

# Watershed Achievements Report

2017 Annual Report to the U.S. Environmental Protection Agency

Clean Water Act Section 319, Clean Water Fund,  
and Clean Water Partnership Projects in Minnesota



**This page left blank intentionally.**

# Bald Eagle Lake now meets water quality standards

Thanks to many partners and funding sources, [Bald Eagle Lake](#) in the northern Twin Cities is meeting state water quality standards for the first time since 1980. Once plagued by algal blooms and murky water, this lake near Hugo is now much healthier for recreation.

"This is an example of good science, strong collaboration, and fiscal responsibility resulting in a successful restoration project," said Bryan Bear, Hugo city administrator

The [Rice Creek Watershed District](#) worked with several partners and tapped many funding resources for the \$1.7 million project, including:

- \$497,000 from the Minnesota Board of Water and Soil Resources (BWSR) Clean Water Fund (CWF), established by the 2008 Legacy Amendment.
- \$400,000 Clean Water Partnership (CWP) loan from the Minnesota Pollution Control Agency (MPCA).
- Remainder from the watershed district and Bald Eagle Lake Water Management District, a special tax for lakeshore owners that was initiated by the property owners themselves.



*Barge spreads alum in lake to help reduce algae growth*

Partners in the lake restoration included the City of Hugo, lakeshore property owners, and a local golf course. Following the implementation of the project, phosphorus (P) and algae decreased by 67% and 69%, respectively, and clarity improved by 63%. Bald Eagle Lake is meeting state water quality standards for nutrients, algae, and clarity for the first time since 1980, when data collection began.

"Today we have more than 5 feet of water clarity on Bald Eagle Lake. I think it was closer to 8 or 10 feet this year in

August. Three years ago, we were lucky to have 1 foot. I no longer need to worry about my grandsons swimming in a toxic algae bloom!" said Gary Krejcarek. He has lived on or near the lake for 40 years and is president of the [Bald Eagle Area Association](#).

This project used a three-pronged approach to improve water quality in the lake. First, the lake was treated with aluminum sulfate, or "alum." Alum is a non-toxic material that attaches itself to P. Once alum and P are combined, P is no longer available to stimulate algae growth. This was Minnesota's largest full lake alum treatment.



*Bald Eagle Lake alum treatment*

Second, the local Oneka Ridge Golf Course installed a system that captures stormwater and reuses it for watering the golf course. This reduces the amount of stormwater flowing to the lake and reduces the use of groundwater for irrigation.

Finally, 10 residential rain gardens were installed and 6 shoreline areas restored. They capture stormwater and reduce runoff that carries P into the lake. The results may help the lake move off the impaired waters list, a rare accomplishment and a long-term process.

The project earned the Rice Creek Watershed District a special award in 2016 from the Minnesota Association of Watershed Districts. "This is particularly satisfying because the award is heavily based on the measurable results in the lake. The fact that the homeowners are pleased makes it even more gratifying," said Matt Kocian, the district's lake and stream specialist.

The Rice Creek Watershed District encompasses about 186 square miles of urban and rural lands in Anoka,



*Rain garden in the Rice Creek Watershed District*

Hennepin, Ramsey, and Washington Counties with the purpose of conserving and restoring water resources for the beneficial use of current and future generations.

The project was partially funded by the Bald Eagle Lake Water Management District, a special tax district for lakeshore property owners that was initiated by the homeowners themselves.

Additional funding came from the BWSR's CWF of the Clean Water, Land, and Legacy Amendment and a CWP loan from the MPCA.

This project is a great example of how state agencies like the MPCA and BWSR can work with local partners like Rice Creek Watershed District and the City of Hugo along with local businesses and property owners to use the CWF to restore waters based on scientific studies and long-term efforts.

# Watershed Achievements Report

## 2017 Annual Report to the U.S. Environmental Protection Agency

Clean Water Act Section 319, Clean Water Fund,  
and Clean Water Partnership Projects in Minnesota



*A portion of the Clean Water Partnership Grant funds that are passed through to local units of government for nonpoint source implementation projects listed in this report are appropriated from the Clean Water, Land, and Legacy Amendment.*

*Cover photo: Lake Koronis, Upper Mississippi River Basin Watershed. For more information, see page 102.*

wq-cwp8-21

<b>A Success Story . . .Bald Eagle Lake</b> .....	<b>3</b>
<b>List of Acronyms</b> .....	<b>8</b>
<b>Introduction</b> .....	<b>9</b>
<b>Maps</b>	
Statewide intensive watershed monitoring schedule and progress .....	13
Watershed Restoration and Protection Strategies (WRAPS) progress .....	14
Major watersheds Stressor Identification status .....	15
Major watersheds model status .....	16
Impaired waters in Minnesota .....	17
Approved TMDLs in Minnesota .....	18
Tracking progress .....	19
Previous impairments now meeting water quality standards due to corrective actions .....	21
<b>eLINK results from Section 319 and CWP projects August 2007 – August 2017</b> .....	<b>22</b>
<b>All projects awarded through 2017</b> .....	<b>26</b>
<b>Summary of statewide watershed project activity</b> .....	<b>30</b>
<b>Statewide</b> .....	<b>31</b>
Chloride Reduction Outreach Program .....	32
eLINK Database Support – FFY 2016 .....	33
HSPF Scenario Application Manager (SAM) Training and Testing Support .....	35
Linking Water Storage BMPs to Watershed Goals .....	37
Reducing Phosphorus Runoff from Livestock Farms .....	39

Turf and Winter Maintenance Training .....	41
<b>Statewide active projects.....</b>	<b>42</b>
<b>Cedar River Basin .....</b>	<b>43</b>
<b>Cedar River Basin active projects .....</b>	<b>44</b>
<b>Des Moines and Missouri River Basins .....</b>	<b>45</b>
Heron Lake T <sup>o</sup> MDL Phosphorus Reduction Project.....	46
Jack and Okabena Creek Sediment Reduction Project .....	47
<b>Des Moines and Missouri River Basins active projects.....</b>	<b>48</b>
<b>Lake Superior Basin.....</b>	<b>49</b>
<b>Lake Superior Basin active projects .....</b>	<b>50</b>
<b>Lower Mississippi River Basin.....</b>	<b>51</b>
Dakota County Nitrate Reduction Project.....	52
<b>Lower Mississippi River Basin active projects .....</b>	<b>53</b>
<b>Minnesota River Basin .....</b>	<b>55</b>
Cottonwood-Redwood River Septic Loan Program.....	56
Greater Blue Earth Urban Retrofit Initiative .....	58
Collaborative for Sediment Source Reduction: Greater Blue Earth River Basin .....	60
Elm Creek Tile Outlet Treatment Trains.....	62
Lake Minnewaska Phase I Resource Investigation .....	64
Cottonwood Streambank Inventory and Prioritization Project.....	66
Le Sueur Watershed Targeted Conservation Practices.....	68
Blackhawk Lake Protection Project.....	70
Credit River Protection Plan.....	71
Middle Minnesota River Low Dissolved Oxygen TMDL Project.....	72
Hawk Creek Watershed Nitrogen Reduction Project .....	74
Pomme de Terre River Protective Buffer Project .....	75
<b>Minnesota River Basin active projects .....</b>	<b>76</b>
<b>Red River Basin.....</b>	<b>83</b>
<b>Red River Basin active projects .....</b>	<b>84</b>
<b>St. Croix River Basin.....</b>	<b>85</b>
Forest Lake North Shore Subwatershed Assessment.....	86
Forest Lake Stormwater Filtration Retrofit (Hilo Lane).....	87
Sand and Long Lake Enhancement Project Continuation.....	89
Kanabec Water Resources Protection Project .....	90

<b>St. Croix River Basin active projects .....</b>	<b>91</b>
<b>Upper Mississippi River Basin .....</b>	<b>93</b>
Targeted Fertilizer Application Reduction Project .....	94
Platte River Restoration/Protection Project .....	95
Lake McCarrons Subwatershed Clean Watershed Partnership BMP Project.....	97
Crow Lakes Protection and Resource Investigation.....	99
Crow River Middle Fork Watershed Resource Investigation .....	100
Lake Koronis Subwatershed Protection Project .....	102
<b>Upper Mississippi River Basin active projects.....</b>	<b>104</b>

# List of acronyms

<b>BMPs</b> best management practices	<b>LGU</b> Local Government Unit
<b>BOD</b> biochemical oxygen demand	<b>LiDAR</b> Light Detection and Ranging
<b>BWSR</b> Minnesota Board of Water and Soil Resources	<b>MDA</b> Minnesota Department of Agriculture
<b>CFU</b> colony forming units	<b>mg/L</b> milligrams/liter
<b>CLFLWD</b> Comfort Lake – Forest Lake Watershed District	<b>mi<sup>2</sup></b> square mile
<b>CMM</b> Conservation Marketplace Midwest	<b>MPCA</b> Minnesota Pollution Control Agency
<b>COD</b> chemical oxygen demand	<b>MS4</b> Municipal Separate Storm Sewer Systems
<b>CRP</b> Conservation Reserve Program	<b>MVTL</b> Minnesota Valley Testing Laboratory
<b>CRWP</b> Cannon River Watershed Project	<b>N</b> Nitrogen
<b>CWF</b> Clean Water Fund	<b>N/N</b> Nitrogen-Nitrate
<b>CWP</b> Clean Water Partnership	<b>NPS</b> nonpoint source
<b>DEM</b> Digital Elevation Model	<b>NPSMPP</b> Nonpoint Source Management Program Plan
<b>DNR</b> Minnesota Department of Natural Resources	<b>NRCS</b> Natural Resource Conservation Service
<b>DO</b> dissolved oxygen	<b>NWQI</b> National Water Quality Initiative
<b>EPA</b> U.S. Environmental Protection Agency	<b>P</b> Phosphorus
<b>EQuIS</b> Environmental Quality Information System	<b>PAT</b> Pre-processing Application Translator
<b>FC</b> Fecal Coliform	<b>RCRCA</b> Redwood-Cottonwood Rivers Control Area
<b>FLUX32</b> software used for calculation of material fluxes (loads) in streams	<b>SAM</b> Scenario Application Manager
<b>FTE</b> full time equivalent	<b>Section 319</b> Section 319 Grant Program
<b>GBERBA</b> Greater Blue Earth River Basin Alliance	<b>SEMWRB</b> Southeast Minnesota Water Resources Board
<b>GIS</b> geographic information system	<b>SRF</b> state revolving fund
<b>GPS</b> global positioning system	<b>SRWD</b> Sauk River Watershed District
<b>HEI</b> Houston Engineering, Inc.	<b>SSTS</b> Subsurface Sewage Treatment System
<b>HCWP</b> Hawk Creek Watershed Project	<b>SWCD</b> soil and water conservation district
<b>HICW</b> High Island Creek Watershed	<b>SWPTSA 5</b> Southwest Prairie Technical Service Area 5
<b>HICWD</b> High Island Creek Watershed District	<b>T/mi<sup>2</sup></b> tons per square mile
<b>HICWJPB</b> High Island Creek Watershed Joint Powers Board	<b>T/yr</b> tons per year
<b>HLWD</b> Heron Lake Watershed District	<b>TMDL</b> total maximum daily load
<b>HSPF</b> Hydrologic Simulation Program FORTRAN	<b>TOTT</b> Tile Outlet Treatment Train
<b>HUC</b> hydrologic unit code	<b>TP</b> total phosphorus
<b>IBI</b> index of biological integrity	<b>TSS</b> total suspended solids
<b>IESF</b> iron enhanced sand filtration	<b>UMN</b> University of Minnesota
<b>IPM</b> integrated pest management	<b>µg/L</b> micrograms per liter
<b>IWAV</b> Impaired Waters Viewer	<b>WASCOB</b> Water and Sediment Control Basin
<b>IWM</b> Intensive Watershed Monitoring	<b>WFDMR</b> West Fork Des Moines River
<b>JD2</b> Judicial Ditch 2	<b>WMA</b> Winter Maintenance Assessment
<b>LARS</b> Local Annual Reporting System	<b>WRAC</b> Water Resources Advisory Committee
<b>lbs</b> pounds	<b>WRAPS</b> Watershed Restoration and Protection Strategies
<b>lbs/yr</b> pounds per year	<b>WRC</b> Water Resources Center
	<b>WWTP</b> Wastewater Treatment Plant



