

C

Managing Water Quality

The Ohio General Assembly directs Ohio EPA and other state government departments to manage Ohio's water resources. The U.S. Environmental Protection Agency (U.S. EPA) has also delegated to Ohio EPA the responsibility to administer certain federal programs in Ohio.

The functions of various water quality management programs are explained in this section, along with a description of some funding expenditures for water quality activities in Ohio. Some federal government programs are included. Local government programs and decisions (for example, ordinances, planning and zoning) can have major impacts on water quality, but are not described here.

C1. Program Summary – Surface Water

The goal of Ohio EPA's Division of Surface Water (DSW) is to restore and maintain Ohio's water resources. This goal reflects the national water quality objective as contained in the federal Clean Water Act (CWA), which is "... to restore and maintain the chemical, physical and biological integrity of the Nation's waters"—often referred to as the fishable/swimmable goal. Fishable/swimmable waters are resources that support stable, balanced populations of aquatic organisms that are ecologically healthy and provide safe water to the people of Ohio for public and industrial water supplies and recreation.

DSW has a full-time staff of approximately 200 located in Columbus and the five Ohio EPA district offices. The division also employs approximately 50 interns during the summer to assist with biological and chemical water quality surveys. Funding for the division is comprised of federal monies, environmental protection funds generated through solid waste disposal fees and annual discharge fees.

A watershed-based approach to assessments and delivery of services has been a program management objective within DSW for nearly three decades. In 1990, DSW initiated an organized, sequential approach to monitoring and assessment (the Five-Year Basin Approach) to better coordinate the collection of ambient monitoring data so that information and reports would be available in time to support water quality management activities such as the issuance of National Pollutant Discharge Elimination System (NPDES) permits and periodic revision of the Ohio water quality standards (WQS).

To establish the framework, the state was divided into 25 different areas that were aggregations of subbasins within major river basins. Each of the 25 areas were assigned to one of the five basin years, considering the need to appropriately distribute the monitoring workload among Ohio EPA's five district offices. The initial 1990 workload estimates and resource planning indicated that five years would be needed to complete the cycle of monitoring. However, the monitoring program has never been fully funded to meet those resource needs, and thus the monitoring cycle takes more than 10 years to complete, making it more generally a rotating basin approach rather than a Five-Year Basin Approach.

The rotating basin approach and the core work of the biological and water quality monitoring program have gradually become the division's assessment component within the Total Maximum Daily Load (TMDL) program. Ohio's TMDL program has been designed to be watershed-focused and to promote integration of other ongoing water program elements on a watershed basis.

Biological and Water Quality Surveys

Ohio EPA routinely conducts biological and water quality surveys on a systematic basis throughout the state. A biological and water quality survey is an interdisciplinary monitoring effort coordinated on a reach-specific or watershed scale. Such efforts may involve a relatively simple setting, focusing on one or two small streams, one or two principal stressors and a handful of sampling sites or a much more complex effort including entire drainage basins, multiple and overlapping stressors and tens of sites.

Each year, Ohio EPA conducts surveys in four to six major watersheds in Ohio with an aggregate total of 400 to 450 sampling sites. Biological, chemical and physical habitat monitoring and assessment techniques are employed in surveys to meet four major objectives:

- provide a current and thorough re-assessment of water quality conditions in watersheds that have federally approved TMDLs for pollutants identified as impairing beneficial uses based on data collected during prior surveys;
- determine the extent to which use designations assigned in the Ohio WQS are either attained or not attained;
- determine if use designations assigned to a given water body are appropriate and attainable and recommend designations or changes where needed; and
- determine if any changes in key ambient biological, chemical or physical indicators have taken place over time, particularly before and after the implementation of point source pollution controls or best management practices (BMPs).

The gathered data is processed, evaluated and synthesized in a biological and water quality report. The findings and conclusions of each biological and water quality survey may factor into regulatory actions taken by Ohio EPA and are incorporated into the Ohio WQS (Ohio Administrative Code (OAC) 3745-1), Water Quality Permit Support Documents, State Water Quality Management Plans, the Ohio Nonpoint Source (NPS) Assessment and the aquatic life beneficial use analysis in the Ohio Integrated Water Quality Monitoring and Assessment Report [this report, prepared to meet the requirements of CWA Sections 305(b) and 303(d)] and TMDLs.

More information about DSW's water quality monitoring and assessment program is available at epa.ohio.gov/dsw/bioassess/ohstrat.aspx. An index with links to available biological and water quality reports can be found at epa.ohio.gov/dsw/document_index/psdindx.aspx.

Biosolids

Sewage sludge is the solid, semisolid or liquid residue generated during the treatment of domestic sewage in a treatment facility. When treated and processed for beneficial use, sewage sludge becomes biosolids—nutrient-rich organic materials that can be safely recycled and applied as fertilizer. Only biosolids that meet the standards spelled out in Federal and state rules can be approved for use as a fertilizer. Publicly Owned Treatment Works (POTWs) make the decision whether to recycle the biosolids as a fertilizer, incinerate it or bury it in a landfill.

Ohio EPA received delegation to administer the biosolids program (CWA Section 503 Program) in 2005. In March 2000, the Ohio General Assembly passed House Bill (HB) 197 to provide the statutory authority for the director of Ohio EPA to seek delegation of the program. HB 197 modified the Ohio Revised Code (ORC) to provide the director of Ohio EPA the authority to adopt, enforce, modify and rescind rules necessary to implement the biosolids program. HB 197 also modified the ORC to include an annual sewage sludge fee to fund the program. Each dry ton of sewage sludge treated or disposed in the State of Ohio is assessed a fee, with a cap of \$600,000 per year on all monies collected.

Shortly after the passage of HB 197, Ohio EPA began drafting rules that became effective in April 2002, as Ohio's Sewage Sludge Rules: Chapter 3745-40 of the OAC. The purpose of Chapter 3745-40 of the OAC is to "establish standards applicable to the disposal, use, storage, or treatment of sewage sludge or biosolids, which standards are intended to reasonably protect public health and the environment, encourage the beneficial use of biosolids and minimize the creation of nuisance odors." The most recent version of OAC 3745-40 became effective in July 2011.

Funded by annual sludge fees, Ohio EPA hired employees to complete sewage sludge management duties in the field and office. These employees perform compliance evaluation inspections at POTWs that beneficially use biosolids. They review annual data submitted by POTWs to ensure compliance with pollutant limits, monitoring and reporting requirements and perform authorization inspections at proposed land application sites. Field reconnaissance inspections are conducted at land application sites to verify compliance with site restrictions and management practices. These employees also review the NPDES permits that regulate sewage sludge generators.

Ohio EPA also funded college interns through the annual sludge fees to track authorized biosolids application sites. The interns developed a Geographic Information System (GIS) project to add authorized biosolids sites to a digital base map. Each authorized biosolids site receives a unique identification number through the GIS program. The GIS project is useful for managing the numerous land application sites and associated data such as cumulative pollutant loadings rates or proximity to source water protection areas for public drinking water supplies.

Combined Sewer Overflow Control Program

Combined sewers were built to collect sanitary and industrial wastewater, as well as storm water runoff, and transport these combined waters to a wastewater treatment plant (WWTP). During dry weather, they are designed to transport all flow to the WWTP. When it rains, the volume of storm water and wastewater may exceed the capacity of the combined sewers or of the WWTP. When this happens, the combined sewers are designed to allow a portion of the combined wastewater to overflow into the nearest stream, river or lake. This is a combined sewer overflow (CSO). Ohio has approximately 1,138 known CSOs in 89 CSO communities (June 2017), ranging from small, rural villages to large metropolitan areas.

In 1994, U.S. EPA published the national CSO Control Policy. Working from the national policy, Ohio EPA issued its CSO Control Strategy in 1995. The primary goals of Ohio's strategy are to control CSOs so that they do not significantly contribute to violations of water quality standards or the impairment of designated uses and to minimize the total loading of pollutants discharged during wet weather. Ohio's strategy addresses several issues that aren't covered by the national policy (for example, sanitary sewer extensions that occur up pipe of CSOs).

In 2000, Congress passed the Wet Weather Water Quality Act, which did two important things: it codified the 1994 national policy by making it part of the CWA and required that all actions taken to implement CSO controls be consistent with the provisions of the national policy.

Ohio EPA continues to implement CSO controls through provisions included in NPDES permits and using orders and consent agreements when appropriate. The NPDES permits for Ohio's CSO communities require them to implement the nine minimum control measures. Requirements to develop and implement Long-Term Control Plans (LTCPs) are also included where appropriate. In 2007, U.S. EPA adopted a new definition for the Water Safe for Swimming Measure, which sets goals to address the water quality and human health impacts of CSOs. The new definition sets a goal of incorporating an implementation schedule of approved projects into an appropriate enforceable mechanism, including a permit or enforcement order, with specific dates and milestones for 91 percent of the nation's CSO communities by September 2015. As of June 2017, 83 of Ohio's 89 CSO communities met this definition (93 percent), meeting the U.S. EPA's Safe for Swimming Measure goal.

Compliance Program

DSW staff works closely with the regulated community and local health departments to ensure that surface waters of the state are free of pollution. The regulated community with which DSW staff works includes wastewater facilities, both municipal and industrial; and small, unsewered communities experiencing problems with unsanitary conditions.

DSW staff provides technical assistance, conducts inspections of wastewater treatment plants, reviews operation reports, oversees land application of biosolids and manure from certain large concentrated animal feeding operations and investigates complaints regarding malfunctioning wastewater treatment plants and violations of Ohio's Water Quality Standards. DSW strives to ensure that permitted facilities comply with their National Pollutant Discharge Elimination System (NPDES) permits.

Concentrated Animal Feeding Operations

On Dec. 14, 2000, Governor Taft signed a bill that started the process of transferring authority to regulate concentrated animal feeding operations (CAFOs) to the Ohio Department of Agriculture (ODA), which now regulates construction and operation of large concentrated animal feeding facilities under their Permit-to-Install (PTI) and Permit-to-Operate (PTO) programs. However, PTI authority for sewage treatment and disposal systems at animal feeding facilities and for animal feeding facilities that discharge to POTWs remains with Ohio EPA.

Ohio EPA also retains authority for implementing the NPDES permit program for animal feeding operations until the revised delegation agreement with U.S. EPA that has been submitted by Ohio is approved by U.S. EPA. Because of federal rule revisions and court decisions, only facilities that meet the definition of a CAFO and that are discharging or proposing to discharge are required to apply to Ohio EPA for an NPDES permit.

The CAFO program at Ohio EPA uses a watershed perspective to prioritize work to some degree. The changes in the federal rule resulting in CAFO NPDES permits being required only when a facility discharges limits our need and ability to prioritize permitting by watersheds. However, the status of the watershed is considered in making decisions about enforcement and compliance activities (for example, supplemental environmental projects may be preferred over penalties; more technical assistance may be focused on TMDL watersheds).

Credible Data – Citizen Monitoring Program

The program's authorizing legislation was passed and signed by the governor in 2003. Ohio EPA adopted rules in 2006 (OAC Chapter 3745-4) for the program's operation and revised those rules in 2011 and 2018. The legislation and the rules are explicit in the desire to not only encourage the collection of water quality data by citizens, but also to ensure that the data are valid and useful for their intended purpose. In other words, the data should be credible. The rule package bears the name credible data because of this important feature and because the enabling legislation was referred to as the credible data bill. Thus, the words credible data appear in the terminology applied to citizen monitoring programs that choose to participate.

