

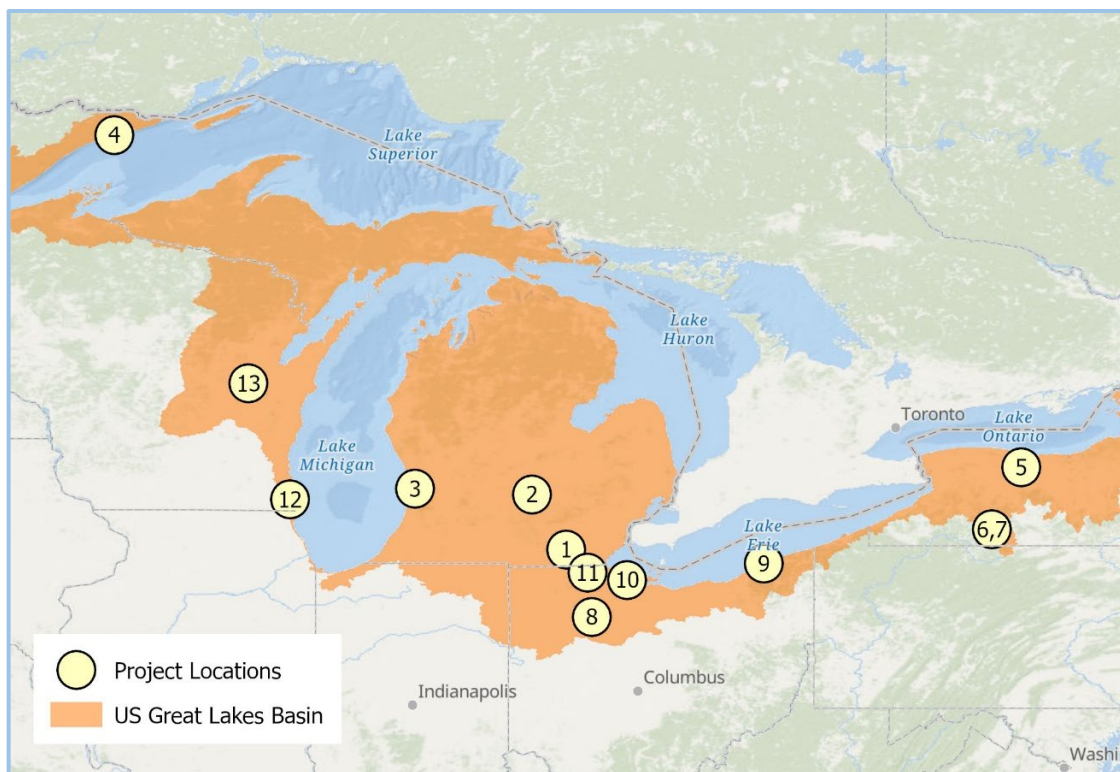
Great Lakes Sediment and Nutrient Reduction Program

REPORT ON AGREEMENT 9 OUTCOMES

The **Great Lakes Sediment and Nutrient Reduction Program** is a state and federal partnership managed by the Great Lakes Commission in cooperation with the USDA's Natural Resource Conservation Service (NRCS), U.S. EPA, and the eight Great Lakes states. Through this program, the GLC has provided grants to nonfederal units of government and watershed organizations to install erosion and sediment control practices in the Great Lakes basin for more than 30 years.

Since 2010, funding for the program has been provided by the Great Lakes Restoration Initiative. The funding has been directed to innovative projects that help address sources of nutrient and sediment losses within the basin. The program is directed by a Task Force that includes representatives from the states, NRCS, and U.S. EPA; the Task Force identifies priorities for funding and reviews proposals to award funding each year.

2019's grantees faced ongoing issues due to the COVID pandemic and communication with landowners. GLC worked with grantees to amend project timelines, budget details, and scope as needed.



Locations of Agreement 9 grantees. Overall, 13 projects were funded through this agreement.

Each number corresponds to a project description below.