## Introduction

Minnesota's water resources are treasured by its citizens for the beneficial uses they provide including recreation, drinking water, aquatic life, industrial, and agricultural uses. With more than 10,000 lakes, 100,000 river and stream miles, and extensive groundwater systems, water is a major part of Minnesota's culture, economy, and natural ecosystems.

Three programs provide local governments with resources to restore and protect surface water, with a special focus on nonpoint pollution sources (NPS).

1. The Minnesota Pollution Control Agency (MPCA) relies on the Federal Section 319 Grant program (Section 319) to provide funding for efforts to reduce nonpoint sources of pollution.
2. The second source, the Clean Water Partnership (CWP) grant program was defunded by the state legislature in 2015. However, previous grants are underway and will be until June 2018.
3. Finally, the CWP loan program provides low interest loans to local units of government for best management practices (BMPs) which reduce NPS water pollution in local areas.

The Watershed Achievements Report is an annual report on the efforts supported by these three funding resources and the state's progress for reducing NPS pollution. This report describes the newly awarded, active, and final nonpoint source projects for statewide and watershed-based projects.

## Watershed Program Accomplishments – 2017

### Minnesota Watershed Approach Update

The State of Minnesota has adopted the Minnesota Watershed Approach to address the state's 80 major watersheds, denoted by 8-digit hydrologic unit code or HUC. The Minnesota Watershed Approach incorporates **water quality assessment, watershed analysis, civic engagement, planning, implementation, and measurement of results** into a 10-year cycle that addresses both restoration and protection.

### What is the WRAPS Report?

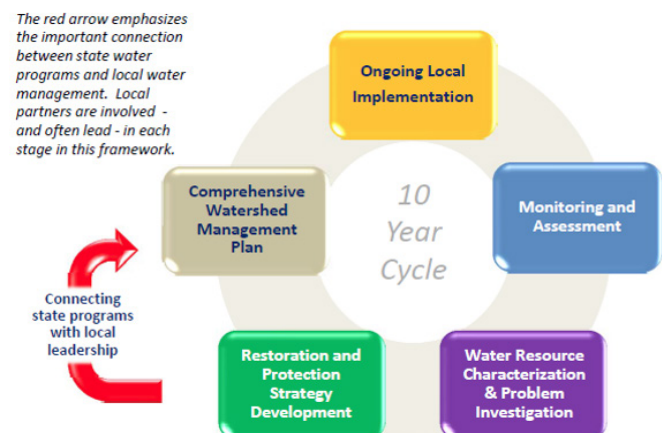
Along with the watershed approach, the MPCA developed a process to identify and address threats to water quality in each of these major watersheds. This process results in the WRAPS or the Watershed Restoration and Protection Strategy report. WRAPS is based on data from watershed monitoring, impairment assessment, computer modeling, stressor identification and total maximum daily load (TMDL) studies.

Using this data, the Minnesota Watershed Approach facilitates a more cost-effective and comprehensive characterization of multiple water bodies and overall watershed health, including both protection and restoration efforts. A key aspect of this effort is to develop and utilize watershed-scale models and other tools to identify strategies and actions for point source and NPS pollution that will cumulatively achieve water quality targets.

For NPS pollution, this report informs local planning efforts based on the data available from MPCA and local partners. But ultimately the local partners decide what work will be included in their local plans by using adaptive management and any new data that becomes available. This report also serves to address the U.S. Environmental Protection Agency's (EPA) Nine Minimum Elements, helping to qualify applicants for eligibility for Clean Water Act Section 319 implementation funds.

### Status of the Minnesota Watershed Approach (10-year cycle)

All 80 watersheds in Minnesota have restoration and protection strategy projects underway. WRAPS reports



have been completed for 20% of the watersheds and more are on track for completion this year. For more information: [Minnesota Watershed Approach](#).

### Surface water protection and restoration

Over the last eight years, we have increased our monitoring efforts. By the end of 2017, we will have **all watersheds** monitored. In 2018, the monitoring cycle starts again to help us see if water quality has improved.

### Intensive Watershed Monitoring Cycle Two

The MPCA is embarking on our second 10-year cycle of watershed-based lake and stream monitoring, which includes biological, fish contaminant, water quality, and pollutant load sampling. The first 10 years of Intensive Watershed Monitoring (IWM) sought to characterize the condition of lakes and streams to target restoration and protection efforts. The purpose of this next ten years of monitoring is to gather and evaluate sufficient data to measure progress in restoring and protecting lakes and streams, fill monitoring gaps to guide local planning and implementation efforts, and begin to track long-term changes in water quality and biological communities over time. As the MPCA returns to watersheds, we are reducing core monitoring to provide monitoring capacity for other state and local needs, such as to support permitting decisions or to address a local monitoring need. To date, MPCA has begun implementing this modified approach in three watersheds with monitoring underway, and an additional five watersheds with monitoring planned to begin in 2018.

Progress is also being made in completing TMDL studies for impaired waters in the state. TMDL studies are being done on a watershed scale as part of the watershed approach, which has accelerated the pace on TMDL study completions.

### One Watershed One Plan and WRAPS Coordination

The Minnesota Board of Water and Soil Resources' (BWSR) vision for [One Watershed, One Plan](#) (1W1P) is to align local water planning on major watershed boundaries (slightly adjusted for planning purposes) with state strategies towards prioritized, targeted, and measurable implementation plans – the next logical step in the evolution of water planning in Minnesota.

Five watershed planning areas were selected for piloting the 1W1P: Red Lake River, Lake Superior North, North Fork Crow River, Yellow Medicine River, and Root River.

In 2016, Clean Water Fund (CWF) 1W1P Grants were awarded for these planning areas:

1. Buffalo-Red River Watershed
2. Lower St. Croix River Watershed
3. Mustinka/Bois de Sioux River Watershed
4. Pine River Watershed
5. Sauk River Watershed
6. Watonwan River Watershed

The BWSR approved seven new planning grants for the *One Watershed, One Plan* program in 2017:

1. Cannon River Watershed
2. Cedar River Watershed
3. Lake of the Woods Watershed
4. Leech Lake Watershed
5. Missouri River Basin
6. Pomme de Terre Watershed
7. Thief River Watershed

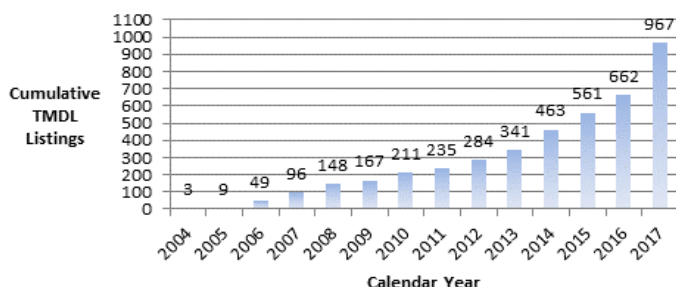
### Using WRAPS Reports in Local Water Planning

Local governments can incorporate the elements of a WRAPS report into their local water planning process. It is important to connect local water management programs and activities and WRAPS reports because each informs the other. Water plan refers to County Water Plans, Watershed District Plans, Watershed Management Organization Plans, and Comprehensive Watershed Management Plans (1W1P).

A WRAPS report can be valuable to understanding the broader watershed-wide water quality and water resource issues by providing information such as the relative magnitude and type of contributing

**Approved TMDLs in Minnesota**

July 2017



pollutant sources and the relationships between water management practices and water quality conditions. The protection-related information in WRAPS is designed to help prioritize, target, and deliver measurable improvements in protection outcomes. The WRAPS may also incorporate statewide water quality plans, such as the Nutrient Reduction Strategy and sediment strategy reports where available; potentially streamlining the development of local water plan priorities. WRAPS strategies and actions to restore impaired waters should be incorporated into a water plan. If WRAPS strategies are not identified as local priorities, the plan should include a description of why not.

### **Governor Dayton's new goal to improve water quality in Minnesota 25 percent by 2025**

**February 3, 2017**

Governor Mark Dayton announced a new "25 by '25" Water Quality Goal, which would spur innovation and collaboration around strategies to improve Minnesota's water quality 25 percent by 2025. Without additional action, the quality of Minnesota's waters is expected to improve only 6 to 8 percent by 2034. If approved by the Legislature, Governor Dayton's proposed new goal would engage local governments, farmers, scientists, environmental groups, and business leaders in a collaborative effort to address Minnesota's water quality challenges.