As envisioned by the legislation, any person with an interest in water quality should have a means to collect certain types of data useful for various inquiries about the quality of the water resource. Ohio EPA's role is to foster and broadly oversee the collection, analysis and use of data collected by such volunteer individuals and organizations. To promote scientific validity, Ohio EPA has established specific requirements to participate in the program and to collect data using approved study plans.

The law and the administrative regulations are the basis for establishing three broad categories or levels of data that will be deemed credible for distinctly different purposes. The overall premise is that there must be an increasing level of scientific rigor behind the sampling and analytical work as we progress from Level 1 to Level 2 to Level 3.

Level 1's purpose is primarily to promote public awareness and education about surface waters of the state. Level 1 may be appropriate for educators from soil and water conservation districts (SWCDs), park districts, health departments, schools or anyone with an interest in Ohio water quality.

Level 2 was designed with watershed groups in mind and may also be appropriate for SWCDs and health departments. Level 2 data can be used to evaluate the effectiveness of pollution controls, to conduct initial screening of water quality conditions and to promote public awareness and education about surface waters of the state. Level 2 groups are often in the position to perform the valuable function of monitoring long-term surface water quality trends in a watershed (where Ohio EPA may not have the resources to frequently revisit an area).

Level 3 provides the highest level of scientific rigor, and methods are equivalent to those used by Ohio EPA personnel. The law limits the director to using only Level 3 data collected under the credible data program for certain regulatory applications (for example, setting water quality standards and evaluating attainment of those standards). In other words, data submitted under this program as Level 1 and Level 2 data cannot be used for those regulatory purposes.

As of September 2017, the Agency has approved more than 1,200 qualified data collectors and 200 study plans. Ohio EPA has created a web-based portal for data entry and data access (Credible Data Online Application, epa.ohio.gov/dsw/credibledata/submission_of_data.aspx), available through Ohio EPA's eBusiness Center.

Enforcement Program

Quarterly non-compliance reports are prepared by all delegated states and contain instances of non-compliance; State or Federal enforcement responses to the instances of non-compliance; other actions being taken to address the violations; and current compliance statuses for major dischargers. In cases in which Ohio EPA is unable to resolve continuing water quality violations, DSW may recommend that enforcement action be taken. An enforcement action could be Director's Final Findings and Orders completed within Ohio EPA or a court action through the Attorney General's Office. DSW enforcement staff work with Ohio EPA attorneys, as well as the Attorney General's Office, to resolve these cases. Where possible, an added emphasis and priority is given to actions in sensitive watersheds. All final enforcement orders are posted on the DSW webpage.

Inland Lakes Program

Ohio EPA initiated a renewed monitoring effort for inland lakes in 2008. This report assesses three of the four beneficial uses that apply to inland lakes: recreation; public drinking water supply; and human health (via fish tissue). Ohio EPA plans to update the water quality standards rules for lakes. Once these rule updates are complete, Ohio EPA expects to include an assessment of the aquatic life use for lakes as a factor in listing watershed or large river assessment units in future CWA Section 303(d) lists. More information about Ohio EPA's Inland Lakes Program may be found in Section I of this report.

Isolated Wetlands Permitting

Ohio Revised Code (ORC) 6111 requires anyone who wishes to discharge fill material into an isolated wetland within Ohio, regardless of whether on private or public property, to obtain an Isolated Wetland Permit (IWP) from Ohio EPA. Isolated wetlands are not connected to other surface waters and are not considered waters of the United States by the U.S. Army Corps of Engineers and, therefore, are not subject to CWA Sections 404 and 401.

Ohio EPA's regulatory authority regarding isolated wetlands is provided in ORC 6111.02 through 6111.028. There are three different levels of IWPs, depending on the quality of the wetland and the acreage of wetland proposed for impact. Level one IWPs are considered a general permit and reissued by Ohio EPA every five years. The current level one IWP was issued on April 10, 2017. Applicants must submit a pre-activity notice for authorization under the level one IWP. Level two and level three IWPs are considered individual permits and involve a public notice and comment period.

Level two IWP applications require the submittal of everything required with a level one IWP application along with an analysis of practicable on-site alternatives. Level three IWP applications require the submittal of everything required with a level one IWP application and must undergo a full antidegradation review in accordance with OAC 3745-1-05 (antidegradation) and OAC 3745-1-54 (wetland antidegradation). Under Ohio's antidegradation review, the director may authorize the lowering of wetland quality resulting from the discharge of dredged or fill material only after determining that the lowering of wetland quality will not result in the violation of state water quality standards. This is achieved through: 1) conducting an alternatives analysis; 2) intergovernmental coordination with other state and federal resource agencies; and 3) a public involvement process. The alternatives analysis is intended to walk applicants through a deliberate procedure to avoid and minimize impacts to wetlands while still achieving the project's purpose and need.

Ohio EPA strongly encourages applicants to engage in pre-application coordination early in the development phase to help identify high-quality resources, discuss potential alternatives and identify mitigation obligations. Applicants must provide compensatory mitigation for any unavoidable impacts to isolated wetlands in accordance with ORC 6111.022 through 6111.023 and 6111.027. Under state law, each IWP application must contain specific items for the permit to be issued. Ohio EPA has 30 days from the date of receipt of a level one IWP to authorize the project under the general permit or require the applicant to apply for an individual IWP. When a level two IWP application is formally considered complete, Ohio EPA has 90 days to either issue or deny the permit. When a level three IWP application is formally considered complete, Ohio EPA has 180 days to either issue or deny the permit.

IWP staff are assigned a region of the state based on Ohio EPA districts. In addition, Ohio EPA has staff dedicated specifically to the review of coal mining and Ohio Department of Transportation (ODOT) projects, as well as the review of wetland mitigation project compliance. Additional staff is dedicated to wetland research in support of the IWP program.

Lake Erie Program

DSW participates in many Lake Erie- and Great Lakes-related issues and efforts. The key program areas are implementation of Remedial Action Plans (RAPs) under the Areas of Concern (AOC) Program and implementation of the binational Lake Erie Lakewide Action and Management Plan (LAMP). Restoration of AOCs and implementation of the Lake Erie LAMP are focused on reducing the loadings of pollutants and restoring all beneficial uses to these waterbodies. Both programs are described in the Great Lakes Water Quality Agreement (GLWQA) between Canada and the United States and are mandated under the Great

Lakes Critical Programs Act amendment to the CWA. The GLWQA was most recently revised in 2012 and the Agency is directly involved in implementing the new goals and requirements contained in the agreement.

Ohio EPA also conducts routine monitoring of Lake Erie (within Ohio's jurisdiction) and is responsible for reporting the Lake's condition and identifying impaired waters under the CWA. Ohio EPA initiated a *Comprehensive Lake Erie Nearshore Monitoring Program* in 2011 with the assistance of a Great Lakes Restoration Initiative (GLRI) grant to develop and implement a comprehensive monitoring program. Ohio's long-term monitoring program includes an assessment of water and sediment quality in the western and central basins at fixed ambient stations located in shoreline (bays) and nearshore areas. Biological monitoring includes tracking of burrowing mayfly¹ populations and calculation of fish index scores at select shoreline locations. The hypoxia/anoxia phenomenon in the Central Basin is also monitored with a series of transects that connect fixed ambient stations to the open waters. Periodic intensive surveys in bays, harbors and estuaries are also done.

This monitoring effort supports Annex 2 in the GLWQA, which calls for development of nearshore monitoring to support an integrated nearshore framework. Annex 4 of the GLWQA addresses nutrients and Ohio EPA's monitoring may also support assessment of the lake ecosystem objectives identified in the agreement. Monitoring will directly support the agency's CWA evaluation of the Lake Erie Assessment Units in the bi-annual Integrated Report (IR). Additionally, long-term monitoring will provide the data needed to evaluate water quality trends, assess the effectiveness of remedial and nutrient reduction programs, measure compliance with jurisdictional regulatory programs, identify emerging problems and support AOC delisting.

Areas of Concern and Remedial Action Plans

AOCs were initially identified in the early 1980s as the most environmentally degraded areas along Ohio's Lake Erie coast. Annex 1 of the GLWQA calls for restoration of beneficial uses that have become impaired due to local conditions at AOCs through development and implementation of RAPs. In many ways, these beneficial use impairments (BUIs) reflect similar goals as Ohio WQS but may have targets that differ slightly. BUIs include: restrictions on fish and wildlife consumption; tainting of fish and wildlife flavor; degradation of fish and wildlife populations; fish tumors or other deformities; bird or animal deformities or reproductive problems; degradation of benthos; restrictions on dredging; eutrophication or undesirable algae; restrictions on drinking water or taste and odor problems; beach closings; degradation of aesthetics; added costs to agriculture and industry; degradation of phytoplankton and zooplankton populations; and loss of fish and wildlife habitat.

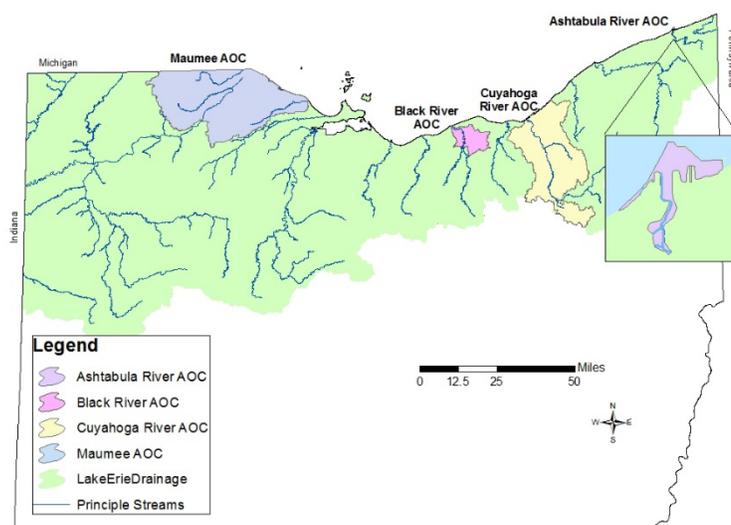


Figure C-1 — Ohio Lake Erie AOCs and major Lake Erie tributaries.

¹As an indicator organism, the status of mayfly populations can be used to evaluate long-term changes in water and sediment quality (Krieger et al, 2004).

One way to track progress in AOCs is to measure how close the areas are to achieving restoration (delisting) targets. Restoration targets have been determined for each of the beneficial uses (aquatic life, human health, recreation and public drinking water supply) and the monitoring programs needed to evaluate the targets are now being designed and implemented. In 2014, Ohio EPA developed a new AOC program framework and updated the *Delisting Guidance and Restoration Targets for Ohio Areas of Concern*. The new framework and guidance provide clarity for how the state and local AOC advisory committees will work together to implement the needed management actions and remove BUIs and delist the AOC. The guidance also assists in tracking progress toward achieving the stated delisting goals under the Great Lakes Regional Collaboration (GLRC) and the associated Great Lakes Initiative Action Plan.

Ashtabula AOC

A series of successful dredging projects in 2006-2007 and 2012-2013 under the Great Lakes Legacy Act (GLLA) program, the GLRI and other recent dredging by the U.S. Army Corps of Engineers (Corps) were conducted to remediate contaminated sediments that was necessary to remove the BUIs for dredging; degradation of benthos; fish tumors; and fish consumption restrictions.

To address the fish population and habitat-related BUIs, Ohio EPA completed a large habitat restoration project on the 5 ½ Slip in 2012; and a sediment and restoration GLLA project in 2014 in the North Slip at Jacks Marine. In 2014, a significant milestone was reached with the completion of all management actions. The river is rapidly rebounding and in April 2014, the BUIs for fish consumption, fish and wildlife populations, and fish and wildlife habitats were formally removed.

