based planning and implementation processes to realize the long-term goal for the state's NPS management program.

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PROGRAM VISION

This section addresses Key Element No. 1 in the *NPS Program and Grants Guidance* issued by the U.S. EPA. It presents Indiana's long-term goal and details explicit program objectives and strategies to protect and restore surface and ground water.

The vision of this program is to restore waters impaired by NPS pollution and maintain water quality through locally led partnerships. This vision cannot be realized in a short amount of time, nor can it be realized by IDEM alone. The prevention and remediation of NPS pollution in Indiana's waters requires cooperation of many groups and agencies at the federal, state, and local levels, as well as the citizens of the State of Indiana. IDEM and its many partners will need to continue to work together on a watershed-by-watershed basis to improve and protect our water resources.

LONG-TERM GOAL

This document lays out a strategy to achieve the primary long-term goal for the state of Indiana's NPS program. Achieving this goal relies on the support, cooperation, and resources IDEM and its partners offer to address NPS pollution in Indiana. Some goals will be easier to achieve than others. IDEM recognizes that the plan is a living document. As progress is made towards the achievement of the goals and objectives, the plan will be evaluated. Objectives and the approaches to reach objectives will be restructured to reflect both progress made and challenges encountered.

The state's long-term goal (between seven and ten years from implementation) of this NPS management plan is to:

Make measurable improvements in water quality by addressing NPS pollution through education, planning, and implementation.

The Plan lays out steps to achieve this goal by providing a single, unified, and coordinated approach to dealing with NPS pollution structured around program objectives. Achievement of the long-term goal will be reached through efforts made on a number of more detailed objectives. Collectively, these objectives will develop processes, programs, and skills needed to improve water quality and reduce NPS pollution. The key components of the long-term goal are:

1. identify gaps in knowledge concerning NPS pollution issues in Indiana;
2. characterize the extent and magnitude of NPS pollution in Indiana;
3. build partnerships to reduce NPS pollution and improve water quality within all impaired waterbodies in Indiana;
4. focus resources within IDEM to help educate, train, and assist stakeholders and partners as they work to address NPS pollution; and,
5. target resources to activities that will result in measurable improvements in water quality and reduce NPS pollution.

The long-term goal and corresponding program objectives (short-term, medium-term, and long-term) are explained in the following sections. The goal and objectives will guide the program in reaching the program vision. In this report, short-term refers to one to five years. Medium-term refers to four to seven years. Long-term refers to seven to ten years from the adoption of the plan. All objectives build on each other with the achievement of long-term objectives relying on the achievement of short-term and medium-term objectives. Program objectives are expressed as activities linked to the long-term goal. Also included is a quantitative metric to track progress and judge if the objective is successfully met.

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IDEM will implement activities and strategies to monitor water quality and assess NPS pollution in Indiana waters. Of critical importance is the need to **identify NPS pollution knowledge gaps and characterize the extent and magnitude of NPS pollution in Indiana**. The following objectives and measures will be implemented by IDEM to enhance its existing programs.

Objective A NPS Water Quality Monitoring Strategy

- i. Short-term: Develop a NPS monitoring strategy in conjunction with IDEM's Assessment Branch to evaluate the magnitude and extent of NPS pollution within the state of Indiana.

Measure: Completion of the NPS monitoring strategy and its incorporation into IDEM's comprehensive water quality monitoring strategy.

- ii. Short-term: Develop a data quality objective (DQO) process to require performance and acceptance criteria for data collection by third party entities.

Measure: Completion of a third party DQO process to serve as the basis for designing a plan for collecting data of sufficient quality and quantity to support the goals of the study.

- iii. Medium-term: 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.

Measure: Implementation of the NPS monitoring program and analysis of data collected.

Objective B Data Collection

- i. Medium-term: Develop and implement a system to store and evaluate NPS pollution environmental monitoring data collected in the state of Indiana.

Measure: Completion of a NPS pollution database for the storage and evaluation of data collected by NPS projects.

- ii. Long-term: Develop standard operating procedures to allow third party entities to enter data into the NPS pollution database.

Measure: Development of a Web page for use by third party entities to enter data collected for Section 319-funded projects into the NPS database optimizing the access to and evaluation of data collected by 319 funded projects.

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Objective C NPS Pollution Assessment Technology

- i. Long-term: Use Geographic Information System (GIS), remote sensing, and other tools to illustrate differences in land use that could affect NPS pollution in Indiana waterways and demonstrate anthropogenic changes.

Measure: Increased number of tools used to demonstrate the effects of various land uses on NPS pollution.

Objective D NPS Pollution Assessment Methodology

- i. Medium-term: Develop an assessment methodology to characterize the causes of impaired waters listed on the 303(d) list and discern point source pollution from NPS.

Measure: Creation of a formal assessment process that uses best available data to characterize pollutant sources.

- ii. Long-term: Use available data to rank watersheds, based on NPS pollution levels and potential to address the problem, to prioritize the state's management efforts and assist state and local partner NPS programs.

Measure: Development of a ranking system for all watersheds in Indiana and assignment of a NPS management rank to each watershed.

Partnerships are a key to effective watershed management. Through a partnership, different people and organizations work together to address common interests and concerns. In order to achieve its long-term goals, IDEM is committed to **building partnerships to address NPS pollution in Indiana**. Building successful partnerships takes skill, time, and patience. IDEM will implement the following objectives to build partnerships at the local, state, and federal levels.

Objective A Improve U.S. EPA/IDEM NPS Program Coordination

- i. Short-term: Establish a formal schedule of meetings with U.S. EPA to evaluate IDEM's NPS program and obtain feedback on program improvement opportunities and successes.

Measure: Establishment of a fixed communication schedule for program coordination.

Objective B Support the Section 6217 component of the Indiana Department of Natural Resource's (IDNR's) Indiana Coastal Management Program

- i. Short-term: Support the IDNR Coastal Nonpoint Pollution Control Program in obtaining full program approval.

Measure: Number of conditions resolved through the collaborative efforts of the two programs.

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- ii. Medium-term: Develop a collaborative approach between IDEM and the IDNR Coastal Nonpoint Management Program to work on local watershed management planning and implementation efforts in the Great Lakes drainage basin.

Measure: Number of projects in the coastal area where IDEM has worked collaboratively through funding, technical support, or other methods with stakeholders in the Lake Michigan and Lake Erie watersheds.

Objective C IDEM Programs

- i. Short-term: Focus NPS financial and technical resources in watersheds with approved TMDLs that address NPS pollution and implementable watershed plans that are supported by a local watershed group.

Measure: Number of watersheds with approved TMDLs that address NPS pollution impacts and that have Section 319-funded planning or implementation activities occurring.

- ii. Short-term: Work collaboratively with IDEM's assessment program(s) through the establishment of a formal NPS monitoring strategy.

Measure: Creation of a NPS monitoring strategy and internal procedures detailing needed monetary and staffing resources.

- iii. Medium-term: Use input obtained from NPS partners to develop and revise, as needed, a comprehensive IDEM Watershed Specialist strategy to support IDEM's internal and external partners efforts to focus on alleviating NPS pollution issues.

Measure: Completion and implementation of a comprehensive Watershed Specialist strategy.

- iv. Long-term: Implement a formal watershed approach to IDEM program coordination when evaluating permits, policies, and rules related to water pollution.

Measure: Development of a formal procedure and staff taskforce to address, on a watershed basis, individual agency actions that may affect water pollution.

Objective D NPS Partnerships

- i. Short-term: Implement the creation of an advisory group of state and federal agencies, as well as interested entities and organizations, to assist with refining the state's NPS policy and procedures for all programs and agencies that work with NPS pollution.

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Measure: Creation of an advisory group to the IDEM Section 319 Program on NPS issues that includes representatives from all applicable programs and partnerships, both regulatory and non-regulatory.

- ii. Short-term: Use current IDEM Watershed Specialists to assist partners with NPS planning and implementation activities.

Measure: Percentage of partner projects working with a IDEM Watershed Specialist for NPS-related activities.

- iii. Medium-term: Create a NPS management plan workgroup to conduct annual evaluations of the effectiveness of the NPS program and recommend revisions to specific components and sections of the plan.

Measure: Creation of the workgroup and production of an annual report.

- iv. Medium-term: Work with surrounding states that share watersheds with Indiana to develop consistent approaches to addressing NPS pollution.

Measure: Creation of standard operating procedures to work with Ohio, Michigan, Illinois, and Kentucky on the coordination of NPS activities within watersheds that span state boundaries.

- v. Long-term: Establish a formal process to maintain an inventory of watershed groups, organizations, and governmental entities whose primary purpose is to study, plan, or manage NPS pollution.

Measure: Creation and maintenance of a Web-based database of active watershed groups, organizations, and governmental entities whose primary purpose is to study, plan, and manage NPS pollution. The database will be deployed on IDEM's Web site.

Capacity building means raising the necessary level of awareness and the abilities of organizations to address issues related to NPS pollution in an effective and efficient manner. IDEM recognizes that watershed groups and IDEM partners need a range of tools to effectively manage water resources. In addition, the increasing complexity of watershed projects, combined with the difficulties of maintaining volunteer organizations, strain the existence of watershed groups and their ability to protect and restore watersheds. Sustainable watershed partnerships that include citizens, private industries, and government agencies, that are not dependent upon government grants, provide the long-term interest and focus needed for effective, local watershed management. Capacity building is also critical to this effort. In an effort to provide additional resources and or tools to assist these entities, IDEM will implement the following objectives and measures related to education and training to support watershed organizations as they manage NPS pollution.

Objective A Develop Education and Training Initiatives for Use at the Watershed Level to Build Capacity of the Staff of Watershed Groups and Local Governments

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- i. Short-term: Update IDEM's NPS Web site to create a repository for information on NPS planning, implementation, and guidance on applying for and implementing Section 319 grants.

Measure: Completion of updated NPS Web site and compilation of a utilization survey.
- ii. Short-term: Evaluate existing NPS pollution program partners and determine resources (financial and technical) needed to improve program efficacy.

Measure: Development of partner resource needs report.
- iii. Medium-term: Develop collaborative training and outreach materials based on needs solicited from partners.

Measure: Number and types of training and types of outreach materials developed and distributed as a result of assessed needs.
- iv. Long-term: Create Web-based tools to assist local groups with identification of resources, partners, and technical support to create more self-sustaining watershed groups dedicated to addressing NPS pollution.

Measure: Number and type of IDEM NPS Web site hits.
- v. Long-term: Survey and assess staff knowledge levels, with partner participation, to refine and modify capacity-building needs and existing resources.

Measure: Modification of partner participation, capacity-building needs based on the results of survey assessment.

Objective B Comprehensive Training Program

- i. Short-term: Develop and conduct training workshops to inform 319 grant recipients about key program policies and provide training on grant implementation.

Measure: Annual Section 319 training workshop conducted by IDEM available for all grant recipients and applicants.
- ii. Medium-term: Develop internal IDEM training manuals and policy documents for use by IDEM personnel to ensure clear and consistent grant program implementation.

Measure: Number of internal training manuals incorporated in day-to-day operations of IDEM's program for Section 319 implementation and financial management.

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- iii. Long-term: Develop and implement self-sustaining programs (train-the-trainer) to teach watershed leaders, water quality data collectors, and project facilitators to successfully implement watershed plans.

Measure: Development of a multi-agency strategy for assessing needs and developing related skills and publish on IDEM's NPS Web site.

Objective C Raise Public Awareness and Education Through Outreach Activities

- i. Short-term: Enhance efforts to educate citizens on urban and agricultural NPS issues through the development of a comprehensive outreach campaign.

Measure: Number of outreach efforts conducted, categorized by training versus education.

- ii. Medium-term: Develop a repository of Web-based public outreach, educational materials for use by internal and external partners and local watershed groups.

Measure: Number of IDEM NPS Web site hits.

- iii. Medium-term: Utilize the IDEM NPS Web site to distribute information regarding NPS pollution, upcoming training events, available resources, and other relevant information. Make it available for use by locally led watershed groups.

Measure: Number of IDEM NPS Web site hits. Evaluate the usage of the IDEM NPS website by using their length of stay on the Web site.

Objective D Build Sustainable, Locally-Led Watershed Groups

- i. Short-term: Work with active watershed groups to assess resource (technical, financial, and managerial) needs to enhance or ensure sustainable activities beyond Section 319 funding.

Measure: Number of watershed groups that actively seek and obtain funding, in addition to Section 319, to sustain the continual group operation.

- ii. Long-term: Work to create new watershed groups from ground level and provide these groups with a strong base for sustainability.

Measure: Number of new watershed groups formed subsequent to January 2009.

IDEM is committed to **target resources to activities that will result in measurable improvements in water quality and reduce nonpoint source pollution**. To achieve this goal,

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it is essential that funding priorities be established and target pollutants and watersheds be addressed using adaptive management. The following objectives and measures will be utilized by IDEM to address NPS pollution and improve water quality.

Objective A Focus Section 319 Planning Funds

- i. Short-term: Target Section 319 funds in appropriate amounts, to watershed groups that will develop and implement watershed plans to address 303(d)-listed waters impaired by NPS pollution.

Measure: Number of watershed groups developing and or implementing watershed plans in 303(d) listed waters receiving Section 319 funds in appropriate amounts to accomplish their projects goals.

- ii. Medium-term: Assess water quality data to identify watersheds that should be evaluated for possible NPS water quality improvements.

Measure: Number of watersheds identified for evaluation of NPS water quality improvements.

- iii. Long-term: Work with internal and external partners to solicit and utilize joint funding strategies, including Section 319 funds, in watersheds where other partner-funded projects are occurring to maximize the efficacy of funds.

Measure: Number of projects funded by Section 319 in connection with other partner funds that document improvements in water quality where NPS pollution was identified and a watershed approach was used to solve the problem.

Objective B Target Key Pollutants and Watersheds

- i. Short-term: Determine the extent of impacts that sediments, bacteria, nutrients, and other identified NPS pollutants have on Indiana waters.

Measure: Document the results of impact analysis.

- ii. Medium-term: Target Section 319 funds to watersheds with waters that are impaired by NPS pollution and where TMDLs can be implemented.

Measure: Number of watersheds that have received Section 319 funds where implementable TMDLs have been completed.

- iii. Long-term: Upon completion of nutrient standards, focus Section 319 funds on watersheds that have waters impaired by nutrients.

Measure: Percentage of Section 319 funding allocated to waters impaired by nutrients.

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Objective C Adaptive Management

- i. Short-term: Work with U.S. EPA to establish a comprehensive adaptive management program to improve all aspects of the implementation of the IDEM Section 319 Program with clearly delineated priorities and corrective actions.

Measure: Percentage of program completion.

- ii. Medium-term: Establish formal processes to incorporate NPS advisory group, social and environmental indicators, and ad hoc, in-house evaluation information in improved program policy and direction.

Measure: Number of formal processes incorporated into program policy.

- iii. Long-term: Update the NPS management plan to reflect completed goals, new priorities, and needed corrective actions.

Measure: Percentage of updated plan completed.

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IDEM and its NPS partners recognize the increasing magnitude of statewide NPS needs set against the backdrop of limited financial resources. To satisfy Key Element No. 5 and to effectively meet the NPS program goal and objectives, the State of Indiana has begun linking the approval of local NPS project funding to a hierarchy of priorities. These priorities include recognizing the importance of successful watershed planning and continued focus on restoring waters impaired by NPS pollution. In some cases, the result is NPS implementation project funding targeted to priority watersheds. In other cases, NPS implementation project funding is linked more directly to the environmental benefit and/or the appropriate connection to specific recommendations in a state-endorsed watershed plan or federally-approved TMDL. IDEM has identified NPS activities that are prioritized to receive Section 319 funds:

- management planning and implementation in watersheds with waterbodies on the Section 303(d) list of impaired waters where the impairment is NPS;
- management planning and implementation in watersheds with approved TMDLs; and,
- implementation of watershed plans that meet the requirements identified in the IDEM checklist, which includes U.S. EPA's Nine Key Elements.

Developing comprehensive watershed management plans is an effective way to focus efforts and resources in a watershed. Problems can be identified and effective solutions can be developed. In the process, local stakeholders join together to develop plans that address conditions found in that watershed. Linkage between NPS project implementation, watershed planning, and TMDLs is an additional step that allows the State of Indiana to more effectively focus limited funding on projects that can result in the elimination of known NPS causes of impairment. The state can also focus on the restoration of impaired waters and ultimately improve water quality.

Before a watershed management plan can be implemented using Section 319(h) funds, it must meet the required elements of IDEM's Watershed Management Plan Checklist. The checklist incorporates U.S. EPA's Nine Key Elements of a watershed-based plan and is provided in IDEM's Watershed Management Plan Guidance document. The guidance document is found on the following Web site: http://www.idem.in.gov/files/watershed_planning_guide.pdf.

Approved NPS management program funded activities or projects must lead to accomplishing the objectives stated in the approved NPS Management Plan. Table 3-1 highlights the NPS management program objectives from Chapter 2 and briefly updates the status of each objective. While many of the objectives are early in their implementation phase and some have not yet been implemented, the majority are being actively pursued by the state's NPS staff. While all of the objectives are the responsibility of the state's NPS Program, the fourth objective is primarily achieved through the work of grant projects. Grant work plans must link the funded activities or projects to the relevant elements of Indiana's NPS Management Plan. Work plans should indicate which federal, state, and local agencies are responsible for implementing each project or activity.

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Table 3-1

Objective	Status
1. ID knowledge gaps and the magnitude of NPS pollution	
Objective A	Initial monitoring strategy scheduled for 2009 rollout
Objective B	AIMS database completion scheduled for March, 2009
Objective C	Project has begun, but still a long-term objective
Objective D	Not yet begun
2. Build partnerships to address NPS pollution	
Objective A	Scheduled to begin March 2009
Objective B	Has begun, but partnership still growing
Objective C	IDEM staff currently working on objective
Objective D	Informal discussions have occurred
3. Capacity Building	
Objective A	Not yet begun
Objective B	Preliminary work started, but nothing ready to implement
Objective C	IDEM staff working on external guidance for 319 groups
Objective D	Section 319 funded Watershed Specialists implementing objective
4. Achieve measurable improvements in water quality by addressing NPS pollution	
Objective A	Ongoing implementation and different strategies being discussed
Objective B	Not yet begun
Objective C	Process in early stages

IDEM realizes that it is important to consider how Section 319 funding can be used in a way that does not duplicate, but rather complements, other environmental protection programs (i.e., coastal, wetlands, watershed planning, ambient monitoring programs, etc.). Section 319 funding is critical to support NPS projects that are not eligible for funding by other partner agencies. Project categories targeted for Section 319 funding are described in this chapter. Project categories are based on the type of human activity or NPS pollution addressed within the context of Section 319. Although not all of the categories have been funded by the state's 319 program, they are all potentially eligible projects. However, Indiana is constrained by Section 319 funding limitations, the environmental benefits of eligible projects, and other factors that ultimately require prioritization of eligible categories of projects.