"Without an ambitious, achievable goal, the quality of our water will continue to deteriorate," said Governor Dayton. "Minnesotans must set this goal now, and then work together to achieve it. I ask all Minnesotans to join me in finding solutions that will ensure our children and grandchildren inherit clean water to drink, swim, and fish in. This is everyone's challenge, and everyone's responsibility."



The "25 by '25" goal would engage local governments, businesses, farmers, scientists, and others in a new collaborative effort to restore and improve water quality across Minnesota

Governor Dayton's proposal would not add new regulations, but would instead drive public engagement and partnerships to address Minnesota's water quality challenges.

### **Water quality town hall meetings to be held across Minnesota**

*Minnesotans are encouraged to participate and continue important conversations around improving the state's water quality 25 percent by 2025.*

Governor Mark Dayton announced a series of Water Quality Town Hall meetings beginning in late July 2017. The ten town halls will offer Minnesotans an opportunity to discuss the water quality challenges facing their communities and our state, learn from experts, and engage with policymakers. The town hall meetings build on the momentum from Governor Dayton's "25 by 25" Water Quality goal proposal, announced [earlier this year](#).



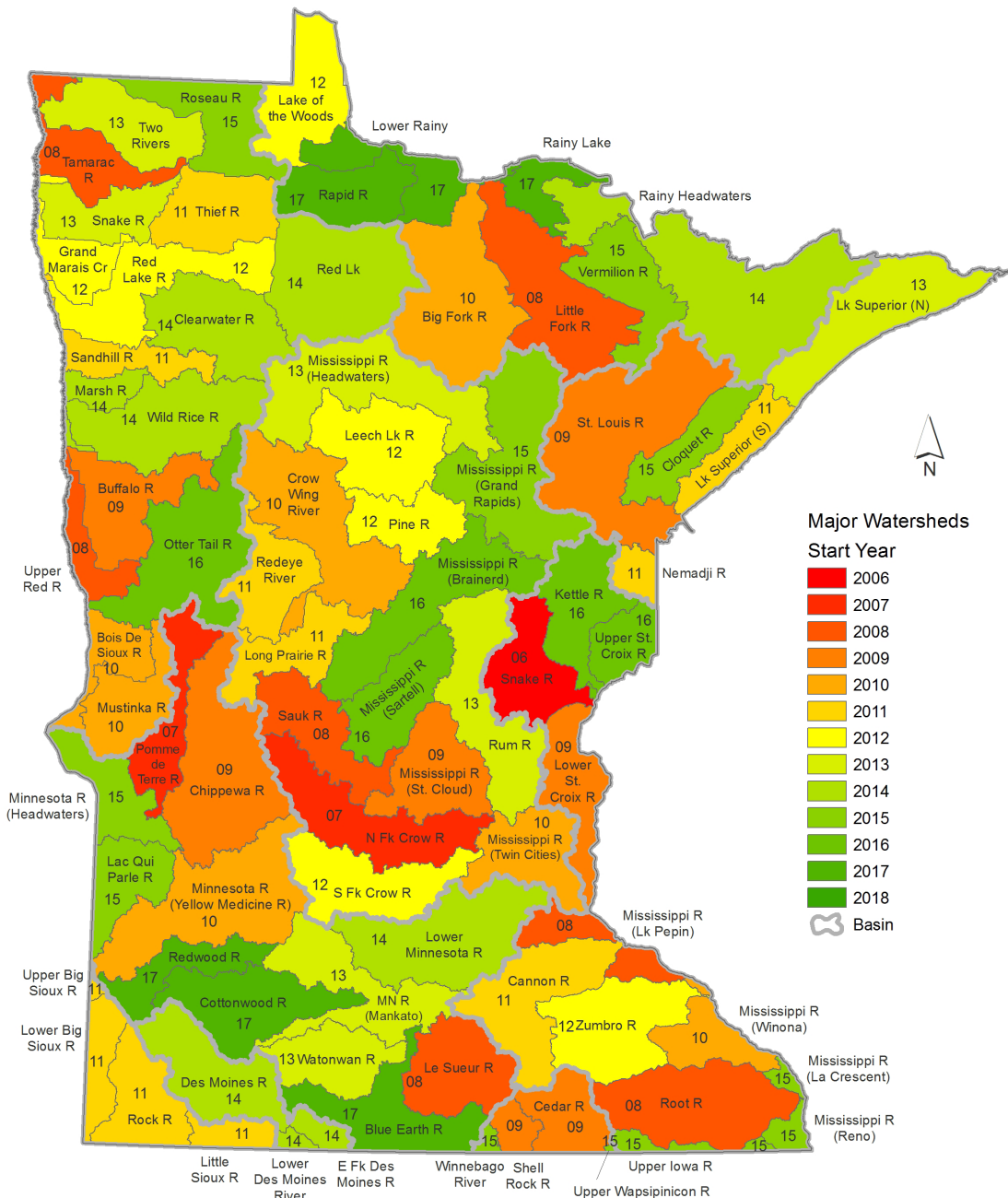
['I am here to listen:' Governor visits Marshall for water quality town hall.](#)  
*Marshall Independent | August 19, 2017*

"All Minnesotans have a stake in water that's safe for drinking, swimming, and fishing," said Governor Dayton. "These town hall meetings will further the important conversations already happening across Minnesota around water quality. Together we can develop strategies and solutions that work for all of our communities."

The town hall meetings will be attended by key members of Governor Dayton's Cabinet who want to hear from Minnesotans about ways to improve the state's water quality at the local level. These town hall meetings are free to attend and open to the public.

### Statewide intensive watershed monitoring schedule and progress

Minnesota’s Watershed Approach starts with Intensive Watershed Monitoring (IWM) around the state. Because of MPCA’s monitoring efforts, combined with other local monitoring efforts, Minnesota is well on its way to a comprehensive assessment of the waters of the state on a 10-year cycle, wrapping up in 2018. The MPCA has now initiated or completed IWM in 69 of the state’s major watersheds – that is approximately 85% of the state’s watersheds. The level of effort of this monitoring and the amount and types of data being collected in Minnesota’s Watershed Approach is well beyond that of past monitoring efforts.

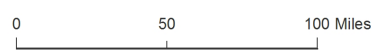


**Major Watersheds**

**Start Year**

- 2006
- 2007
- 2008
- 2009
- 2010
- 2011
- 2012
- 2013
- 2014
- 2015
- 2016
- 2017
- 2018