There are now only three BUIs remaining in this AOC. Verification monitoring is needed to assess the effects of remediation and restoration activities including evaluation of the benthos community; fish tumors and other deformities; and characterization of current sediment quality. Once monitoring indicates that the river has responded as anticipated and restoration targets have been achieved, the Ashtabula River will be delisted as an AOC.

Black AOC

Two BUIs, fish consumption and eutrophication or undesirable algae, were recently removed, leaving seven BUIs, with one - fish tumors - listed as in recovery. U.S. EPA funded development of the *Lower Black River Ecological Restoration Master Plan* in 2009 and numerous restoration projects and characterization studies identified in the plan have been completed. In July 2015, the AOC was formally re-sized to include just the lower portions of the Black River mainstem watershed and the French Creek watershed (East and West Branches are now excluded). In July 2015, U.S. EPA also accepted a list from Ohio EPA and the local advisory committee identifying the remaining management actions. Ohio EPA is working with U.S. EPA, the Black River AOC Advisory Committee and local implementers to complete the remaining projects. Progress in this AOC is accelerating. The management actions are scheduled for completion in 2018-2019 and the local AOC Advisory Committee and partners are committed and energized to remove the remaining BUIs at that time.

Cuyahoga AOC

There are nine BUIs in the Cuyahoga River AOC (plus one locally derived one - public access). The local (public access) BUI was removed in December 2017, along with the degradation of aesthetics BUI. In 2016-2017, Ohio EPA worked with the Advisory Committee to develop a management action report from which a list will be developed. The entire mainstem is achieving delisting targets for biological populations except in the Rt. 82/Brecksville Dam pool, the Gorge Dam pool and in the navigation channel. Addressing the contaminated sediments is a top priority and a significant number of actions are currently underway. The

ecological assessment for the Brecksville Dam removal project has been drafted, reviewed and public noticed. It is anticipated that the bid process may be in 2018 with demolition of the dam in 2019. The Gorge Dam removal planning process is proceeding with project agreements being drafted for sediment management.

Maumee AOC

The Maumee AOC is Ohio's largest and most complex AOC. Contaminated sediments, nonpoint sources, nutrient loads and habitat loss are all major causes of Beneficial Use Impairments. The Maumee River watershed is also a significant contributor to water quality concerns in the western basin of Lake Erie. The western basin is a priority concern under Annex 4 and the Lake Erie LAMP. An important milestone was reached in September 2015 with the removal of the first BUI (BUI12 – added costs to agriculture and industry). There are nine BUIs remaining. A GLLA sediment remediation project has been completed and Natural Resource Damage Assessment is nearly settled on the Ottawa River and other GLLA work on the mainstem Maumee and Otter Creeks are continuing. These sediment assessments, along with Ohio EPA's stream assessments, are vital in helping Ohio EPA and the local advisory committee determine restoration needs and priority management actions. With the reorganization of the AOC advisory committee a few years ago, along with the revitalized sense of purpose and focus on management action project identification, the Maumee AOC is making progress toward removing BUIs more quickly than previously expected.

Lake Erie Lakewide Action and Management Plan (LAMP, formerly LaMP)

Annex 2 of the GLWQA addresses binational lakewide management and specifies that the LAMPs for each of the Great Lakes shall document and coordinate the management actions required in the Annex. Specifically, Annex 2 calls for the following:

- establish lake ecosystem objectives;
- assemble, assess and report on existing scientific information;
- identify research, monitoring and other priorities to support management actions;
- conduct surveys, inventories and studies and support outreach efforts;
- identify additional action needed to address priority water quality threats;
- develop and implement lake-specific binational strategies; and
- by 2015, develop an integrated near shore framework for implementation.

The Lake Erie LAMP also serves as the primary mechanism for coordinating development and implementation of lakewide habitat, native species protection and conservation strategies as required in Annex 7 (Habitat and Species) of the GLWQA. The Lake Erie LAMP was originally intended to focus on reducing loadings of toxic chemical pollutants to the lake but now also includes strategies for addressing NPS pollutants such as nutrients and habitat alterations. The LAMP is a comprehensive framework that outlines the management actions needed to bring Lake Erie back to chemical, physical and biological integrity. Work to restore the AOCs and implement the LAMP program both support the U.S. EPA Strategic Plan objective 2.2 – Protect and Restore Watershed and Aquatic Ecosystems.

NPS and beach health issues listed in the GLRC and the GLRI plans are important issues for both the AOCs and the Lake Erie LAMP. Programs such as the CWA Section 319, the Beaches Environmental Assessment and Coastal Health (BEACH) Act of 2000, CSO Long-term Control Plans, NRCS-supported agricultural BMP programs and many others are existing efforts that RAP and LAMP partners must coordinate with to expedite restoration. Since January 2014, Ohio EPA's Lake Erie program has been managed alongside the NPS program, which has strengthened coordination between the two programs.

For both the AOCs and the LAMP, it is important to maintain the engagement of local communities and stakeholders. In Ohio's AOCs, the local communities and partners play significant roles in obtaining the resources for implementation, providing matching funds and sometimes serving as local project sponsors. A reliable, long-term source of funding is essential to continue to fund the administration and outreach costs associated with local coordinator leadership efforts. Public outreach efforts are also needed to better connect the decisions and projects in the watersheds to the environmental condition of the lake.

National Pollutant Discharge Elimination System (NPDES) Permits

To protect Ohio's water resources, Ohio EPA issues NPDES permits. These permits authorize the discharge of substances and establish other conditions related to activities such as CSOs, pretreatment, storm water and sludge disposal. This is an overview of the process for the development of individual NPDES permits.

Limit Types

The Clean Water Act has provisions for technical based effluent limits (TBELs) and water quality based effluent limits (WQBELs). When deriving an NPDES permit, the writer will compare applicable TBELs and WQBELs and apply the most stringent limit. Additionally, when the receiving stream has an approved final TMDL in place, the permit writer will incorporate the TMDL requirements.

Technical Based Effluent Limits

U.S. EPA issues effluent guidelines which are national standards for industrial discharges to surface waters and sewage treatment plants. The standards are based on the performance of treatment and control technologies and are linked to production amount or size. Therefore, permit writers only need the production amount or size to develop TBELs.

For example, a company which pours 1,000 tons of steel will have more allowable loading discharged than a company which pours one ton of steel. At the same time, the same TBEL will be applied whether you discharge to a large river like Ohio River or a small creek.

Water Quality Based Effluent Limits

Ohio rules require NPDES permits to be protective of the receiving stream uses, including public water supply, industrial, agricultural, aquatic life, human health and recreational. To develop limits to protect these uses, the first step is determining:

- Discharge Information
 - Concentrations of pollutants
 - Proposed flows
- Receiving Stream Information
 - In-stream chemistry data
 - Low-flow conditions
 - Applicable uses

The permit writer does a mass balance to determine the allowable discharge amounts which will be protective of the water quality criteria.

Total Maximum Daily Load

Receiving streams which are impaired may result in a TMDL for a certain pollutant, such as phosphorus. In these cases, point sources are allocated an amount (or load) of pollutant which will result in the stream fully obtaining its designated uses. The permit writer will use the TMDL as a technical document to justify permit limits.

NPDES Permit Implementation

NPDES permits are issued for a period of five years. Ohio EPA may re-open NPDES permits if the discharge is having adverse effects on human health or the environment. If not, the permit writer will reassess permit limits when the permittee submits the renewal application.

The keystone of the NPDES program is self-monitoring data provided by the permittee. The permittee monitors and submits effluent data throughout the duration of the permit. If limits are exceeded, the permittee is required to provide notice to Ohio EPA, state what caused the exceedance and what will be done to prevent future exceedances.

Ohio EPA can also perform sampling of the effluent, typically as part of a permit renewal or as part of a larger survey on the receiving stream watershed. A stream survey would also determine any potential biological impacts of the NPDES permit discharge. This sampling information is used to further evaluate the impacts the discharge may be having on the receiving stream and to justify any additional permit limits or conditions needed to eliminate adverse impacts.

Nonpoint Source (NPS) Program

The framework for Ohio's NPS program is provided in Ohio's Nonpoint Source Management Plan (NSMP). The updated NSMP, which outlines strategies and objectives for Ohio's NPS program through 2019 was approved by U.S. EPA Region V in 2015. The updated plan includes a description of Ohio's NPS Section 319(h) grant funding sources as well as a listing of state, federal and local partners who Ohio EPA wishes to implement the strategies outlined in the updated plan.

The NSMP plan provides four sections outlining the strategic vision along with aggressive (yet reasonable) goals and objectives of Ohio's NPS program over the next five years. These sections include:

- Urban Sediment and Nutrient Reduction Strategies—including recommended practices;
- Altered Stream and Habitat Restoration Strategies—including recommended practices;
- NPS Reduction Strategies—including practices and management actions to reduce silt, sediment and nutrient losses from agricultural lands; and
- High Quality Waters Protection Strategies.

Ohio's NPS program also manages DSW's Lake Erie AOC program. This program tracks implementation of remedial action plans on Lake Erie tributaries designated as Areas of Concern, supports Lake Erie shoreline monitoring and participates in the development and implementation of the LAMP, a document that outlines and helps coordinate management actions to protect and restore Lake Erie. More information about these programs is available in the Lake Erie program description above. The updated NSMP includes five-year goals and objectives for Ohio's Lake Erie program. The most current version of Ohio's NSMP is available at epa.ohio.gov/Portals/35/nps/NPS_Mgmt_Plan.pdf.

Much of Ohio's population is in urban areas and many are located near major rivers that are impacted by hydromodification, riparian corridor losses and inputs from storm sewers. Ohio's NPS program is committed to partner with local communities, to provide leadership and funding and to use a well-defined hierarchy that prioritizes projects, so that high-magnitude causes of impairment are eliminated and impaired stream segments in urban areas are incrementally restored.

Progress toward achievement of Ohio's Section 319(h) grants program goals will continue to be measured as part of Ohio's NPS monitoring and assessment initiative. Ohio EPA staff conducts all monitoring (physical, chemical and biological) to determine the effectiveness of Section 319(h)-funded NPS projects. This initiative provides cost savings and improved data quality as well as critical information about 319(h) project effectiveness.

Pretreatment

The State of Ohio received authorization to administer the pretreatment program on July 27, 1983. As of August 2017, Ohio EPA has approved 128 municipal pretreatment programs and continues to provide pretreatment training and guidance. These pretreatment programs have the authority to issue permits to indirect industrial dischargers and enforce their own local regulations. Many of these programs, such as Cincinnati's Metropolitan Sewer District and Cleveland's Northeast Ohio Regional Sewer District, are national leaders and are regarded as very strong pretreatment programs.

In addition, Ohio EPA's pretreatment program issues permits through its indirect discharge permit (IDP) program. The IDP program permits, monitors, inspects and provides enforcement to the significant industrial users (SIUs) that discharge into pretreatment POTWs which do not have approved pretreatment programs. Through the IDP program, Ohio EPA prevents toxic discharges to these smaller POTWs and thereby reduces the potential for severe environmental harm.