Great Lakes Sediment and Nutrient Reduction Program BY THE NUMBERS

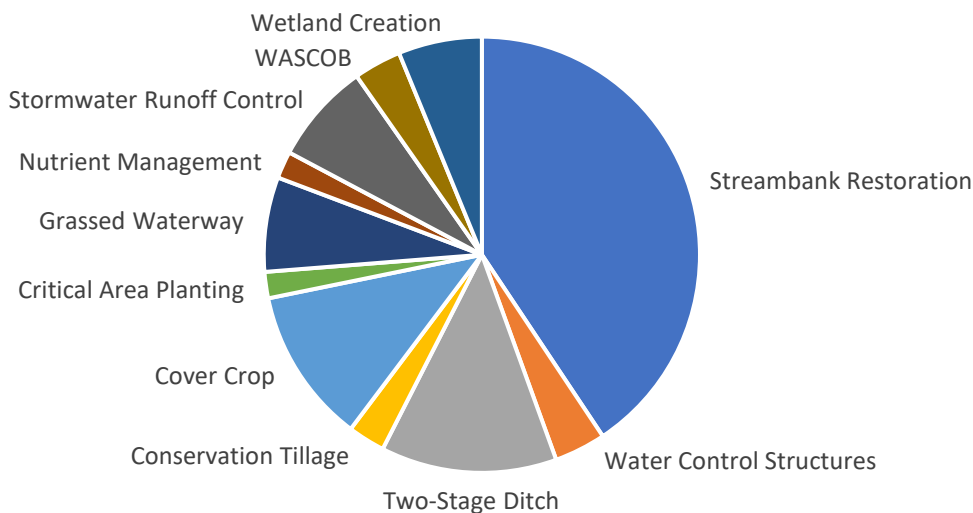
13 GRANTS, \$2,199,230 IN TOTAL FUNDING

State	Number of Grants	Total Funding
Minnesota	1	\$200,000.00
Michigan	3	\$452,450.00
Wisconsin	2	\$354,776.00

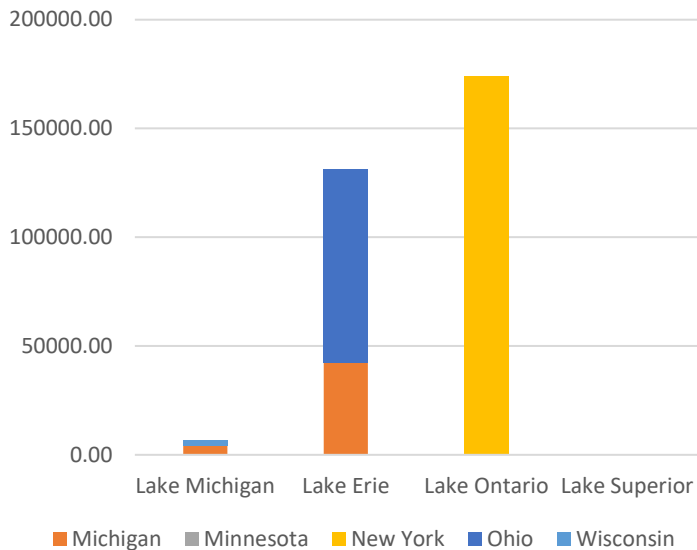
State	Number of Grants	Total Funding
Ohio	4	\$706,341.00
New York	3	\$485,663.00

AGREEMENT 9 GLSNRP PRACTICES

Under Agreement 9 the Great Lakes Sediment & Nutrient Reduction Program funded a variety of best management practices.



TOTAL PHOSPHORUS REDUCTIONS AGREEMENT 9



For Agreement 9, practices were installed in five states with total phosphorus reductions occurring in the watersheds of 4 Great Lakes. Close to half of funds were spent in the Lake Erie basin for this award, with 4 of the 13 projects benefitting the Western Lake Erie Basin specifically.

Phosphorus reductions were estimated using the Region 5 model, STEPL/PLET, SnapPlus (Wisconsin), MIDS Calculator (Minnesota), EGLE’s model for sediment loading (Michigan), and NTT, which were multiplied across the life of the installed practice. Please note that phosphorus reductions amount to 34.56 pounds for Lake Superior. Estimated total phosphorus reductions amount to 29,030.67 pounds per year. This total is not inclusive of 16,700 pounds of phosphorus which the Lucas County Engineer’s Office removed in a one-time practice through sediment removal. For more information, see Appendix 7. The average lifespan for practices installed under this agreement is 5.4 years.