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As IDEM meets objectives in the NPS plan, there will be more data and resources to make further objective decisions regarding funding priorities. These current priorities are based primarily on experiences gathered from partners who have completed watershed management plans (WMPs) and WMP implementation projects. Those experiences not only show that certain categories provide greater pollutant load reduction potential than others, but also that there are categories of projects that are not easily addressed at the local watershed level with Section 319 funds. The state also recognizes that certain categories are regulated under other programs and/or have funding through other sources. The overriding desire in creating funding categories is to provide a cost-effective approach to ensuring load reductions at the watershed level. The funding categories, which in effect will exclude some projects from funding, are defined as follows:

1. Category 1 – Categories with this ranking are eligible for inclusion in Section 319 grant applications as the category historically has produced reliable load reductions, potentially has a high impact on water quality, and can reasonably be addressed at a local watershed level. Activities in the given category would be chosen first to address NPS pollution in critical areas.
2. Category 2 – Categories with this ranking are potentially eligible for inclusion in Section 319 grant applications, provided applicants can demonstrate within a given watershed that all Category 1 priorities have been addressed by previous activities. The high cost of individual projects in these categories, when compared with Category 1 projects, makes these categories less desirable. IDEM will consider funding of these on a case-by-case basis.
3. Category 3 – Categories with this ranking are likely not eligible for inclusion in a Section 319 application, even if applicants can demonstrate within a given watershed that all Category 1 and 2 projects have been addressed by previous activities. Many NPS sources in these categories are the responsibility of other state agencies or programs, or will require statewide solutions or expenditures of funds that far exceed the capacity of the 319 program. These categories could be counted as match towards grant activities, provided load reductions are ensured and a clear link is documented between the activity and the NPS problem that will be addressed.

For each category, a range of methods to address the target source of NPS pollution can be utilized. Education and outreach plays a critical role in addressing NPS pollution and is fundable by Section 319 funds in all categories, if it addresses a documented problem. The list of project activity categories described below is listed in alphabetical order, not in order of priority.

1. Agricultural Management – **CATEGORY 1**

The goal of these project activities is to reduce sediment, nutrient, pesticide, and pathogen loading from crop and livestock production areas. Projects should utilize practices, measures, and management methods that will eliminate or reduce sediment delivery to surface waters and reduce loadings of nutrients, pesticides, and pathogens into surface and ground water. Projects



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should also provide educational opportunities to promote new sediment reduction and new pollution control technologies. Farms that participate in a watershed project and wish to receive Section 319 funds must have a conservation plan for their operations.

Note: Farms that require National Pollutant Discharge Elimination System (NPDES) permits, approvals required under the state's confined feeding rule, or any subsequent rules, are not eligible for cost share from a Section 319 grant for any practices required by the permit or any other requirements of federal, state, or local permits. IDEM has additional guidance on agricultural practices and Section 319 eligibility that should be consulted.

2. Atmospheric Deposition – **CATEGORY 3**

The goal of these project activities is to reduce the transfer of pollutants between air and water media and abate deposition of NPS pollutants through atmospheric transport. The primary responsibility for air quality falls on IDEM's Office of Air Quality. The Section 319 program does not currently have a set of practices, measures, and/or management methods that will reduce the transfer of pollutants between air and water media. Therefore, atmospheric deposition is not likely to be funded.

3. Closed Landfills and Solid Waste Disposal Sites – **CATEGORY 3**

The goal of these project activities is to reduce polluted run-off from solid waste disposal activities. Projects should utilize practices, measures, and management methods that will reduce pollutants in run-off from landfill sites. Since primary responsibility for solid waste oversight falls on IDEM's Office of Land Quality, this category is not a high priority of the Section 319 program and is not likely to be funded.

Note: Grants may not be used to fund attainment of any permit requirements or to treat end-of-pipe discharges. Project sponsors are encouraged to explore linkages with the IDEM Office of Land Quality and local solid waste management districts.

4. Ground Water – **CATEGORY 2**

The goal of these project activities is to prevent the discharge of NPS pollution to ground water, aid in the reduction of NPS pollution discharges to ground water, and aid in the cleanup of NPS pollution in ground water. Projects should use practices, measures, and management methods that will reduce the transfer of NPS pollution to ground water.

5. Hydromodification – **CATEGORY 2**

The goal of these project activities is to improve water quality and aquatic ecosystems through the assessment, research, and remediation of anthropogenic activities that have altered the pre-European settlement hydrology of Indiana streams and lakes. This extends broadly to dams, channelization, hydraulically inadequate structures, impediments to fish passage, alteration of normal water levels due to increased or decreased flows, and water removals. In all cases, a clear link to NPS pollution must be demonstrated. Possible activities could include dam removal, channel redesign, or modifications to existing structures. Research and assessment of the effects and possible solutions to hydromodification are eligible activities. Funding for activities in this category will be contingent on the scope of the project and the potential water quality benefits within a given

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watershed or a large geographic area. In addition, upstream NPS problems need to have been addressed so the proposed project can be managed.

6. Land Application of Non-Agricultural Wastes – **CATEGORY 3**

The goal of these project activities is to reduce polluted run-off from land application of non-agricultural wastes. In most circumstances, land application of non-agricultural wastes needs a permit from IDEM's Office of Land Quality. When this is the case, Section 319 cannot fund projects in this category. Projects should incorporate practices, measures, and management methods that will reduce pollutant loading from land application of non-agricultural wastes. Project plans must take into account soil characteristics, soil conditions, and hydrogeologic vulnerability.

7. Urban Issues – **CATEGORY 1**

The goal of these project activities is to prevent or reduce polluted run-off and habitat degradation resulting from urban areas. Projects should incorporate practices, measures, and management methods that will preclude or reduce erosion and pollutant loading from existing development, land development, or redevelopment of brownfields or other contaminated sites. Projects may provide education opportunities to promote technologies that avert or reduce the environmental impact of urbanization. Projects should include consideration of present and planned impervious areas, storm water run-off, quality of run-off water, ground water quality, storm water management, and effects on all waters of the state. Project sponsors are encouraged to explore linkages with other grant sources and other agencies that have jurisdiction or provide assistance in the area. Projects that promote innovative planning techniques and practices are encouraged and green infrastructure and low impact development techniques are preferred activities. Projects that conflict with NPDES permits will not be funded.

Note: Grant funds cannot be used for measures required by any permit.

8. Natural Resource Extraction – **CATEGORY 2**

The goal of these project activities is to reduce polluted run-off into streams and lakes from present and past coal extraction activities, oil and gas production, and non-energy mineral extraction. Projects should utilize practices, measures, and management methods that will reduce sediment, acid drainage, and other pollutant loading from these activities. This includes oil and gas waste products, sediment, and brine. Projects may also provide education opportunities leading to remediation of abandoned mines and well sites. Project sponsors should work with the IDNR Division of Reclamation, IDNR Division of Oil and Gas, and, where possible, the federal Office of Surface Mining, as these programs play a larger role in natural resource extraction than IDEM.

Note: Grant funds cannot be used for measures required by any permit.

9. On-Site Sewage Disposal – **CATEGORIES 3 and 1**

Remediation of on-site sewage pollution in Indiana is complicated by three facts:

- a. a funding source to address the scope of the problem does not exist;

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- b. the state Board of Health does not permit alternative systems; and,
- c. local health departments have different priorities, resources, and budgets.

The Section 319 program will not fund physical practices, measures, and management methods that will reduce pollutant loading to surface or ground water from improper disposal of residential wastes. These activities fall with Category 3. The Section 319 program will fund educational opportunities that promote new technologies that reduce pollutants from residential waste and teach the public about septic system maintenance as a Priority 1 activity. Project plans should consider soil type, hydrogeologic vulnerability, applicable rules and regulations, and economic factors. Project sponsors are encouraged to collaborate with local health departments in developing proposals.

10. Sediment Removal – **CATEGORY 3**

The goal of these project activities is to reduce pollutant loading to waters of the state from the accumulation of sediments that, either on their own or due to the presence of NPS pollutants, are adversely affecting water quality. Dredging projects intended to remove contaminated sediments that are hindering the development of a healthy aquatic ecosystem are considered eligible under Section 319. However, dredging to improve drainage for flood control, to increase reservoir capacity, or to improve navigation are not eligible. In addition, dredging will not be funded in wetlands or coastal areas. Due to the high cost of dredging, it is unlikely that Section 319 will fund this activity.

11. Stream Bank/Shoreline Erosion – **CATEGORY 2**

The goal of these project activities is to reduce or remediate the erosion of stream banks and lake shorelines and the associated loss or degradation of aquatic habitat by addressing the cause of erosion. Projects should utilize practices, measures, and management methods that will reduce stream bank and shoreline erosion from agricultural practices, land development, transportation, or other causes. Methods to establish riparian vegetation, improve aquatic habitat, and provide educational opportunities to promote new habitat protection or enhancement technologies should also be utilized. Other aspects of a project could include innovative drainage maintenance practices, such as two-stage ditches. Projects may include the promotion of in-stream and riparian habitat, vegetation preservation, and restoration of critical habitat types such as wetlands. Stream bank and shoreline erosion control project plans must take into account the hydrologic system of the watershed above the project area, any planned or existing hydrologic modifications, land use and land use trends, and applicable laws and restrictions. Aquatic habitat enhancement projects should be coordinated with the Lake and River Enhancement Program of the IDNR, as well as other programs and resources that can assist in project design.



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12. Timber Management – **CATEGORY 2**

The goal of these project activities is to reduce polluted run-off from timber harvesting. Projects should utilize practices, measures, and management methods that will reduce pollutant loading from timber harvesting activities, or reduce loss of forests due to land use changes. Practices may include establishing, restoring, or protecting riparian vegetation and improving aquatic habitat. Projects should provide educational opportunities to promote new timber harvesting technology with environmental benefits. Project plans should take into account forest management activities associated with timber harvesting, grazing of woodlands by livestock or overabundant wildlife populations, and forestation practices.

13. Transportation - **CATEGORY 2**

The goal of these project activities is to reduce polluted run-off from transportation facilities and transportation facility construction that are not specifically required to address run-off under state and federal water pollution laws. Projects should incorporate practices, measures, and management methods that will reduce pollutants in storm water run-off originating from transportation-related facilities. The focus of the project may be on either transportation-related construction or existing transportation facilities. Project sponsors are encouraged to explore linkages with the Indiana Department of Transportation (INDOT) for funding and project design. Applicants should take into account the IDNR rules written for boating activities for lakes.



Note: Grant funds cannot be used for measures required by any permit.

BEST MANAGEMENT PRACTICES

The term BMP applies to structural and management practices that are used in agriculture, forestry, urban land development, and industry to reduce the potential for damage to natural resources from human activities. A BMP may be structural (i.e., something that is built or involves changes in landforms or equipment), or it may be managerial (i.e., a specific way of using or handling infrastructure or resources). All Section 319 grant-funded management practices must have technical credibility as evidenced by standards and specifications that can be produced for review by Section 319 staff. A partial list of acceptable management measures is included in Appendix A.

To be considered a BMP, a practice must be selected through a conscious planning process designed to inventory resources and needs, determine available alternatives, weigh their benefits, and make decisions. In addition, after the selection and implementation of practices have been completed, follow-up needs to include monitoring and evaluation to verify the desired effect.

Sources for standards and specifications for BMPs appropriate to Indiana are detailed in Appendix A, and listed below:

- Natural Resources Conservation Service, [Field Office Technical Guide](http://efotg.nrcs.usda.gov/efotg_locator.aspx?map=IN), http://efotg.nrcs.usda.gov/efotg_locator.aspx?map=IN
- The Indiana Department of Natural Resources, Division of Forestry, [Indiana's Forestry Best Management Practices](http://www.in.gov/dnr/forestry/6759.htm), <http://www.in.gov/dnr/forestry/6759.htm> (click on Forestry BMPs)
- The Indiana Department of Agriculture, Division of Soil Conservation, *Erosion and Sediment Control Practices for Developing Areas*
- Indiana Department of Natural Resources, [Lakeshore Protection in Indiana](http://www.in.gov/dnr/files/seawall.pdf), <http://www.in.gov/dnr/files/seawall.pdf>
- Indiana Department of Natural Resources, [The Indiana Drainage Handbook](http://www.in.gov/dnr/water/8690.htm), <http://www.in.gov/dnr/water/8690.htm>
- Indiana Department of Environment Management, [The Indiana Storm Water Quality Manual](http://www.idem.in.gov/4899.htm), <http://www.idem.in.gov/4899.htm>
- Illinois Natural Resources Conservation Service, [Illinois Urban Manual](http://www.il.nrcs.usda.gov/technical/engineer/urban/), <http://www.il.nrcs.usda.gov/technical/engineer/urban/>

BMPs are selected to address specific NPS pollution problems and are considered in relation to impacts on surface water. However, consideration must also be given to possible impacts on ground water. The selection of BMPs must weigh expected benefits against costs.

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IMPLEMENTATION

Chapter 4 satisfies Key Element No. 8 in the *NPS Program and Grants Guidance* by outlining the state's methods and tools for managing and implementing its NPS program efficiently and effectively. This section details the procedures and protocols IDEM will implement to address agency coordination, planning, financial management, and education. These activities are the foundation of a successful NPS program.

Although IDEM has a lead role in developing and coordinating the implementation of the NPS management plan in the state of Indiana, IDEM is not solely responsible for solving the problem of NPS pollution. Many local, state, and federal agencies have authorities, programs, or responsibilities relating to the control of NPS pollution. Coordinating and focusing such a large number of entities to produce an effective NPS management program poses many challenges. While increased use of regulatory authorities has helped to address certain categories of NPS pollution, such as the issuance of the NPDES permits for the most significant municipal storm water discharges, Indiana will need to rely on a wide range of tools, activities, and authorities to address NPS pollution statewide.

Within IDEM, there are a number of programs that work to address NPS pollution through regulatory and non-regulatory approaches. A goal of IDEM is to strengthen internal communication between these programs to improve the exchange of information, coordinate program activities, and create new approaches to addressing NPS pollution with existing resources. In 2007, IDEM's OWQ created the Watershed Initiative Task Force to verify whether resources were being allocated effectively to improve water quality in Indiana. The task force is comprised of members from all programs within the OWQ and is intended to improve the communication between programs and maximize resource effectiveness. A key function of this group is to evaluate watersheds identified by IDEM with NPS pollution issues and gauge watershed-based efforts to improve water quality. Another function is to recommend new approaches for IDEM programs to directly assist or improve the overall condition of water quality in the target watershed, as well as on the larger statewide level.

The following section summarizes the primary purpose of each IDEM program that addresses NPS pollution, notes its applicable legal authority, and links its role to IDEM's NPS Plan.

The NPS program, which is part of IDEM's OWQ, has the responsibility of administering Section 319 and Section 205(j) grant programs to fund education, planning, and implement activities targeted to reduce NPS pollution. The program also implements major sections of the NPS plan through internal and external coordination with partners and builds capacity on the state and local levels. Several other OWQ programs are linked to the NPS program, as follows:

- IDEM Watershed Specialists provide direct support for all aspects of watershed planning and implementation work on the local level.
- The storm water program provides assistance and regulatory oversight of:
 - large municipal storm water dischargers;
 - storm water associated with industrial activity (Rule 6);
 - storm water associated with construction activity (Rule 5); and,
 - storm water associated with municipal separate storm sewer systems (Rule 13).

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The storm water program, which coordinates permit review and compliance activities with the NPS Program regarding project eligibility and 319 program policy development, works to address NPS pollution issues. Additional information is available at <http://www.idem.in.gov/4896.htm>.

- The TMDL program develops TMDL reports to characterize, on a watershed level, the extent and sources of water quality impairments, and develop required load reductions for the targeted pollutant. The TMDL program also provides information and technical support to watershed groups through water quality monitoring, data exchange, load reduction calculation assistance, and development of locally-led partnerships. Additional information is available at <http://www.idem.in.gov/4676.htm>.
- The water quality assessment program monitors water chemistry, biology, and habitat of streams to determine if a given waterbody is impaired. The program determines potential sources of pollution and the effects of water quality improvement activities in a given watershed. Data and analysis can be used to:
 - assess sources of NPS pollution;
 - determine the efficiency of Section 319-funded projects; and,
 - determine water quality trends of a watershed basis.

Additional information is available at <http://www.idem.in.gov/4681.htm> and <http://www.idem.in.gov/4677.htm>.

- The source water program coordinates plans to public water suppliers regarding the degree to which the drinking water source may be impacted by a potential source of contamination. Results from source water assessment plans can be used by watershed groups and partners to identify possible water quality trends on a watershed-by-watershed basis. Additional information is available at <http://www.idem.in.gov/4142.htm>.
- The wetland program administers regulations regarding the alteration of streams, wetlands, and lakes by activities involving the placement of dredged or fill materials. The program coordinates permit review and compliance activities with the NPS program and can work to address NPS pollution issues. Additional information is available at <http://www.idem.in.gov/4138.htm>.

The IDEM Office of Land Quality administers several programs, which are associated with the NPS program as follows:

- The confined feeding program administers regulations to assure that animal waste storage structures are designed, constructed, and maintained to be structurally sound, and that manure is handled, and land applied, in an environmentally-acceptable manner. The program coordinates permit review and compliance activities with the NPS Program and works to address NPS pollution issues. Additional information is available at <http://www.idem.in.gov/4994.htm>.

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- The land application program regulates issues such as the application of biodegradable sludge. The program coordinates permit review and compliance activities with the NPS program and works to address NPS pollution issues. Additional information is available at <http://www.idem.in.gov/4555.htm>.
- The solid waste/landfill program regulates the siting, construction, and maintenance of facilities designed to hold solid and hazardous wastes. The program coordinates permit review and compliance activities with the NPS program and works to address NPS pollution issues. Additional information is available at <http://www.idem.in.gov/5068.htm>.

The IDEM Office of Pollution Prevention and Technical Assistance administers several programs, which are linked to the NPS program, as follows:

- The compliance and technical assistance program (CTAP) administers Indiana's small business environmental assistance program (BEAP), provides free and confidential environmental assistance to Indiana businesses. The program provides NPS pollution source elimination services to small businesses. Additional information is available at <http://www.idem.in.gov/4108.htm>.
- The Pollution Prevention Program promotes pollution prevention, including NPS pollution reduction or elimination, to Indiana industries and within IDEM. This program also provides information on BMPs for storm water NPS issues. Additional information is available at <http://www.idem.in.gov/5224.htm>.
- The community environmental health and education program educates the public on various environmental topics, including NPS pollution, through the "Indiana Environment and You" curriculum and through school presentations. The program is also beginning an outreach effort to educate the public on phosphorus in fertilizer. More information is available at <http://www.idem.in.gov/4091.htm>.