A goal of Ohio EPA's pretreatment program is to permit 100 percent of SIUs with control mechanisms to implement applicable pretreatment standards and requirements. Ohio EPA's permit framework is designed to ensure that all SIUs within the state, regardless of the POTW's pretreatment program approval status, are issued permits. Those SIUs in approved POTW pretreatment programs are identified by industrial user surveys. SIUs discharging to a POTW without an approved program are identified primarily through inspections, permits to install and referrals from wastewater treatment plant operators. As of August 2017, there are 1,355 SIUs that discharge to POTWs with approved programs and 158 SIUs that discharge into pretreatment POTWs without approved pretreatment programs. For more information, please visit Ohio EPA's pretreatment program webpage at epa.ohio.gov/dsw/pretreatment/index.aspx.

Section 208 Plans and State Water Quality Management Plan

Ohio EPA oversees the State Water Quality Management (WQM) plan. The State WQM plan is a requirement of CWA Section 303 and must include nine discrete elements:

- 1) TMDLs;
- 2) Effluent limits;
- 3) Municipal and industrial waste treatment;
- 4) NPS management and control;
- 5) Management agencies;
- 6) Implementation measures;
- 7) Dredge and fill program;
- 8) Basin plans; and
- 9) Ground water.

The State WQM plan is an encyclopedia of information used to plot and direct actions that abate pollution and preserve clean water. A wide variety of issues are addressed and framed within the context of applicable laws and regulations. For some issues and locales, information about local communities may be covered in the plan. Other issues are covered only at a statewide level. Many of the topics or issues overlap with planning requirements of CWA Section 208 (items 3-9 above). The state WQM plan includes, through references to separate documents, all 208 plans in the State.

Local governments typically conduct planning to meet the sewage disposal needs of the community. Ohio EPA has established guidelines for planning that are useful in the context of Section 208 and the State WQM plan. Local governments that follow these guidelines are more likely to have the results of their planning work incorporated into the state 208 plan prepared by Ohio EPA.

Under Section 208 of the federal CWA, states may designate regional planning agencies to prepare, maintain and implement water quality management plans. Ohio has six areawide planning agencies that have established their own operating protocols, committees and processes to involve local governments in shaping their 208 plans. All six areawide planning agencies updated their 208 plans in 2011, thanks to increased funding through the American Recovery and Reinvestment Act of 2009 (ARRA) and the state's biennium budget. Additional updates occur on an ongoing basis. The most recent 208 Plan amendments were approved by U.S. EPA on April 8, 2016.

Section 401 Water Quality Certifications

The CWA requires anyone who wishes to discharge dredged or fill material into the waters of the United States, regardless of whether on private or public property, to obtain a CWA Section 404 permit from the U.S. Army Corps of Engineers and a CWA Section 401 water quality certification (WQC) from the state. Ohio EPA is responsible for administering the CWA Section 401 WQC process in Ohio.

Rules governing the 401 review process are currently found in OAC 3745-1-05 (stream antidegradation), 3745-1-50 through 54 (wetland water quality standards) and 3745-32-01 through 03 (Section 401 WQCs). Under Ohio's antidegradation review, the director may authorize the lowering of water quality resulting from the discharge of dredged or fill material only after determining that the lowering of water quality will not result in the violation of state water quality standards. This is achieved through: 1) conducting an alternatives analysis; 2) intergovernmental coordination with other state and federal resource agencies; and 3) a public involvement process.

Applicants must develop alternatives for each development in accordance with 40 C.F.R. Part 230. The alternatives analysis is intended to walk applicants through a deliberate process to avoid and minimize impacts to aquatic resources while still achieving the project's purpose and need. Applicants must provide compensatory mitigation for any unavoidable impacts to streams and/or wetlands. The program emphasizes evaluation of physical habitat and biocriteria to determine potential impacts to water quality and to evaluate potential mitigation sites.

Ohio EPA strongly encourages applicants to engage in pre-application coordination early in the development phase to help identify high quality resources, discuss potential alternatives and identify mitigation obligations. Under state law, the 401 application must contain 10 specific items for the technical review to begin. When the application is formally considered complete, Ohio EPA has 180 days to conduct its technical review and either approve or deny the project. During this time, the applicant may withdraw the application. All projects are subject to minimum 30-day public comment period. Controversial projects may also require a public hearing.

Nationwide permits (NWP) are general permits issued by the Corps for certain types of projects that are similar in nature and cause minimal degradation to surface waters of the state. There are currently 52 NWPs. Ohio EPA certified many of the NWPs on March 17, 2017 (subject to conditions). The NWPs must be renewed every five years.

401 staff are assigned a specific region of the state based on Ohio EPA districts. In addition, Ohio EPA has staff dedicated specifically to the review of coal mining and Ohio Department of Transportation (ODOT) projects, as well as the review of stream and wetland mitigation project compliance. Additional staff is dedicated to wetland research in support of the 401 WQC program.

Semi-Public Disposal System Inspection Contracts (HB 110)

Annually, Ohio EPA issues hundreds of permits for the installation and operation of small, commercial/industrial wastewater treatment and/or disposal systems. These may be onsite soil dissipation systems or discharging systems under the NPDES permit program for the treatment and disposal of sewage generated within the operation. To date, there are thousands of these small systems operating in Ohio. These semi-public systems may include apartment complexes, small businesses, industrial parks, etc. and, by definition, are any system that treats sewage from human activities up to a capacity of 25,000 gallons per day. Because of the magnitude and resources available, many of these systems have the potential of going without regular inspections to determine if they are complying with state rules, laws and regulations and ultimately protecting water quality.

As an aid to support this program, the Ohio General Assembly created Ohio EPA's HB110 program. The program is a contractual partnership between local health districts (LHDs) and Ohio EPA, whereby LHDs conduct, on behalf of the Agency, inspection and enforcement services for commercial sanitary waste treatment/disposal systems discharging up to 25,000 gallons per day (semi-publics).

Ohio EPA operates the HB110 program to better protect the public health and welfare and to protect the environment. Ohio EPA believes that because of the proximity, multitude of facilities and the availability of resources, oversight of operations for sanitary waste disposal at semi-publics may best be accomplished locally by qualified personnel. To offset costs of local oversight, state law (ORC 3709.085) authorizes LHDs to charge fees for inspection services to be paid by semi-publics.

Inspection Program

In accordance with Ohio EPA's HB110 contracts, LHDs regularly inspect sanitary facilities at semi-publics for compliance with Ohio's water pollution control laws and regulations. Investigations of complaints regarding waste disposal by semi-publics are also accomplished locally. LHDs are consulted prior to Ohio EPA approval of plans and issuance of PTIs for semi-publics. Installation inspections may be performed locally to ensure compliance with Ohio EPA's PTI conditions.

Enforcement Activities

In coordination with Ohio EPA, LHDs may notify entities of noncompliance with Ohio's water pollution control regulations. LHDs are also instrumental in identifying semi-publics installed without PTIs, of which Ohio EPA may not be aware. Where noncompliance notification and informal requests fail to correct violations, entities may be referred to Ohio EPA for enforcement or the county prosecutor may bring an action under local nuisance ordinances. All discharges of pollutants in a location where they cause pollution to waters of the state that are unpermitted or above permitted amounts are statutory nuisances under Revised Code 6111.04.

Training Program

Ohio EPA intends to provide periodic training for LHDs. Training programs will focus on sanitary waste disposal for semi-public facilities, technical assistance, inspection issues and enforcement case development.

Summary

The HB110 program is a unique opportunity for Ohio EPA and LHDs to assist one another in achieving the mutual goal of protecting public health and welfare. Through responsible regulation of semi-public facilities, the local community will benefit from decreased health risks and the state will benefit from improvements in water quality. Ohio EPA welcomes the participation of all LHDs.

Storm Water Permit Program

Ohio EPA implements the federal regulations for storm water dischargers. Dischargers currently covered include certain municipalities (Phases I and II of the program) with separate storm sewer systems (MS4s) and those facilities that meet the definition of industrial activity in the federal regulations, including construction.

In 1992, Ohio EPA issued two NPDES general storm water permits: one for construction activity and the other for all remaining categories of industrial activity. The strategy was to permit the majority of storm water dischargers with these baseline general permits (33 USC Section 1342; OAC Chapter 3745-38). It is estimated that more than 42,000 storm water discharges have been granted general permit coverage since that time.

The industrial permit has been renewed five times. The construction permit was renewed in April 2013 for the third time and addresses large and small constructions sites. The one-page application form is called a Notice of Intent (NOI). Ohio EPA responds to NOIs with approval letters for coverage under one of the general permits or, in limited instances, instructions to apply for an individual permit.

After the baseline general permits were issued, Ohio EPA directed its efforts toward additional permitting, compliance and enforcement activities, education and technical assistance. Inspections and complaint investigations for compliance and enforcement have been handled at the district level as resources allow. BMPs and pollution prevention have been the major thrust of education and technical assistance activities.

On the municipal side of permitting, five large and medium municipalities in Ohio submitted applications between November 1991 and November 1993. A work group was formed with the cities to draft acceptable permit language for the municipal permits. BMPs included in a citywide storm water management plan were the primary focus of the permits. The cities of Dayton, Toledo and Akron received their original permits in 1997. Exceptions for Cleveland and Cincinnati were also processed². Columbus received its initial permit in 2000. Permits for Columbus, Toledo and Akron have been renewed twice. Dayton's permit has been renewed three times.

Additional categories of discharges, both public and privately owned, were included in Phase II. U.S. EPA issued Phase II regulations in December 1999. The Phase II storm water regulations required a general permit for small MS4s be issued by December 2002 and required applications by March 2003.

² Phase I federal storm water regulations required permit coverage for municipal separate storm sewer systems (MS4s), which had an MS4 service population of 100,000 or more to obtain NPDES permits. The cities of Cleveland and Cincinnati demonstrated that their MS4 service population was less than 100,000 people because of large areas of these cities being served by combined sewers. These two cities were permitted under Phase II of the small MS4 general permit in March 2003. Cleveland and Cincinnati currently have coverage under the third-generation small MS4 general permit.

Ohio EPA issued two general permits for small MS4s during 2002. One is a baseline permit and the second is for MS4s in rapidly developing watersheds. This latter permit accelerated construction and post-construction measures to protect surface waters from the impacts of high-density land use development. Federal regulations allowed small MS4s to apply for individual NPDES permits in lieu of general permit coverage. No small MS4 within Ohio chose the individual permit option. The third generation of the small MS4 general permit was renewed on Sept. 11, 2014.

On the construction side of permitting, Ohio EPA has begun to develop and issue watershed-specific construction permits if recommended by a TMDL. On Sept. 12, 2006, Ohio EPA issued a watershed-specific construction permit for the Big Darby Creek watershed. This permit was renewed on Oct. 1, 2012. On Jan. 23, 2009, Ohio EPA issued a watershed-specific construction permit for portions of the Olentangy River watershed. This permit was renewed on June 2, 2014. These permits contain conditions/requirements that differ from the standard construction permit and each other. Ohio EPA anticipates developing additional watershed specific permits when recommended by TMDLs.

Total Maximum Daily Load (TMDL) Program

The TMDL program identifies and restores polluted waters. TMDLs can be viewed simply as problem solving: investigate the problem; decide on a solution; implement the solution; and check back to make sure the solution worked. By integrating programs and aligning resources, Ohio is pursuing TMDLs as a powerful tool to develop watershed-specific prescriptions to improve impaired waters.

Ohio uses three key enhancements to the basic federal TMDL requirements to increase the chances that real, measurable improvements in Ohio's water resources will result:

- 1) an initial, in-depth watershed assessment to obtain recent data for analysis of problems and discussion of alternatives;
- 2) implementation actions identified as part of the TMDL with follow-through in permitting and incentive programs such as 319 and loan funds; and
- 3) involving others – citizens, landowners, officials, natural resource professionals – in the process.