1. Erosion Control 101, Back to Basics: Controlling On-Farm Erosion with Grass Waterways, WASCOSBs, and Grade Stabilization Structures

Lenawee Conservation District (Michigan)

The goal of the Erosion Control 101, Back to Basics project was to install grassed waterways, water and sediment control basins (WASCOSBs), and grade stabilization structures as conservation best management practices for landowners at 75% cost share to improve Lake Erie water quality. In total, Lenawee Conservation District completed 12,123 feet of grassed waterway, 24 WASCOSBs, and 9 grade stabilization structures meeting all project goals. Additional practices beyond the original project workplan were also

installed including 29 acres of critical area planting, 500 feet of water diversion, and nine blind inlets to improve local water quality.

“There is a need to have more funding available for the bread-and-butter practices that are needed across the Western Lake Erie Basin which include grass waterways, water and sediment control basins, grade stabilization projects.”

Tom VanWagner
Lenawee Conservation District

The project will ultimately prevent over 4,000 tons of sediment and 26,000 pounds of phosphorus from entering the Western Lake Erie Basin via the River Raisin and Bean Creek over the life of the installed practices. The conservation practices were well received by the 11 participating landowners and generated enough attention in the area that several producers indicated interest in practice installation beyond what this grant could support.



Lenawee Conservation District in Michigan installed a combination of practices including grassed waterways (left) and water and sediment control basins (right).

2. Michigan State University Red Cedar River Restoration

Michigan State University (Michigan)

Michigan State University's GLSNRP project worked to address streambank erosion and sedimentation along a stretch of the Red Cedar River caused by development in the watershed. The erosion was negatively impacting water quality downstream in the Grand River and Lake Michigan while also jeopardizing campus infrastructure. The campus community was invited to assist with the construction of the streambank stabilization and over two days, more than 30 students, faculty, and staff volunteered to support the effort.

Overall, 430 linear feet of river streambank was stabilized, more than the original project scope. Of that 430 linear feet, 300 linear feet were stabilized using bioengineered lifts which were constructed of field stone, bioengineered materials, topsoil, and native seeds and plants. The other 130 linear feet were stabilized with toe wood and brush bundles. Additionally, 430 linear feet of native filter strip was installed between the project site and the adjacent sidewalk. The project reduces approximately 116 tons of sediment and 82 pounds of phosphorus annually.

"With the Great Lakes Sediment and Nutrient Reduction Program support, Michigan State University initiated the Red Cedar Riverbank restoration process. Phase I of this restoration effort has had a positive impact on both the Great Lakes ecosystem and the local community."

Yun Cao
Michigan State University



Streambank stabilization on the Red Cedar River before (left) and after construction (right) performed by Michigan State University.

3. Sediment and Phosphorus Reduction in the Macatawa Watershed

Macatawa Area Coordinating Council (Michigan)

The Macatawa Area Coordinating Council aimed to reduce sediment and phosphorus in the agriculturally dominated watersheds of Ottawa and Allegan counties in Michigan to improve water quality for Lake Macatawa and Lake Michigan. The original project scope included 3,900 linear feet of grassed waterway and 1,450 acres of annual cover crop. Due to weather complicating the planting season for cover crops, land ownership challenges with an interested producer, a Macatawa Area Coordinating Council agricultural technician leaving the organization during the project, and early delays with the COVID-19 pandemic, these goals were not met in totality.

“Funding provided by the Great Lakes Sediment and Nutrient Reduction Program is critical for the protection and improvement of water quality in Lake Macatawa and the entire Great Lakes ecosystem.”

Kelly Goward
 Project Lead
 ODC Network (formerly with MACC)

However, 3,600 linear feet of grassed waterway and 1,231 acres of annual cover crops were implemented during the project period, meeting a large portion of the MACC and partner Outdoor Discovery Center (ODC) goals. The 11 producers who partnered on the project help to mitigate 957 tons of sediment and 1,547 pounds of phosphorus each year. The successes of this GLSNRP project were displayed at field day and luncheon events to hundreds of community members and area farmers to spread the impact beyond the participating farm fields.



Conservation practices installed by Macatawa Area Coordinating Council included ryegrass cover crops (left) and grassed waterways with rock check dams (right).

4. Lake Superior North Watershed Sediment & Nutrient Reduction

Cook County Soil and Water Conservation District (Minnesota)

In Minnesota, the cities of Grand Marais and Lutsen sit on the shore of Lake Superior where stormwater runoff contributes to localized nutrient pollution and sedimentation. Cook County SWCD's GLSNRP grant focused on utilizing rain gardens and bioswales throughout the community to reduce this pollution and protect Lake Superior.