The Indiana State Revolving Fund Loan Program provides low interest loans to communities that can help in developing projects that reduce NPS pollution. 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;
- failing septic system repair, replacement, or connection to sewer;
- storm water BMPs;

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- source water and wellhead protection;
- conservation easements; and
- agricultural and waste management BMPs.

The goal of atmospheric deposition activities is to reduce the transfer of pollutants between air and water media, and abate deposition of NPS pollutants through atmospheric transport. The primary responsibility for air quality falls on IDEM's Office of Air Quality.

AGENCY COORDINATION

The state understands the importance of seeking input from interested parties in determining program direction. Some processes and programs for determining those watersheds in need of restoration, protection, or maintenance are located at IDEM, but the state strives to involve federal, state, local, and private partners to restore and protect Indiana's water resources. The activities carried out by these programs include funding prioritization (Chapter 3.0), monitoring (Chapter 5.1), and planning, assessment, and public education. These activities, to be effective, need to be integrated throughout all levels of societal and geographic settings: surface and ground water, lakes and streams, and hydrology and landscape.

To satisfy the requirements of Key Element No. 2 in the *NPS Program and Grants Guidance*, IDEM is actively strengthening partnerships with appropriate federal and state agencies, regional and local entities, and private sector and citizens' groups. One of IDEM's objectives for this program is to build partnerships that address NPS pollution in Indiana. IDEM will achieve this objective by:

- conducting meetings with U.S. EPA to evaluate IDEM's NPS program and obtain comments regarding needed improvements and program successes;
- identifying opportunities with the IDNR Coastal Management Program to assist with the approval of a final coastal zone plan;
- developing collaborative grant processes and funding priorities to support NPS restoration projects in the coastal zone that will improve water quality;
- focusing NPS financial and technical resources in watersheds with approved TMDLs by working closely with local watershed groups, to address planning and implementation issues in those watersheds;
- developing partnerships through the establishment of formal NPS monitoring strategies;
- developing watershed-based approaches to the evaluation of permits, policy, and rules related to NPS water pollution;
- revising, as needed, the comprehensive IDEM Watershed Specialist strategy;
- implementing an advisory group of state and federal agencies and local/regional coordinators to assist with priority setting and policy and procedure refinement;
- strengthening the existing NPS team by adding representatives from permitting programs that have an impact on NPS pollution;
- assisting internal and external partners with NPS planning and implementation activities;
- creating a NPS management plan workgroup to conduct annual evaluations and recommend revisions to the state NPS management plan;
- working with other states that share watersheds with Indiana to develop consistent approaches to addressing NPS pollution;

AGENCY COORDINATION

- establishing a formal process to maintain an inventory of active watershed groups, organizations, and governmental entities whose primary purpose is study, planning, or management of NPS pollution and related activities;
- incorporating or cross-referencing existing baseline requirements established by other applicable federal or state laws to the extent they are relevant; and,
- working more closely with the SRF program to provide technical assistance to their NPS financing program.

The integration of state NPS management programs with other environmental programs provides a vehicle for cooperative design and implementation of watershed-based plans in a coordinated manner that employs the resources, authorities, and expertise of all relevant programs. A comprehensive list of key partner agencies, including their functions, is included in Appendix B.

To address Key Element No. 7 in the *NPS Program and Grants Guidance*, IDEM must develop a process for working with federal land-holding agencies within Indiana to ensure that federal activities are consistent with state NPS program objectives. There are 510,660 acres in Indiana that are owned and/or operated by the following Federal agencies:

U.S Department of Defense	167,065 acres
U.S. Army Corps of Engineers	118,869 acres
U.S. Fish and Wildlife Service	13,626 acres
U.S. Forest Service	198,358 acres
The National Park Service	12,742 acres

Federal lands comprise only 2.2 percent of Indiana's land area, but these areas contain many sensitive aquatic resources, such as dune and swale wetland habitat in the Lake Michigan watershed. Currently, IDEM has no formal process for working with these agencies, except on an ad hoc basis through individual actions that require permits or other state authorizations. IDEM will establish formal processes with each of the identified agencies before the next NPS plan update. Key components will include a review of overall practices on federal lands, identification of future activities, establishment of communication and consultation processes, U.S. EPA review, and long-term coordination of priorities that could be formalized through individual agreement documents. The U.S. Forest Service has begun a process that mirrors many of these objectives which could, with further consultation and revision, serve as a template for IDEM's federal consistency program.

PLANNING

When monitoring and assessment are complete and priorities have been set, mandated and informal planning sets the stage for implementation. Mandated planning activities, such as this document and the comprehensive planning process required of all states by U.S. EPA, has statewide impact. Mandated planning activities can also focus on individual watersheds or the development of TMDLs. Examples include non-mandated planning activities include watershed project plans developed at the local level and diagnostic and feasibility studies carried out under the IDNR Lake and River Enhancement Program.

A work plan outlining planned activities for the subsequent year will be included as part of the annual *319 NPS Grant Program Report*. The report will identify section 319-funded projects and BMPs designed to reduce NPS pollution, along with a conceptual implementation schedule. In addition to NPS pollution-control implementation projects, BMP construction, and educational programs, the report will describe the specific activities carried out by IDEM under its base operating program during the same period.

To satisfy Key Element No. 3 in the *NPS Program and Grants Guidance* issued by U.S. EPA, IDEM uses an approach that emphasizes both statewide NPS programs and on-the-ground management of individual watersheds where waters are impaired and threatened. To do this, the NPS program and the state's partners advocate a watershed planning process built on local-level decision making. This process is useful for project planning watersheds where local citizen groups play a vital role in water resource management. This process is driven primarily by the willingness of local stakeholders to become actively involved in addressing NPS pollution within their watershed. This watershed-by-watershed approach places resources within watersheds where the greatest opportunity for local involvement in both planning and implementation will result in potential measureable improvements to water quality.

FINANCING

The NPS/TMDL section in the Office of Water Quality manages two federal pass-through grant programs aimed at improving water quality in Indiana: Section 319(h) and Section 205(j), each named for the Clean Water Act's authorizing section. 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, and to develop planning documents.

The 319(h) grant program is the primary grant program for supporting both IDEM NPS programs and many locally led watershed-planning efforts. Funds may be used to conduct assessments, develop and implement TMDLs and watershed management plans, provide technical assistance, demonstrate new technology, and provide education and outreach. Nonprofit organizations, universities, and local, state, or federal agencies are eligible for funding. A 40 percent (non-federal) in-kind or cash match of the total grant cost must be provided. Each year, funding proposals are submitted, reviewed by a committee, and selected based on NPS program funding priorities and the quality of the proposal. In addition, emphasis is placed on project partners and documentation of their commitment to the project. Strong partnerships are a key to project success. Matching funds are tracked by IDEM for all projects to ensure compliance with federal requirements. Grant funds are dispersed to grantees upon approval of invoiced expenses. IDEM uses the federal *Grants Reporting and Tracking System* (GRTS) database to collect data on all activities associated with each 319 grant for reporting to U.S. EPA.

General information about the two grant programs in Indiana may be found on IDEM's Web site at: <http://www.idem.in.gov/4342.htm>.

A summary of the Section 319(h) and 205(j) funding programs and other potential funding sources are included in Appendix C.

Matching Funds and In-Kind Resources

Matching funds and in-kind resources must be directly associated with the project and for work done to fulfill the contract tasks. Federal dollars may not be used to match Section 319 grant funds, since Section 319 funds are also federal dollars. Specific details on the Section 319 program, including requirements, eligibility, and staff contacts, can be obtained at: <http://www.idem.in.gov/5225.htm>.

EDUCATION

Educating the public and partners is an important step in controlling NPS pollution and improving and maintaining the quality of water resources for current and future generations. Education and capacity building are vital to addressing NPS pollution. The dissemination of information, increase of skills, and exchange of ideas help to build a stronger statewide cadre of NPS managers. In order to protect, enhance, and restore Indiana's water quality, one of the state's long-term goals is to build public interest, increase citizen knowledge, and provide awareness of existing environmental conditions. Short-term objectives include:

- development of a comprehensive outreach program to educate citizens on urban and agricultural NPS issues to improve water quality;
- production of a repository of readily available, Web-based outreach materials designed to increase public knowledge of NPS issues; and,
- creation of a broadly distributed e-newsletter containing information on NPS issues, training events, and other relevant information.

IDEM is continually seeking ways to build capacity of watershed groups around the state in an effort to strengthen the effectiveness of groups working to achieve water quality goals and show measurable results. The objective is to promote the organizational development and growth of local watershed partnerships and stakeholders committed to improving and maintaining the natural and economic resources of their watersheds. The objective also includes providing training and technical assistance to these groups so they can better address watershed-based problems, and help develop sustainable solutions. IDEM collaborates with a number of groups and organizations to build capacity statewide through efforts, such as: training watershed coordinators and other water resource professionals; providing needed tools to help groups fulfill their mission and achieve their goals; and, educating citizens and professionals on reducing NPS pollution and documenting the success of their efforts.

The state has been, and will continue to, track and maintain basic project information in U.S. EPA's GRTS database for all Section 319-funded projects. Tracked project elements include the project schedule, budget, description, BMPs implemented, estimated pollutant load reductions, match, and progress reports. Projects implementing BMPs are also stored in the Web-based Reach Indexing Tool (WebRIT). The WebRIT is an Internet mapping tool that allows users to provide and update location data for a wide variety of water programs.

To help users identify locations, the WebRIT provides point-and-click tools, along with reference data from various U.S. EPA and non-U.S. EPA data sources. The current WebRIT application supports users under the 319 and Beaches Environmental Assessment and Coastal Health (BEACH) Act grant programs, as well as the NPDES permit applicants. This data is available at: <http://www.epa.gov/waters/tools/>.

5

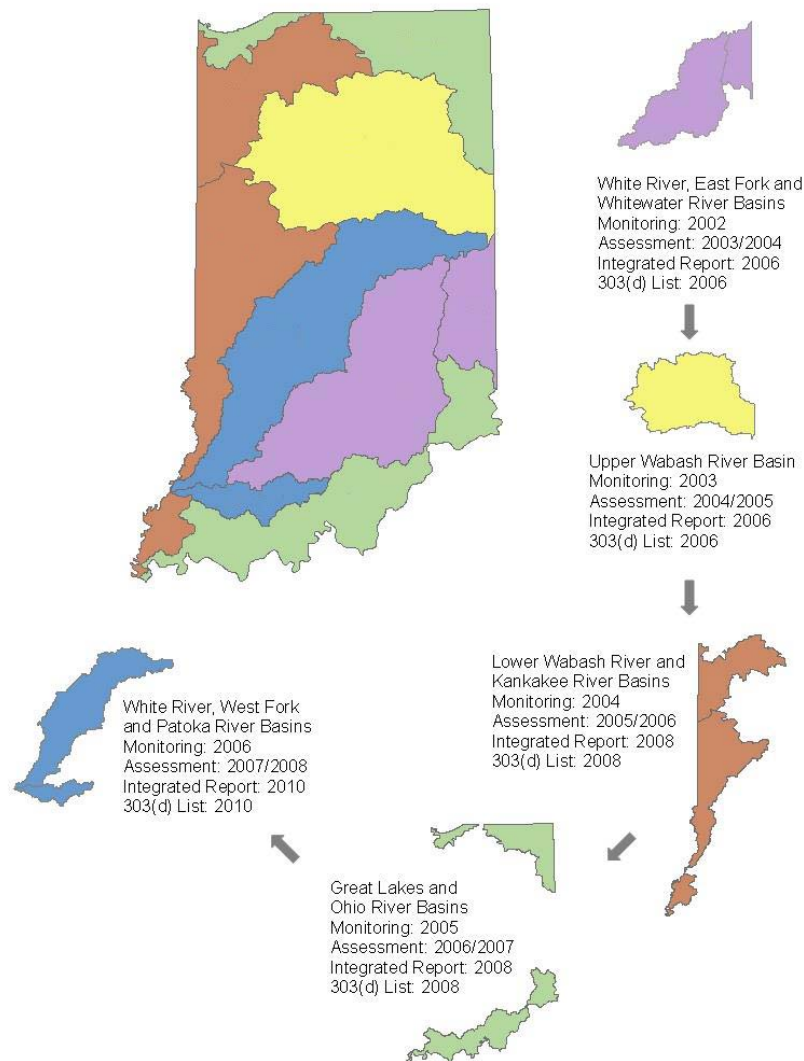
Monitoring, Evaluation, and Assessment

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INTRODUCTION

Monitoring and evaluation are a means to assess if NPS pollution prevention and restoration objectives are being met. IDEM's OWQ assesses the quality of Indiana's waters using a rotating basin approach. The rotating basin plan (Figure 5-1) makes it possible to update water quality assessments on a five-year cycle for monitored watersheds throughout the state, and ensures that the information available for planning and watershed management activities is no more than five years old. Approximately one-fifth of some of the state's waters (1-2 basins) are assessed for support of aquatic life, fishing, and recreational uses each year. The monitoring program is designed to characterize the overall environmental quality of each major river basin, and to identify those monitored waterbodies within each basin that are not fully supporting their designated uses. Waters that do not fully support one or more of their designated beneficial uses are placed on Indiana's 303(d) List of Impaired Waters.

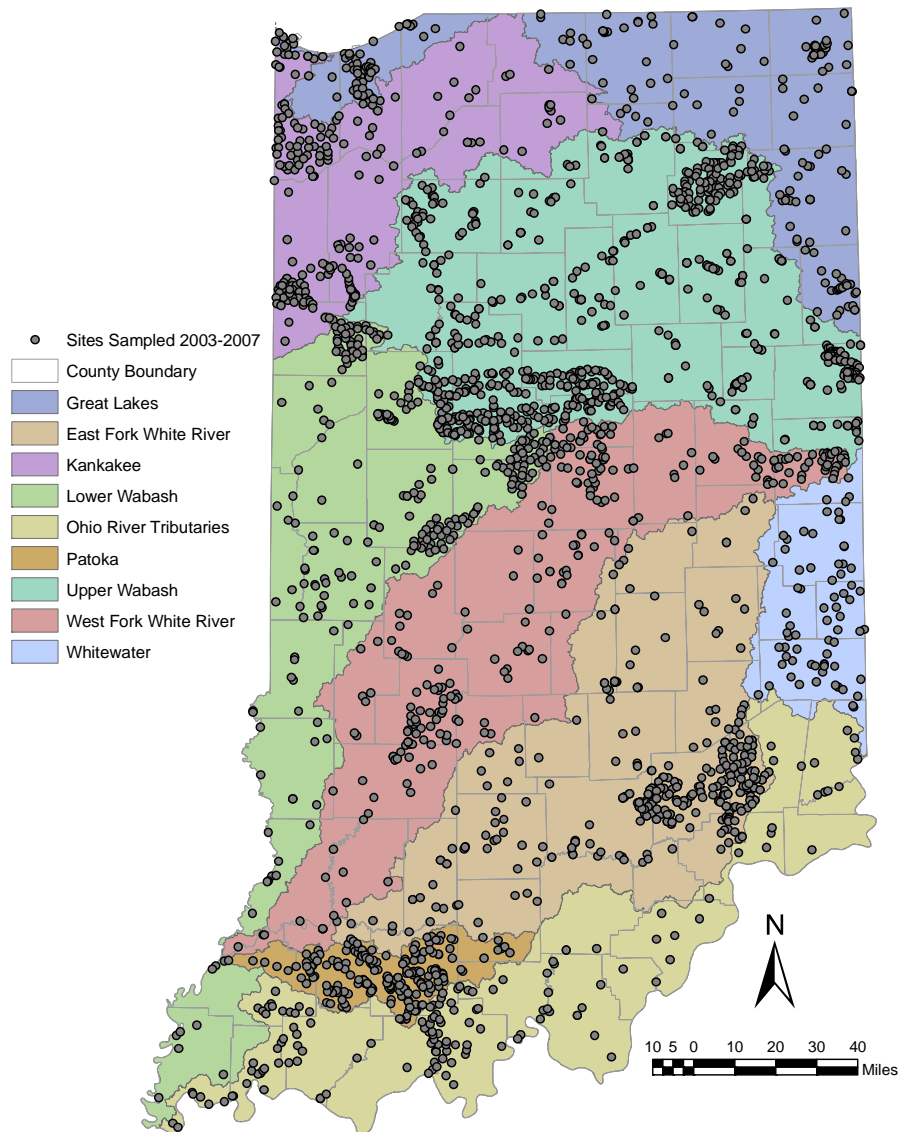
Figure 5-1
IDEM's Rotating Basin Monitoring, Assessment, Reporting, and Listing Schedule



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Figure 5-2 shows the monitoring locations for all of IDEM's sampling programs and illustrates the sampling density achieved through IDEM's water quality monitoring strategy over the past five years (2003-2007).

Figure 5-2
Monitoring Locations for IDEM Sampling Programs



The 303(d) list defines the basic priorities for IDEM's NPS Program. Impaired waters are targeted first for watershed-based projects such as TMDLs or 319-funded watershed plans to further characterize pollutant sources, loadings, and develop strategies for addressing NPS pollution. Another important IDEM goal is to augment the existing monitoring program to address waters where watershed improvement work has occurred, which could be funded through IDEM or other NPS-partners, and determine the scope and extent of water quality improvements. This step is critical, as data derived from the earlier work will determine

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additional needs within a given watershed or target approaches that were successful in addressing the pollutants of concern.

A detailed analysis of current water quality conditions and IDEM program efforts to assess ambient water quality is located in the 2008 *Integrated Water Quality Monitoring and Assessment Report*, which can be obtained at: <http://www.idem.in.gov/4679.htm>.

MONITORING

As Indiana continues to strengthen its focus on restoring waters that have been listed as impaired on the Section 303(d) list, as well as protect waters that are currently not impaired, it is critical that Indiana monitor both:

- the progress the state is making towards achieving and maintaining water quality standards through the use of appropriate monitoring and/or environmental indicators; and
- the implementation of its programs and projects to assure that they are successfully executed.

Consequently, data collected as part of the monitoring programs is utilized to:

- assist with TMDL development for NPS-impacted watersheds;
- prepare data collection guidelines and standard operating procedures to make existing and future databases compatible. Standard procedures will be useful in determining long-term trends and comparing potential water quality improvement of selected BMPs;
- refine and standardize field assessment and data interpretation techniques to improve NPS assessments and ensure future trend evaluations are based on consistent and reliable indicators; and,
- create programs to support program efforts to enhance the public's knowledge of NPS pollution problems and solutions, and solicit the public's interest and participation in water-quality improvement programs.

To determine its success in implementing the state's NPS management program, IDEM has identified measures associated with each of its short-term, medium-term, and long-term objectives, as noted in Chapter 2.0. The performances of these measures, which are designed to lead to the achievement of the state's long-term goal, indicate progress towards achieving and maintaining beneficial uses of water.

