WISCONSIN DEPT. OF NATURAL RESOURCES

Clean Water State Revolving Fund

EPA United States Environmental Protection Agency

Exploring Opportunities for Financing Distributed Infrastructure Projects Using Wisconsin's CWSRF Program

A Nonpoint Source Pilot to Address Phosphorus Management

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A New Way of Thinking About Infrastructure

States, municipalities, and wastewater utilities are increasingly recognizing that "distributed infrastructure" is a complement to the traditional, centralized infrastructure that has historically been used to improve water quality. Distributed infrastructure refers to technologies and practices that are decentralized, and therefore take place throughout the watershed at many locations, such as businesses, farms, homes, streets, and parks. These are often nonpoint source and green infrastructure projects that may not be under direct control of the utility or municipality. Yet, the utility or municipality directly benefits from these investments because it helps them to achieve water quality criteria and meet permitting requirements. States such as California and Maryland have expanded their definitions of infrastructure to include distributed infrastructure and other watershed-based solutions. Wisconsin is using this concept to help provide a more cost-effective way to achieve nutrient reductions in its lakes, rivers, and streams.

During the summer months, many Wisconsin residents and visitors encounter algal blooms in rivers and lakes caused by excess nutrients that make their way into local waterways. Algal blooms lead to oxygen-depleted waters that can cause fish kills and water quality problems. Certain algal blooms can also be toxic to people and pets. Wisconsin's 2022 Water Quality Report to Congress found that phosphorus accounted for 49 percent of impaired listings—by far the most significant cause of impaired surface waters across the state.

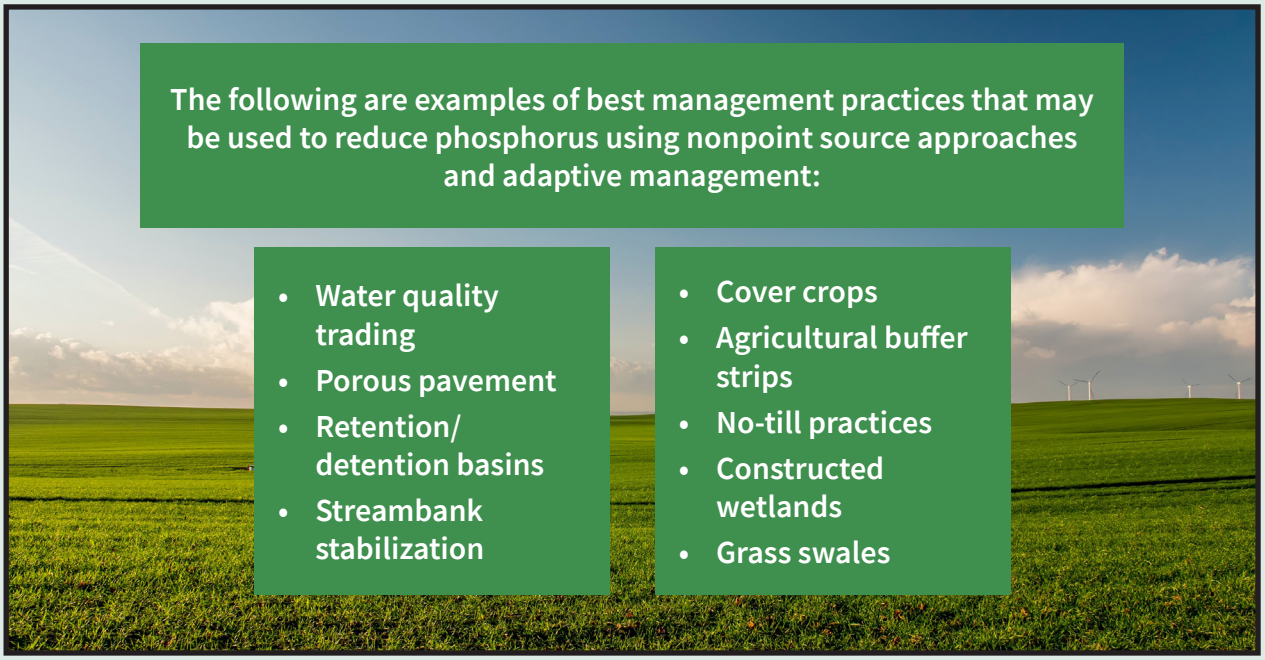
To address this challenge, Wisconsin established phosphorus criteria in 2010, targeting both point sources and nonpoint sources of pollution. Phosphorus is the limiting nutrient for most waters of the state, so that Wisconsin believes that controlling it is the key toward restoring water quality for many water bodies. The state has set strict Wisconsin Pollution Discharge Elimination System (WPDES) permit requirements on wastewater treatment plants to achieve phosphorus criteria of 0.1 milligrams per liter in rivers and 0.075 milligrams per liter in streams. Water quality-based effluent limits for phosphorus are commonly set equal to the applicable in-stream criterion, often necessitating a treatment upgrade to tertiary filtration.