Involving others is critical to restoring waters. Working watershed by watershed, Ohio EPA meets with citizens and landowners to explain the findings of our water quality studies and to identify workable solutions to the problems found. Ohio EPA includes other agencies that can improve water resources either by exercising their authority in new ways or through relationships they have already established with critical decision makers. After solutions are identified and recommendations are made, Ohio EPA meets with consultants, elected officials and others to ensure that projects continue to completion.

Recent Developments in the TMDL Program

On March 24, 2015, the Supreme Court of Ohio determined that “A TMDL established by Ohio EPA pursuant to the Clean Water Act is a rule that is subject to the requirements of R.C. Chapter 119, the Ohio Administrative Procedure Act. Ohio EPA must follow the rulemaking procedure in R.C. Chapter 119 before submitting a TMDL to U.S. EPA for its approval and before the TMDL may be implemented in an NPDES permit.” (*Fairfield Cty. Bd. of Commrs. v. Nally*, 143 Ohio St.3d 93, 2015-Ohio-991 available online at supremecourt.ohio.gov/rod/docs/pdf/0/2015/2015-Ohio-991.pdf).

Subsequently, Ohio EPA collaborated with stakeholders and the Ohio General Assembly which passed legislation exempting TMDLs from the ORC Chapter 119 rulemaking procedure. The statute was revised effective Sept. 29, 2017, and includes the following: 1) reinstates previously approved TMDLs; 2) requires stakeholder outreach at several points in the project; 3) mandates consideration of several technical and

financial items; 4) affirms that TMDLs are not actions of the director and challenges are made through the NPDES permit appeal process; and 4) requires Ohio EPA to adopt administrative rules for stakeholder notification and significant public interest by December 2018. Ohio EPA is in the process of drafting rule language and prioritizing and updating projects to incorporate the new requirements where needed.

All TMDLs are available on Ohio EPA's website at epa.ohio.gov/dsw/tmdl/index.aspx.

Water Quality Standards (WQS) Program

Many different sources and types of pollution affect Ohio's water quality. The CWA states that authorized states and tribes must adopt water quality standards that protect public health or welfare; enhance water quality; and provide for the protection and propagation of fish, shellfish and wildlife and for recreation in and on the water. Water quality standards contain three elements to ensure the goals of the CWA are met: designated uses; numerical or narrative criteria designed to protect and measure attainment of the use designation; and antidegradation policy.

The key components of Ohio's WQS (OAC Chapter 3745-1) are described below.

Beneficial use designations describe existing or potential uses of water bodies. They take into consideration the use and value of water for public water supplies, protection and propagation of aquatic life, recreation in and on the water, agricultural, industrial and other purposes. Ohio EPA assigns beneficial use designations to water bodies in the state. There may be more than one use designation assigned to a water body. Examples of beneficial use designations include: public water supply; primary contact recreation; and aquatic life uses (warmwater habitat, exceptional warmwater habitat, coldwater habitat.).

Numeric criteria are concentrations of specific chemicals or levels of parameters in water that protect aquatic life and human health. Numeric criteria are based on sound scientific rationale and must contain sufficient parameters to be protective of designated uses. Numeric criteria are developed to protect human health and both acute and chronic toxicity for aquatic life and form the basis of discharge permit (NPDES) limits.

Narrative criteria are general water quality criteria that apply to all surface waters. These criteria state that all waters shall be free from sludge, floating debris, oil and scum, color and odor producing materials, substances that are harmful to human, animal or aquatic life, public health nuisances associated with raw or poorly treated sewage and nutrients in concentrations that may cause algal blooms. Narrative criteria also state that discharges from human activity must be free from substances in concentrations that are toxic or rapidly lethal in the mixing zone.

Biological criteria are based on aquatic community characteristics and provide a direct measure of attainment of aquatic life uses. The principal biological evaluation tools used by Ohio EPA are the index of biotic integrity (IBI), the modified index of well-being (MIwb) and the invertebrate community index (ICI). These three indices are based on species richness, trophic composition, diversity, presence of pollution-tolerant individuals or species, abundance of biomass and the presence of diseased or abnormal organisms. The IBI and the MIwb apply to fish. The ICI applies to macroinvertebrates. Ohio EPA uses the results of sampling reference sites to set minimum criteria index scores for use designations in water quality standards. During biological assessments, depression of indices can be used to identify causes for impairment of designated uses.

Antidegradation policy aims to keep clean waters cleaner than the applicable chemical criteria set by the standards wherever possible. The policy is adopted in rule (OAC 3745-1-05) and describes the conditions under which lowering water quality may be authorized under a discharge permit from Ohio EPA. Existing beneficial uses must be maintained and protected. Water quality better than that needed to protect existing beneficial uses must be maintained unless lower quality is deemed necessary to allow important economic or social development (existing beneficial uses must still be protected).

Public participation is mandated and encouraged in all administrative rule makings, including the WQS. Any interested individuals are afforded an opportunity to participate in the process of developing water quality standards. Ohio EPA reviews and, as appropriate, revises water quality standards at least once every three years. When water quality standards revisions are proposed, the public is notified of these revisions. A public hearing is held to gather input and comments.

Wetland Bioassessment Program

Numerous grants from U.S. EPA over many years have funded work that is advancing the science of wetland assessment methodologies in Ohio. Published work includes an amphibian index of biotic integrity (AmphIBI) for wetlands, a vegetation index of biotic integrity (VIBI) for wetlands and a comparison of natural and mitigation (constructed) wetlands. More recently, reports on an assessment analysis of the association between streams and wetland condition and functions in the Big Run Scioto River watershed, incorporating wetland information with data from other surface water resources to develop a TMDL analysis of a central Ohio watershed and the development of a GIS tool to identify potential vernal pool habitat restoration areas have been made available on DSW's webpage (epa.ohio.gov/dsw/401/ecology.aspx).

DSW recently finalized a report from a U.S. EPA grant to assess the ecological condition of 50 randomly selected natural wetlands across Ohio to generate a scorecard of wetland condition. This grant intensifies data collected as part of U.S. EPA's National Wetland Condition Assessment conducted across the United States in 2011. Also in progress is a detailed study to improve mitigation success in Ohio, which will include: a publicly-accessible GIS website for selecting sites with a high likelihood of achieving ecological success; the creation of a simple soil health assessment tool to better identify sites that may require remediation due to historical soil disturbances; and a survey of reference condition riparian habitats to develop specific ecological performance goals for riparian vegetation restoration projects.

DSW has also recently streamlined its VIBI procedure to simplify data collection, analysis and interpretation, with the goal of enhancing the utility of this assessment as a monitoring tool for wetland restoration projects. The modified procedure, called the VIBI-Floristic Quality (VIBI-FQ), is beginning to be used to monitor compensatory mitigation, 319 grants and contaminated clean-up sites, which have required the establishment of wetland habitat. The initial results have been extremely encouraging. Additionally, DSW has conducted VIBI-FQ monitoring on 10 reference condition riparian forests and in 2018 will begin using the VIBI-FQ to monitor non-wetland riparian habitats associated with stream restoration projects. DSW will use this riparian vegetation data to establish consistent performance standards for stream mitigation and restoration projects.

Wetland Protection Program

Ohio's Wetland Water Quality Standards (OAC 3745-1-50 to -54) contain definitions, beneficial use designations, narrative criteria and antidegradation provisions that guide Ohio EPA's review of projects in which applicants are seeking authorization to discharge dredged or fill material into wetlands. OAC 3745-1-53 gives all wetlands the wetland designated beneficial aquatic life use. However, wetlands are further defined as Category 1, 2 or 3 based on the wetland's relative functions and values, sensitivity to disturbance, rarity and potential to be adequately compensated for by wetland mitigation.

Category 1, 2 and 3 wetlands demonstrate minimal, moderate and superior wetland functions, respectively. Category 1 wetlands are typified by: low species diversity; a predominance of non-native species; no significant habitat or wildlife use; and limited potential to achieve beneficial wetland functions. Category 2 wetlands may be typified by: wetlands dominated by native species but generally without the presence of, or habitat for, rare, threatened or endangered species; as well as wetlands that are degraded but have a reasonable potential for reestablishing lost wetland functions. Category 3 wetlands typically possess: high levels of diversity; a high proportion of native species; high functional values; and may contain the presence of, or habitat for rare, threatened and endangered species. Wetlands that are scarce, either regionally or statewide, form a subcategory of Category 3 wetlands for which, when allowable, only short-term disturbances may be authorized.

The rigor of the antidegradation review conducted under OAC 3745-1-50 through -54 is based on the category of the wetland(s) proposed to be impacted. Category 1 wetlands are classified as limited quality waters and may be impacted after examining avoidance and minimization measures and determining that no significant impacts to water quality will result from the impacts. Category 2 and 3 wetlands are classified as general high-quality waters and may be impacted only after a formal examination of alternatives and a determination that the lowering of water quality is necessary to accommodate social and economic development. In addition, an applicant must demonstrate that public need is achieved to receive authorization to impact Category 3 wetlands. Compensatory mitigation ratios are based on wetland category, vegetation class and proximity of the mitigation to the impact site.

C2. Program Summary – Environmental and Financial Assistance

The Division of Environmental and Financial Assistance (DEFA) includes the Office of Financial Assistance (OFA), which promotes water quality benefits by financing cost-effective and environmentally sound wastewater and drinking water infrastructure improvements and other water resource projects. OFA works in conjunction with the Ohio Water Development Authority (OWDA) to administer two state revolving loan funds (SRFs) — the Ohio Water Pollution Control Loan Fund (WPCLF) and the Water Supply Revolving Loan Account (WSRLA). More information about the specific financial assistance provided by OFA and OWDA during this report cycle can be found in Section C6: Funding Sources for Pollution Controls.

Water Pollution Control Loan Fund

Projects eligible for financing under the WPCLF include municipal wastewater treatment improvements (for example, sewage treatment facilities, interceptor sewers, sewage collection systems and storm sewer separation projects) and nonpoint pollution control projects. This state revolving fund, jointly administered by Ohio EPA and OWDA, was established in 1989 to replace the construction grants program. Construction loans from the WPCLF are available at several interest rates: a standard rate, which is below market rates; a small community interest rate, which is below the standard interest rate; and one percent and zero percent interest rate loans for hardship communities. Principle forgiveness is also available for

communities that are of the greatest financial need. Planning and design loans are available at a short-term interest rate.

Eligible activities include:

- improvements to and/or expansions of wastewater treatment facilities;
- improvement or replacement of on-lot wastewater treatment systems;
- brownfield/contaminated site remediation;
- agricultural runoff control and BMPs;
- urban storm water runoff;
- septage receiving facilities;
- landfill closure;
- septic system improvement;
- development of BMPs; and
- forestry BMPs.

More information about the WPCLF can be found at epa.ohio.gov/defa/ofa.aspx.

Water Resource Restoration Sponsor Program (WRRSP)

A satellite program of the WPCLF is the Water Resource Restoration Sponsor Program (WRRSP). The WRRSP was developed by Ohio EPA and has been a part of the WPCLF since 2000. The intent of the WRRSP is to address a limited and under-assisted category of water resource needs in Ohio through direct WPCLF loans. The goal of the WRRSP is to counter the loss of ecological function and biological diversity that jeopardize the health of Ohio's water resources. The program achieves this goal by providing funds, through WPCLF loans, to finance implementation of projects that protect or restore water resources and by ensuring either maintenance or attainment of warmwater habitat or higher designated aquatic life uses under Ohio's water quality standards. Since its inception, more than \$160 million has been awarded through the WRRSP.