All watershed projects funded by IDEM that are designed to implement a watershed-based plan must describe how the plan's monitoring component will be used to evaluate the effectiveness of the implementation efforts over time measured against the specific criteria established in the watershed plan. The criteria against which the progress is being monitored should be designed to focus on whether loading reductions are being achieved over time and substantial progress is being made towards attaining or maintaining water quality standards. This can be achieved through watershed-scale monitoring to measure the impacts of multiple programs, projects, and trends over time.

The state's monitoring program consists of three distinct efforts: surface water monitoring, ground water monitoring, and third party monitoring.

MONITORING

Surface Water Monitoring

The IDEM's Office of Water Quality's surface water quality monitoring strategy is designed to describe the overall environmental quality of each major river basin, and to identify monitored waterbodies that do not fully support designated uses. The monitoring strategy allows IDEM to continue to meet the goal of assessing all waters of the state within 5 years, while enhancing support of the other OWQ programs. The monitoring strategy and fact sheets with detailed descriptions of the monitoring programs are available at <http://www.idem.in.gov/5512.htm>.



Ground Water Monitoring

Understanding the interconnections of ground water and surface water is fundamental to the development of effective integrated water resource management and policy. Management of a single component of the hydrologic system, such as a stream or an aquifer, is only partly effective because each hydrologic component interacts with other components.

Sampling ground water in specific settings across the state and targeting those areas within hydrogeologic connection of impaired waterbodies will complete the water cycle of knowledge and enable targeting of the resource where contamination is most prevalent.

The goal of the IDEM ground water section is to assess, protect and restore Indiana's source water. The Ground Water Section provides guidance for public water systems in establishing Wellhead Protection Plans and Source Water Assessment Plans, as well as providing guidance to private well owners. It works closely with IDEM's Watershed Planning Section. Details on this program can be found at <http://www.idem.in.gov/4288.htm>.

Additional detail on ground water and IDEM's program activities can be found in the Integrated Water Quality Monitoring and Assessment Report, which can be obtained at: <http://www.idem.in.gov/4679.htm>.

Third Party Monitoring Programs

IDEM works with a number of external organizations to obtain data for potential use in water quality assessment processes. IDEM recognizes that many organizations, such as other state and federal agencies, cities, universities, and volunteer groups collect water quality data that is exceptionally valuable to measuring the scope and extent of NPS pollution in Indiana. IDEM's OWQ is developing a framework for soliciting and using this data in the process of developing the 303(d) list of impaired waters and in other programs, such as the TMDL and NPS programs. The goals of this project include:

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- identifying IDEM processes for which external organizations would like to see their data used (e.g., education, planning, TMDL development, 305[b] assessment, 303[d] listing, etc.);
- developing an effective data solicitation process;
- developing a data quality ranking system and criteria specific for each type of proposed use; and,
- developing a process for providing technical assistance to help organizations meet the data quality criteria necessary for the process in which they want their data considered.

In 2007, it was determined that a broad data solicitation, prior to having the external data framework fully developed, would provide a fuller understanding of the variety of organizations that are collecting water quality data in Indiana, the types of data they are collecting, and its relative data quality. IDEM solicited data from:

- relevant programs at every college and university in the state;
- environmental groups and interested citizens identified through various sources;
- Hoosier Riverwatch, Indiana's statewide volunteer stream monitoring program;
- drinking water utilities;
- county health departments and the Indiana State Department of Health (ISDH);
- county soil and water conservation districts (SWCD) (via the Indiana Association of Soil and Water Conservation Districts [IASWCD]);
- Municipal Separate Storm Sewer System (MS4) entities and Combined Sewer Overflow (CSO) communities;
- Federal agencies (United States Geological Survey [USGS], United States Forest Service [USFS], etc.); and,
- state professional organizations (Indiana Water Resources Association, Indiana Association of Cities and Towns, etc.).

Results from this solicitation have also helped to identify where IDEM should focus its solicitation and technical assistance efforts to achieve a greater response from the water quality monitoring community at large. In total, IDEM sent solicitations by e-mail or letter to approximately 670 individual organizations that fall into one or more of the categories in the above list. In response to this solicitation, IDEM received more than 100 water quality data packages and reports from 41 individual organizations. A summary of the types of organizations that responded with data is provided in Table 5-1.

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Table 5-1

Summary of results from IDEM's external data solicitation, conducted in 2007

Type of Organization	Number that Submitted Data
Cities and Towns	14
County Soil and Water Conservation Districts (SWCD)	8
Watershed Groups and Environmental Organizations	6
County Health Departments	5
Colleges and Universities	2
Private Drinking Water Utilities	1
County Surveyors	1
Resource Conservation and Development (RC&D) Areas	1
Regional Planning Commissions	1
Parks and Recreation Departments	1
Other State Agencies	1

The chemical and physical data sets received from the 2007 solicitation are presently being reviewed to determine their usability in IDEM's 305(b)/303(d) processes and to synthesize the information they contain relative to the development of IDEM's external data framework. IDEM is also reviewing projects conducted with funding from the IDNR Lake and River Enhancement Program and projects funded through IDEM's Section 319 and 205(j) programs.

A subset of third-party monitoring is volunteer monitoring. Volunteer monitoring programs encourage grassroots involvement in water quality monitoring and foster cooperation among citizens, schools, organizations, and various units of government. Indiana has numerous active volunteer stream monitoring groups including a statewide volunteer program, a successful volunteer lake-monitoring program, and an adopt-a-wetland program.

Hoosier Riverwatch is a state-sponsored stream water quality monitoring initiative. The program was started in 1994 to increase public awareness of water quality issues and concerns by training volunteers to monitor stream water quality. Hoosier Riverwatch collaborates with agencies and volunteers to:

- provide education and training on watersheds and the relationship between land use and water quality;
- increase public involvement in water quality issues;
- promote responsible stewardship of water resources; and
- provide water quality information to citizens and government officials working to protect and restore Indiana's rivers and streams.

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Hoosier Riverwatch is sponsored by the IDNR, Division of Fish and Wildlife. Funding is provided in part by the federal Sport Fish Restoration Fund.

Hoosier Riverwatch:

<http://www.in.gov/dnr/8561.htm>

In order to conserve the valuable wetlands in our communities, the Indiana Adopt-A-Wetland Program was developed. Local, community-based groups called “focus areas” primarily accomplish wetland conservation in Indiana. Individual citizens can help create focus areas to protect or restore a wetland by adopting one in their community. The project Web site provides resources for citizens interested in starting a locally led program.

Adopt-A-Wetland:

<http://www.idem.in.gov/4138.htm>

The Indiana Clean Lakes Program was created in 1989 as a program within the IDEM Office of Water Quality. The program is administered through a Section 319 grant to Indiana University's School of Public and Environmental Affairs (SPEA) in Bloomington. The Indiana Clean Lakes Program is a comprehensive, statewide public lake management program having five components:

1. public information and education;
2. technical assistance;
3. volunteer lake monitoring;
4. lake water quality assessment; and,
5. coordination with other state and federal lake programs.

Indiana Clean Lakes Program:

<http://www.spea.indiana.edu/clp/>

Together, these data collection approaches serve to define the scope and extent of NPS pollution in Indiana. In the near term, developing methods to utilize this data to ascertain the efficiency of NPS programs in Indiana is critical to the successful implementation of the NPS plan. The state and its partners must continue to explore and develop new ways to assess water quality and use that data to make improvements to existing programs, target resources to critical areas, and develop new methods that will have a direct positive impact on water quality across all types and sources of NPS pollution.

EVALUATION STRATEGIES

In an effort to measure the effectiveness of Indiana's NPS program, the NPS/TMDL section developed an evaluation strategy framework that is updated annually. The goal of this strategy is to develop and use indicators, both social and environmental, to establish baselines, and improve performance-monitoring systems, including a description at both the state level and project level of evaluation activities. The goal also strives to document what the state and citizens do, and the impact of those actions on the environment, as well as integrate the NPS program with the monitoring and assessment programs. The strategy will be implemented in a graded/stepwise approach with full implementation of the strategy in the NPS program targeted for September 30, 2009.

Evaluation framework goals include:

- developing indicators to improve performance-monitoring systems: administrative, environmental, and social;
- developing logic models with indicators that will be used to evaluate successes and failures of the 319 program and 319 projects and assist in planning;
- integrating NPS program monitoring results with the Assessment Information Management System (AIMS) database in IDEM's Assessment Branch;
- providing a mechanism for front-end, formative, and summative evaluations;
- describing the strategy's adaptive management process by which evaluation results will "feedback" into the project and statewide efforts;
- integrating the evaluation framework goals in the 319 program; and,
- identifying a schedule, with milestones, for fully implementing the evaluation strategy.

The full strategy is included as Appendix D.

ASSESSMENT

Assessment allows IDEM to identify waterbodies that are not managed consistently with the NPS program objectives, including federal lands. The assessment process satisfies Key Element No. 7 in the *NPS Program and Grants Guidance* issued by U.S. EPA.

Water quality data analyzed by IDEM's Assessment Branch and other state agencies is used to assess water quality for *Indiana's Integrated Water Quality Monitoring and Assessment Report* (IR). The IR identifies the waters that fail to meet Indiana's water quality standards. The IR is published in even-numbered years and includes the Section 305(b) water quality report and consolidated list. The objective of the IR is to report the number of stream miles, coastline miles, and lake acres that do not meet designated uses so that remediation or restoration programs can be implemented. The IR contains waterbody specific assessments for all designated uses, and comprehensive basin-wide assessments for aquatic life use. Waterbodies that do not meet the state's water quality standards for one or more designated uses are considered impaired and are placed on Indiana's 303(d) List of Impaired Waters, Category 5 of the Consolidated List published with the IR.

Assessing the effectiveness of the overall statewide NPS program will combine the results from project or watershed evaluations with the broader regional or statewide evaluations. The results will include trends in water quality, aquatic biological conditions, target audience knowledge of NPS problems, and other environmental and social indicators. Presently, the assessment approach includes results from ambient water chemistry monitoring, fish and macro invertebrate 0 surveys, fish tissue analysis, sediment chemistry sampling, habitat assessments, visual observations, photographs, watershed land use assessments, and limited social and behavioral information. Data generated from the monitoring activities may, when available, be used to assess watersheds and determine their baseline results and trends.

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Review, Revisions, and Reports

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INTRODUCTION

To satisfy Key Element No. 9 in the *NPS Program and Grants Guidance* issued by U.S. EPA, states must periodically review and evaluate the effectiveness of their NPS programs using environmental and functional measures of success and modify, as needed, the programs at least every five years. IDEM developed the following review, revision, and reporting strategies to satisfy Key Element No. 9.



REVIEW AND REVISIONS

In the future, IDEM will review the implementation progress of the **Indiana NPS Management Plan** by:

- evaluating environmental monitoring data to assess changes in environmental quality;
- reporting on activities through the *Section 319 Program NPS Annual Report*. Annual reports will include information on 319-funded activities and program requirements, milestone progress, non-319 local/state/Federal NPS accomplishments, and success stories. Partners could propose changes to the NPS Plan that would be considered in the regular updating process;
- updating the NPS plan as part of the IR, which is published in even-number years and includes the Section 305(b) water quality report and consolidated list; and,
- updating the NPS plan at least every five years, or when deemed appropriate or directed by U.S. EPA.

Future updates will also include information and input gathered from the NPS Advisory Committee. Formation of this group will be critical to evaluating progress, coordination of program efforts, and development of further goals and measures to address NPS pollution on a statewide basis. Initially, implementation will focus significant resources on program objectives and measures identified in Chapter 2 of this document. IDEM will have the ability to revise the short-term objectives of the overall program annually to reflect changing priorities and conditions in the state's watersheds. Modifications and/or amendments will be submitted to U.S. EPA, Region 5, when substantial changes or additions to the existing plan are required due to changes in federal or state legislation or other events. In cooperation with U.S. EPA Region 5, IDEM will determine when such amendments are warranted.

PROGRESS REPORTS

Program accountability is critical to assure the public of the state's commitment to deal with the NPS pollution problem. The NPS management plan contains actions that will result in consistent and timely evaluation and reporting of the Program's progress in effectively dealing with NPS pollution. This includes annual, biennial, and five-year reporting cycles and the use of Web-based, interactive information tools.

Each year when the *Section 319 Program NPS Annual Report* is submitted to U.S. EPA, there is an opportunity to evaluate progress in meeting the goals and responsibilities of the **Indiana NPS Management Plan**. In previous years, the NPS program report was primarily a discussion of the Section 319 grants program, with general information from partner agencies related to their conservation programs.

Since federal fiscal year (FFY) 2000, the *Section 319 Program NPS Annual Report* contains an evaluation and discussion of each goal of the **Indiana NPS Management Plan** and information on goal progress. The *319 NPS Grant Program Report* also includes information from partner agencies on watershed restoration projects and project results, in accordance with U.S. EPA Region 5's goal to capture this information. The location, cost, and effectiveness of practices implemented are reported in as much detail as partner agencies' information collection procedures allow.

The *Annual NPS Grant Program Report* is posted on the Internet. Members of the NPS management plan review committee and partner agencies will be alerted to the opportunity to comment on the state's NPS progress and identify issues that may need to be addressed in future plans or through amendments to the existing Plan.

Section 319 NPS Grant Program Annual Report:
http://www.idem.in.gov/files/2007_nonpoint_annual_report_final.pdf

A

Management Measures

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INTRODUCTION

Management measures are means to control the entry of pollutants into surface waters. Management measures achieve nonpoint source (NPS) pollutant control goals through the application of NPS pollution control best management practices (BMPs). These BMPs may include technologies, processes, siting criteria, operating methods, or other alternatives.

Implementing Management Measures in Watersheds

Management measures can be implemented in either a preventive or restorative mode depending upon the state and local needs identified through the watershed planning process. Similarly, although management measures are generally considered to be technology-based, they can also be used as key elements of a water quality-based approach to solving identified water quality problems. Technology-based pollution control measures are identified based upon technical and economic achievability rather than on the cause-and-effect linkages between particular land use activities and water quality problems that drive water quality-based approaches.

The following sections are general summaries of U.S. EPA guidance documents on national management measures to control NPS pollution from the following categories:

- urban Areas;
- agriculture;
- forestry;
- marinas and recreational boating;
- hydromodification; and,
- wetlands and riparian areas.

Although IDEM has provided summaries of the national management measures for each of these categories, it does not preclude other state agencies or local watershed groups from implementing additional management measures in accordance with an approved watershed plan. These national management measures are intended to provide technical assistance to state and local program managers and other practitioners on the best available, most economically achievable means of managing run-off and reducing NPS pollution of surface and ground waters.

URBAN AREA MANAGEMENT MEASURES

People and their actions are the most significant sources and causes of urban run-off and pollution. Uncontrolled or treated run-off from the urban environment and from construction activities can run-off the landscape into surface waters. This run-off can include such pollutants as sediments, pathogens, fertilizers/nutrients, hydrocarbons, and metals. Pavement and compacted areas, roofs, reduced tree canopy, and open space increase run-off volumes that rapidly flow into our waters. This increase in volume and velocity of run-off often causes stream bank erosion, channel incision, and sediment deposition in stream channels. In addition, run-off from these developed areas can increase stream temperatures. Along with the increase in flow rate and pollutant loads, these elements negatively affect water quality and aquatic life.

Other common sources of urban pollution include improperly sited, designed, and maintained onsite wastewater treatment (septic) systems; pet wastes; lawn and garden fertilizers; pesticides; household chemicals that are improperly disposed of; automobile fluids; road deicing/anti-icing chemicals; and vehicle emissions.

Management measures are described in the U.S. EPA guidance document, *National Management Measures to Control Nonpoint Source Pollution from Urban Areas*, 2005 (<http://www.epa.gov/owow/nps/urbanmm/>).

This guidance helps citizens and municipalities in urban areas protect bodies of water from polluted run-off that can result from everyday activities. These scientifically sound techniques are the best practices known today. The guidance will also help states to implement their NPS control programs and municipalities to implement their Phase II Storm Water Permit Programs.

The implementation of management measures for urban run-off will reduce the generation of NPS pollutants from existing development and control run-off and treat pollutants associated with new development and redevelopment. The execution of the following management measures will also result in more consistent and widespread implementation of existing state NPS programs.



National Management Measures to Control Nonpoint Source Pollution from Urban Areas



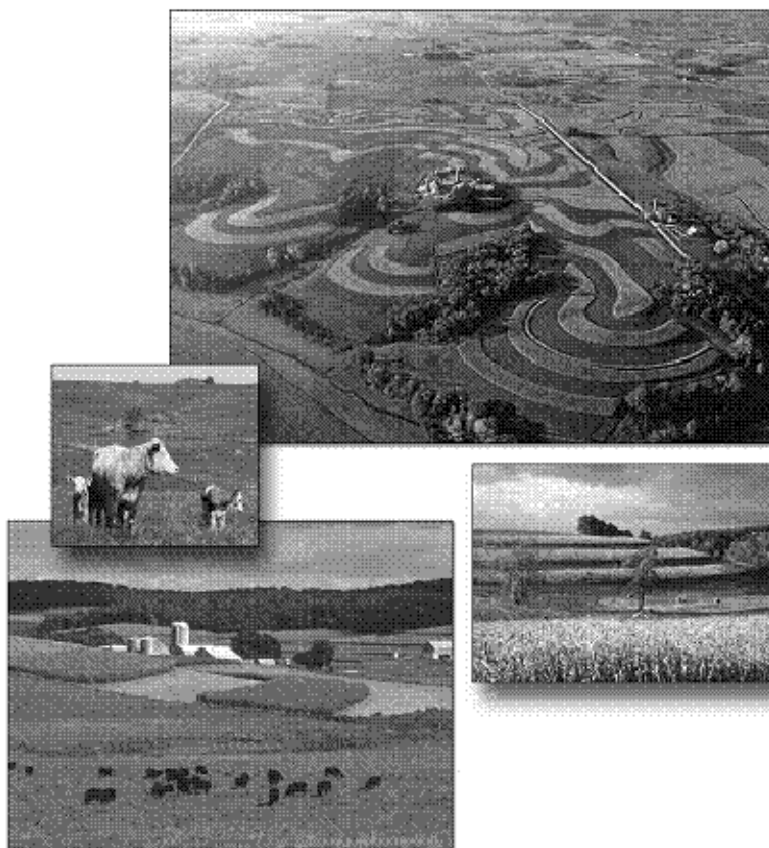
AGRICULTURAL MANAGEMENT MEASURES

Agricultural management measures are described in the U.S. EPA guidance document, *National Management Measures to Control Nonpoint Pollution from Agriculture*, 2003 (<http://www.epa.gov/owow/nps/agmm/index.html>). This guidance document is intended to provide technical information to state program managers and others on the best available, economically achievable means of reducing NPS pollution of surface and ground water from agriculture. The guidance provides background information about agricultural NPS pollution, where it comes from, and how it enters the nation's waters; discusses the broad concept of assessing and addressing water quality problems on a watershed level; and presents up-to-date technical information about how to reduce agricultural NPS pollution. Additionally, the Natural Resources Conservation Service has *Field Office Technical Guides* for agriculturally-focused BMPs, which are produced for each state: <http://www.nrcs.usda.gov/technical/eFOTG/>.