The Wisconsin Department of Natural Resources (DNR) offers a number of options to help state-regulated wastewater utilities reduce phosphorus in local waterways, in addition to traditional treatment options. For example, they can utilize adaptive management and water quality trading approaches which have the potential to be more cost-effective than upgrading wastewater treatment facilities.

Adaptive management: Under this approach, a wastewater utility partners with landowners, municipalities, and counties in the watershed to implement improvements that reduce nonpoint sources of phosphorus. The utility develops an adaptive management plan, using modeling to establish pollutant load reduction targets, identify best management practices (BMPs), and develop cost-effectiveness criteria. Upon approval by DNR, the utilities and their partners have up to four 5-year permit terms to install BMPs, monitor progress, and achieve compliance by reducing phosphorus levels to the required levels.

Water quality trading: Under this approach, the permittee purchases phosphorus reduction credits from other sources in the watershed to offset its discharges. In this scenario, another entity in the watershed implements projects that result in measurable pollutant reductions, such as implementation of agricultural BMPs. The permittee, typically a wastewater treatment plant, can elect to purchase those reductions to offset its own pollutant load.

Figure 1: Agricultural BMPs to Mitigate Phosphorus in the Environment



The Wisconsin Clean Water State Revolving Fund (CWSRF) had already financed water quality trading projects but had not yet ventured into adaptive management projects. The state's CWSRF program requested assistance through EPA's 319-CWSRF Nonpoint Source Pilot program to understand how to successfully finance adaptive management projects. Questions and concerns included:

- How can the CWSRF be confident that the adaptive management projects will achieve established water quality criteria for phosphorus?
- Can the program ensure that the projects meet the Wisconsin CWSRF's cost-effectiveness criteria?
- Are there statutory or regulatory obstacles standing in the way of financing adaptive management projects using the CWSRF?
- What is the most effective way to structure loans for watershed-based phosphorus reduction projects?