Water Supply Revolving Loan Account Fund

The Ohio Water Supply Revolving Loan Account (WSRLA) provides an opportunity for mutually beneficial partnerships between Ohio EPA and Ohio's public water systems to assure a safe and adequate supply of drinking water for all the citizens of Ohio. This is accomplished primarily by providing below-market interest rates for compliance-related improvements to community (public) water systems and non-profit non-community public water systems. Additionally, the WSRLA can provide technical assistance to public water systems in a variety of areas from the planning, design and construction of improvements to enhancing the technical, managerial and financial capacity of these systems.

The WSRLA is administered by Ohio EPA's DDAGW and DEFA. Certain financial management services are also provided by OWDA. More information about WSRLA can be found at epa.ohio.gov/defa/EnvironmentalandFinancialAssistance.aspx.

C3. Program Summary – Drinking and Ground Waters

The mission of Ohio EPA's Division of Drinking and Ground Waters (DDAGW) is to "protect human health by characterizing and protecting ground water quality and ensuring that Ohio's public water systems provide adequate supplies of safe drinking water." The division has several programs in place to achieve this mission.

Drinking Water Program

Every Ohioan relies on a safe source of drinking water. DDAGW's drinking water program has jurisdiction over 4,500 public water systems that are required to ensure a safe and adequate supply of drinking water to more than 11 million Ohioans.

The drinking water program's functions include: overseeing the design and construction of drinking water treatment facilities through plan approval; conducting sanitary survey inspections; administering an operator certification program and a drinking water revolving loan fund; managing compliance monitoring for bacteriological and chemical contaminants; working with public water systems to implement corrective actions when significant deficiencies are identified; developing state rules and guidance for implementing new federal drinking water regulations; and sharing public water system information with the public on the division's website. Significant interdivision and interagency efforts are being expended to assist public water systems and implement Ohio's *Public Water System Harmful Algal Bloom Response Strategy*.

Ground Water Program

DDAGW's ground water program maintains a statewide ambient ground water quality monitoring program; shares ground water quality data on the division website; conducts ground water quality investigations; provides technical support to other Ohio EPA programs by providing technical expertise on local hydrogeology and ground water quality; and protects ground water resources through the regulation of waste fluid disposal in its underground injection control program for Class I, IV and V wells.

HABs Program

In 2016, DDAGW established a new program section to address harmful algal blooms (HABs). The purpose of this program is to provide oversight and implementation of the new rules for public water systems and to coordinate Ohio's HAB response strategy for drinking water and recreational waters. Ohio Senate Bill 1, passed in July 2015, established ORC 3745.50 and directed Ohio EPA to serve as the coordinator of harmful algae management and response. New and revised HAB rules became effective on June 1, 2016, and include analytical protocols, establishment of health advisories and public notification protocols and triggers, sampling, treatment technique, algaecide application and reporting requirements.

DDAGW manages and coordinates response to bloom reports, maintains the website ohioalgaefinfo.com and an online HABs database and mapping application and provides technical assistance and training related to HAB sampling procedures, treatment optimization, reservoir management and other related topics. Significant interdivision and interagency efforts are being expended to assist public water systems to assure the safety of finished drinking water. Additionally, Ohio EPA's HABs program conducts outreach to local health districts and other local agencies to provide guidance and technical expertise in response to HABs in recreational waters.

State of Ohio Coordinated Response

As incidents of HABs have increased, Ohio's response continues to evolve. The ohioalgaefinfo.com website provides links to the State of Ohio's HAB response strategies; background information about HABs; tips for staying safe when visiting public lakes; links to sampling information; and current advisories and contact information for reporting suspected HABs. It also includes historic and current cyanotoxin data for public water supplies and a link to the ODH BeachGuard site, which has information about recreation advisories for both bacteria and algae (<http://publicapps.odh.ohio.gov/BeachGuardPublic/Default.aspx>).

Ohio EPA, ODH and ODNR have continued a close partnership to develop and implement the unified state response strategy for recreational waters. The agencies annually review and revise the State of Ohio's *Harmful Algal Bloom Response Strategy for Recreational Waters* and work together throughout the season under an interagency communication and coordination framework.

Algal Toxin Monitoring and Phytoplankton Monitoring

Monitoring of HABs has occurred in a variety of ways across the state. Ohio EPA-DSW conducts ambient HAB sampling at inland lakes and Lake Erie as part of their inland lakes (Section I3) and nearshore Lake Erie monitoring programs (Section C1), and public water systems routinely monitor for HABs on their source waters and provide that data to Ohio EPA. DSW's Inland Lakes data also provided paired cyanobacteria screening (via qPCR) and cyanotoxin results which was used to evaluate the cyanobacteria screening tool. Additional information about algal toxin monitoring at public water systems and assessment of the public drinking water supply beneficial use is addressed in Section H.

The routine microcystin and cyanobacteria screening analysis required by Ohio's public water systems using surface water sources provides an indication of HAB occurrence across the state. Microcystins continue to be the most commonly detected cyanotoxin, detected at 47 percent of Ohio's PWS source waters. Microcystin-producing genes were detected at 56 percent of source waters and saxitoxin-producing genes were detected at 38 percent of source waters. Cylindrospermopsin-producing genes were only detected at two sites with the actual toxin only detected at one location. Ohio EPA's follow up sampling, triggered by saxitoxin-producing gene detections, indicated saxitoxins were detected at 18 percent of PWS source waters.

Recreational waters across the state continue to be impacted by HABs, and during 2016-2017 the state had at least six waters with posted recreational advisories. Ohio DNR routinely monitors the state beaches and waters for HABs and analyzes for microcystins at beaches if a bloom is suspected. All state park beaches and boat ramps have informational HAB signs posted during the season. Local health districts and park managers are becoming more involved in HAB response, including sample collection and posting local advisories. Ohio EPA continues to provide technical and analytical assistance to support local response as needed.

Ohio EPA continued funding the Lake Erie charter captains to collect water quality samples during charter fishing runs in the Western Basin of Lake Erie during 2016 (151 samples) and 2017 (146 samples). Funding was provided to Ohio State University to administer the program and conduct analysis at Stone Laboratory, supporting development of local lab capacity and expertise to serve the region.

Use of Satellite Imagery to Evaluate HABs on Lake Erie and Inland Waters

The State uses remotely sensed imagery collected and processed by the National Oceanic and Atmospheric Administration (NOAA) or the National Aeronautical and Space Administration (NASA) to assist in identifying the location of cyanobacteria blooms in Lake Erie, inland state park lakes, and portions of the Ohio River. For state recreation managers, the imagery is used as a tool to assist in visual confirmation of algal bloom presence. These remote sensing tools can provide information on lakes or rivers that are at least 300 meters wide. A processed image can detect HABs approximately 1-2 feet below the surface when the human eye cannot. It can also detect algal blooms in turbid waters when the blooms can be difficult to visually identify. Hyperspectral imaging by airplane may also be used during times of increased cloud cover to supplement the satellite images. For Lake Erie, NOAA prepares a bi-weekly bulletin depicting satellite images of HABs, predicted algal bloom densities and wind directions. NOAA's experimental Lake Erie forecast system switched to operational status in 2017 and remains an invaluable tool provided to

thousands of subscribers in the state, including state agencies, public water systems, beach managers and the public. More information on the NOAA HAB detection and monitoring program for Lake Erie can be found at the Great Lakes Environmental Research Lab website at glerl.noaa.gov/res/HABs_and_Hypoxia/.

Ohio is also one of four states participating in NOAA's Cyanobacteria Assessment Network (CyAN) Project. Beginning in May 2017, Ohio EPA reviewed near daily images for cyanobacteria detections, generated maps of cyanobacteria detections for individual lakes, and shared a summary of current cyanobacteria detections and lake maps with ODNR, ODH and public water systems. This tool provided valuable information about Ohio's inland waters and early warning on HAB formation. More information about the CyAN project can be found at the U.S. EPA website at epa.gov/water-research/cyanobacteria-assessment-network-cyan.

Outreach

Ohio EPA continues to coordinate a workshop at Ohio Sea Grant Stone Laboratory in August of each year. This two-day workshop, Dealing with Cyanobacteria, Algal Toxin and Taste and Odor Compounds, attracts public water supply operators and water managers from Ohio and other states. Instructors include experts from NOAA, OSU and public water supply operators with experience dealing with HABs. Ohio EPA also provided annual training each spring for ODNR park managers on HAB sampling and response. Starting in 2016 and continuing in 2017, Ohio EPA provided webinars and in-person workshops to public water systems, local health departments, emergency management agencies and local governmental officials throughout the state. Ohio EPA also provided presentations and share the State's HAB monitoring and response experience with numerous U.S. EPA regions, states and other groups.

Source Water Protection Program

Several programs are in place or are being implemented to help protect Ohio's water resources. The source water assessment and protection program protects aquifers and surface water bodies that are used by public water systems. A public water supply beneficial use assessment methodology has been developed in conjunction with DSW and it is being implemented.

C4. Program Summary – Environmental Services

For Ohio EPA to protect public health and the environment, Agency staff depend on scientific data to make well-informed decisions. The Division of Environmental Services (DES), Ohio EPA's laboratory, provides most of this data. DES analyzes environmental samples for more than 300 parameters. The laboratory provides chemical and microbiological analyses of drinking, surface and ground water; wastewater effluent; sediment; soil; sludge; manure; air filters and air canisters; and fish tissue.

DES processes approximately 10,000 samples annually, generating approximately 139,500 inorganic and 91,000 organic data points. DES also administers U.S. EPA's Discharge Monitoring Report-Quality Assurance Study Program, inspects drinking water and wastewater laboratories and provides technical assistance to Ohio EPA divisions as well as state and local agencies.

C5. Cooperation among State Agencies and Departments

Ohio Lake Erie Commission

The Ohio Lake Erie Commission (OLEC) is comprised of the directors of Ohio EPA and the Ohio departments of natural resources, transportation, development, health and agriculture and up to five additional public members appointed by the governor. The role of OLEC is to preserve Lake Erie's natural resources; to protect the quality of its waters and ecosystem; and to promote economic development and tourism in the region. OLEC develops and is guided by the *Lake Erie Protection and Restoration Strategy*,

which identifies 12 priority issues on which the member state agencies and other partners focus their attention. OLEC administers Ohio's Lake Erie Protection Fund, which was established to finance research and implementation projects aimed at protecting, preserving and restoring Lake Erie and its watershed. The fund is supported through tax-deductible donations and purchases of Lake Erie license plates, which display the Marblehead Lighthouse, Toledo Harbor Lighthouse or the Lake Erie life preserver. The Commission also receives Ohio's share of the interest earnings from the Great Lakes Protection Fund, an interstate trust fund established in 1989 to protect and restore the Great Lakes. Since its inception in 1993, the Commission has awarded approximately \$13 million for projects that focus on issues critical to the effective state management of Lake Erie and that further the goals of the *Lake Erie Protection and Restoration Strategy*. More information is available online at lakeerie.ohio.gov.

C6. Funding Sources for Pollution Controls

It is beyond the means of this report to place a dollar value on the environmental improvements gained to date. However, Ohio EPA has documented the recovery of numerous major river segments including the Cuyahoga River, Licking River, Paint Creek and Scioto River. The most successful restoration efforts in Ohio have been those that have combined one or more funding sources to reach water resource goals. Different funding sources are directed toward many facets of water resource management, so there is always a challenge to pursue and coordinate the various programs at once. Such coordination takes time and administrative effort to be successful.