The implementation of agricultural management measures will reduce the generation of NPS pollutants from agricultural activities and minimize the transport of pollutants from agricultural land to surface and ground waters.



National Management Measures for the Control of Nonpoint Pollution from Agriculture



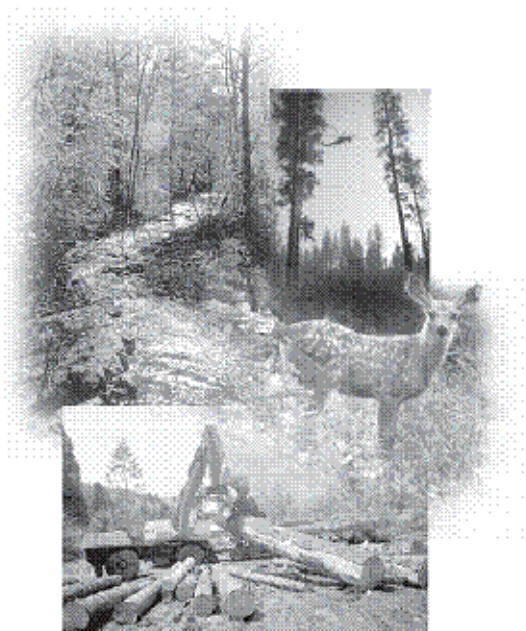
FORESTRY MANAGEMENT MEASURES

Forestry management measures are described in the U.S. EPA guidance *National Management Measures to Control Nonpoint Pollution from Forestry*, 2005 (<http://www.epa.gov/owow/nps/forestrymgmt/>). This guidance document is intended to provide technical assistance to state water quality and forestry program managers, nonindustrial private forest owners, industrial forest owners, and others involved with forest management on the best available, most economically achievable means of reducing the NPS pollution of surface and ground waters that can result from forestry activities. The guidance document provides background information about NPS pollution from forestry activities, including where it comes from and how it enters our waters. It presents the most current technical information about how to minimize and reduce NPS pollution to forest waters, and it discusses the broad concept of assessing and addressing water quality problems on a watershed-by-watershed level. By assessing and addressing water quality problems at the watershed level, state program managers and others involved with forest management can integrate concerns about forestry activities with those of other resource management activities. This will allow the identification of conflicting requirements and provide balance between short-term impacts and long-term benefits. This approach can maximize the potential for overall improvement and protection of watershed conditions, as well as provide multiple environmental benefits.

The implementation of management measures and their associated management practices applied at forest harvest sites and along roads provides essential control of erosion and sedimentation. It will also limit, as much as possible, the potential for water pollution that can result from forest harvesting activities.



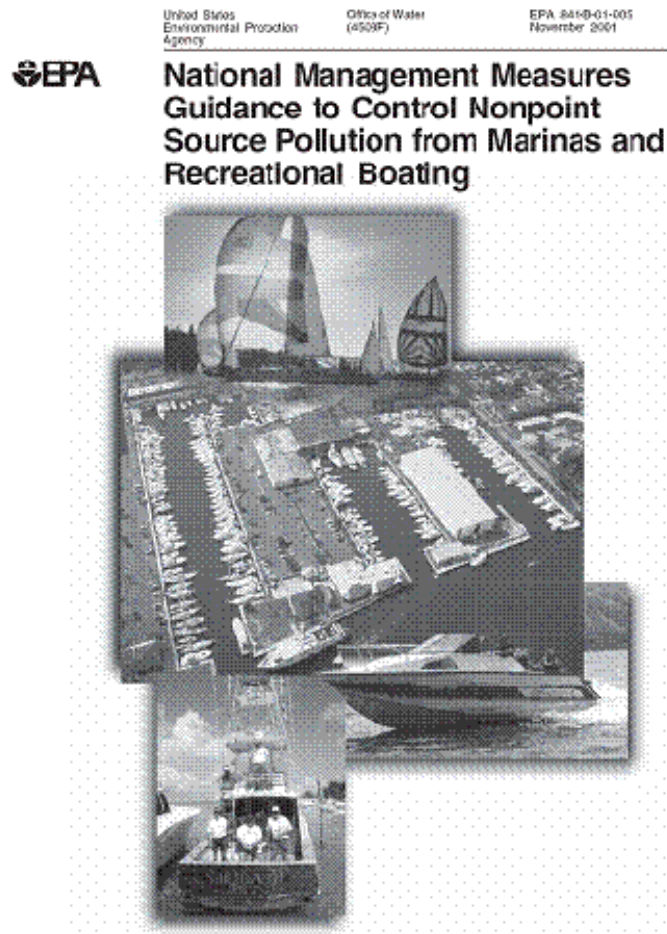
National Management Measures to Control Nonpoint Source Pollution from Forestry



MARINAS/BOATING MANAGEMENT MEASURES

Marinas/Boating management measures are described in the U.S. EPA guidance document, *National Management Measures to Control Nonpoint Pollution from Marinas and Recreational Boating*, 2001 (<http://www.epa.gov/owow/nps/mmsp/index.html>). This document provides guidance to states, territories, authorized tribes, and the public regarding NPS pollution management measures. The guidance document is intended to provide technical assistance to state program managers and others on the best practicable means of reducing NPS pollution of surface waters from marinas and recreational boating. The guidance document also provides related background information about NPS pollution, including where it comes from and how it enters the nation's waters, and technical information about how to reduce NPS pollution from marinas and recreational boating. It also discusses the relationship of marinas to the watersheds in which they are located.

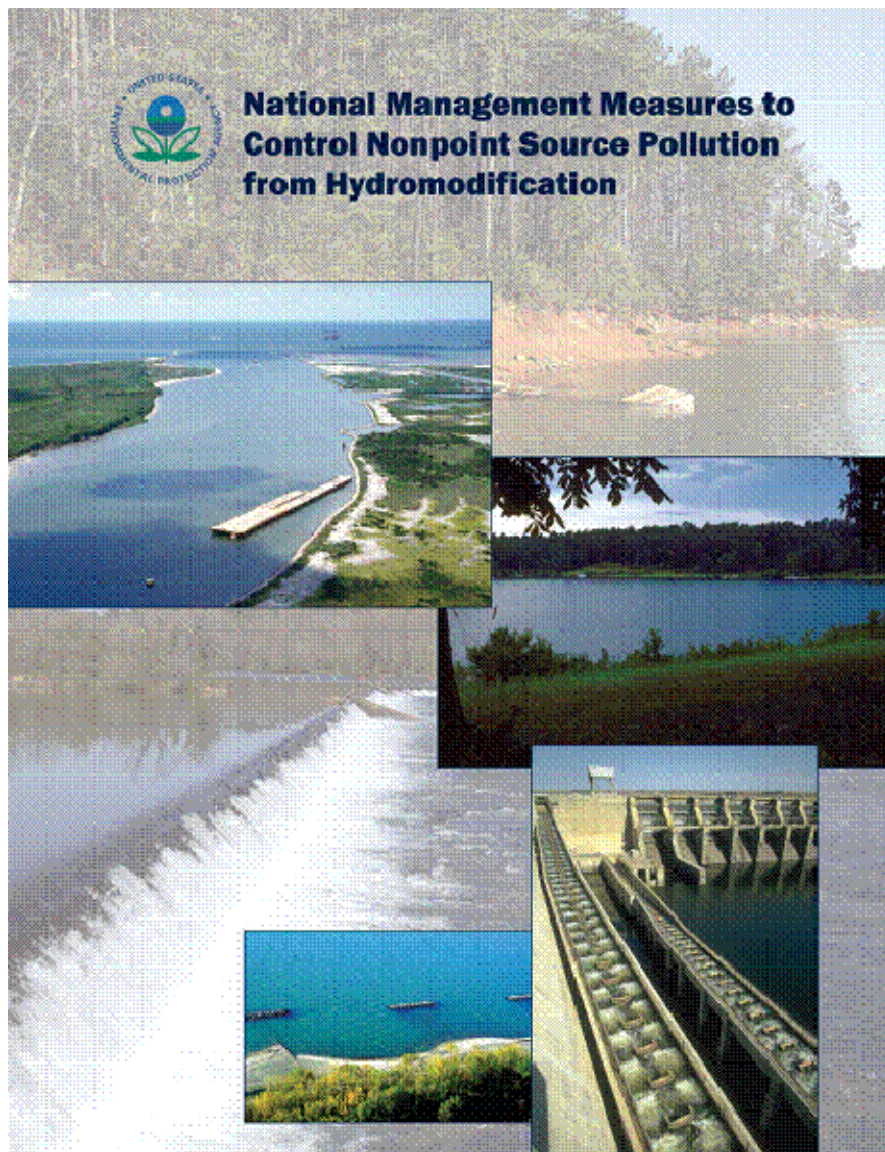
The implementation of management measures for marinas and recreational boating will reduce the run-off of pollutants to marine waters and mitigate the impacts associated with the siting, design, operation, and maintenance of new and expanding marinas.



HYDROMODIFICATION MANAGEMENT MEASURES

Hydromodification management measures are described in the U.S. EPA guidance document, *National Management Measures to Control Nonpoint Source Pollution from Hydromodification*, 2007 (<http://www.epa.gov/owow/nps/hydromod/index.htm>). This guidance document provides background information about NPS pollution and offers a variety of solutions for reducing NPS pollution resulting from hydromodification activities.

The implementation of management measures for hydromodification activities are intended to prevent degradation of the physical and chemical characteristics of surface waters. They are also intended to prevent detrimental changes to instream and riparian habitat resulting from the transport of pollutants, as well as from alterations in the supply of sediment and freshwater. The measures will minimize erosion, control sediment run-off, prevent downstream contamination, and protect the quality of water and aquatic habitat in reservoirs. The measures will also protect eroding streambanks and shorelines that constitute a nonpoint pollution source.



WETLAND AND RIPARIAN MANAGEMENT MEASURES

Wetland and riparian management measures are described in the U.S. EPA guidance document, *National Management Measures to Protect and Restore Wetlands and Riparian Areas for the Abatement of Nonpoint Source Pollution*, 2005 (<http://www.epa.gov/owow/nps/wetmeasures>). This guidance document describes practices to reduce NPS pollution of surface waters and ground water through the protection and restoration of wetlands and riparian areas, as well as the implementation of vegetated treatment systems. The guidance document also provides background information about NPS pollution, including where it comes from and how it enters the nation's waters; discusses the broad concept of assessing and addressing water quality problems on a watershed-by-watershed level; and presents recent technical information about how certain types of NPS pollution can be reduced effectively through the implementation of these management measures. This document is not intended to be used as a design guide for restoring or constructing wetlands, nor should it replace input from experts during the planning or implementation phases of wetland or riparian area creation or restoration.



National Management Measures to Protect and Restore Wetlands and Riparian Areas for the Abatement of Nonpoint Source Pollution



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B

Key Agencies

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INTRODUCTION

Partnerships exist between IDEM and other agencies at the state, regional, and federal level that support watershed protection and nonpoint source (NPS) management. A key goal of this plan is to build new partnerships to include a much wider range of organizations, entities, and stakeholders. Current partnerships have been classified into two groups: primary and secondary partners. Primary partners are those with a direct role in NPS pollution control and who work with IDEM in implementing NPS pollution reduction activities. Secondary partners are those agencies that have no direct involvement with NPS pollution control, but through their other activities, they can have an impact. The following appendix names these agencies and describes their missions and roles in Indiana's approach to NPS management.

An important consideration for locally-led watershed groups, as they develop watershed management plans, is the impact permitting programs have on various stakeholders. Many permits contain requirements to actively manage stormwater, create best management practices, and conduct assessments of stormwater on water quality. These requirements not only complement watershed management planning, but also provide regulatory control over certain sources of NPS pollution in a watershed. It is critical that not only permittees be included as partners, but also regulatory authorities on the federal, state, and local level. Coordination of regulatory and non-regulatory approaches to managing NPS pollution is key to a holistic approach to this issue.

PRIMARY PARTNERS

Indiana Association of Soil and Water Conservation Districts (IASWCD)

The Indiana Association of Soil and Water Conservation Districts (IASWCD) and local soil and water conservation districts (SWCDs) work toward a shared purpose: to coordinate assistance from available sources (public and private, local, state, and federal) in an effort to develop locally driven solutions to natural resource concerns. The mission of IASWCD is to provide technical, financial, and educational assistance needed to implement economically and environmentally compatible land and water stewardship decisions, practices, and technologies. The local SWCDs are a resource for residents, especially farmers and rural residents, in matters of land conservation, prevention of soil erosion, and other natural resources concerns. The IASWCD's Web site references IDEM's Office of Water Quality (OWQ) for its publications related to water quality issues such as NPS pollution.

<http://www.iaswcd.org/>

Indiana Department of Natural Resources (IDNR) – Coastal Zone Management Program

The purpose of the Lake Michigan Coastal Program (LMCP) is to support coordination and partnerships among local, state, and federal agencies and local organizations for the protection and sustainable use of natural and cultural resources in the Lake Michigan region. The Coastal Zone Management Program created a coastal NPS pollution control program framework which is available on its Web site. The *Indiana Coastal Nonpoint Management Plan* (Section 6217) is a requirement of U.S. EPA and NOAA. The plan requires that LMCP identifies how existing and new programs address a suite of 55 management measures. The NPS Management Plan, developed by IDEM, is consistent with the *IDNR Coastal Zone 6217 Program* and will be a part of the implementation.

<http://www.in.gov/dnr/lakemich/program/index.html>

IDNR – Lake and River Enhancement Program (LARE)

The goal of the Division of Fish and Wildlife's LARE Program is to protect and enhance aquatic habitat for fish and wildlife, and to ensure the continued viability of Indiana's publicly accessible lakes and streams for multiple uses, including recreational opportunities (<http://www.in.gov/dnr/fishwild/7032.htm>). This is accomplished through measures that reduce nonpoint sediment and nutrient pollution of surface waters to a level that meets or surpasses state water quality standards. The LARE Program provides technical and financial assistance for qualifying projects. Approved grant funding may be used for one or more of the following purposes:

- investigations to determine what problems are affecting a lake or a stream segment;
- evaluation of identified problems and effective action recommendations to resolve those problems;

PRIMARY PARTNERS

- cost-sharing with land users in a watershed above a project lake or stream for installation or application of sediment and nutrient reducing practices on their land;
- matching federal funds for qualifying projects;
- watershed management plan development;
- feasibility studies to define appropriate lake and stream remediation measures;
- engineering designs and construction of remedial measures;
- water quality monitoring of public lakes;
- management of invasive aquatic vegetation; and,
- sediment removal from qualifying lakes

Natural Resources Conservation Service (NRCS)

The Natural Resources Conservation Service (NRCS) is a federal agency in the U.S. Department of Agriculture. With the mission of “Helping People Help the Land,” NRCS provides products and services that enable people to be stewards of soil, water, and related natural resources on non-federal lands. NRCS’ guiding principles are service, partnership, and technical excellence. NRCS employees work in every county in Indiana to provide technical assistance, conservation planning, and program information support to private land users. NRCS also provides financial assistance for many conservation activities through various voluntary Farm Bill programs.

<http://www.in.nrcs.usda.gov/>

Indiana State Department of Agriculture (ISDA) – Division of Soil Conservation

Indiana SWCDs are independent subdivisions of the state government and the Indiana State Department of Agriculture (ISDA) provides support to the SWCDs. The Division of Soil Conservation is one member of a partnership that includes the SWCDs, IASWCD, NRCS and Purdue Cooperative Extension. The ISDA’s State Soil Conservation Board’s Clean Water Indiana (CWI) Grants Program provides Indiana’s SWCDs with a great opportunity to showcase pilot programs of what Hoosier conservationists can do when given the resources to make a difference. The ISDA can assist IDEM and local project sponsors in the control of NPS pollution related to agricultural activities.

<http://www.in.gov/isda/index.htm>

Farm Service Agency (FSA)

The Farm Service Agency (FSA), also a federal agency in the U.S. Department of Agriculture, administers and manages farm commodity, credit, conservation, disaster, and loan programs as laid out by Congress through a network of federal, state, and county offices. Through the FSA's work with the agricultural community, it can help in the education of farmers in the prevention of soil erosion and NPS pollution. FSA provides financial assistance to landowners for conservation under the Conservation Reserve Program.

<http://www.fsa.usda.gov/>

IDNR – Division of Reclamation

The Division of Reclamation is responsible for oversight of active coal mining and restoration of land disturbed for coal extraction. The Division of Reclamation states on its Web site that “all water affected by the mining operation must pass through approved sediment control structures before leaving the mine site to prevent water pollution.” The operator must comply not only with the mining laws, but also applicable state and federal water quality laws, including obtaining water discharge permits issued by IDEM. Siltation structures must remain until permanent vegetation is well established and water entering the pond meets water quality standards. Ponds not approved for retention after mining must be filled and reclaimed. IDEM permits approved for mining operations can be used to ensure compliance with any NPS management programs needed.

<http://www.in.gov/dnr/reclamation/5483.htm>

Indiana Geological Survey (IGS)

The mission of the Indiana Geological Survey (IGS) is to provide geologic information and counsel that contribute to the wise stewardship of the energy, mineral, and water resources of the state. The IGS primarily focuses on ground water. The IGS's knowledge of mapping to aid in water quality evaluation/improvements can be utilized by IDEM to assess its program.

<http://igs.indiana.edu/>

Indiana Department of Transportation (INDOT)

The Indiana Department of Transportation's (INDOT's) mission is to build, maintain, and operate the state's transportation system with the goal of enhancing safety, mobility and economic growth. INDOT publishes documents that assist those pursuing transportation projects in complying with environmental rules, applying for waterway permits, and preparing environmental studies. INDOT normally references IDEM's Rule 5 for erosion control. INDOT mitigates for impacts to streams and wetlands resulting from transportation projects. This mitigation can also serve to address NPS issues in a given watershed.

<http://www.in.gov/dot/>

SECONDARY PARTNERS

IDNR – Division of Water (DOW)

The IDNR Division of Water (DOW) staff members are engaged in multiple activities that benefit both current and future generations of Indiana residents and property holders. DOW collects, maintains, and provides water resource information to users such as individual citizens, businesses, environmental organizations, and federal, state, and local government agencies. DOW generates surface and ground water resource assessments. It strives to alleviate flood disaster damages and abuse of Indiana's water resources through floodplain regulation, dam and levee inspection, construction projects, water rights administration, and public education.

<http://www.in.gov/dnr/water/index.htm>

Indiana State Department of Health (ISDH)

The Indiana State Department of Health (ISDH) regulates commercial onsite wastewater disposal systems. ISDH has developed standards for the construction and maintenance of onsite disposal systems. ISDH also provides education, training, and technical assistance to local health departments for building resources at the local level. Faulty onsite disposal systems can be a source of NPS pollution and any efforts put forth by IDEM related to these systems will be coordinated with ISDH.