Basin

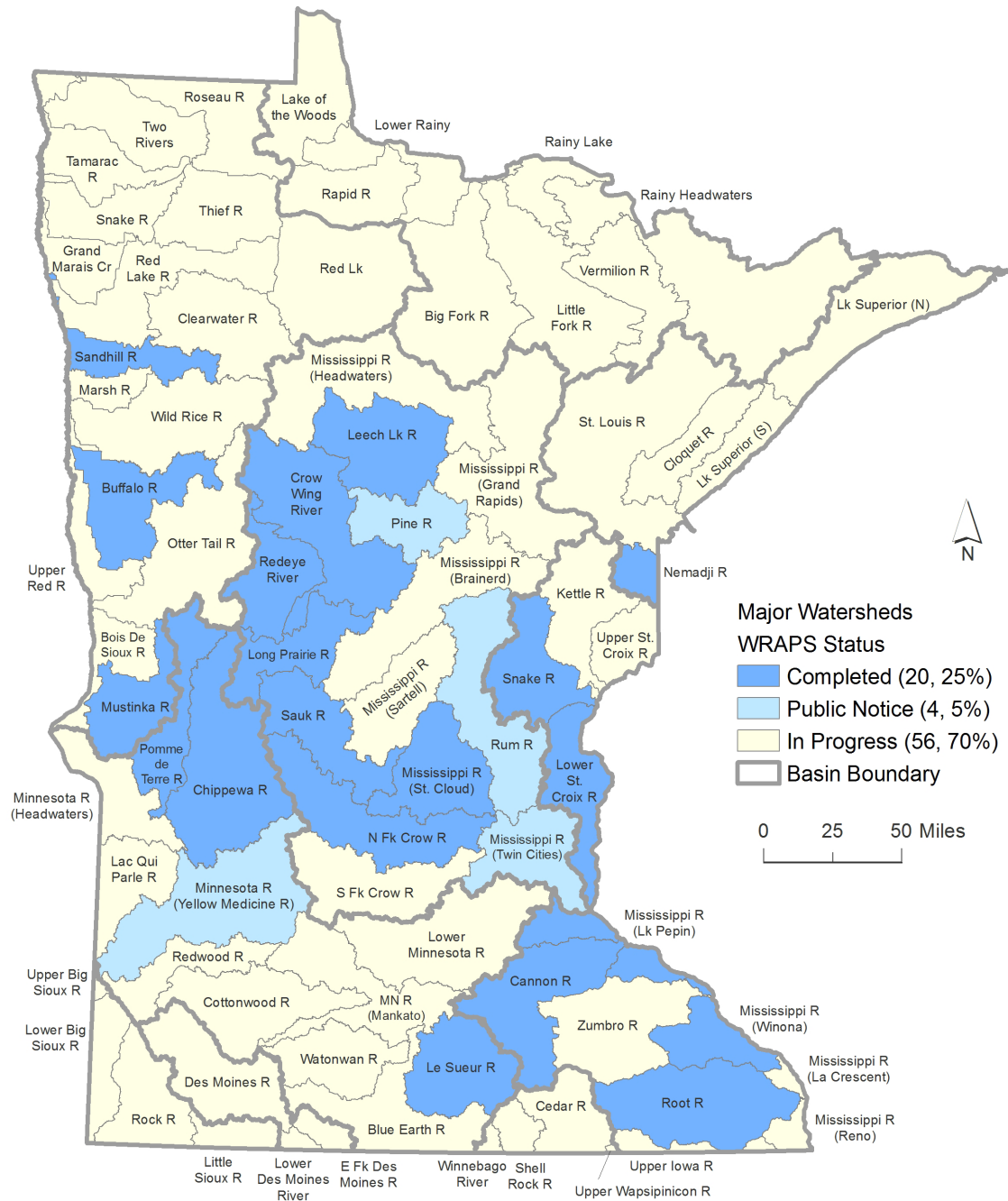


June 2016

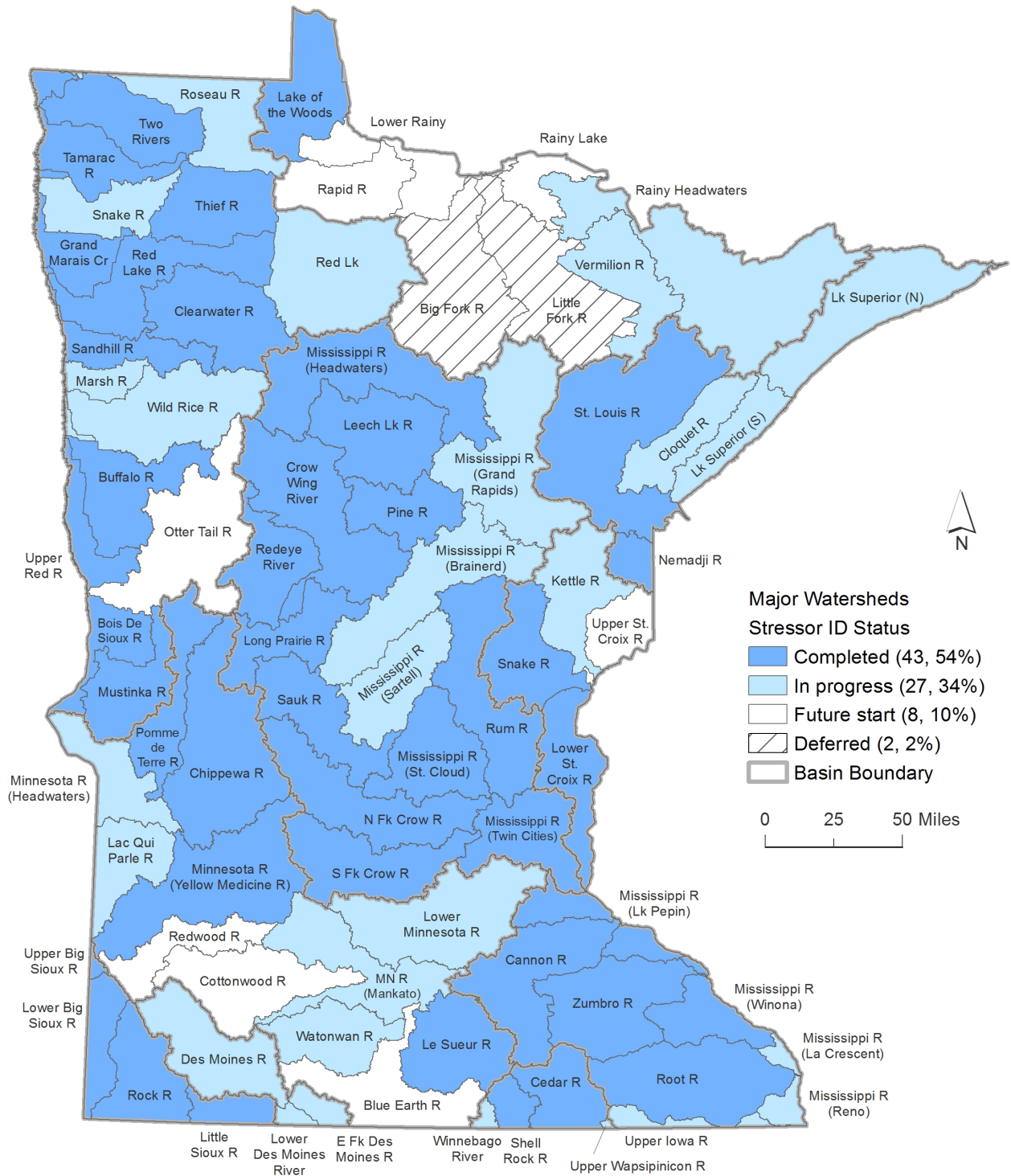


### Watershed Restoration and Protection Strategies (WRAPS) progress

WRAPS reports for the major watersheds in Minnesota are completed or underway for all except one watershed. There are eight completed WRAPS studies and work in the other watersheds is underway with monitoring, watershed modeling, biological stressor work, and/or a WRAPS project in progress.



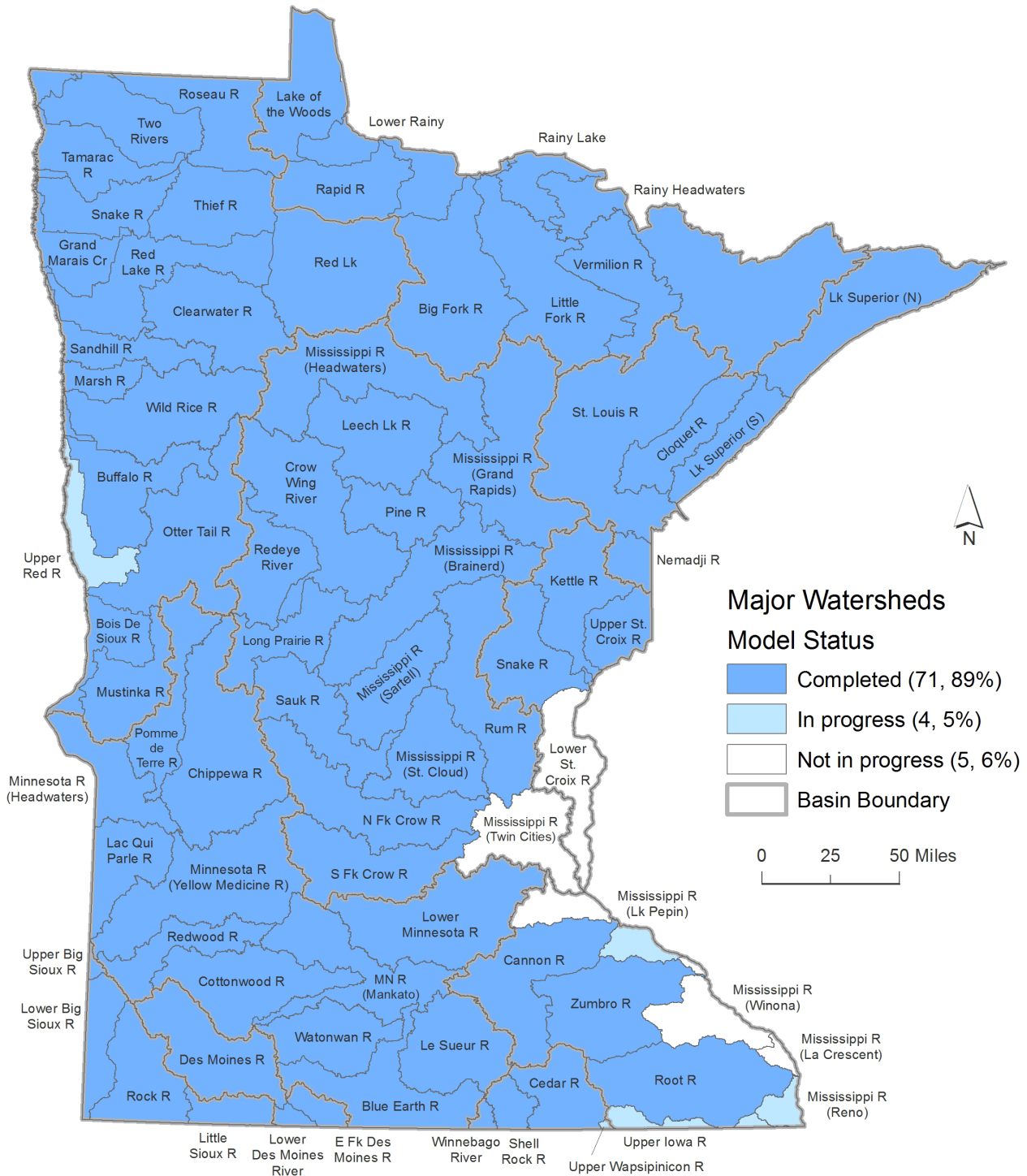
### Major watersheds Stressor Identification status



June 2017



### Major watersheds model status



June 2017

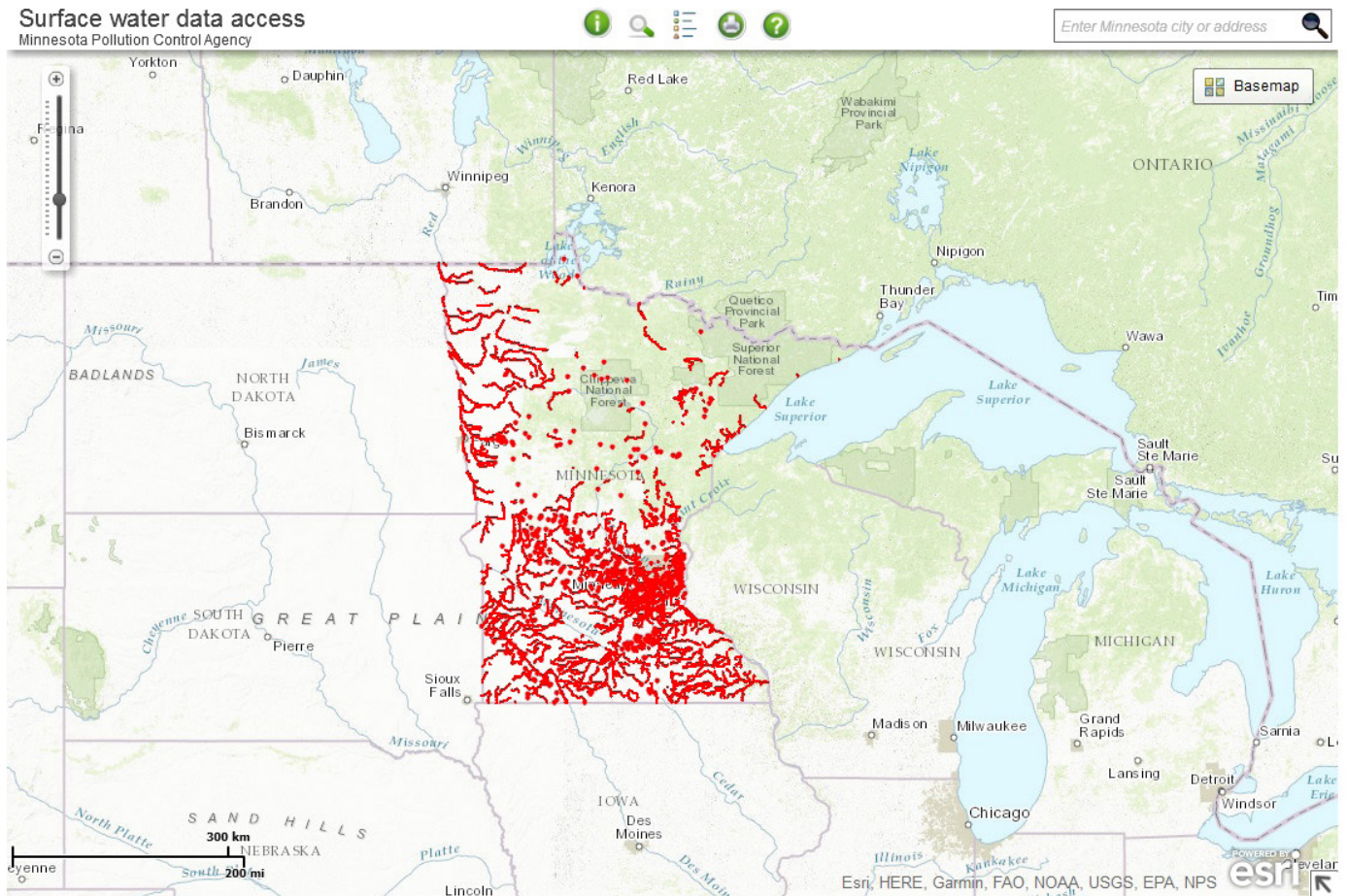




## Impaired waters in Minnesota

Impaired waters in Minnesota can be viewed using the MPCA web-based mapping application Impaired Waters Viewer (IWAV). The graphic below is a screen shot of the application that is available at this internet address:

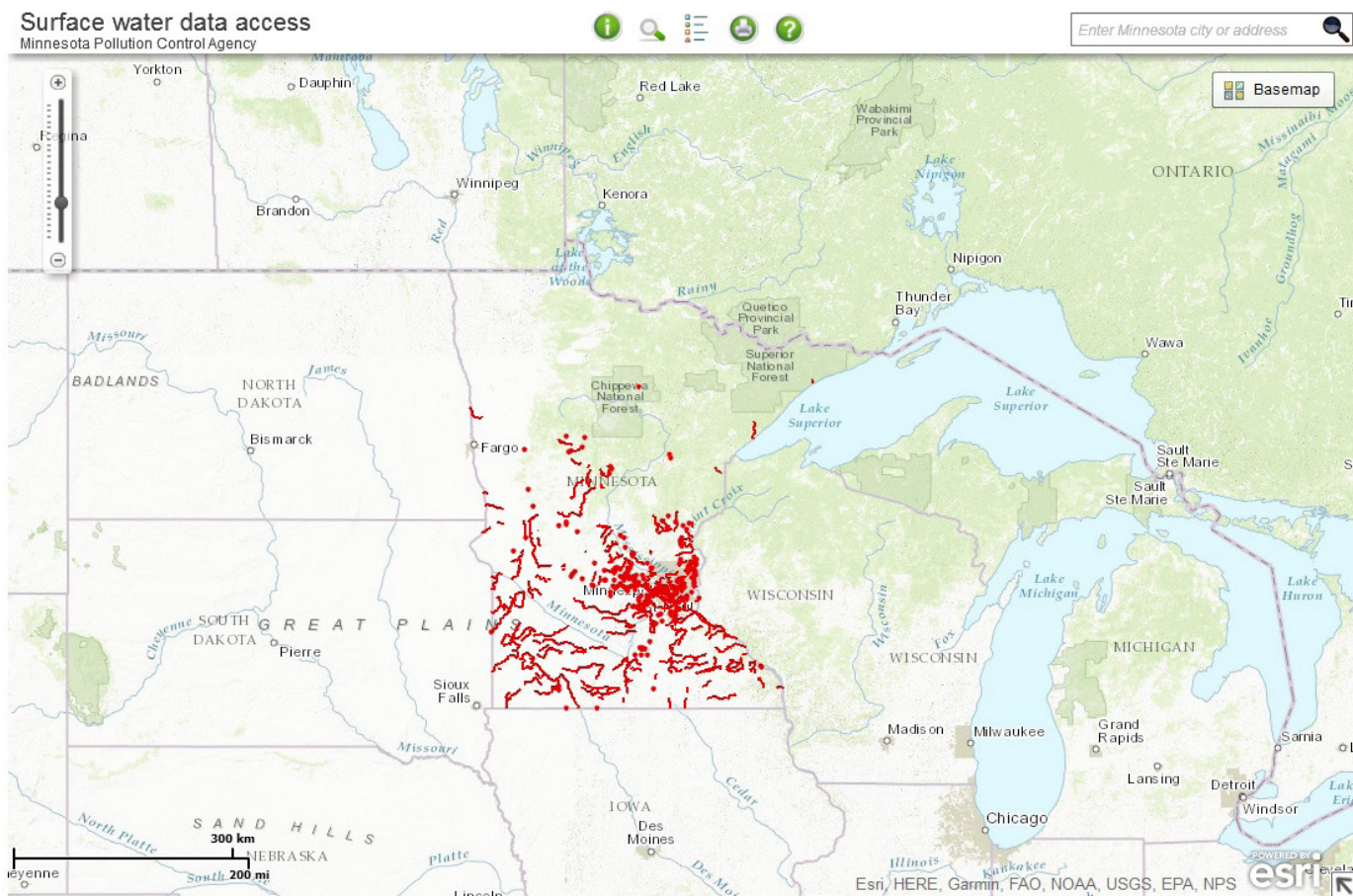
<https://www.pca.state.mn.us/water/impaired-waters-viewer-iwav>



### Approved TMDLs in Minnesota

Approved TMDLs in Minnesota can be viewed using the MPCA web-based mapping application IWAV. The graphic below is a screen shot of the application that is available at this internet address:

<https://www.pca.state.mn.us/water/impaired-waters-viewer-iwav>



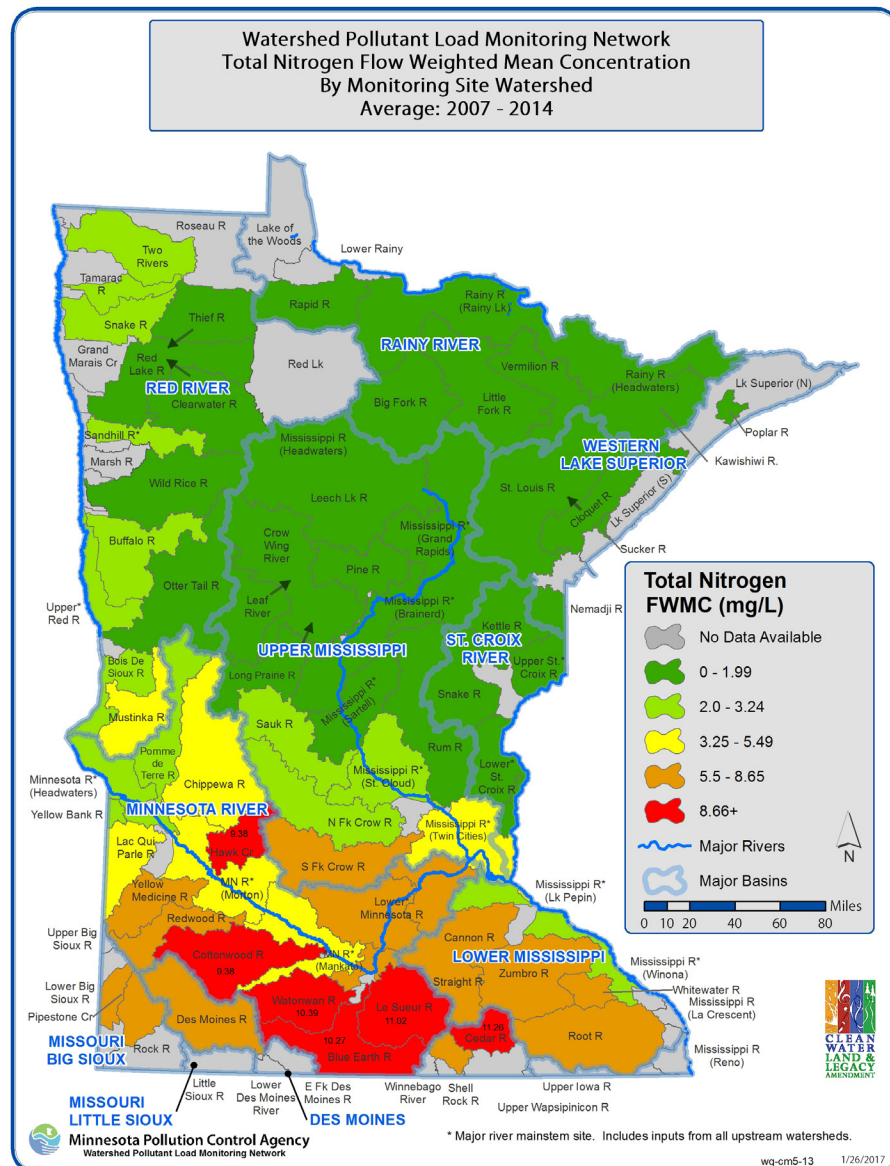
## Tracking progress

January 2017

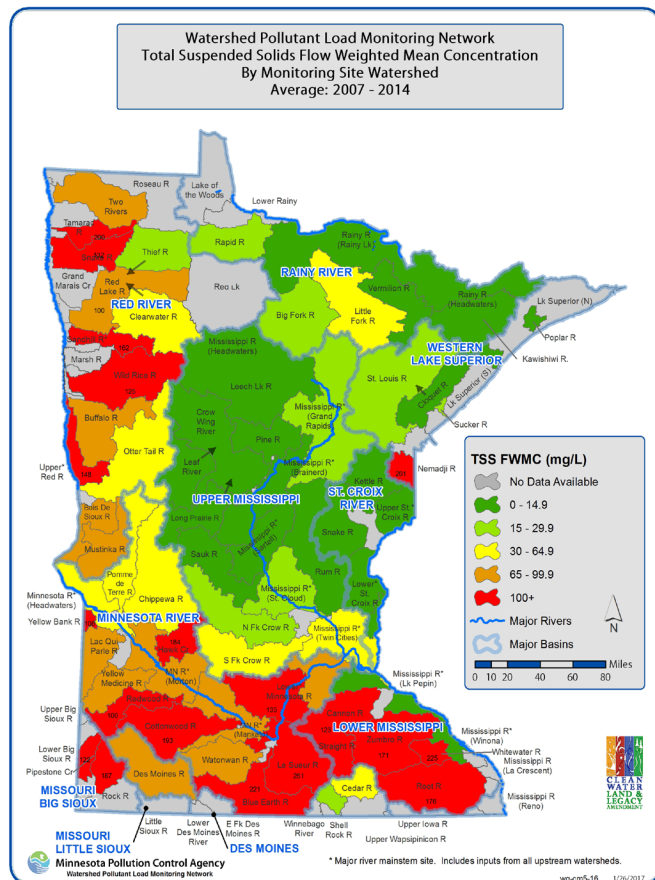
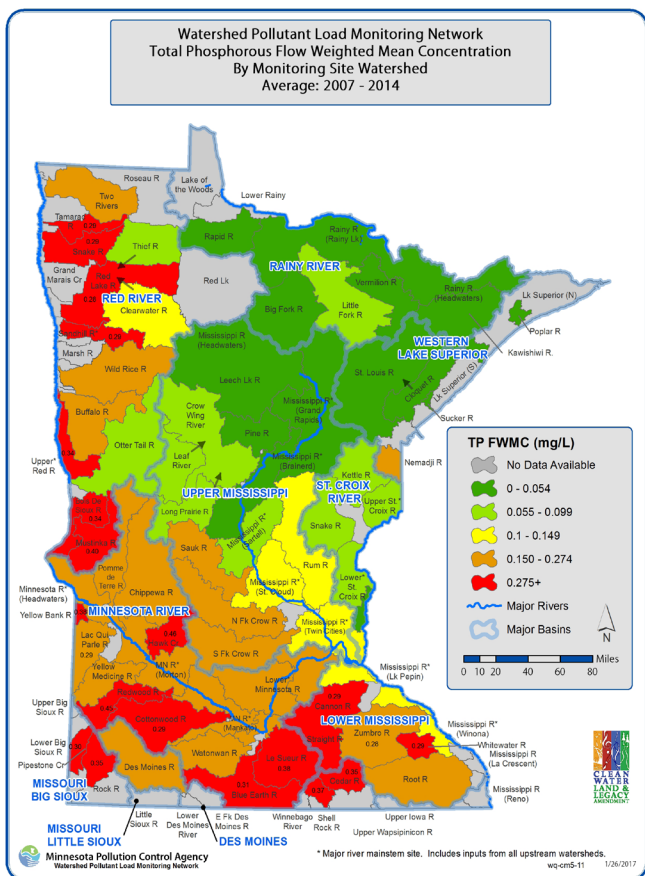
The Watershed Pollutant Load Monitoring Network is designed to obtain spatial and temporal pollutant load information from Minnesota's rivers and streams and track water quality trends. This long-term program utilizes state and federal agencies, universities, local partners and MPCA staff to collect water quality and flow data to calculate pollutant loads. Monitoring sites span three ranges of scale:

- Basin – major river main stem sites along the Mississippi, Minnesota, Rainy, Red, and St. Croix rivers
- Major Watershed – tributaries draining to major rivers with an average drainage area of 1,350 mi<sup>2</sup> (8 digit hydrologic unit code [HUC] scales)
- Subwatershed – major branches or nodes within major watersheds with average drainage areas of approximately 300-500 mi<sup>2</sup>

Most installations occurred in 2008 and 2009, all sites were installed by the end of 2010 and intensive sampling began the year following installation.



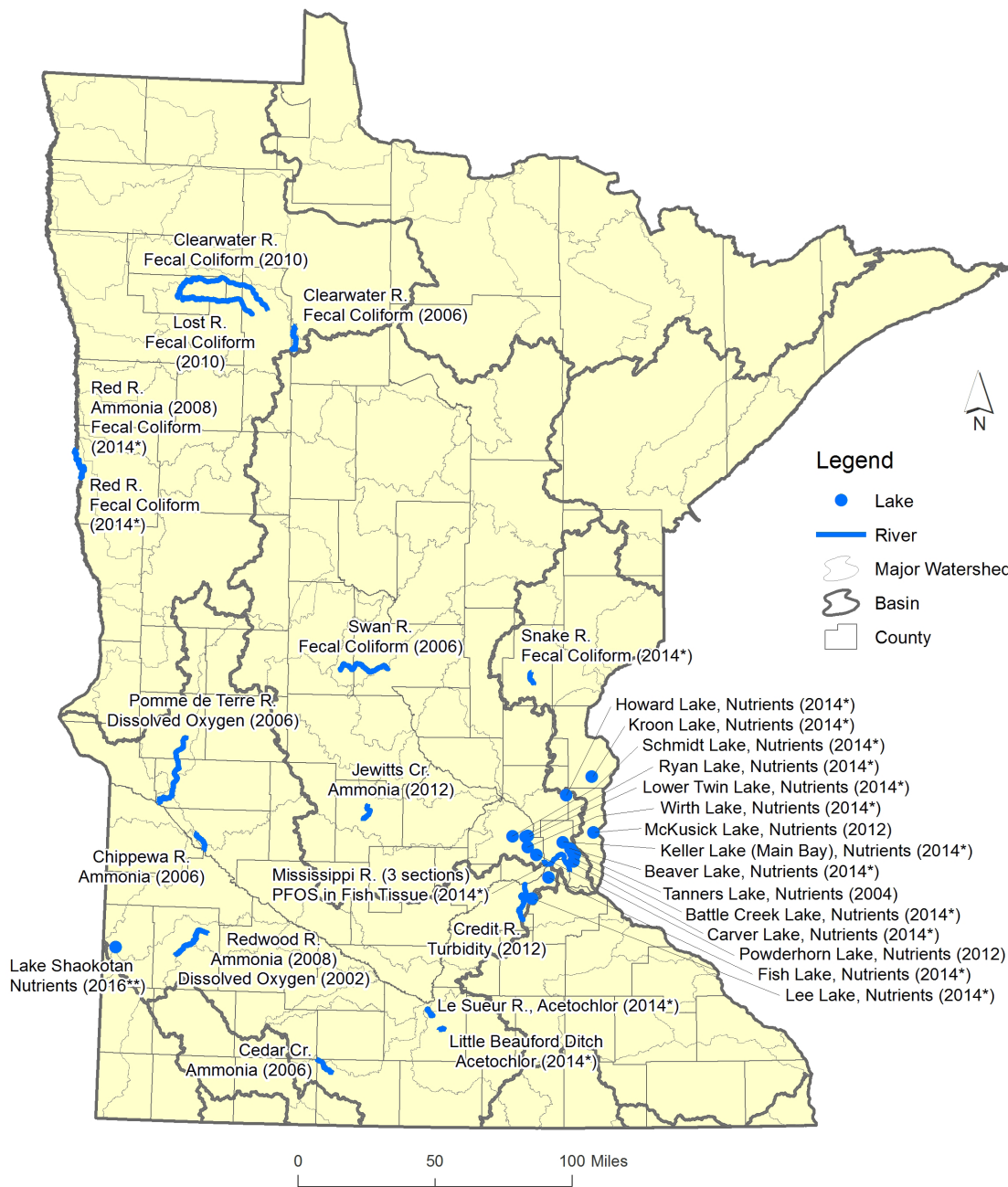
# Tracking progress continued



# Previous impairments now meeting water quality standards due to corrective actions

January 2017

36 Impairments



\* Proposed during the 2014 listing cycle. Currently under review for EPA approval.  
 \*\* Proposed during the 2016 listing cycle. Currently under review for EPA approval.

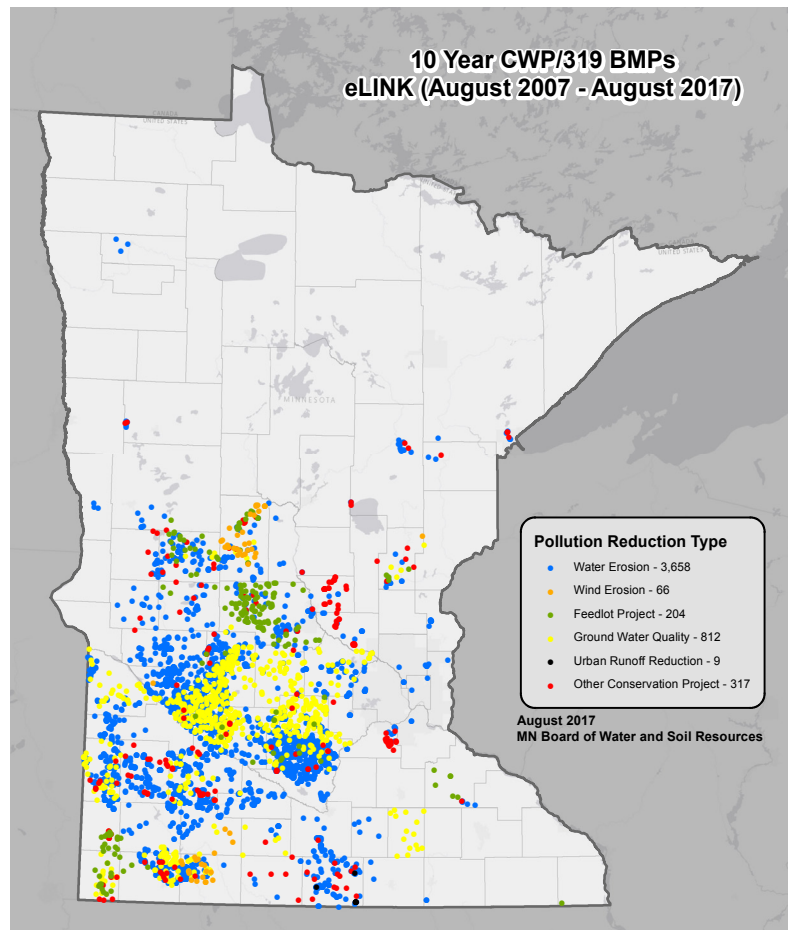
# eLINK results from Section 319 and CWP projects August 2007 – August 2017