There are several funding sources for water quality improvement projects in Ohio. Funding for wastewater and drinking water infrastructure improvement projects is available through: Ohio EPA (WPCLF and WSRLA); the Ohio Water Development Authority (OWDA); Ohio Public Works Commission (OPWC); U.S. Department of Agriculture (USDA) Rural Development; and the Community Development Block Grant (CDBG) program. Ohio EPA's *State and Federal Funding for Drinking Water and Wastewater Systems* details some of these funding sources. There is also funding available for preservation, conservation and restoration projects that directly benefit water quality. These include: Clean Ohio Fund; Section 319 Grants Program; Great Lakes Restoration Initiative (GLRI); Conservation Reserve Program (CRP); and Ohio EPA's WRRSP. Additional funds from the federal government, as well as the investment in water pollution control measures made by municipal and county governments and the private sector, are the reason for dramatic improvements in water quality in Ohio since the inception of the federal CWA in 1972.

A summary of funding sources, amounts and trends is presented here. Efforts have been made to include sources not traditionally associated strictly with water quality improvement, but that nevertheless have the potential to positively impact Ohio's water resources.

Clean Ohio Fund

Although not tied directly to measures of water resource improvement, a major Ohio bond fund provides funds for projects that should positively impact water quality in the state. The Clean Ohio Fund, created in November 2000, provides \$400 million over four years for brownfield environmental cleanup projects and green space and conservation preservation projects. Placed before Ohio's voters as Issue 2 in 2008, the ballot initiative was overwhelmingly approved in all 88 counties, which extended the Fund with another \$400 million bond program. The Fund consists of three competitive funding programs, as described below.

Clean Ohio Green Space Conservation Program

The Clean Ohio Green Space Conservation Program helps to fund preservation of open spaces, sensitive ecological areas and stream corridors. The program awards \$37,000 per year to projects that:

- Protect habitat for rare, threatened or endangered species;
- Preserve high quality wetlands and other scarce natural resources;
- Preserve streamside forests, natural stream channels, functioning floodplains, and other natural features of Ohio's waterways;
- Support comprehensive open space planning;
- Secure easements to protect stream corridors, which may be planted with trees or vegetation to help reduce erosion and fertilizer/pesticide runoff;
- Enhance eco-tourism and economic development related to outdoor recreation in economically challenged areas;
- Reduce or eliminate nonnative, invasive plant and animal species;
- Provide safe areas for fishing, hunting and trapping in a manner that provides a balanced ecosystem.

Clean Ohio Agricultural Easement Purchase Program

The Clean Ohio Local Agricultural Easement Purchase Program (LAEPP) provides funding to assist landowners and communities in preserving Ohio's farmland. The program purchases agricultural easements from landowners who volunteer to keep their land in agricultural production in perpetuity. In 2015, almost \$6 million was awarded through this program; and, in 2016, a little more than \$7.5 million was awarded.

Clean Ohio Trails Fund

The Clean Ohio Trails Fund, administered through the Ohio Department of Natural Resources, provides funding to local governments, park and joint recreation districts, conservancy districts, soil and water conservation districts and non-profit organizations to improve outdoor recreational opportunities for Ohioans by funding trails for outdoor pursuits of all kinds. Eligible projects include: land acquisition for a trail; trail development; trailhead facilities; engineering; and design. In 2015, just over \$6 million was awarded through this program; and, in 2016, \$10.5 million was awarded.

More information about Clean Ohio Fund can be found at development.ohio.gov/cleanohio/. Information about the Clean Ohio Trails Fund can be found at realestate.ohiodnr.gov/outdoor-recreation-facility-grants.

Ohio Water Development Authority

OWDA offers financial assistance for several project types, either alone or in conjunction with a state agency (including Ohio EPA). In addition to solid waste, brownfields and emergency programs, OWDA oversees the Fresh Water Program. The Fresh Water Program is a market-based rate program that mirrors the below-market financing available through the WSRLA and the WPCLF (see below). The OWDA 2016 annual report provides an overall summary of loan expenditures for all State of Ohio water and wastewater programs in 2016 (OWDA 2017). More information about OWDA can be found at www.owda.org.

Table C- 1 — OWDA loans administered during calendar years 2015 - 2016.

Project Type	2016		2015	
	Number	Amount	Number	Amount
Planning				
Water	22	\$3,187,582	23	\$6,006,860
Wastewater	37	\$18,093,691	38	\$32,530,233
Subtotal	59	\$21,281,273	61	\$38,537,093
Construction				
Water	64	\$301,545,853	82	\$171,818,412
Wastewater	175	\$673,222,273	124	\$784,602,894
Alternative Storm Water	3	\$4,085,446	0	0
Brownfield	4	\$4,331,286	7	\$18,853,245
Local Economic Development	1	\$10,595,567	0	0
Subtotal	247	\$993,780,931	213	\$975,274,551
Total	306	\$1,015,062,204	274	\$1,013,811,644

Water Pollution Control Loan Fund

In calendar year 2016, the WPCLF financed many municipal wastewater treatment needs, as well as NPS pollution control needs. Through this program, \$632,483,026 in financing was provided for 153 projects, of which 96 projects were for municipal point sources and 57 projects assisted NPS controls.

The WPCLF financed implementation of 96 municipal wastewater treatment projects costing \$619,184,526. These projects directly addressed sources of impairment for Ohio water resources. Nearly half of these loans (45 percent or 43 loans), totaling \$91,845,696, were made to communities with a service population of fewer than 5,000 people.

During calendar year 2016, a total of \$13,298,500 was awarded for 57 NPS pollution control projects. The Water Resource Restoration Sponsor Program (WRRSP) financed 10 projects for \$13,090,362 to protect and restore stream and wetland aquatic habitats. Additionally, the WPCLF awarded 57 direct (principal forgiveness) loans, administered through county health departments, totaling \$13,298,500 for the correction of failing home sewage treatment systems to economically distressed individuals.

Water Supply Revolving Loan Account

The Water Supply Revolving Loan Account focuses on drinking water supplies. In SFY 2016, the fund made 46 loans totaling \$152,203,792, which included \$80,867,052 to economically disadvantaged communities.

Section 319 Grants Program

Ohio EPA receives federal CWA Section 319(h) funding to implement a statewide NPS program, including offering grants to implement local projects to reduce the impacts of nonpoint sources of pollution. Annual funding for local sub-grant awards typically averages \$2.5 million. Section 319(h) grants are awarded for projects such as low-head dam removal, natural stream channel restoration, wetland restoration and other types of projects designed to restore impaired waters. Projects identified in watersheds with TMDLs and/or with endorsed watershed action plans that focus on eliminating identified sources of impairment or restoring impaired waters are most likely to receive funding. Other eligible activities include lake management projects and agricultural BMPs that are not funded under Farm Bill programs. Nearly all successful grant applications are from watersheds that have either completed an endorsed local watershed action plan or in watersheds where TMDL studies have been completed. More information can be found at epa.ohio.gov/dsw/nps/index.aspx.

Federal Farm Bill Funding in Ohio

Among funding sources from the federal government, conservation programs connected to the federal Farm Bill are notable. Administered by USDA, several programs provide cost-share, technical assistance and economic incentives to install and/or implement NPS pollution reduction practices. The 2016 Farm Bill included significant changes in programs such as:

- consolidation of conservation programs for flexibility, accountability and adaptability at the local level;
- linkage of basic conservation practices to crop insurance premium subsidy for highly erodible lands and wetlands; and
- building upon previous successful partnerships and encouraging agricultural producers and partners to design conservation projects that focus on and address regional priorities.

Ohio EPA works closely with the Ohio Natural Resources Conservation Service (NRCS) on several water quality related landscape initiatives, including the Great Lakes Restoration Initiative and the National Water Quality Initiative (NWQI). Ohio EPA has assisted with selecting priority watersheds and practices in these initiatives and provides water quality monitoring.

Programs that set aside farmlands such as the Conservation Reserve Program (CRP) and the Conservation Reserve Enhancement Program (CREP) are among the most popular of available programs in Ohio. Targeted acreage through these programs is intended to be environmentally sensitive for land that can have a particularly deleterious impact on natural resources when farmed. Examples include highly erodible land, land near waterways, land that was formerly wetland and lands that can serve as habitat critical to declining wildlife populations. It is a potential concern that once contracts expire on the marginal or environmentally sensitive lands, those acres may revert to agricultural production.

Conservation Reserve Enhancement Program

The CREP is a federal-state conservation partnership program intended to protect environmentally sensitive cropland and convert it to native grasses, trees and other vegetation. The CREP uses financial incentives to encourage farmers and ranchers to enroll in contracts of 10-15 years. In return, participants are incentivized annually 150-175 percent of crop rental rates, depending on the type of vegetation planted. Ohio is one of two states in the nation to have three CREP watersheds. Most existing CRP and CREP land retirement program acres involve stream-side grass strips. There are opportunities to further expand acreage under these programs to include practices that better reduce rate and amount of agricultural runoff. These practices include: filter area; wooded riparian corridors; and/or wetlands designed to trap, retain, intercept, distribute, store and/or treat runoff from cropland.

Environmental Quality Incentives Program

The Environmental Quality Incentives Program (EQIP) is another widely used, well-funded program in the Farm Bill. EQIP is designed to improve management practices and facilities on working farms to achieve environmental quality goals. Several specific practices are eligible for funding through EQIP, covering broad categories such as nutrient and pesticide management and storage, manure management and storage, livestock fencing, conservation tillage, cover cropping, conservation crop rotation and drainage water management, among others. Historically, most EQIP-funded practices in Ohio have gone toward installation of livestock fencing, access roads, manure storage units and other structural practices). Recognizing that NPS pollution from agriculture is largely related to management (for example, crop rotations and tillage management, or fertilizer application timing, method, rate and form), Ohio-NRCS

offered incentive payments to farming operations to adopt a suite of management practices, including conservation tillage, nutrient management plan implementation and cover crops.

More information about the Agricultural Act of 2014 and related programs in Ohio is available at nrqs.usda.gov/wps/portal/nrqs/main/national/programs/farmland/ and nrqs.usda.gov/wps/portal/nrqs/site/oh/home.

C7. New 303(d) Vision Implementation in Ohio

In December 2013, U.S. EPA announced a new “Vision” for the CWA Section 303(d) program to provide an updated framework for implementing the responsibilities under the impaired waters program. U.S. EPA recognized that “... there is not a one-size-fits-all approach to restoring and protecting water resources.” Under the new Vision, states will be able to develop tailored strategies to implement the 303(d) program in the context of their water quality goals.

The Vision effort grew out of frustration caused by the 1990s-era litigation concerning the pace at which TMDL analyses were being completed. The resulting consent decrees forced many states to produce great quantities of TMDLs that many felt did not contain the necessary *quality* to effectively improve water quality. As the decrees were completed, discussion centered on how to produce better TMDLs that could be implemented to bring about measurable improvements in the quality of the nation’s waters.

Fortunately, Ohio was not burdened by a harsh consent decree and was able to carefully consider how to proceed with TMDLs. Fifteen years ago, Ohio EPA developed an approach to TMDLs that already aligns with the spirit of the Vision. The Ohio TMDL program strives to:

- focus on CWA responsibilities across programs;
- build on the state’s investments in monitoring, especially biological monitoring;
- use data efficiently, for multiple programs and purposes;
- restore beneficial uses;
- focus on watersheds: maintain rotating basin structure to enable adaptive management; and
- recognize that water quality is impacted by the actions of many and that it will change over time.