Wastewater Utility Approaches to Adaptive Management and Green Infrastructure

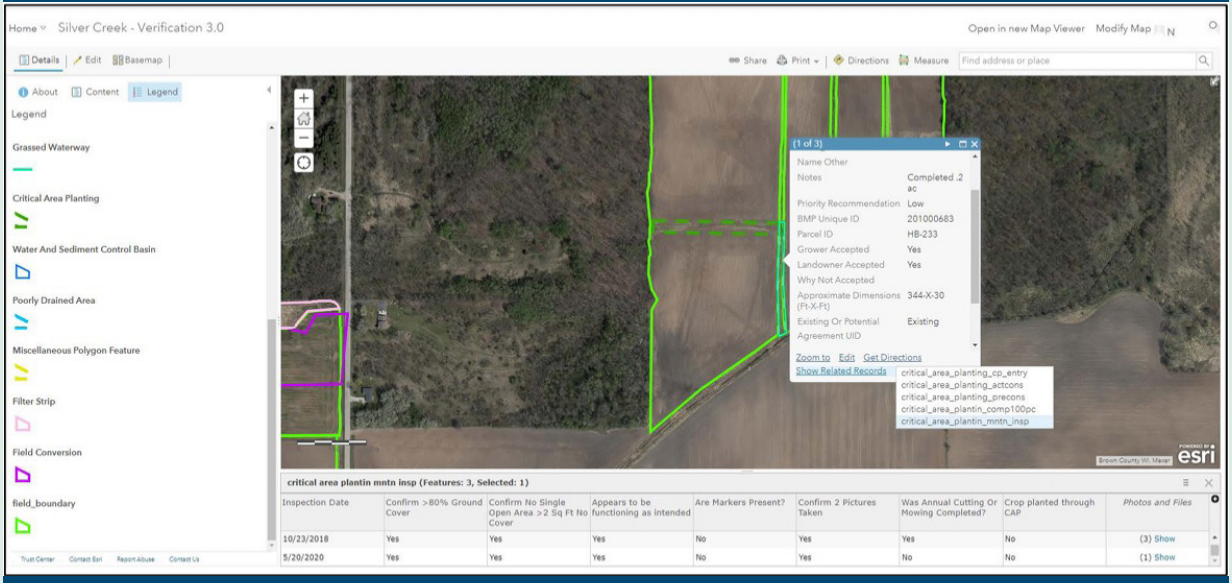
To address the first two questions, EPA's technical support contractor initiated interview-style discussions with three entities leading the way in adaptive management practices in Wisconsin: the Madison Metropolitan Sewerage District, Green Bay NEW Water, and the City of Oconomowoc. All three entities have active adaptive management programs that target nonpoint source pollution in both agricultural and urban environments. In recent years, they have established agreements with partners, farmers, and landowners to implement streambank restoration and cover crops, as well as to make structural investments such as manure management facilities. In addition, they consider urban green infrastructure projects in their nutrient reduction plans, such as installing permeable pavement and increasing street sweeping.

These entities identified several best practices and challenges for implementing and financing adaptive management programs:

Cost-effectiveness is key to project selection.

The utilities and Oconomowoc use a comprehensive process for determining the cost-effectiveness of the projects under consideration. They recognize that there is a responsibility to select the most cost-effective approaches because their utility user fees are being used to fund the work. They use modeling, such as Wisconsin's SnapPlus nutrient management planning software, as well as proprietary cost models to calculate the cost per pound of phosphorus reduced. Due to the additional challenges of identifying partners, tracking projects, and ensuring proper maintenance of the adaptive management projects, the utilities and the city have developed extensive screening, cost-modeling, and prioritization criteria. These criteria help the entities identify the projects that will give them their greatest water quality return on investment.

Figure 2: Example of ArcGIS Map Utilized by Green Bay NEW Water to Identify and Prioritize BMPs



Source: Silver Lake Pilot Project Report (April 2022). https://7337473.fs1.hubspotusercontent-na1.net/hubfs/7337473/PDFs/Silver%20Creek/SilverCreekPilot_FinalReport_FINAL_4.18.2022.pdf