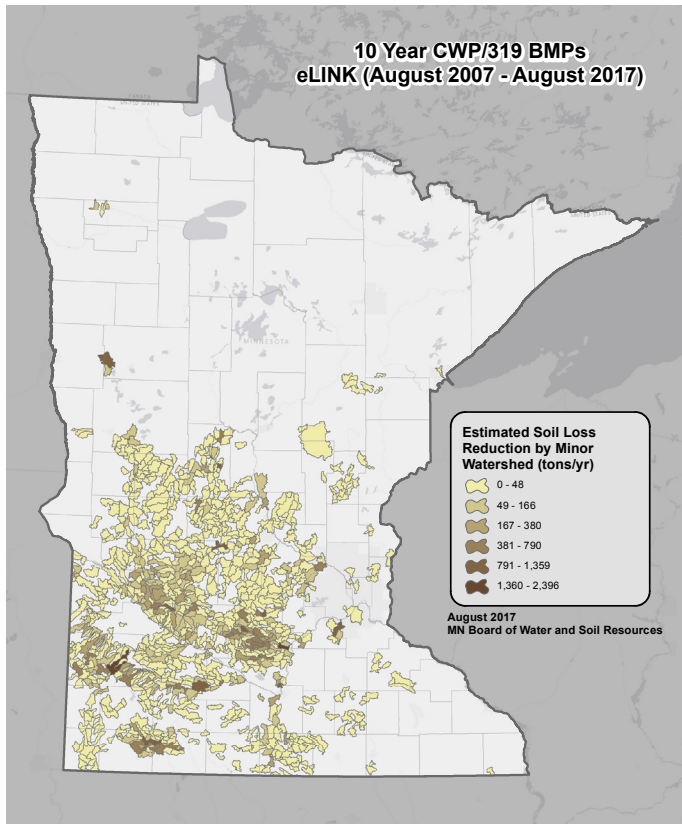
The following table shows progress through August 2017 based on reporting data from eLINK (August 2007 – August 2017). Based on eLINK reporting by CWP and Section 319 project partners, these projects have reduced **soil loss** from August 2007 through August 2017 by more than 65,133 tons per year (T/yr). During the same period, **sedimentation** was reduced by more than 76,450 T/yr, **phosphorus (P)** loading by more than 109,529 pounds per year (lbs/yr), and **nitrogen** reduction by more than 221,126 lbs/yr. This report only reflects the last 10 years.

Pollution Reduction Estimate Type	# of BMPs	Estimated Soil Loss Reduction (tons/yr)	Estimated Sediment Reduction (tons/yr)	Estimated Phosphorus Reduction (lbs/yr)	Estimated Nitrogen Reduction (lbs/yr)*
Feedlot Project	196	0	0	6,450	12,250
Ground Water Quality	734	0	4,549	6,570	14,124
Other Conservation Project	337	2,149	7,933	13,136	27,424
Urban Runoff Reduction	7	0	1	1	1
Water Erosion	5,613	62,776	63,967	83,371	167,326
Wind Erosion	65	208	0	1	1
<b>Total</b>	<b>6,952</b>	<b>65,133</b>	<b>76,450</b>	<b>109,529</b>	<b>221,126</b>

\* If no nitrogen reduction was reported, then estimated nitrogen was calculated by doubling estimated phosphorus

CWP/Section 319 BMPs  
eLINK (2007 – present)

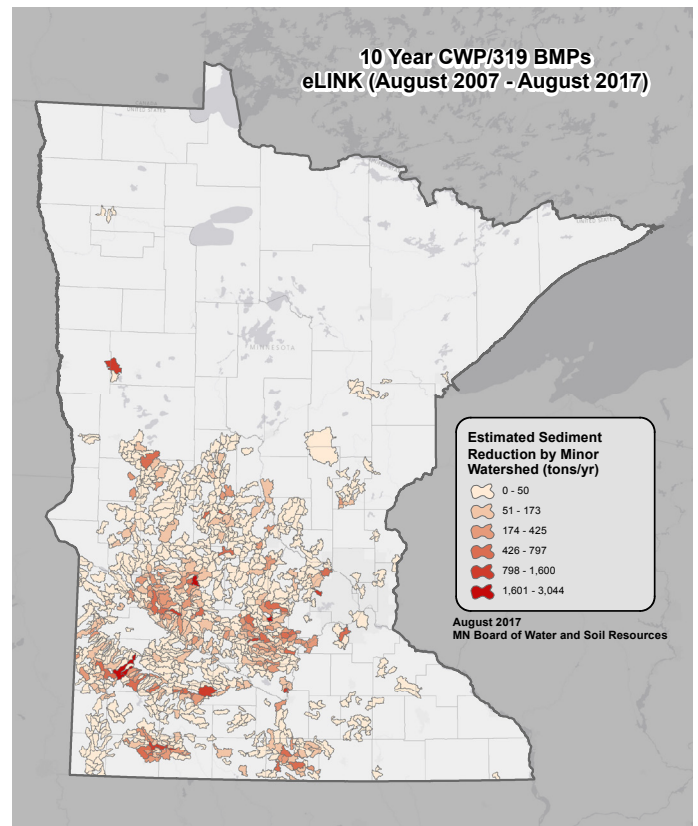




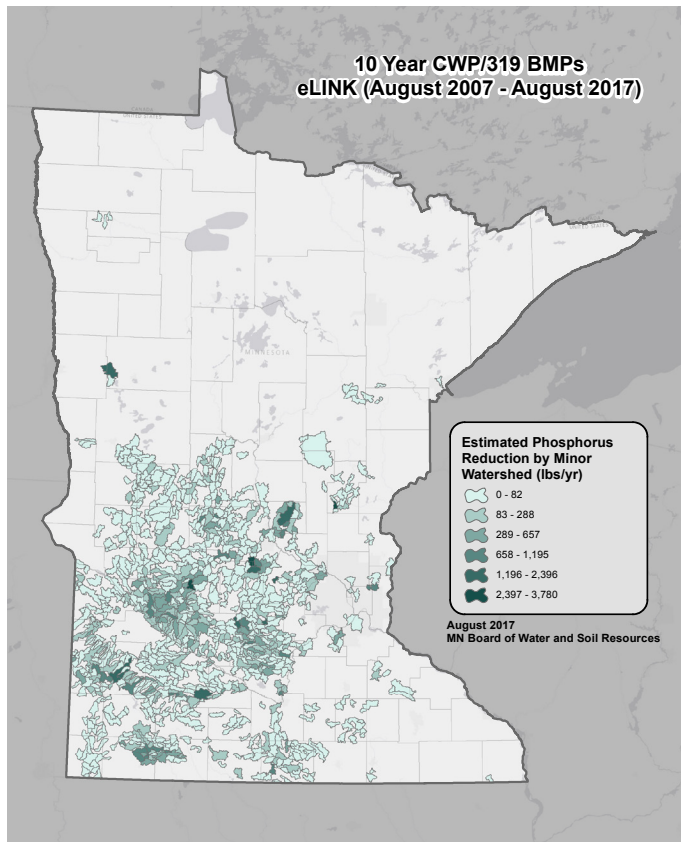
**Estimated soil loss reduction  
CWP/319 BMPs  
eLINK (2007 – present)**

\* These are ESTIMATED soil loss reductions. They DO NOT represent reductions in WATERSHED soil loss yield. They represent the sum of estimated soil loss reductions to all water bodies (even isolated ones) within the geographic regions of the watershed.

**Estimated sediment reduction  
CWP/319 BMPs  
eLINK (2007 – present)**



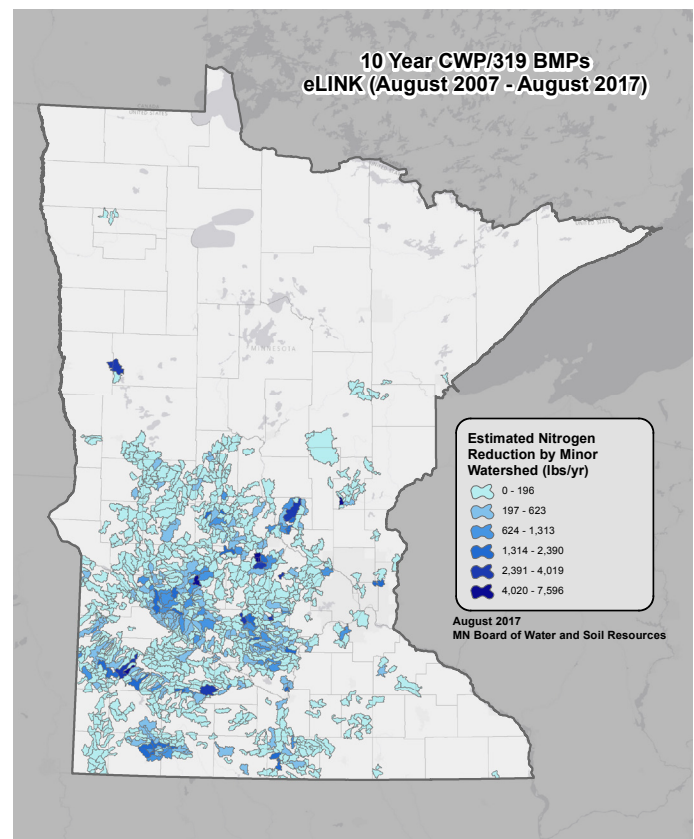
\* These are ESTIMATED sediment reductions. They DO NOT represent reductions in WATERSHED sediment yield. They represent the sum of estimated sediment reductions to all water bodies (even isolated ones) within the geographic regions of the watershed.



**Estimated P reduction  
CWP/Section 319 BMPs  
eLINK (2007 – present)**

\* These are ESTIMATED P reductions. They DO NOT represent reductions in WATERSHED P yield. They represent the sum of estimated P reductions to all water bodies (even isolated ones) within the geographic regions of the watershed.