<http://www.in.gov/isdh/>

National Park Service

The National Park Service is responsible for the management of the Indiana Dunes National Lakeshore and the storm water run-off it contains. The National Park Service has programs in place to limit the amount of shoreline erosion taking place. The management of the Indiana Dunes would also be consistent with the IDNR Coastal Zone Management Program and the IDNR Division of State Parks in the area of the Dunes State Park. Efforts to decrease NPS pollution will include all agencies.

<http://www.nps.gov/indu/>

Office of the Indiana State Chemist (OICS)

The Office of the Indiana State Chemist (OICS) is charged with administering several agricultural laws involving seeds, fertilizer, animal feeds, and pesticides. Pesticide management is addressed in a document entitled, "Estimating Ground Water Vulnerability to Nonpoint Source Pollution from Nitrates and Pesticides on a Regional Scale." Enforcement of laws regarding fertilizer and pesticide use and storage can improve NPS pollution and would be of interest to IDEM.

<http://www.isco.purdue.edu/>

Office of Surface Mining Reclamation and Enforcement – U.S. Department of Interior

The Office of Surface Mining Reclamation and Enforcement is the federal agency that works with the IDNR – Division of Reclamation. The state of Indiana has the authority to administer the mine reclamation program. This agency may be involved in activities to assist the state mitigating NPS pollution.

<http://www.osmre.gov/>

U.S. Forest Service – Hoosier National Forest

The U.S. Forest Service manages public lands in national forests and grasslands. The U.S. Forest Service focuses on forest management and can have an impact on NPS pollution through the management measures chosen for use in the state's national forest. The forest management plan for the Hoosier National Forest has a discussion of BMPs consistent with IDNR's forestry program that can be used to control point and NPS pollution.

<http://www.fs.fed.us/r9/hoosier/>

U.S. Fish and Wildlife Service (USFWS)

The U.S. Fish and Wildlife Service's (USFWS's) mission is to work with others to conserve, protect, and enhance fish, wildlife, and plants and their habitats for the continuing benefit of the American people. The *Environmental Quality Program* has contaminants specialists who review environmental documents, legislation, regulations, permits, and licenses with pollution potential to ensure that harmful effects on fish, wildlife, and plants are avoided or minimized. This review includes analysis of documents and permits related to control of NPS pollution from agriculture and urban run-off; point source pollution from industrial and municipal waste treatment facilities; and discharges of dredge and fill material. These reviews can identify areas for NPS pollution control improvements that the state can focus on.

<http://www.fws.gov/>

U.S. Geological Survey (USGS)

The mission of the U.S. Geological Survey (USGS) is to serve the nation by providing reliable scientific information to describe and understand the Earth; minimize loss of life and property from natural disasters; manage water, biological, energy, and mineral resources; and enhance and protect our quality of life. The National Water Quality Assessment Program researches water quality and NPS in urban watersheds. The USGS has published reports on nonpoint and point sources of nitrogen in major watersheds of the United States, including an analysis of the White River in Indiana. The USGS can provide valuable research and sampling assistance to the state.

<http://www.usgs.gov/>

SECONDARY PARTNERS

U.S. Department of Defense (DOD)

The U.S. Department of Defense (DOD) is the federal agency in charge of Indiana military installations. DOD staff can assist IDEM by making sure that all measures are being taken to keep NPS pollution at a minimum on all military installations in Indiana.

<http://www.defenselink.mil/>

Federal Highway Administration (FHWA)

The Federal Highway Administration (FHWA) is charged with the broad responsibility of ensuring that America's roads and highways continue to be the safest and most technologically up-to-date. Although state, local, and tribal governments own most of the nation's highways, FHWA provides financial and technical support to them for constructing, improving, and preserving America's highway system. One of its strategic goals is to protect and enhance the natural environment and communities affected by highway transportation. FHWA publishes a reference document entitled, "Storm Water Best Management Practices in an Ultra-Urban Setting: Selection and Monitoring" (<http://www.fhwa.dot.gov/environment/ultraurb/>) which is used to select BMPs for use in controlling storm run-off and water quality. Proper use of the information provided by FHWA can help to minimize NPS pollution on highway projects.

<http://www.fhwa.dot.gov/>

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C

Funding

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INTRODUCTION

This appendix serves as a summary of known funding sources available to public and private entities, at the time of publication, for implementation of NPS pollution elimination/control projects.



SECTION 319 GRANTS PROGRAM

The Section 319 grants program is implemented by IDEM's Office of Watershed Management (OWM). Work plans, grants administration, financial administration, annual reporting, and use of the Grants Reporting and Tracking System (GRTS) are carried out by the OWM, in accordance with U.S. EPA guidance from Region 5.

Work plans: The Section 319 grant program follows a cycle dependent on the development and passage of the federal budget. Although the federal fiscal year begins on October 1st of each year, final allocations of Section 319 funds may not be certain until March or April. Work plans explaining how the funds will be expended by the state will provide details of individual projects. These work plans are submitted to U.S. EPA Region 5 by December 1st of each year. Final proposals are submitted in February. The entire grants award process, from submitting a proposal through contract execution, can take from six to nine months.

Design and oversight of watershed projects: Section 319 projects are normally contracted for two to four years. Projects fall into several categories: watershed planning, implementation of plans, education, and demonstration. The application package submitted by the sponsor contains a budget, schedule, description of the problem, proposed activities for addressing the problem, how the project will be evaluated, and letters of commitment from project partners. Project managers work with the sponsor to refine the application package as needed. This package is used to develop the grant agreement between IDEM and the sponsor.

Projects are assigned to a specific project manager who works closely with the sponsoring group, meeting with them at least quarterly, providing technical assistance or referrals to others as needed, and handling all paperwork submitted for the project. This oversight is concluded when the project's final report and all claim vouchers have been submitted and the contract has been closed.

Targeting of projects: In order to continue to make measurable improvements in water quality in Indiana, IDEM's Section 319 NPS Program is focusing funding on the following priority activities:

1. watershed planning and/or implementation in watersheds with one or more impaired waterbodies that have an approved Total Maximum Daily Load (TMDL) report;
2. watershed planning and/or implementation in watersheds that include waterbodies in Category 5A on the 303(d) List of Impaired Waterbodies; and
3. implementation of watershed management plans that have or will soon meet IDEM's "2003 - Watershed Management Plan Checklist."

Proposals for activities that do not meet one of the priorities are unlikely to be funded.

SECTION 319 GRANTS PROGRAM

Reporting: Annual reports are submitted to U.S. EPA on October 1st of each year. These reports include a list of open projects and their contract term, pollutant load reduction estimations, geographic location of all projects, administrative and water quality goals, and copies of final reports for projects that have closed since the last annual report. In addition, a summary of all NPS pollution efforts in the state, including efforts by the Indiana Department of Natural Resources and the Natural Resources Conservation Service, is provided. The GRTS is continually maintained for U.S. EPA's access, including at least the required mandated elements, quarterly progress reports, and final reports for all projects as they are received.

GRTS (Grants Reporting Tracking System): Indiana began utilizing GRTS in 1996. Project managers enter all information for their projects, including quarterly and final reports, as text documents. Quarterly and final reports are either summarized or copied electronically into the GRTS. This database is available nationally so states may view each other's project information.

Project Quality Assurance/Quality Control (QA/QC) and monitoring component: NPS projects are required to include appropriate monitoring to gauge the effectiveness of the project. In many cases, this involves water quality monitoring. Depending on the goals of the project, the water quality monitoring plan may be detailed and tailored to obtain specific water quality data with which to make decisions. Monitoring plans may also utilize volunteers to test the streams and rivers for educational purposes, detecting possible problems, or determining trends. When environmental data is being collected during the course of a NPS project, a quality assurance project plan (QAPP) must be developed, submitted, and implemented. The QAPP is reviewed by the program's quality assurance manager to ensure that the data collected will be of known and suitable quality and quantity, and that it meets U.S. EPA requirements and the project's needs.

Depending upon the type of project and the goals of the project, environmental monitoring may not be appropriate to determine the effectiveness and success of a project. Additional types of monitoring activities include: tracking the number of people attending an event; determining how many acres of land are affected by the project; assessing the results of surveys; and other kinds of monitoring specific to the goals of the project.

The requirements for Section 319 project grants are described below:

- project sponsors must be units of government, nonprofit organizations, or universities;
- the area in which the project takes place must be within the watershed of a waterbody which is:
 - listed in the current 303(d) list as impaired due to a pollutant that may have a NPS; or,
 - listed in the current 305(b) report as not fully supporting a designated use due to an impairment that may be due to a NPS;
- projects of a statewide or regional nature must directly assist the program in reaching an administrative or water quality goal as detailed in Sections 1 and 7 of this document; and,

SECTION 319 GRANTS PROGRAM

- Projects targeted to a specific watershed must address a water quality goal as detailed in Sections 1 and 7 of this document, and must address one or more of the project objectives listed in this section.

CLEAN WATER ACT SECTION 205(J) GRANT PROGRAMS

This program is designed for projects aimed at reducing and eliminating pollution at the state level through community planning processes. Section 205(j) funding was previously allocated through Section 604(b) of the Clean Water Act. Eligible organizations include municipal governments, county governments, conservation districts, and regional planning commissions. Typical projects have included watershed management planning, identification of appropriate Best Management Practices (BMPs), GIS mapping, and sewer feasibility studies.

The funding for this program is provided by U.S. EPA under the authority of the Clean Water Act. No match is required by the community. Usual annual funding from U.S. EPA Region 5 to the state ranges from \$0 to \$450,000. The average project receives \$30,000 to \$70,000.

<http://www.in.gov/idem/4103.htm#205j>

STATE REVOLVING FUND (SRF) LOAN PROGRAM

The Indiana Revolving Fund (SRF) Loan Program provides low-interest loans to Indiana communities for projects that improve wastewater and drinking water infrastructures. The Indiana Finance Authority administers this program that protects both public health and the environment. Recently, SRF has implemented a program to fund NPS projects, as well. The Indiana SRF Loan Programs have provided over \$1.3 billion dollars in low-interest loans to Indiana communities for projects that improve wastewater and drinking water infrastructure. More than 200 communities have closed on over 200 wastewater loans and 75 drinking water loans. Great strides have been made by communities with this money in addressing water quality problems from point sources; however, SRF recognizes that NPS run-off and watershed disturbances threaten these successes and impede future water quality improvements. In response to this situation, SRF has expanded its financing opportunities to projects that abate or prevent NPS pollution of Indiana's waters. Integrating a NPS project with a wastewater or drinking water project may reduce a community's SRF program loan interest rate by up to as much as 0.5 percent, or half of the cost of the NPS project.

Who is eligible?

- Cities, towns, counties, regional sewer/water districts, conservancy districts, and water authorities are eligible for wastewater, drinking water, and NPS SRF loans; and,
- Private and not-for-profit facilities are eligible only for drinking water SRF loans.

Where does the money come from?

- The state applies to the U.S. EPA annually for capitalization grants to fund its SRF programs. To increase available funds, the state leverages its U.S. EPA capitalization grants in the municipal bond market. These funds are combined with the U.S. EPA required state match and are then made available to Indiana communities in the form of low-interest rate loans.

What types of projects are eligible for funding?

- Any project where there is an existing pollution abatement and need is eligible for SRF funding;
- Wastewater projects include:
 - treatment plant improvements and upgrades;
 - sewer line extensions to existing unsewered properties;
 - combined sewer overflow corrections; and,
 - infiltration/inflow projects.

<http://www.in.gov/ifa/srf/2680.htm>

- Drinking water projects include:
 - treatment plant improvements and upgrades;
 - water line extensions to existing unserved properties; and,

STATE REVOLVING FUND (SRF) LOAN PROGRAM

- water storage facilities.

(<http://www.in.gov/ifa/srf/2711.htm>)

- NPS projects include:
 - wetland protection and restoration measures;
 - on-site sewage disposal systems;
 - BMPs for agriculture and storm water run-off;
 - riparian buffers and conservation easements; and,
 - wellhead and source water protection measures.

What types of projects are not eligible for funding?

- Projects that are solely intended for economic development;
- Projects that are primarily for fire suppression; and,
- Storm water projects that have no water quality benefits.

How does a community apply for a SRF loan?

- Application forms are available on the SRF Web site at <http://www.srf.in.gov>.

What are the loan terms?

- The SRF loan is a fixed rate, 20 year loan; and,
- Interest rates reset quarterly and are at or below 90% of the average 20 year, AAA-rated, general obligation bond Municipal Market Data. Rates are further discounted based on the applicant's median household income (from current census data) and local user rates.

Where can I get more information about SRF loans?

- For more information about SRF program administration and the SRF process, please contact the Indiana SRF Program Office at (317) 232-8655 or visit the SRF Web site at <http://www.srf.in.gov>.

LAKE MICHIGAN COASTAL PROGRAM

The U.S. Congress has made funds available to states and territories with approved coastal zone management programs for competitive grants for community-based coastal activities. Funding and oversight are provided by the National Oceanic and Atmospheric Administration (NOAA), Office of Ocean and Coastal Resource Management (OCRM). Projects must be consistent with the goals and objectives of the Coastal Zone Management (CZM) Act of 1972 (CZMA, 16 U.S.C. §1451 et seq.) and meet the requirements of the CZM program administered by OCRM.

The state requires that projects are consistent with the CZM Act. For Indiana, this funding will be administered by the IDNR, Division of Nature Preserves (DNP), and the Lake Michigan Coastal Program (LMCP). You may visit the LMCP Web site at <http://www.in.gov/dnr/lakemich> to view additional information or to download copies of the application guidance and the application.

This document is intended to establish the structure and requirements for Indiana's Coastal Grants Program. The purpose of the program is to preserve, protect, restore, and, where possible, develop the resources of the coast for this and succeeding generations. The program also exists to achieve wise use of the land and water resources of the coastal region, giving full consideration to ecological, cultural, historic, and esthetic values, as well as to needs for economic development. The LMCP seeks out social, economic, and environmental solutions that balance the use and protection of the coast's valuable, yet fragile, resources. Proposals for projects will be reviewed on a competitive basis, using the grant funds available to Indiana.

Eligible Applicants

The following are eligible applicants:

- units of local government, such as municipalities, townships, counties, and towns;
- area-wide agencies, including county and regional planning agencies;
- state agencies;
- state colleges, universities, and other state institutions of higher learning;
- conservancy districts and port authorities;
- basin commissions;
- non-profit organizations – 501(c)3 (some restrictions apply); and,
- non-profit organizations are only eligible to apply for non-construction/non-acquisition projects as grantees. They may partner with a public entity to perform some or all tasks of a 306(a) construction or acquisition project, but they may not be a grantee for construction/acquisition projects. Additional information can be downloaded at <http://www.in.gov/dnr/lakemich/grants>.

LAKE MICHIGAN COASTAL PROGRAM

Eligible Projects

- Funding is available for projects that protect, restore, and plan for the management of coastal, natural, historical, and cultural resources. Projects must be consistent with the CZM Act. The CZM Act can be found at http://coastalmanagement.noaa.gov/czm/czm_act.html

Ineligible Projects include, but are not limited to:

- construction projects on privately owned land without a conservation easement or other public interest;
- large scale, hard structure erosion control projects;
- beach renourishment;
- infrastructure projects related to water and sewer line construction;
- dredging;
- restrooms;
- road and parking lot construction;
- routine maintenance;
- general recreational facilities such as playgrounds, ball fields, courts, etc.;
- wetland or other habitat restoration that is required as a condition of a permit or other regulatory action; and,
- contaminated site cleanup that is required as a condition of a permit or other regulatory action.

Eligible Geographic Area

Projects must be located entirely within the LMCP Coastal Program Area, which comprises the northern portion of Lake, Porter, and LaPorte counties. The applicant may also attempt to demonstrate that the project will have direct substantial benefits within the coastal region.

Lands owned by a federal entity are excluded from the LMCP Program Area and, therefore, projects may not occur on these lands.

LAKE MICHIGAN COASTAL PROGRAM

LAKE MICHIGAN COASTAL PROGRAM – SMALL GRANT PROGRAM

Beginning in 2003, the LMCP allocated a limited amount of funds to serve short-term requests for funding from the coastal community. The projects are to be short-term in duration, small in scope, and use the same application as the large grant program.

Two different Small Grant categories are available:

- **Outreach and Education:** includes ideas such as public participation processes, information kiosks, symposiums, conferences (cannot cover food costs), etc.; and
- **Resource Management:** projects such as GIS data collection, aerial photography, land use planning, and other projects that allow for better resource management.

Who can apply?

- All entities eligible for the annual large grant funding cycle are eligible to apply for small grant funds. This includes local units of government, nonprofits, colleges and universities, joint powers boards, state agencies, etc. The project must occur within the coastal area and address coastal issues.

What are the match requirements?

- request for funds cannot be more than \$5,000;
- projects must be matched *at least* 50/50 or 1:1;
- a \$5,000 request must be matched with \$5,000 of non-federal cash or in-kind services for a total of \$10,000;
- must follow the same accounting standards as large grants; and,
- all funds are distributed on a reimbursement basis.

What are the project limitations?

- a project can receive LMCP small grant funds only once during the project life;
- an applicant can only have one request funded at a time; and,
- projects cannot involve construction, land acquisition, or restoration.

What is the timeline for small grants?

- small grant applications are accepted at the same time as the regular large scale grants and anytime thereafter;

LAKE MICHIGAN COASTAL PROGRAM

- projects must be ready to begin within 30 days of approval, pending a signed grant agreement; and,
- projects must be fully completed within six months, including all paperwork and requests for reimbursements.

INDIANA SOIL AND WATER CONSERVATION DISTRICTS – CLEAN WATER INDIANA GRANT

The State Soil Conservation Board's (SSCB's) Clean Water Indiana (CWI) Grants Program provides Indiana's SWCDs with a great opportunity to showcase pilot programs of what Hoosier conservationists can do when given the resources to make a difference.

By displaying the impact of our stewardship, the current level of CWI funding will serve as seed money to grow into much larger sources of funding for soil and water conservation initiatives.

Districts will find that these programs are not "one size fits all;" therefore, SWCDs are encouraged to "think outside the box" and submit creative and innovative ideas within the guidance provided.

Districts focus on conservation practices such as nutrient management, no-till/strip till, cover crops, buffers, and pasture/livestock management.

<http://www.in.gov/isda/2362.htm>



INDIANA DEPARTMENT OF NATURAL RESOURCES – LAKE AND RIVER ENHANCEMENT PROGRAM

The goal of the Division of Fish and Wildlife's Lake and River Enhancement (LARE) Program is to protect and enhance aquatic habitat for fish and wildlife to ensure the continued viability of Indiana's publicly accessible lakes and streams for multiple uses, including recreational opportunities. This is accomplished through measures that reduce nonpoint sediment and nutrient pollution of surface waters to a level that meets or surpasses state water quality standards.