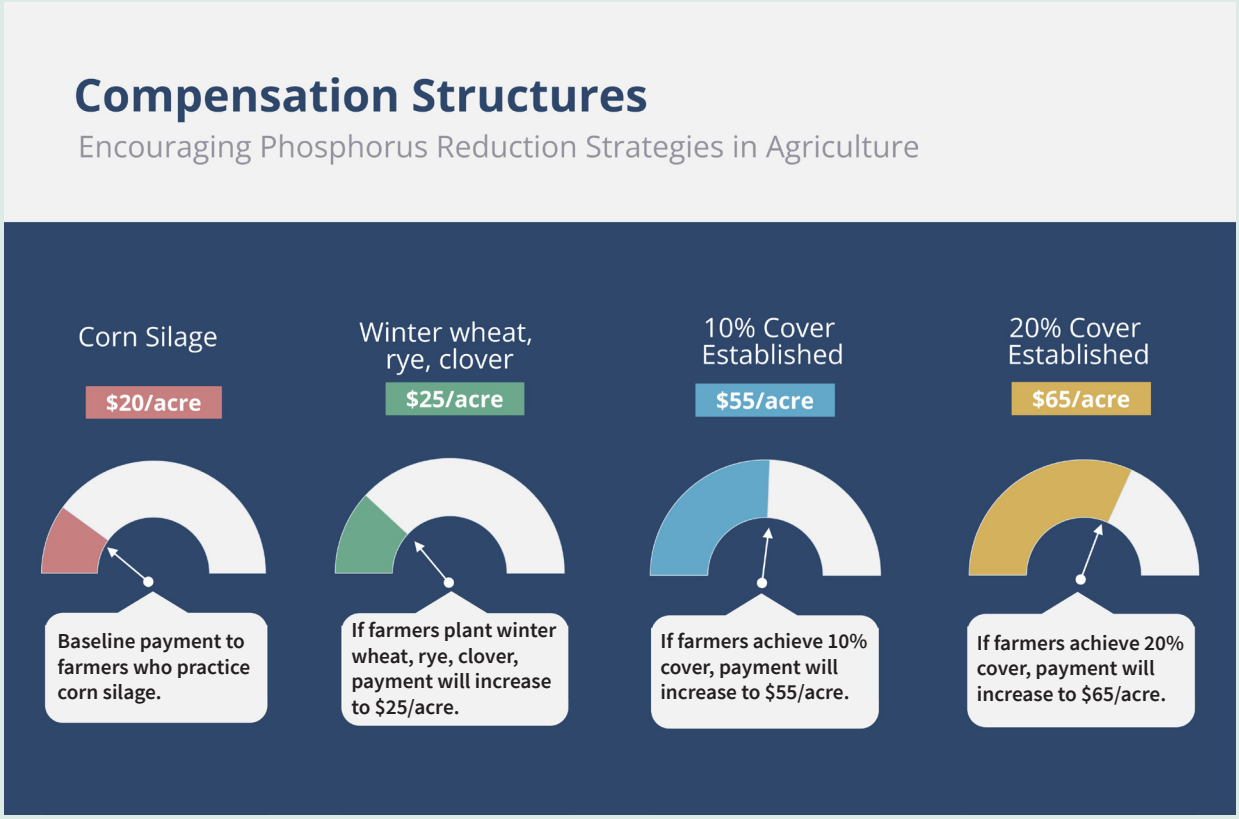
Follow-Up Monitoring is Essential.

When projects are implemented, the entities utilize monitoring to track the actual reductions. The actual reductions are used to determine whether they are meeting the phosphorus reduction targets.

Flexibility in Designing Compensation Structures is Required.

Projects and practices are implemented using a cost-share approach (Figure 3). The three entities interviewed utilize a range of options for compensating landowners, farmers, and other implementers for their investments in phosphorus-reducing practices. These can include budgeting for the expenses in annual budgets, seeking grant and loan funding, and obtaining compensation from other communities in the watershed that benefit from the activities.

Figure 3: Example of compensation structures offered to agricultural producers for phosphorus management



Public Education is Fundamental to Success.

The entities interviewed have created extensive public relations and branding campaigns to educate residents on the broader benefits of adaptive management when compared against treatment facility upgrades alone. These efforts help ensure that ratepayers are supportive of the impacts of the investments on their user rates.

Municipalities and Utilities Must Work Closely with the Wisconsin DNR.

Entities must submit extensive plans to the Wisconsin DNR to receive approval to use the adaptive management approach. Those approvals must be renewed every five years for the 20-year implementation period. Each five-year period requires escalating goals. The plans describe how the entity will seek partners, locate projects, and implement the necessary activities, but generally do not include specific adaptive management projects. Actual project selection and development occur at the next planning stage.