The original project scope included five project sites for stormwater management practices, though over the course of the project one site experienced planning delays and the landowner decided not to proceed with the project. However, a new project was eventually added, so five final sites were completed. These included two bioswales and three rain gardens totaling 0.278 acres of stormwater management. These sites capture 1,943 pounds of sediment and 3.45 pounds of phosphorus per year.

"The Great Lakes Sediment and Nutrient Reduction Program aided the SWCD in working with landowners to achieve projects to reduce sediment and nutrient loading into Lake Superior that might otherwise not have been completed without this support."

Ilena Hansel
Cook County SWCD



Cook County SWCD installed rain garden and bioswale projects which improve local stormwater management and capture sediment.

5. Genesee Riverbank Restoration – Mallards Dairy

Genesee RiverWatch, Inc. (New York)

Genesee RiverWatch's GLSNRP project sought to address erosive conditions on the western bank of the Genesee River in the town of Canadea, New York. This stretch of river had significantly eroded the toe of the bank which had caused undercutting and sloughing. Additionally, there was no vegetative buffer between the adjacent agricultural field and the top edge of the eroding stream bank.

"Our experience with the Great Lakes Sediment and Nutrient Reduction Program has been excellent. Their staff is always available, very responsive, and flexible. The grant submittal, contracting, and reporting processes are relatively easy to navigate."

George Thomas
Genesee RiverWatch, Inc.

To address these issues, Genesee RiverWatch completed 1,800 linear feet of streambank stabilization using bioengineering techniques and habitat enhancement including embedded root wads in the stream channel with stone barbs to deflect high energy flows. Additionally, 1,800 linear feet of riparian forest buffer and riparian herbaceous cover were added to protect the newly stabilized stretch of river. The combination of newly established riparian cover and the use of toe wood construction techniques created beneficial habitat as well. In total, this project saves 2,381 tons of sediment and 3,760 pounds of phosphorus from entering Lake Ontario each year, meeting all project goals.



A stretch of the Genesee River before (left) and after (right) streambank stabilization and riparian plantings by Genesee RiverWatch.

6. Genesee River Watershed Streambank Erosion Remediation Project

Allegany County Soil and Water Conservation District on behalf of the Genesee River Watershed Coalition of Conservation Districts (New York)

The Genesee River Watershed Streambank Erosion Remediation Project focused on tributaries to the Genesee River in Genesee, Monroe, and Allegany counties in New York. These Lake Ontario tributaries have been impacted by severe erosion and loss of riparian cover from invasive insect predation.

Specifically, projects in Genesee County focused on reestablishing stream buffers for Black Creek and Oatka Creek where riparian forests were decimated by emerald ash borer. A project in a Monroe County section of Oatka Creek stabilized 300 linear feet of eroded shoreline using riprap and rock stream barbs coupled with a riparian buffer. Lastly, projects in Allegany County stabilized two sections of Van Campen Creek using rock riprap and willow plantings along 680 linear feet.

“Funding from the Great Lakes Sediment and Nutrient Reduction Program was key in helping to fund project in three counties located on the tributaries to the Genesee River. Funding helped stabilize sections of creeks that were severely eroded and contributing high level of sediment and phosphorous into the Genesee River watershed. Funding was also helpful in replacing riparian buffers that were negatively impacted by the emerald ash borer.”

Scott Torrey
Allegany County SWCD

In total, 980 linear feet of streambank were stabilized, and 10.8 acres of riparian forest buffer were established during this project period, which will reduce 2,164.8 tons of sediment and 2,909.5 pounds of phosphorus from entering the waterways during the life of the installed practices. These values exceeded the project scope. Additional matching funds were secured as project leaders navigated the rising cost of construction materials during the COVID-19 pandemic.



Streambank stabilization and riparian planting on Oatka Creek before (left) and after project completion (right).

7. Van Campen Creek Stabilization

Allegany County Soil and Water Conservation District (New York)

Allegany County SWCD's project proposed to stabilize a south branch stretch of Van Campen Creek. The streambank had been eroded between ten and thirty vertical feet and was actively eroding at a rate of 12.5 inches per year. This tributary to the Genesee River and Lake Ontario was causing an estimated 8,780 tons of sediment loss each year which threatened 10 buildings and homes.