To accomplish this goal, the LARE Program provides technical and financial assistance for qualifying projects. Approved grant funding may be used for one or more of the following purposes:

1. investigations to determine what problems are affecting a lake/lakes or a stream segment;
2. evaluation of identified problems and effective action recommendations to resolve those problems;
3. cost-sharing with land users in a watershed above upstream from a project lake or stream for installation or application of sediment and nutrient-reducing practices on their land;
4. matching federal funds for qualifying projects;
5. watershed management plan development;
6. feasibility studies to define appropriate lake and stream remediation measures;
7. engineering designs and construction of remedial measures;
8. water quality monitoring of public lakes;
9. management of invasive aquatic vegetation; and,
10. sediment removal from qualifying lakes.

Technical assistance to this program is provided through the LARE staff's aquatic biologists and program specialists.

OTHER

A summary of various federal, state, and non-profits/Grassroots funding opportunities are included in the attached table. The information came from the U.S. EPA Catalog of Federal Funding Sources for Watershed Protection (Second Edition), the Indiana Department of Environmental Management, the Indiana Department of Natural Resources, and various Internet Web site searches. This information is believed to be accurate at the time it was gathered, but the reader is encouraged to review and confirm all available funding prior to applying.

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D

Framework for Developing Evaluation Strategies

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INTRODUCTION

In the fall of 2003, the U.S. Environmental Protection Agency (U.S. EPA) directed the states to develop an evaluation strategy for the statewide Nonpoint Source (NPS) Pollution Program. The state evaluation strategy is to measure the effectiveness of the NPS program at two levels: the overall statewide program level and individual NPS projects or activity level.

- A. The evaluation is to be used as a multi-purpose tool to:
1. build on existing data collection of state NPS programs and their partners;
 2. select methods and approaches that are appropriate within each state;
 3. support accountability at the program and project level; and,
 4. provide mechanism to improve and strengthen the states' implementation approaches at the statewide and project levels.

The increased emphasis on environmental measures or outcomes will require the *NPS Evaluation Framework* to be closely integrated with the state's monitoring and assessment program. The Indiana NPS program monitoring is conducted by the sub-grantees and IDEM staff. IDEM's Assessment Branch data is requested by grantees for historical and supplemental data to be used in developing watershed management plans. The IDEM Assessment Branch data is the backbone for the 305(b) report and is also used to select streams added to the 303(d) list of impaired waters. Many of the 319 projects are selected in watersheds containing streams on the 303(d) list (an environmental indicator). Some projects are selected for education (a social indicator).

Historically, the greatest emphasis on measuring goals and final evaluations has been with administrative indicators, such as: funds spent, hours worked, and reports completed. This evaluation strategy will continue to use the administrative indicators, but with an increased emphasis on environmental and social indicators.

- B. Timeline goals in this statewide NPS program Evaluation Strategy:

6/2005: Identify additional administrative and environmental indicators for assessing the effectiveness of the overall NPS Program.

Results 2005: Additional indicators were included in the evaluation framework.

Results 2006: Rough drafts of both social and environmental indicators have been provided by Purdue University through the NPS Environmental Framework 319 project.

Results 2007: Rough draft of environmental indicators has been prepared by Purdue University. In addition to the final list of core social indicators, there is also an option to select additional social indicators that are selected on a project-by-project basis.

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6/2005: Submit 319 grant application to develop environmental and social indicators for both baseline results and post-BMP results.

Results 2005: The first two years of the 319 grant is expected to begin by October 2005.

Results 2006: This project is on target to be renewed for the third and fourth year.

Results 2007: An additional year was added to the Purdue Environmental Outcomes I with the addition of gathering more detailed information with social indicators and to establish an environmental council. The Environmental Outcomes II 319 proposal was submitted for contracting; still waiting for an executed contract.

10/2005 All NPS grant applicants will be required to supply information on project inputs, expected outputs, and short-term and long-term outcomes (or impacts) with their grant applications.

Results 2005: These elements were included in the 2005 grant applications and a much improved version was added to the 2006 grant applications.

Results 2006: These elements were also included in the 2007 grant applications and were part of the evaluation checklist.

Results 2007: These elements are included in the 2008 grant applications as part of the evaluation checklist.

10/2005 Develop a data storage system compatible with Storage and Retrieval (STORET).

Results 2005: A 319 grant was given to the IDEM Data Management Section to assist in this project with an emphasis on the IDEM Assessment Branch AIMS database. Another option is to feed data through the Assessment Branch with 319 data in an acceptable format to be added to their AIMS database and the Indiana Water Quality Atlas.

Results 2006: The RFP for the new AIMS II database is almost complete. The project manager worked with personnel from IT, the Assessment Branch, and NPS/TMDL to provide detailed information on the NPS database that will be housed with the original AIMS database. It will be separated by programs and data requirements. The database for the NPS data will have versatility not exhibited in the older AIMS. AIMS and AIMS II data will be downloaded to STORET (Water Quality Exchange [WQX]).

Results 2007: Proposals were solicited by the state and a contractor was selected. Work is in progress and is slated to be completed by early 2009.

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6/2006: Identify social indicators for assessing the effectiveness of the overall NPS program.

Results 2005: Purdue was awarded a 319 grant to complete this task.

Results 2006: The Purdue team, along with other Region 5 states, has developed a list of social indicators. They are in the process of developing a Web-accessible/Web-based tool box that will provide pre-project, middle project, and post-project surveys at the project level. They are also developing a database that will integrate with GRTS to house all the data collected from each 319 project.

Results 2007: The Purdue team is in the process of collecting baseline information using the developed indicators. Additional watershed projects are being selected for data collection and in-depth evaluation.

12/2006: Develop a long-term NPS monitoring plan to measure post-BMP results that will be updated annually.

Results 2005: Purdue University will be awarded a 319 grant to develop this plan.

Results 2006: The environmental framework project and the AIMS II project are addressing this issue and, with IDEM's assistance, will develop the appropriate monitoring plans. Also, IDEM has begun to identify and work with a project by offering to supply equipment and additional funds in order to establish effectiveness monitoring with pre- and post-BMP implementation strategy and using a paired watershed to reduce the variability factor.

Results 2007: After AIMS II is completed, Implementation projects will submit strategy to measure the effectiveness of their BMP installations. Strategy will be provided with their proposals and added to their tasks list.

12/2006 Incorporate environmental and social indicators into selected projects.

Results 2005: Purdue University will be awarded a 319 grant to complete this timeline goal.

Results 2006: Purdue, through the 319 grant, has already selected and collaborated with three projects throughout the state to complete this timeline.

Results 2007: Social indicator data is already being gathered for the projects selected last year. A clear plan for measuring the environmental indicators has not yet been finalized. Discussions for a few select projects selected for next year's budget may have increased sampling strategy before and during implementation designed to measure BMP effectiveness and changes in water quality.

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12/2006: Develop a data storage system for additional indicators.

Result 2005: IDEM has redefined this timeline to, "Develop a procedure to store the results of the social indicators."

Results 2006: The AIMS II project has a draft request for proposal and will be ready to hire a programmer to develop this data storage system. The social indicators will be stored in a database that is presently being developed by the Region 5 states. This database will be integrated into GRTS.

Results 2007: The data storage system to collect social indicators has been developed by Region 5, but is not yet released for use. The collection of environmental indicators has already begun with the individual 319 project. The quality assurance project plans require projects collecting environmental data to submit data to the project manager in electronic format, preferably in a Microsoft Access table with required spatial and temporal information.

12/2006 Establish protocol for gathering baseline information for social indicators.

Results 2005: This timeline is expected to be included in the 319 Purdue University Environmental Framework project.

Results 2006: Purdue, with the 319 Environmental Framework project, is presently developing an online toolbox that will assist project coordinators in collecting baseline social indicators.

Results 2007: Toolbox has been developed, but is not officially online at this time. The first training to IDEM 319 and watershed specialist staff was presented by the Purdue team. The current contract was extended one year to add more in-depth study of social indicators and 319 projects. An additional three year contract, "Demonstration of Outcomes Phase II," was submitted for approval.

12/2007 Develop a system to accurately measure trends or environmental improvements, quantitatively, as a result of implementation of BMPs.

Results 2005: A basic system will be incorporated in each project's Quality Assurance Project Plans.

Results 2006: This system is being developed through the Purdue Environmental Framework project and also by incorporating the strategies used by a large project that were presented at the 2006 National NPS Monitoring Conference.

Results 2007: Five projects were submitted to the Region 5 U.S. EPA Accountability Project. Each year, the estimated load reductions are submitted to Region 5 U.S. EPA through the required database. Two of the projects have submitted first year results. The other three will be implementing BMPs next year. A "W" team has been assembled and will be selecting additional projects to evaluate changes to water quality. A proposal was submitted to the 319 project selection team to add additional monitoring capabilities for the purpose of

INTRODUCTION

showing improvements as a result of BMP installations. This may result in a decrease in the number of projects selected and an increase of budgets to the selected projects. Estimated number of projects to be selected are three to four total.

12/2007 Incorporate all indicators into selected 319 projects.

Results 2005: This timeline is expected to be completed on time.

Results 2006: Three projects throughout the state have already been selected and data is being gathered through a collaborative effort between project coordinators and Purdue University that is funded by the 319 Environmental Framework project.

Results 2007: Social indicators have been incorporated into selected 319 projects and environmental indicators are being measured by several planning and implementation projects through environmental sample collection or models.

12/2008 Begin tallying the environmental quality improvements.

Results 2005: This timeline is expected to be completed on time.

Results 2006: Results from the three test projects will be summarized and the toolbox with training materials will be close to being launched.

Results 2007: Region 5 database systems for the collection and evaluation of effectiveness, using social indicators, have not yet been released. The database system to collect environmental indicators has found a contractor to complete the work but this project has not started and is awaiting an executed contract.

9/30/2009 Develop a formal report to provide feedback to the NPS program.

Results 2005: This timeline is expected to be completed on time.

Results 2006: This timeline is expected to be completed on time.

Results 2007: Report will depend on the establishment of a format to collect indicators and to measure their effectiveness. Updates in GRTS and the Social Indicator Toolbox, along with the NPS database with a means of uploading data into STORET (WQX), will provide results of the NPS program to Region 5 U.S. EPA.

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IDEM will develop one document that will describe an evaluation procedure for the overall statewide NPS program. The evaluation strategy must describe how the state will implement the evaluation activities for the NPS program and its relationship with the state monitoring and assessment programs. The state must be able to demonstrate this accomplishment as part of the annual NPS program report.

A. Goals of the Evaluation Framework:

1. develop indicators to improve performance-monitoring systems: administrative, environmental, and social;
2. develop logic models containing indicators that can be used to evaluate successes and failures of the 319 program and 319 projects;
3. develop specific, measurable, agreed-upon, realistic, and time-specific (SMART) objectives at the program and project level;
4. integrate monitoring results of the NPS program with the AIMS database in the Assessment Branch, or an acceptable alternative;
5. provide a mechanism for front-end, formative, and summative evaluations;
6. describe the strategy's adaptive management process by which evaluation results will "feedback" into the project and statewide;
7. integrate the goals of the evaluation framework into the 319 program by 2009; and,
8. identify a schedule, with milestones, for fully implementing the Evaluation Strategy.

B. NPS Programs and Staff Organization:

1. NPS Programs: The Federal Clean Water Act Section 319(h) provides funding for various types of projects that work to reduce NPS water pollution. Funds may be used to conduct assessments, develop and implement TMDLs and watershed management plans, provide technical assistance, demonstrate new technology, and provide education and outreach. Organizations eligible for funding include nonprofit organizations, universities, and local, state, or federal government agencies. A 40 percent (non-federal) in-kind or cash match of the total grant cost must be provided.
2. Staff Organization of the NPS program:
 - a. Section Chief: This position manages the staff and work of the NPS/TMDL section, which includes the state's Sections 319 and 205(j) Grant Programs, IR Report, and TMDL development.

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- b. Program Administrator: This position is responsible for assisting with grant selection and program administration.
- c. Project Management Team Leader: This position oversees project management activities, drafting of contracts, reporting to U.S. EPA, and current operating procedures. This position also serves as a project manager.
- d. Special Projects Coordinator: This position works with projects such as the Indiana Water Quality Atlas, the *Nonpoint Sources Indicators Guide*, and the *Conservation Tillage Initiative*. This position provides technical support to the NPS/TMDL section in the areas of GIS, BPS, database development/maintenance, and Web-accessible Web site design. This position also serves as a project manager.
- e. Quality Assurance Manager: This position reviews and approves quality assurance project plans required of all projects conducting water quality or other technical monitoring. This position also serves as a project manager.
- f. Project Manager: Project managers assist grant recipients with their projects, ensuring that project tasks/duties, schedules, and budgets are implemented according to contractual requirements. Project managers draft contracts, review quarterly and final reports, review watershed management plans, review financial claims, and conduct quarterly site visits.
- g. Watershed Specialists: Water Specialists work with local groups and agencies to promote watershed management planning.
- h. Operations Staff: Operations staff works with sub-grantees to prepare and process contracts and provide financial tracking and interface with the U.S. EPA.

C. IDEM Assessment Branch Relationship with NPS program:

The IDEM Assessment Branch has conducted water, sediment, macro invertebrate, habitat, fish community, and fish tissue collection programs that will be used for NPS projects. This data is stored in one database (AIMS) that can be queried by staff to supply NPS sub-grantees with historical data. In addition to the monitoring programs listed above, the IDEM Assessment Branch is also conducting TMDL sampling projects and special studies involving both fish community and water chemistry. After the full implementation of the Evaluation Strategy, the IDEM Assessment Branch will provide services for collecting follow-up sampling for 319 projects on a limited number of watersheds.

The long-term NPS program will be included in the five year rotating basin monitoring schedule performed by the IDEM Assessment Branch. The TMDL 303(d) list investigations are integrated into this five year rotating basin monitoring schedule.

In 2006, the IDEM Assessment Branch Biological Studies Section Staff (ABBSSS) selected a new 319 project that had several stream reaches on the 303(d) list for

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impaired biotic communities. The staff worked with the Salt Creek project coordinator and the 319 project manager to collaborate monitoring efforts. The ABBSSS collected fish community, habitat, and chemistry samples in several locations in the Salt Creek watershed. The project members collected additional samples with ABBSSS to complete their monitoring goals. A follow-up with the same sampling parameters is expected from ABBSSS after the implementation stage is complete. This is expected to result in the ability to measure quantitative improvements in the water quality in this project area.

The IDEM Assessment Branch, USGS, and the NPS/TMDL section are working together with a 319 grant in establishing relationships between algal/chlorophyll, water chemistry, land use, habitat, macroinvertebrates, and fish communities, and to use these relationships for the purpose of establishing a state nutrient criteria. A final report will be submitted to IDEM by February of 2009.

NPS PROGRAM EVALUATION STRATEGY STRUCTURE

The evaluation structure will include indicators that will vary by evaluation types, desired outcomes, and level/types of measurement required. Projects are solicited by the state with a desired set of administrative indicators and a variety of possible environmental indicators. NPS grant applicants complete the proposal format that requires information on project inputs, outputs, and both short-term and long-term outcomes or impacts. A standardized proposal evaluation is used to place the potential projects into categories and rank them by completeness and community support. The U.S. EPA then reviews and approves the final selection of projects to be funded. An initial meeting is held with the project sponsor to finalize project objectives, including a clarification of administrative, environmental, and social indicators included in its project. The formative evaluation, tracking activities, and expenditures will begin before the individual NPS projects starts and will be part of the planning and implementation processes. A state NPS project manager is assigned the responsibility to manage the individual projects. The state project managers will also be responsible for the outcome evaluations.

Effective NPS program implementation of this evaluation strategy depends on collecting monitoring data of appropriate quality and quantity to establish baselines so accomplishments and failures can be measured quantitatively. Timelines for development and implementation are listed in the introduction. However, presently limited monitoring data to establish baseline and post-implementation documentation can be collected from a number of sources such as, but not limited to: the 305(b) and 303(d) Integrated Report, the IDEM Assessment Branch monitoring program, the TMDL program, and the 319 program. Assessing the effectiveness of the overall statewide NPS program will combine results from the project or watershed evaluations with broader evaluations of regional or statewide status. These results will include trends in water quality, aquatic biological conditions, target audience knowledge of NPS problems, and other environmental and social indicators. Presently, the assessment approaches include results from: ambient water chemistry monitoring; fish and macro invertebrate community surveys; fish tissue analysis; sediment chemistry sampling; habitat assessments; visual observations; photographs; watershed land use assessments; and social and behavioral information. Data generated from these monitoring activities may, when available, be used to assess watersheds and determine their baseline results and trends.

The *State Evaluation Framework* will include evaluation indicators, evaluation types, feedback loops, and both internal and external communication of evaluation results.

A. Evaluation Indicators

NPS projects funded by the 319 grant program will include clear goals, quantitative objectives, and evaluation indicators to be measured. Three categories of evaluation indicators will be used to assess the effectiveness of Indiana's NPS program: administrative, environmental, and social. IDEM will track administrative indicators and selected projects will track environmental and social indicators.

Milestone: By 6/2005, submit 319 Grant Project to develop additional environmental indicators and social indicators for both baseline and post-BMP.

Results: Additional indicators were supplied in the 2005 report and in 2006 a draft list of both social and environmental indicators was established by Purdue.

NPS PROGRAM EVALUATION STRATEGY STRUCTURE

Milestone: By 12/2005, the NPS/TMDL section will identify minimum baseline parameters, DQOs, and analytical methods using a graded approach.

Results: *The NPS projects with monitoring elements have a basic list of parameters.*

In 2006, an additional approach was added. Each project's parameters will be selected on a goal and issue basis.

The NPS monitoring program will be updated annually.

1. Administrative Indicators are activities or products related to the execution of a program or project. NPS project managers evaluate proposals and manage projects. Indicators include all GRTS mandated elements and additional items such as funds spent and project tasks completed, which are also included in statewide project tracking systems.

Table 1. Possible Basic Set of Environmental Indicators for Projects Requiring Sampling

Chemical Indicators	Biological Indicators	Physical Indicators
Phosphorus	Macroinvertebrates	QHEI
Nitrogen	<i>E. coli</i>	HHEI
Dissolved oxygen	Fish Communities	Water temperature
pH		Stream flow
Chlorophyll a		

2. Environmental Indicators assess the effect of the NPS program or individual projects on the health of the environment. These indicators may be chemical, biological, or physical and will vary with individual projects. Indicators are dependent on the pollutant identified in each watershed. Data Quality Objectives (precision, accuracy, comparability, representativeness, completeness, and sensitivity) will be included with each project that requires sampling.