Ohio’s program grew out of the Agency’s water mission, which is rooted in the CWA. Today’s new national Vision developed from the same roots, so it should not be surprising that Ohio has been on the Vision path for several years.

Ohio TMDL Program Relative to the Vision Goals

The national Vision contains six goal statements related to prioritization, assessment, protection, alternatives, engagement and integration. While its TMDL program is generally well placed relative to these goals, Ohio expects to continue to improve its program. Potentially the biggest opportunities are in the areas of protection and engaging other organizations to help with implementation. The following is a summary of the goals and how Ohio has been addressing each goal to date as detailed in U.S. EPA’s *A Long-Term Vision for Assessment, Restoration and Protection under the Clean Water Act Section 303(d) Program* (U.S. EPA, 2013), available at epa.gov/sites/production/files/2015-07/documents/vision_303d_program_dec_2013.pdf.

Prioritization Goal

For the 2016 integrated reporting cycle and beyond, States review, systematically prioritize, and report priority watersheds or waters for restoration and protection in their biennial integrated reports to facilitate State strategic planning for achieving water quality goals.

The intent of the Prioritization Goal is for States to express CWA 303(d) Program priorities in the context of the State's broader, overall water quality goals.

-- U.S. EPA, 2013

Based on the state's established monitoring investment and expertise, Ohio's initial priority (in approximately 2000) was on aquatic life use impairments in streams. This priority led to the development of nutrient, sediment, habitat, dissolved oxygen and related TMDLs. A few years later, the agency began to focus on recreation use impairments, which yielded bacteria TMDLs. More recently, work has involved public drinking water use impairments involving nitrate and pesticides TMDLs.

In addition to a focus on restoring uses, other priorities were to begin with headwaters and work downstream. To date, the state has not adopted a geographic priority, choosing instead to work statewide which helps to maintain work balance among district offices. In cases where other agencies or stakeholders have initiated projects, TMDLs in watersheds has been delayed.

Moving forward, Ohio intends to use the following prioritization framework (**bold** items indicate clarification or change from past practices).

Long Term General Priorities:

- continue to work statewide, using rotating basin scheduling for assessment and listing **but on a more limited basis to allow for increased focus on lakes and protecting downstream uses;**
- sharpen focus on Public Water Supply Use;
- **Incorporate HAB considerations into priorities (both PDWS use and ultimately Recreation use);**
- concentrate recreation TMDLs on **High-Use** recreation waters;
- continue to make mercury and legacy/sediment metals low-priority TMDLs as other approaches are anticipated to be more effective

Annual Prioritization of Impaired Waters for TMDL Development: Ohio will continue to use the Priority Point System in Section J2 of the IR. Points are given for presence and severity of Human Health impairment, Recreation Use impairment, Public Water Supply impairment and Aquatic Life Use impairment. Scores by HUC12 range from 1-16.

In addition, the Agency will consider geographic coverage, severity of the impairments represented by the above scores/points for the entire project area and add the following considerations:

- Social Factors (highly used recreational waters, drinking water supply for significant populations, ongoing/sustained involvement of any local groups or government, etc.)
- Value Added (is a TMDL the most efficient way to achieve improved water quality?)
- Is there an approved watershed action plan – if so how many implemented projects?
- How much regulatory authority exists over sources?
- Is there an alternative way to improve water quality more quickly than a TMDL? (for example, immediate implementation of an existing plan or projects, or imposing more stringent permit limits to address a localized problem)

- Are there other factors in play? Examples include:
 - pending enforcement for a discharger (possible 4B option);
 - USACE modeling of reservoir discharge to improve downstream water quality;
 - local or statewide strategy or requirements in place to address a particular issue/pollutant (for example, new health department rules for HSTS if they are sole/primary source of impairment)

Over time, Ohio will strive to develop a more objective system for weighing the social factors and value-added concepts. In each IR, the state plans to provide results of the most recent assessments and prioritization exercise as outlined above; list resulting high-priority TMDL projects; and include schedules for those anticipated to be completed in the next two years.

Assessment Goal

By 2020, States identify the extent of healthy and CWA Section 303(d) impaired waters in each State's priority watersheds or waters through site-specific assessment.

The purpose of this Goal is to encourage a comprehensive understanding of the water quality status of at least each State's priority areas.

-- U.S. EPA, 2013

Ohio has maintained a robust biology and chemistry monitoring program for more than 30 years, maintaining consistent protocols and systematically expanding into new water body types. Assessments are based on surveys conducted using a rotating basin approach. The assessments use site-specific data of the highest quality and the status of waters is reported in watershed reports and summarized in biennial IRs that meet the reporting requirements of CWA 305(b) and 303(d). A framework of goals and measures has been in place for several years and reported on biennially in the Ohio IR.

Protection Goal

For the 2016 reporting cycle and beyond, in addition to the traditional TMDL development priorities and schedules for waters in need of restoration, States identify protection planning priorities and approaches along with schedules to help prevent impairments in healthy waters, in a manner consistent with each State's systematic prioritization.

The intent of the Protection Goal is to encourage a more systematic consideration of management actions to prevent impairments in healthy waters (i.e., unimpaired waters) in order to maintain water quality or protect existing uses or high-quality waters.

-- U.S. EPA, 2013

Protection of the water resource is built into Ohio's CWA programs in multiple ways. Watershed surveys measure the attainment potential and status for all waters; thus, they identify waters to restore and to protect. Tiered aquatic life uses identify "better than CWA" goals for high-quality streams. About 14 percent of Ohio's streams already have this higher use designation. TMDLs have included protection strategies and informational TMDLs to encourage protection of streams currently meeting their designated uses. Ohio also has an active antidegradation process to protect existing uses and plans to update the list of waters afforded higher protection under antidegradation.

Ohio has also issued NPDES permits to protect against water quality impairment and anticipates continuing that approach where warranted. One example is the general construction storm water permits for the Olentangy River and Darby Creek watersheds. Those permits include measures designed to protect the high quality of the streams from development impacts. Other watersheds are being considered for similar actions.

Ohio will explore how other types of plans (Nine-Element Watershed Plans for instance) or regulatory actions could be used more effectively to protect our highest quality waters and/or those that are of high importance for drinking water or recreation.

Alternatives Goal

By 2018, States use alternative approaches, in addition to TMDLs, that incorporate adaptive management and are tailored to specific circumstances where such approaches are better suited to implement priority watershed or water actions that achieve the water quality goals of each state, including identifying and reducing nonpoint sources of pollution.

The purpose of this Goal is to encourage the use of the most effective tool(s) to address water quality protection and restoration efforts.

-- U.S. EPA, 2013

Ohio has been using several alternatives to improve water quality. Relying on the biological criteria as the measure for aquatic life attainment means that restoring habitat to build a stream's capacity to process pollutants can be as or more effective than load reduction; Ohio TMDLs have routinely promoted habitat enhancement. After the first few TMDLs recommended dam modifications to enhance capacity, dam modifications were pursued in areas without TMDLs. The state has used CWA Section 319 funds to remove or modify many dams.

In the past, Ohio EPA worked with mining agencies and the Corps to develop a standard alternative for acid mine drainage problems by aligning processes to quantify load reductions, thus meeting the needs of multiple programs with one project. There have also been several instances where NPDES permits have been adjusted to address point source impairments as monitoring identifies them, in advance of completing a TMDL. In other cases, TMDLs have recommended a stressor study to address impairment where the source could not be identified. This follow-up attention increases the chances that the problem may be eliminated or, at a minimum, data will be available for a future TMDL.

Under the new Vision, Ohio EPA also plans to use approaches that are an alternative to a TMDL. These approaches will be designed to address specific impairments caused by pollutants such as phosphorus or perhaps bacteria. Approaches may include developing Nine-Element Watershed Plans, revising NPDES permit limits or conditions, funding installation of BMPs, supporting local health departments in implementing new rules for household sewage treatment systems, etc. These approaches will be pursued where there is clear legal authority to do so and circumstances are such that they are likely to result in water quality improvements more efficiently than a TMDL.

Engagement Goal

By 2014, EPA and the States actively engage the public and other stakeholders to improve and protect water quality, as demonstrated by documented, inclusive, transparent, and consistent communication; requesting and sharing feedback on proposed approaches; and enhanced understanding of program objectives.

The purpose of the Engagement Goal is to ensure the CWA 303(d) Program encourages working with stakeholders to educate and facilitate actions that work toward achieving water quality goals.

-- U.S. EPA, 2013

Ohio engages the public and other stakeholders in several ways. Ohio EPA maintains an extensive website with information about TMDLs, monitoring and implementation in watersheds across the state³.

In addition to the outreach in individual CWA programs, the TMDL program developed a standard TMDL project communication plan to engage the public, government and technical stakeholders within a project area. The plan includes a standard set of meetings, demonstrations, articles, new releases, etc., that are tied to TMDL project milestones.

In recent years, the CWA Section 319 program has strived to reach beyond stakeholders with general interest to focus on local decision makers and groups who have the wherewithal to act on the ground to improve water quality. These include local governments and park districts.

The preparation of the IR (containing the 303(d), or impaired waters, list) is an open process. Several years ago, an incubator section was added to preview changes that were being contemplated for future listings (for example, adding new beneficial use analyses, revising methodologies or assessment unit types). The section allows for longer-term feedback for public consideration of changes that can have significant impacts. Ohio will strive to complete the IR every two years so that the process remains dynamic and reliable.

Integration Goal

By 2016, EPA and the States identify and coordinate implementation of key point source and nonpoint source control actions that foster effective integration across CWA programs, other statutory programs (e.g., CERCLA, RCRA, SDWA, CAA), and the water quality efforts of other Federal departments and agencies (e.g., Agriculture, Interior, Commerce) to achieve the water quality goals of each state.

The intent of this Goal is to integrate the CWA Section 303(d) Program with other relevant programs that play a role in influencing water quality, in order to collectively and more effectively achieve the water quality goals of States, Tribes, and Territories.

-- U.S. EPA, 2013

As described earlier, program integration is the foundation of Ohio's TMDL work, including both technical and funding programs. Ohio has adopted the Safe Drinking Water Act into the 303(d) listing process and has completed TMDLs for drinking water impairments. Ohio has directed CWA Section 319 funding to park districts and local governments that can directly implement actions to improve water quality by using TMDLs to identify suitable projects. Ohio EPA has also worked with the U.S. Forest Service, U.S. Army Corps of Engineers and state and federal mining agencies to address common water quality goals and to complete TMDLs and TMDL alternatives.

³ epa.ohio.gov/dsw/tmdl/index.aspx

On a practical level, each TMDL project is completed by a team of Ohio EPA staff that represents many aspects of the clean water programs, including drinking water. The team members include staff from various CWA program areas. At a minimum, these program areas include: monitoring and assessment; water quality modeling; NPDES permits; enforcement; water quality standards; and TMDL. Staff from the Agency's Public Water Supply program and Public Interest Center are also part of each team. Ohio EPA district offices and central office both contribute to the effort. On some projects, local representatives such as active watershed group leaders or Soil and Water Conservation District staff are involved during the study plan phase and throughout the project.

For most projects external input is sought for developing the implementation portion of the TMDL. Most commonly, Soil and Water Conservation Districts and watershed groups are consulted, but permittees or other entities may also be asked for input in the development stage of the implementation plan, depending upon the issues in the watershed. While there is always room for improvement, Ohio EPA does not propose significant changes in the integration aspect over the next few years in terms of our internal coordination.