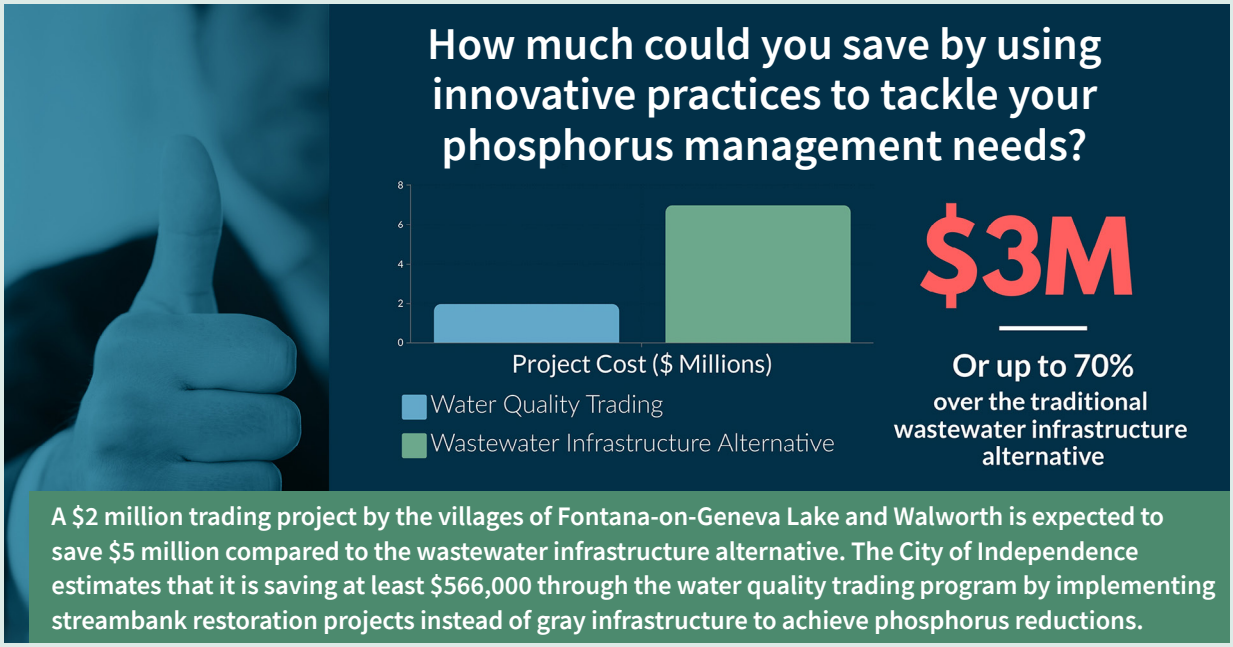
Financing Adaptive Management is a Huge Challenge.

Each of the entities interviewed indicated that obtaining sufficient low-cost funding for the projects was one of their key challenges—in some cases, there are more landowners interested in participating than there are funds available. An easy-to-access, consistent source of low-cost financing was seen as an attractive concept to expand the nutrient reduction efforts.

CWSRF Financing Options for Innovative Phosphorus Management

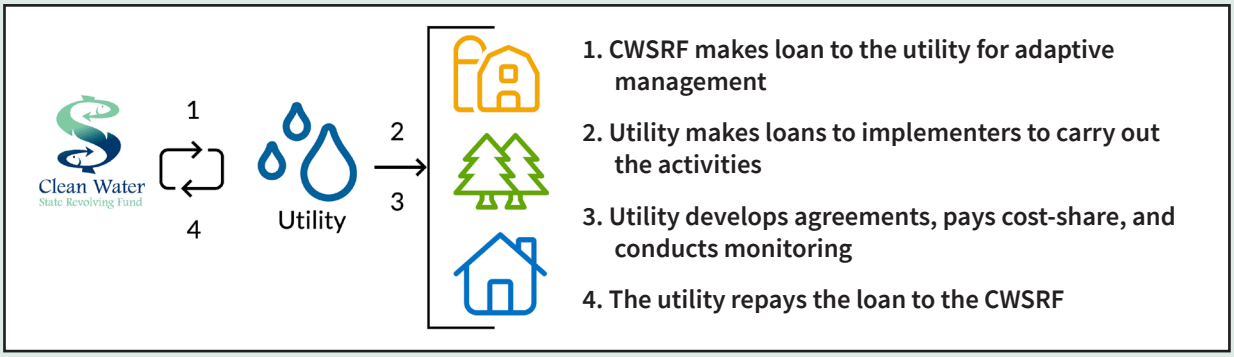
Wisconsin's CWSRF Administrative Code limits project eligibilities to wastewater and stormwater projects sponsored by cities, towns, counties, utilities, and other municipal entities. However, in 2013, the Wisconsin Legislature authorized the Pilot Projects Program (Wis. Stats. 281.58(7)(b)(7)). The Pilot Projects Program allows any projects eligible in the federal CWSRF statutes to be eligible in Wisconsin's CWSRF if they will be used in the phosphorus reduction efforts. As a result, the state's CWSRF significantly expanded the range of eligible nonpoint source projects for phosphorus reduction programs, offering an attractive cost-saving alternative when compared to traditional wastewater treatment optimization options as shown in Figure 4 below. To date, the Wisconsin CWSRF has financed two water quality trading projects through the Pilot Projects Program.