The results of Purdue's 2007 list consist of environmental indicators presented in a draft report which is reprinted below:

Environmental Indicators to Document Success of NPS Projects

DRAFT, Nov 17, 2006

Jane Frankenberger and other members of the Purdue Environmental Indicators Team (Lindsay Birt, Brent Ladd, Adam Baumgart-Getz, Ron Turco)

Overall Framework

We propose a system that includes a number of possible indicators, and allows NPS projects to select those that are useful in documenting the success of their project. This may be a Web-accessible/Web-based list that would present all recommended indicators, grouped by impairment type. This system will be much more open-ended than the *social indicators* framework, in which a common set of indicators will be collected by most or all projects.

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In this proposed environmental indicators framework, each project would be free to select a small subset of the available indicators, but would be asked to use a common measurement method (e.g., nutrient, sediment, flora) for each indicator selected. If each project measures the indicators in the same way, the results can be aggregated to estimate statewide achievements.

Goals, Issues, and Outcomes

We suggest organizing the framework under general **goals** defined by water quality impairments. Since the overall NPS framework is based on restoring impaired waters, structuring the overall organizing system by *impairments* (e.g., *E. coli*, nutrients, impaired biotic community, etc.) will fit most closely with how projects are generally planned and implemented.

Under each goal, several **issues** will be listed, each of which represents the major causes or sources of the impairments.

Under each issue, there will be a number of **outcomes** that NPS projects strive to attain, and that the indicators are developed to represent. One or more **indicators** will be provided for each outcome, which can be used to determine the extent to which the outcome has been achieved. Each indicator will have one or more suggested methods of measurement. Because the environmental indicator selection has to be based partially on the feasibility of measurement, including measurement method from the beginning is vital. Using common indicators with common measurement methods will be important for aggregating project successes. Input will be widely sought on the proposed indicators and measurement methods.

The structure of the framework would therefore be the following:

1. **Goal** (Example: Reduce *E. coli* so that water is swimmable)
 - 1.1 **Issue** (Example: Failed septic systems)
 - Outcome 1, Indicator, Measurement Method
 - Outcome 2, Indicator, Measurement Method

Types of Indicators

We also propose including six different types of indicators in this framework, listed below and described in Table 1.

*Indicators of changes in **management** (M):*

- M1. management is improved or appropriate BMPs are implemented; and,
- M2. management improvements continue (for one or more years) and are effective; appropriate BMPs function well and are maintained.

*Indicators of changes in loadings or **stressors** (S) of water quality:*

- S1. loading to streams is reduced – based on **load estimations**; and,
- S2. loading to streams is reduced – based on **water quality monitoring**.

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Indicators of changes in water quality **condition** (C) or uses:

- C1. water quality or habitat improves; and
- C2: use or uses are restored (e.g., fishing, swimming, drinking).

“M” indicators are the easiest to measure, but are further removed from the ultimate goal of improved water quality. “S” indicators may be measured by estimation techniques, or in limited cases, by monitoring. “C” indicators are the highest level, but often very difficult and expensive to obtain.

Table 2: Description and Examples of Six Types of Indicators

Type	Definition	Examples	Typical measurement methods
M1	Management is improved or appropriate BMPs are implemented	<ul style="list-style-type: none"> • Percentage of people having their septic systems pumped • Number of livestock fenced out of streams • Percentage of construction sites using appropriate BMPs 	These can often be measured using observational techniques, aerial or other photos, or surveys of target audience or others who are likely to have relevant information (e.g., health department). Some surveys done for other purposes (e.g., tillage survey) can be used.
M2	Management improvements continue and are effective; BMPs function well and are maintained	<ul style="list-style-type: none"> • Number of failed septic systems (a result after several years of pumping septic systems) • Livestock that are no longer in stream (a result of the fencing BMP above) 	These indicators usually require a deeper level of observation to see whether the BMP or management change really had positive results.
S1	Loading to streams is reduced – based on load estimations	<ul style="list-style-type: none"> • Decrease in <i>E. coli</i> from failed septic systems • Decrease in direct run-off from impervious areas 	These indicators are estimated by applying a model or technique such as Spreadsheet Tool for Estimating Pollutant Loads (STEPL) to management changes or BMP-installed, such as those determined with the M1 or M2 indicators.
S2	Loading to streams is reduced – based on water quality monitoring	Similar to those listed above (S1), but different measurement methods: <ul style="list-style-type: none"> • Decrease in <i>E. coli</i> from livestock in stream (based on sampling upstream and downstream) 	Upstream/downstream monitoring can be used for some stressors (e.g., straight pipe septics, livestock in streams, channelized run-off from construction sites). For others, paired watersheds or paired fields with separation barriers would be needed.
C1	Water quality or habitat improves	<ul style="list-style-type: none"> • Decrease in <i>E. coli</i>, nitrate, turbidity, etc. in stream • Decrease in stream flashiness • Improved aquatic community habitat 	Paired watersheds are needed for statistically sound conclusions to be made about condition improvements.
C2	Use is restored (fishing, swimming, drinking)	<ul style="list-style-type: none"> • Improved aquatic community 	

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1. **Goal:** Reduce *E. coli* so that water is swimmable
 1.1 **Issue:** Malfunctioning septic systems

Table 3: Example of Indicators (for one goal and two issues)

Outcome	Indicator	Type	Possible Measurement Methods
<i>E. coli</i> loading from failed septic system decreases	<i>E. coli</i> loading from failed septic systems	S1	Use loading model to estimate load from number above
Straight pipe discharges are eliminated	Number of straight pipe discharges eliminated	M1	Work with health departments to compile information on known straight pipes and establish reporting mechanism to track the removal of pipes on a watershed by watershed basis.
<i>E. coli</i> loading from straight pipe discharges is eliminated	Estimated <i>E. coli</i> load from straight pipe discharges eliminated	S1 S2	Identify straight pipe discharges and use load estimation technique to calculate; monitor upstream/downstream of one, or the pipe itself (?)
<i>E. coli</i> in stream reduced	<i>E. coli</i> concentration (Level 5)	C1	Sampling; lab or volunteer methods. For scientifically valid monitoring, must be paired watersheds, upstream/downstream of changes, or have a very large change.
Water is swimmable	Beach closings Number of people swimming?	C2	Consult health department or other agency that collects this data.

- 1.2 **Issue:** Livestock in stream

Outcome	Indicator	Type	Possible Measurement Methods
Fences and alternative watering systems in place	Number of systems installed	M1	Project or NRCS records; observation to learn any other changes
Livestock no longer in stream	Number of livestock previously in stream that are no longer	M2?	1. Estimate from fences installed (project records, NRCS, observations) 2. Have quantifiable method of measuring livestock in streams; photos from all bridges at regular intervals, etc.
<i>E. coli</i> loading from livestock in stream reduced	Estimated <i>E. coli</i> from livestock in streams	S1	Load estimation technique based on collected data; bacterial sampling
	Monitored <i>E. coli</i>	S2	Water monitoring upstream and downstream of area before project, then again after;
<i>E. coli</i> in stream reduced	<i>E. coli</i> concentration (Level 5)	C1	Sampling; lab or volunteer methods. For scientifically valid monitoring, must be paired watersheds, upstream/downstream of changes, or have a very large change
Water is swimmable	Beach closings Number of people swimming?	C2	Consult health department or other agency that collects this data.

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Tentative List of Goals and Issues to Include

1. **Goal:** Reduce Pathogens (*E. coli*)
 - 1.1 **Issue:** Malfunctioning septic systems
 - 1.2 **Issue:** Livestock in streams or pastures
 - 1.3 **Issue:** Confined livestock and Combined Animal Feeding Operations (CAFOs)
 - 1.4 **Issue:** Land application of manure
 - 1.5 **Issue:** Land application of wastewater
 - 1.6 **Issue:** Boat pumpout facilities
 - 1.7 **Issue:** Combined sewer overflows
 - 1.8 **Issue:** Wildlife

2. **Goal:** Reduce Sediment
 - 2.1 **Issue:** Cropland erosion
 - 2.2 **Issue:** Pastureland erosion
 - 2.3 **Issue:** Silviculture and timber harvesting
 - 2.4 **Issue:** Excessive streambank erosion
 - 2.5 **Issue:** Construction
 - 2.6 **Issue:** Urban run-off
 - 2.7 **Issue:** Stream channel modification

3. **Goal: Reduce Nutrients**
 - 3.1 **Issue:** Cropland (fertilizer application)
 - 3.2 **Issue:** Cropland (manure or wastewater)
 - 3.3 **Issue:** Landscaped spaces (lawns, golf courses); fertilizer application
 - 3.4 **Issue:** Construction erosion
 - 3.5 **Issue:** Urban run-off
 - 3.6 **Issue:** Combined Sewer Overflows (CSOs)
 - 3.7 **Issue:** Malfunctioning septic systems
 - 3.8 **Issue:** Pastures
 - 3.9 **Issue:** Boat pumpout

4. **Goal: Reduce Atrazine (or other pesticides)**
 - 4.1 **Issue:** Cropland application
 - 4.2 **Issue:** Lawn and golf courses

5. **Goal: Restore Stream Channel and Aquatic Communities**
 - 5.1 **Issue:** Impaired biotic communities
 - 5.2 **Issue:** Increased stream flashiness (could also be included under other issues).

Next Steps

1. Ask key people for overall comments on the usability and usefulness of the proposed framework.

2. Develop an initial list of indicators, based on a literature review including:

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- indicators that have been used in existing watershed plans;
 - indicators that are suggested in key watershed management guides; and,
 - indicators developed at workshops and elsewhere to respond to commonly-desired outcomes of watershed projects.
3. Develop a Web-accessible/Web-based database framework for the initial list of indicators. This will allow it to be more easily accessed and reviewed. The database will include descriptions of measurement methods, a photo in some cases, and references to where the indicator has been used or described.
 4. Ask a broader group of watershed managers and experts to review the proposed Web-accessible/Web-based list and provide input on the key characteristics of useful indicators. Workshops and/or a Web-accessible/Web-based survey may be included.

The eventual result will be a Web-accessible/Web-based list of all indicators that have been found to be useful and are recommended for documenting the success of NPS projects. New projects will benefit from seeing how others have documented their success in addressing the impairments faced by the new watershed group, and by not being required to develop their own from scratch.

5. Social indicators assess the human behavioral effects of the NPS projects. Examples include general perception of environmental problems, awareness of NPS pollution sources and corrective measures, and participation level in NPS pollution control activities. Social indicators assess the human behavioral dimension of individual NPS projects and the overall statewide NPS program. Social indicators can be collected before, during, and/or after an NPS project. Pre-project social indicators can be used to identify stakeholders, identify potential barriers to NPS BMP implementation, and develop information and education strategies.

To support the development of its evaluation framework for 319 funded projects, Purdue University is developing social indicators and supporting IDEM's development of environmental indicators for NPS management. **Social indicators**, in this context, are used to measure the social components of NPS projects, including measures of capacity, awareness, attitudes, and behaviors of target audiences. Many watershed groups implicitly try to build community and individual capacity, but have lacked the tools to measure the success of this work. Using social indicators as part of a package of assessment tools is a way to address these shortcomings and provide an immediate indication of how a project is proceeding. Purdue is working in conjunction with the other five land grant universities in U.S. EPA Region 5 to develop and test these social indicators. Pilot tests of the social indicators are currently being conducted in three watersheds: Clifty Creek, Eagle Creek, and the South Fork of the Kilmore Creek. Surveys to collect baseline social data are being sent to members of the target audiences in each of these watersheds. Purdue will then help these groups interpret the data and modify their interventions to more appropriately fit the social conditions in their watersheds. Purdue is also conducting capacity building with IDEM staff to develop a comprehensive understanding of how to collect, use, and interpret social indicator data.

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Table 4: Examples of Input vs. Output for Both Project and Program Social Indicator

	Project Social Indicators	Program Social Indicators
Input		
Stakeholders Evaluations Funding sources Watershed Coordinator	Observations Surveys Attendance Meetings Questionnaires Behavioral changes Public awareness	Number of watershed groups 319 Project selection Public awareness Knowledge Change in behavior
Output		
	Community meetings Public support Educational programs Leadership Newsletters Educational workshops Knowledge Critical behaviors Stakeholders identified Citizen awareness BMPs targeted Baseline information	Public involvement Public awareness Behavioral changes Success stories
Social Outcomes	Project	Program
	Increased participation Stable education programs Change in behavior BMPs installed Capacity building Awareness and knowledge	Water quality improvement

Purdue and the Region 5 Social Indicator Team have developed a final list of core indicators to collect measurable changes within our 319 projects.

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Table 5: Goals, Intended Outcomes, and Core Social Indicators

<p>Goal: Increased awareness among the target audience</p> <p>Intended Outcome: Awareness gained regarding the relevant technical issues and/or recommended practices of the target audience in the critical area</p> <p>Indicator 1: Awareness of pollutants impairing waterways Indicator 2: Awareness of consequences of pollutants to water quality Indicator 3: Awareness of appropriate practices to improve water quality</p>
<p>Goal: Attitudes among target audience supportive of NPS management actions</p> <p>Intended Outcome: Attitudes changed in a way that is expected to facilitate desired behavior change of target audience in the critical area</p> <p>Indicator 1: General water quality related attitudes Indicator 2: Willingness to take action to improve water quality</p>
<p>Goal: Reduced constraints for using appropriate practices</p> <p>Intended Outcome: Constraints to behavior change will be reduced</p> <p>Indicator 1: Constraints to behavior change</p>
<p>Goal: Increased capacity to address NPS management issues in the project area</p> <p>Intended Outcome 1: The project improved the recipient's capacity to leverage resources in the watershed</p> <p>Indicator 1: Resources leveraged by grant recipient in the watershed as a result of project funding (including cash and in-kind resources)</p> <p>Intended Outcome 2: Increased capacity to support appropriate practices by target audience in critical areas</p> <p>Indicator 1: Funding available to support NPS practices in critical areas Indicator 2: Technical support available for NPS practices in critical areas Indicator 3: Ability to monitor practices in critical areas</p>
<p>Goal: Increased adoption of NPS management practices by the target audience</p> <p>Intended Outcome: Project resulted in changes in behavior and/or adoption of practices to prevent new problems and improve or maintain water quality in the critical area by the target audience</p> <p>Indicator 1: Percentage of critical area receiving treatment Indicator 2: Percentage of target audience implementing practices in critical areas Indicator 3: Ordinances in place that will reduce NPS stressors</p>

6. Baseline Indicator Data: Some baseline environmental indicator data has been and will continue to be collected through the five year rotating basin statewide monitoring program and other sources. Baseline social indicator data may be collected for individual projects assessing the attitudes and/or behaviors of special target audiences.

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Table 6: Possible Baseline Environmental and Social Indicators

Environmental Indicators	Social Indicators
Stream flow Water quality standards Nutrient and sediment loading River miles impaired or threatened by NPS pollution Biological index QHEI Temperature Unimpaired areas protected	Farming practices Land use Public knowledge Recycled materials 319 proposals Watershed groups Stakeholders Volunteers BMPs

B. Evaluation Types

Effective evaluations will take place at different times during the process. Four evaluation types will be utilized to assess the effectiveness of Indiana’s NPS Program.

1. Formative process evaluation includes proposal reviews and selection, timelines, quality assurance project plans, site visits, and quarterly reports necessary to execute an adaptive management approach to keep a project or program on track. Most NPS projects are conducted over a short period of time of one to three years and will focus on administrative indicators of progress. Project-specific process evaluations will be conducted at regular intervals, quarterly updates, site visits, project expense invoices, budgets, and quarterly milestones identified in the project work plan.
2. Outcome evaluation includes project closure, implementation plans, and a final report that will focus on determining the extent of the NPS project achievement through its short-term goals and objectives. Outcome evaluations are conducted upon the completion of specific NPS projects and will utilize environmental, social, and administrative indicators as appropriate. Collected results will be documented in a project’s final report. There will be two levels of outcome evaluation for specific NPS projects: evaluation using just administrative indicators or some other indirect assessment of environmental and/or social impacts, or more complicated, quantitative evaluations using environmental and/or social indicators.
3. Impact evaluation (three to five years) focuses on assessing the long-term effectiveness of the program and its projects and will require information on all three indicator types: administrative, environmental, and social. The timeframe appropriate for post-implementation impact evaluation will depend on the expected response interval. The response due to a NPS project is as follows: for water chemistry, in most cases would be around a year; biological response would be several years; and stream channel improvements could take decades. Impact evaluations will be used on a subset of the total NPS projects and activities, and projects selected must have sufficient baseline data to assess the environmental changes. Impact evaluations that are estimated values may be presented in the final watershed management plan.

COMMUNICATION OF NPS RESULTS INTERNAL AND EXTERNAL

- A. Internal communication of NPS program evaluation results is currently achieved by the following mechanisms:
1. administrative indicator information is compiled in the GRTS database. The GRTS is accessible to NPS program staff and contains basic information such as project location, organizational details, and quarterly reports.
 2. environmental indicator data from NPS-related field studies is expected to be uploaded into STORET WQX by IDEM's OWQ Data Management Section or Assessment Branch in the future. Presently, the data is collected and stored electronically on a disc and also, in most cases, is displayed on the sub-grantee's Web site.
 3. IDEM Assessment Branch environmental data is available upon request and available through the Indiana Water Quality Atlas.
 4. other program areas are notified and sent a copy of the final report and information for projects that may be of interest to them.

Milestone: Improved external communication of the NPS data by collecting and uploading data to STORET is expected to be started by 12/2006.

Results 11/2006: The relative percent difference (RPD) to solicit a programmer to accomplish this milestone is in the signature process and will soon be submitted.

Results 11/2007: A programmer was selected and work is underway.

Milestone: Improve internal communication of the NPS program by including NPS data from grantees to the IDEM Assessment Branch system, AIMS, by 12/2006.

Results 11/2006: The NPS data will go into AIMS II database and will be housed with AIMS data but, will be separated by program areas.

B. External Communication of NPS Program Evaluation Results:

1. FFY Annual Indiana NPS Pollution Management Program report.
2. 305(d)/303(d) integrated report.
3. IDEM's Office of Water Quality Web-accessible Web site.
4. Indiana Water Quality Atlas (already available on the IDEM Web site). A description of this project is discussed next and on the IDEM OWQ Web site.

COMMUNICATION OF NPS RESULTS INTERNAL AND EXTERNAL

Improving the effectiveness of Indiana's NPS program requires a "feedback" process.

Table 7: Feedback Loop for the NPS Projects and Program Included in Evaluation

Evaluation Types	Feedback
Formative	Initial site visit Site visits Quarterly reports Quality assurance project plan
Outcome	Final report Quality data GRTS NPS annual report Quality benefit Behavioral changes Estimate changes in the environment
Impact	Water quality improvement

Milestone: A formal report to provide feedback from the fully implemented evaluation strategy into the NPS program by 9/30/2009.

Milestone: A way to document and communicate internal and external lessons learned by 9/30/2009.

The state will document progress in implementing the evaluation strategy periodically. The strategy will be revised as needed (minimum of annually) to include updated development and implementation components, progressing toward full implementation of the evaluation strategy by September 30, 2009.