During the GLSNRP project 800 linear feet of streambank were stabilized, which was above the project's original goal. This was done by regrading the slope and slowing velocity with riprap and rock bendway weirs placed in the stream. Additional protection was provided with willow shoots and grass planted as a riparian buffer. The completed project will save 8,550 tons of sediment and 6,833 pounds of phosphorus annually to protect the Lake Ontario watershed.

"Funding from the Great Lakes Sediment and Nutrient Reduction Program was key in helping to fund the stabilization of this section of Van Campen Creek. This area has been on our list of high priority stream stabilization sites for several years. Without this funding we would not have been able to reduce soil and nutrient loss in this area."

Scott Torrey
Allegany County SWCD



Allegany County SWCD's streambank restoration of Van Campen Creek shown before (left) and after construction (right).

8. Innovative Use of the Nutrient Tracking Tool in the Lower Riley Creek Watershed

Blanchard River Watershed Partnership (Ohio)

To address impairments in the Blanchard River, the Blanchard River Watershed Partnership project used the Nutrient Tracking Tool (NTT) to provide farmers in the Lower Riley Creek watershed in Ohio a cost-benefit analysis so they could understand the impact of differing best management practice scenarios on their crop yields. Soil testing was performed on 521.88 acres in tandem with the NTT analysis to help farmers plan the use of cover crops, tillage management, and fertilizer application.

As a result of this planning, three producers received assistance and the project helped to install a total of 1,648.59 acres of tillage management practices and 1,252.56 acres of non-wheat cover crops. Both measures exceeded proposed values. Additionally, 177.28 acres were planted with wheat cover crops; this was lower than projected as farmers experienced weather-related damages and thus expressed a preference for other cover crops, primarily rye. Utilizing precision soil data from the NTT analysis, the project was able to prevent 739.1 tons of sediment and 416.26 pounds of phosphorus from entering the western basin of Lake Erie during the life of the practices.

“The Great Lakes Sediment and Nutrient Reduction Program has allowed the BRWP to pursue its mission of improving water quality throughout the Blanchard River watershed. With this program, the BRWP has been able to facilitate the implementation of thousands of acres of best management practices, all while establishing relationships with farmers and producers in Northwest Ohio. Many of the farmers that work with the BRWP have participated in multiple GLSNRP grants. Farmers in the Blanchard River watershed have come to rely on the BRWP as a funding source for the implementation of best management practices.”

Lauren Sandhu
Blanchard River Watershed



Blanchard River Watershed Partnership helped landowners install conservation practices including conservation tillage management and cover crops.

9. Chagrin River Watershed Streambank Stabilization Program

“This program provided cost-share assistance to landowners who may have been otherwise unable to address streambank erosion on their properties. Further, the program is reducing sediment and nutrient pollution to the Chagrin River Watershed and Lake Erie, helping improve water quality and aquatic habitat for our Great Lake.”

Kim Brewster Shefelton
Chagrin River Watershed Partners, Inc.

“Great work! I was at the project site last week with the mayor, and the end results were very nice...This area has now been greatly improved to properly handle stormwater flows and prevent flooding.”

Partnering Community Representative

“Thank you for CRWP’s assistance to these homeowners to help address long-term stormwater management and property erosion issues at their properties. The village is very grateful for this program and your expertise in guiding the project through to completion.”

Partnering Community Representative

Chagrin River Watershed Partners, Inc. (Ohio)

The Chagrin River Watershed Streambank Stabilization Program project focused on reducing sediment and nutrient pollution through streambank stabilization on several Chagrin River tributaries including Beaver Creek, Griswold Creek, and the Aurora and East Branches in eastern Ohio. In these watersheds, Chagrin River Watershed Partners offered 50% cost share to complete the streambank stabilization projects and five landowners signed up.

In total, 2,000 linear feet of streambank were stabilized through these projects which will prevent 4,779.2 tons of sediment and 2,799.8 pounds of phosphorus from entering Lake Erie over the life of the installed practices, meeting project goals.



An example of a streambank restoration project for a local landowner before (left) and after (right) construction performed by Chagrin River Watershed Partners.

10. Portage River Nutrient Trapping Program

Ottawa Soil and Water Conservation District (Ohio)

Ottawa SWCD aimed to reduce nutrient and sediment pollution to the Lake Erie watershed using cost share and incentives to install best management practices on farm fields. Their GLSNRP project used a Soil Health Challenge to help farmers compare a suite of best management practices specifically recommended for their field versus traditional farming practices to understand the economic impacts. Though there was competition with state programs to sign up fields for the challenge, 409 acres enrolled, slightly under the proposed amount.