Figure 4: Innovative Phosphorus Management Projects Financed by the Wisconsin CWSRF Program



Adaptive management projects differ from the typical SRF model because the recipient of the financing is not the entity implementing the project. In adaptive management programs, the utility pays the implementer, such as a farmer, homeowner, or landowner, to construct the project or carry out the activity. The utility selects the project, develops agreements with the landowner/farmer/homeowner to ensure proper implementation, pays the cost-share amount, and conducts monitoring. In this arrangement, the CWSRF provides a loan to the utility, which transfers the necessary amounts for the implementer's cost-share. The utility repays the CWSRF loan, typically from ratepayer revenues (Figure 5).

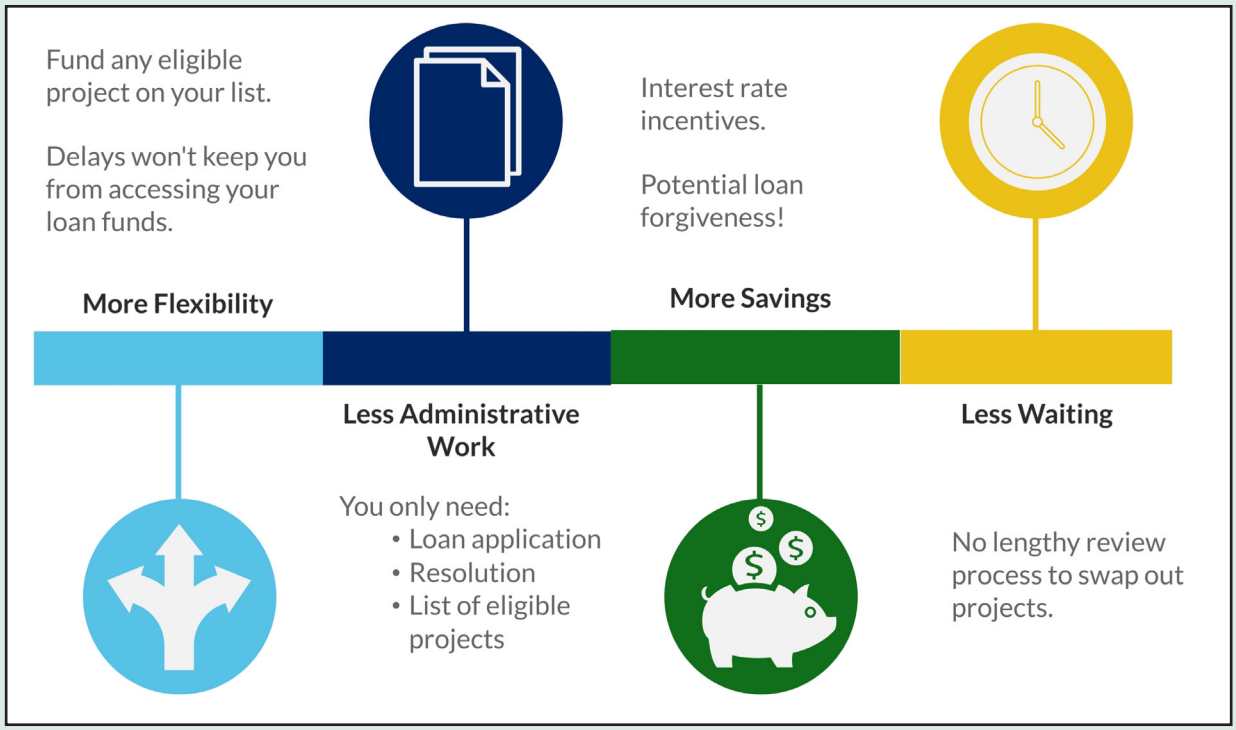
Figure 5: Financial Process for Supporting Adaptive Management Projects



The amount of funding needed on a monthly or annual basis would vary based on the types of projects and the pace of implementation. Furthermore, one CWSRF loan could fund a multitude of these distributed infrastructure projects in a given year.

To meet this challenge, the CWSRF can offer programmatic financing (Pro-Fi) loans to provide borrowers with the capital and flexibility needed to effectively implement adaptive management and green infrastructure projects. In Pro-Fi, SRF programs provide financing to a program rather than a project. This has been used by several states, including Minnesota, Rhode Island, and Alaska, to allow utilities to finance all or a portion of their Capital Improvement Programs (CIPs) through a single financing arrangement, similar to bond financing. Pro-Fi can also be used for nonpoint source projects, such as those implemented through the adaptive management efforts.

Figure 6: Benefits of Programmatic Financing



The proposed Pro-Fi loan structure would allow Wisconsin to make a single loan to an eligible borrower covering one to three years of nonpoint source, adaptive management, and green infrastructure investments. As eligible projects are implemented, funds are drawn from the loan to provide the cost-share. If certain projects are determined to not be eligible or are delayed, they can easily be replaced by other projects in the program or CIP. Per Wisconsin's typical process, at the end of the loan disbursement period, the borrower is responsible only for repaying the amount disbursed. This method of financing gives the borrower time to develop best practices with landowners and farmers, knowing that when it is time to implement the project, the funds will be available. In the meantime, interest does not accrue on the financing until the funds are disbursed, and repayment of unspent amounts will not be required.

This effective, flexible model for financing allows the borrower to bundle together rural adaptive management, nonpoint source, and urban green infrastructure projects that are distributed throughout a watershed with a large range of implementers. This watershed financing partnership approach offers a low-cost, comprehensive way to finance a wide range of projects using many partners throughout a watershed.

Project Status and Next Steps

The Wisconsin CWSRF has begun drafting a Pro-Fi loan agreement and other details needed to implement a Pro-Fi program. As noted earlier, adaptive management plans typically do not include detailed plans and specifications. Wisconsin's SRF program is evaluating how it can obtain sufficient detail about the adaptive management projects at the time of the loan to ensure that they are eligible and will likely achieve the predicted benefits, without causing delays in the application, approval, and disbursement processes.

The program has been engaging in discussions with the Milwaukee Metropolitan Sewerage District (MMSD), whose CIP includes more than $135 million in green infrastructure projects through 2027. Many of the green infrastructure activities in the CIP are distributed throughout the community and would be implemented by homeowners and other property owners. In 2022, MMSD submitted an application for a $36 million CWSRF loan to finance their green infrastructure program.

In addition to drafting a Pro-Fi loan agreement, the CWSRF program has engaged with Green Bay NEW Water to discuss opportunities to finance green infrastructure, adaptive management, and nonpoint source projects using Pro-Fi. Green Bay estimates that it will have to invest as much as $40 million over the next 20 years to satisfy its phosphorus reduction targets. The CWSRF staff is continuing to reach out to utilities and municipalities to discuss Pro-Fi opportunities for financing adaptive management, nonpoint source, and green infrastructure projects.

The Wisconsin DNR has been working to get nonpoint source projects funded via the CWSRF program for over ten years and is excited about the results of this pilot. As of March 2023, DNR has received 22 new Notices of Intent to Apply for nonpoint source projects and a second application for a Pilot Project Program loan (in addition to the $36 million MMSD project). Small municipalities represent a large portion of the entities needing to address phosphorus effluent limits across the state and the Wisconsin CWSRF program will continue reaching out to affected entities to discuss options for financing water quality trading and adaptive management practices.

Lessons Learned

1. Involve potential borrowers at the earliest stages of understanding the problem. The interviews with the utilities and municipalities were valuable for gaining an understanding of how adaptive management projects are selected, and how the CWSRF may structure its financing to best serve them.

2. The CWSRF can use Pro-Fi to finance nonpoint source and distributed infrastructure, providing borrowers with a low-cost option to finance a range of projects throughout a watershed.

3. Many utilities and municipalities nationwide are considering distributed infrastructure in their water quality improvement efforts. Developing tools to use the CWSRF for these investments can create a new avenue to access robust financing and help increase the utilization and pace of distributed infrastructure investments to benefit water quality.

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