After local outreach, the project scope shifted focus away from saturated buffers, water control structures, and prairie buffer strips due to a lack of suitable sites and a conflict noted by the farmers where enrolling buffer strips would remove the acres from USDA Farm Service Records.

Through the process, Ottawa SWCD worked with nine producers overall. They installed one water control structure and three Agricultural Runoff Treatment Systems, which connected farm fields to wetlands. Additionally, 2,406 acres were engaged in nutrient management plans. The practices help to capture 1,339 tons of sediment and 3,750 pounds of phosphorus per year from escaping farm fields.

“The Great Lakes Sediment and Nutrient Reduction Program provided an opportunity to create innovative conservation practices in our county that met both water quality and sediment reduction goals.”

Mike Libben
Ottawa SWCD



Agricultural drainage pumped into newly installed wetlands as part of Ottawa SWCD’s “Fields to Wetland” ARTS projects.

11. Two-Stage Ditch Installation and In-Stream Sediment Removal for Nutrient Reduction in Drennan Ditch in the Maumee River Watershed

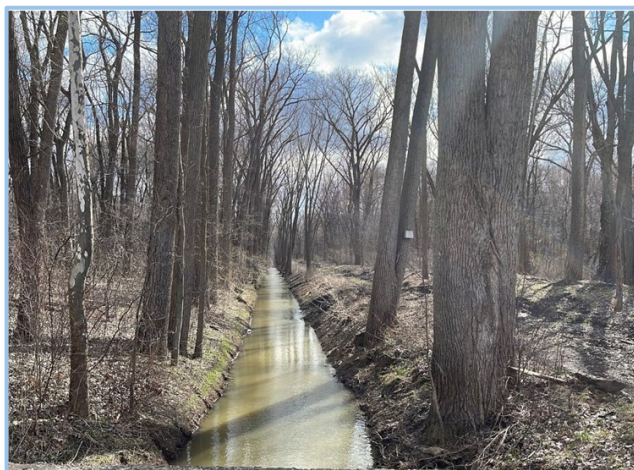
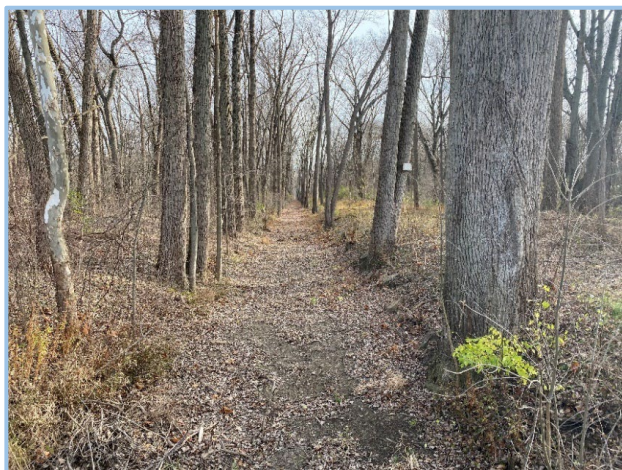
Lucas County Engineer's Office (Ohio)

The Drennan Ditch, within the Swan Creek watershed, is a tributary to the Maumee River and western basin of Lake Erie. Through their GLSNRP project, the Lucas County Engineer's Office aimed to mitigate high phosphorus concentrations and sediment loading with a two-stage ditch installation located at the confluence of two drainage ditches that drain almost 10,000 acres of cultivated cropland.

"The Lucas County Engineer's office appreciates the GLSNRP grant funding assistance to design and implement two-stage ditch and sediment removal projects in Lucas County watersheds tributary to Lake Erie that contribute to the total phosphorus load reduction goal for Lake Erie."

Michael Pniewski
Lucas County Engineer's Office

After an analysis of the flow and sediment accumulation of Drennan Ditch, the Lucas County Engineer's Office worked with landowners to install 840 linear feet of two-stage ditch on one side of Drennan Ditch and removed 13,500 tons of sediment from the ditch bed along 11,883 linear feet of stream. The excavated materials were distributed at least 10 feet from the top of the bank and then seeded with the same mix as was used on the stream banks. Over the life of the installed practices, their GLSNRP project will save 13,500 tons of sediment and 19,100 pounds of phosphorus from entering Lake Erie.



Before (left) and after (right) Lucas County Engineers Office's two-stage ditch construction and sediment removal in Drennan Ditch.

12. Wetland Restoration for Ravine Protection in the Pike River Watershed

Hyslop Foundation, Inc. (Wisconsin)

The GLSNRP project completed by the Hyslop Foundation in the village of Somers aimed to address problems with a severely eroded ravine which is a tributary to the Pike River and Lake Michigan. The project was completed in two phases with the goal of increasing the stormwater holding capacity of treated acres and reducing erosive flows impacting the ravine.

The first phase restored the hydrology of the landscape utilizing a prescribed burn to clear three acres followed by wetland restoration on 1.2 acres and wetland enhancement on 0.75 acres to increase stormwater capacity. Two structures for water control were installed as two spillways were constructed to slowly release water from the restored wetland to a pond. Over 0.65 acres, spoil from the wetland projects was used to install a low berm to catch stormwater from the adjacent farm field and direct the flow toward the wetland.

In the second phase, a grade stabilization structure was installed along 145 linear feet as two severely eroded head cuts of the ravine were filled with spoil from other conservation practices. This was vegetated with critical area plantings to help stabilize the structure. Other conservation practices included fencing along 1,000 linear feet of the project to reduce erosion, herbaceous weed treatment on eight acres, and the establishment of 60 trees and 91 shrubs to combat invasive species. In total, the project will prevent 73.5 tons of sediment and 73.6 pounds of phosphorus from entering Lake Michigan over the life of the installed practices.

“The Great Lakes Sediment and Nutrient Reduction Program helped us stabilize a severely eroding ravine and reduce the total amount of stormwater runoff coming to that ravine, while transforming the surrounding landscape to a much more diverse and productive native ecosystem.”

Lori Artiomow
Hyslop Foundation, Inc.



Practices including grade stabilization (left) installed by the Hyslop Foundation under their GLSNRP grant helped to restore this previously severely eroded ravine to a less degraded state (right), preventing sediment and phosphorus from entering the Pike River.

13. Plum and Kankapot Creeks Right Time Conservation

Outagamie County Land Conservation Department (Wisconsin)

“The Great Lakes Sediment and Nutrient Reduction Program gave us the innovative and flexible funds needed to develop a dairy crop rotation that demonstrated continuous cover during vulnerable corn silage years can be accomplished with cost-sharing BMPs, proactive planning, and utilizing specialized equipment.”

Jeremy Freund
Outagamie County Land Conservation Department

The agricultural watersheds of Plum and Kankapot Creeks have experienced pollution challenges as rising dairy production increases the amount of manure runoff from fields which have little residue to hold soil in place. Outagamie County Land Conservation Department’s GLSNRP grant aimed to overcome barriers to conservation practice adoption by incentivizing planning, providing multi-year cost share for continuous cover, and providing innovative farm equipment to participating farmers. The continuous cover cropping system implemented with this project included the following sequence: overwintering fall cover crop, manure injection in growing cover crops, spring no-till, summer interseeding, and fall overwintering cover crops over a three-year commitment prior to rotating back into hay crops.

The project was able to install this long-term cropping contract on 200 unique acres for three continuous years.

Contracts with four producers included cover crops and conservation tillage on the 200 acres and assistance with conservation planning and troubleshooting. Project match was generated by contracted farms’ use of Outagamie County’s innovative soil health equipment to complement the traditional cropping best management practices. This included cover crops between corns rows in the summer on 543 acres and low disturbance manure injection on 1,519 acres to allow for manure to be injected into the growing cover crops. In total, the project is keeping 2,987.7 tons of sediment and 2,600 pounds of phosphorus on the ground and out of Green Bay and Lake Michigan annually.



Outagamie County Land Conservation District was able to work with landowners to install a continuous cover cropping system to span the seasons.

Disclaimers

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Any opinions, findings, conclusion, or recommendations expressed in this publication are those of the author(s) and do not necessarily reflect the views of the U.S. Department of Agriculture.

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The Great Lakes Commission is a binational government agency established in 1955 to protect the Great Lakes and the economies and ecosystems they support. Its membership includes leaders from the eight U.S. states and two Canadian provinces in the Great Lakes basin.

The GLC recommends policies and practices to balance the use, development, and conservation of the water resources of the Great Lakes and brings the region together to work on issues that no single community, state, province, or nation can tackle alone.