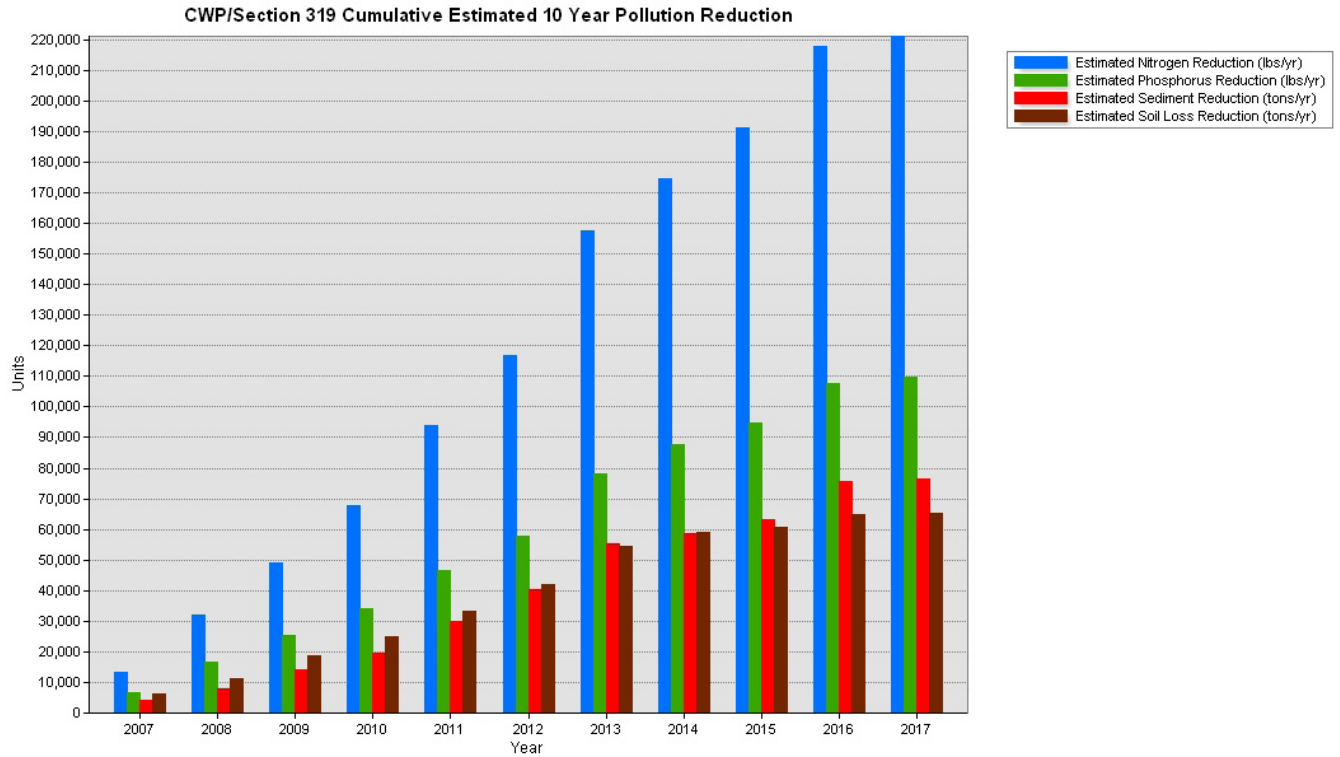
**Estimated nitrogen reduction  
CWP/Section 319 BMPs  
eLINK (2007 – present)**



\* These are ESTIMATED nitrogen reductions. They DO NOT represent reductions in WATERSHED nitrogen yield. They represent the sum of estimated nitrogen reductions to all water bodies (even isolated ones) within the geographic regions of the watershed.



### CWP/Section 319 cumulative estimated pollution reduction benefits via local government reporting and eLINK (2007–2017)



## All projects awarded through 2017

	Project Name	C: Complete A: Active N: New	Year Awarded	Amount
<i>Statewide</i>				
	HSPF Scenario Application Manager User Group Workshop	A	2011	\$10,060.00
	Linking Water Storage BMPs to Watershed Goals	C	2012	\$ 292,140
	Reducing Phosphorus Runoff From Livestock Farms	C	2012	\$ 296,318
	Chloride Reduction Outreach Program	C	2012	\$ 97,286
	Internal Phosphorus Load Reduction with Iron Filings	A	2013	\$ 299,047
	Performance of an Agricultural Drainage Tile Filter	A	2013	\$ 256,465
	Turf and Winter Maintenance Training	C	2013	\$ 110,000
	Level 2 Winter Maintenance Training	A	2014	\$ 129,176
	eLINK Database Support FFY 2016	C	2015	\$ 60,000
	HSPF Scenario Application Manager (SAM) Training and Testing Support	C	2016	\$ 29,845
	Training & Tech Support for Maintenance Staff	A	2016	\$ 249,971
	Smart Salting and Nutrient Reduction Training and S	A	2016	\$ 15,000
<b>Statewide Total</b>				<b>\$ 1,845,308</b>

	Project Name	C: Complete A: Active N: New	Year Awarded	Amount
<i>Cedar River</i>				
	Effectiveness of Targeted Dobbins Creek BMPs	A	2014	\$ 300,000
<b>Cedar River Total</b>				<b>\$ 300,000</b>

	Project Name	C: Complete A: Active N: New	Year Awarded	Amount
<i>Des Moines and Missouri River Basins</i>				
	Heron Lake TMDL Phosphorus Reduction Project	C	2012	\$ 450,000
	Jack and Okabena Creek Sediment Reduction Project	C	2012	\$ 20,600
	Heron Lake Third Crop Phosphorus Reduction Effort	A	2013	\$ 33,120
	WFDNR Targeting and Prioritizing Endeavor	A	2015	\$ 21,955
	Heron Lake TMDL Nutrient Reduction Project	A	2016	\$ 450,000
<b>Des Moines and Missouri River Basins Total</b>				<b>\$ 975,675</b>

	Project Name	C: Complete A: Active N: New	Year Awarded	Amount
<i>Lake Superior Basin</i>				
	Port Authority Stormwater Study and Concept Design	A	2015	\$ 24,000
<b>Lake Superior Basin Total</b>				<b>\$ 24,000</b>

	Project Name	C: Complete A: Active N: New	Year Awarded	Amount
<i>Lower Mississippi</i>				
	Steele County Septic System Loan Program	A	2012	\$ 700,000
	Dakota County Nitrate Reduction Project	C	2012	\$ 215,307
	Reducing Runoff from Southeast Minnesota Feedlots	A	2013	\$ 300,000
	Building a Culture of Citizen Engagement	A	2014	\$ 57,620
	Zumbro River: Ultra-Urban Vol/TSS/FeC Reduction	A	2014	\$ 300,000
	Downtown Winona Pre-Mississippi River Rain Garden	A	2015	\$ 41,324
	Middle Fork Zumbro River Critical Source Area Restoration	A	2016	\$ 219,000
	Mississippi River Lake Pepin Watershed WRAPS Implementation	A	2016	\$ 87,500
	Cedar River Capital Improvement Project Implementation	N	2017	\$ 1,000,000
	Reducing Bacteria from Southeast Minnesota Feedlots	N	2017	\$ 336,000
	Whitewater Watershed Nitrogen Reduction Project	N	2017	\$ 232,825
<b>Lower Mississippi Total</b>				<b>\$ 3,489,576</b>

	Project Name	C: Complete A: Active N: New	Year Awarded	Amount
<i>Minnesota River Basin</i>				
	Middle Minnesota Watershed, Implementation of Conservation Practices	A	2011	\$ 1,400,000
	Chippewa River Accelerated Restoration	A	2012	\$ 900,000
	Collaborative for Sediment Source Reduction: Greater Blue Earth River Basin	C	2012	\$ 300,000
	Cottonwood Streambank Inventory and Prioritization Project	C	2012	\$ 297,000
	Greater Blue Earth Urban Retrofit Initiative	C	2012	\$ 270,250
	Le Sueur Watershed Targeted Conservation Practices	C	2012	\$ 82,491
	Middle Minnesota River Low Dissolved Oxygen TMDL Project	C	2012	\$ 245,475
	Blackhawk Lake Protection Project	C	2013	\$ 46,500
	Chippewa River Phosphorus Reduction Practices	A	2013	\$ 279,518
	Cottonwood-Redwood River Septic Loan Program	C	2013	\$ 519,000
	Credit River Protection Plan	C	2013	\$ 225,000
	Elm Creek Tile Outlet Treatment Trains	C	2013	\$ 165,000
	Hawk Creek – Minnesota River Phosphorus Reduction	A	2013	\$ 228,992
	Hawk Creek Watershed Nitrogen Reduction Project	C	2013	\$ 1,060,000
	High Island Creek – McLeod County SSTS Project	A	2013	\$ 120,000
	Lake Minnewaska Phase I Resource Investigation	C	2013	\$ 112,435
	Pomme de Terre River Protective Buffer Project	C	2013	\$ 716,600
	Rush River Watershed – Nicollet County SSTS Project	A	2013	\$ 150,000
	Scott Watershed Management Organization TMDL Implementation	A	2013	\$ 298,512
	Blue Earth River Dissolved Oxygen: Managing Flows & Nutrients	A	2014	\$ 234,334
	Hawk Creek Watershed Dissolved Oxygen Restoration Project	A	2014	\$ 237,585
	Pomme de Terre WRAPS Implementation Project	A	2014	\$ 275,000
	Greater Blue Earth Nonpoint Reduction Initiative	A	2014	\$ 364,163
	Lower Prior Lake Protection Project Implementation	A	2014	\$ 142,522
	Renville County Minnesota River Mankato Watershed Protection Project	A	2014	\$ 306,750
	Blue Earth River Green Infrastructure Project	A	2014	\$ 1,010,000
	Lake Waconia Stormwater BMP Enhancement	A	2014	\$ 93,000
	Middle Minnesota Watershed SSTS Loan Project	A	2014	\$ 960,000
	Chippewa River Watershed Protection	A	2015	\$ 646,965
	GBERBA Conservation Drainage Partnership Program	A	2015	\$ 147,200
	Redwood River Turbidity Reduction Project	A	2015	\$ 150,512
	Quarry Creek Collaborative	A	2015	\$ 1,998,800
	Carp Management in Spring Lake & Prior Lake	A	2015	\$ 67,323
	Greater Blue Earth River Basin TMDL Implementation	A	2016	\$ 400,000
	Chippewa River Sediment Reduction	A	2016	\$ 285,878
	Le Sueur River WRAPS Implementation Endeavor	A	2016	\$ 347,950
	Minnesota River and Sand Creek Improvement Project	A	2016	\$ 565,000
	Hawk Creek Watershed Subsurface Sewage Treatment System (SSTS) Upgrade Implementation	A	2016	\$ 1,050,000
	Hawk Creek Watershed FY16 Implementation Project	A	2016	\$ 190,054
	Pomme de Terre WRAPS BMP Implementation Project	A	2016	\$ 285,000
	Chippewa Countywide Septic System Upgrades	N	2017	\$ 200,000
	Lac qui Parle-Yellow Bank SSTS Loan Program	N	2017	\$ 500,000
	Hawk Creek Watershed Improvement Project	N	2017	\$ 397,000
	Mankato Watershed – Renville Co FY17 Improvement Project	N	2017	\$ 297,000
	Seven Mile Creek Assessment and Implementation	N	2017	\$ 475,524
<b>Minnesota River Basin Total</b>				<b>\$ 19,044,333</b>

	Project Name	C: Complete A: Active N: New	Year Awarded	Amount
<i>Red River Basin</i>	Red River Basin Reservoir Nutrient Load Reduction	A	2014	\$ 289,998
<b>Red River Basin Total</b>				<b>\$ 289,998</b>

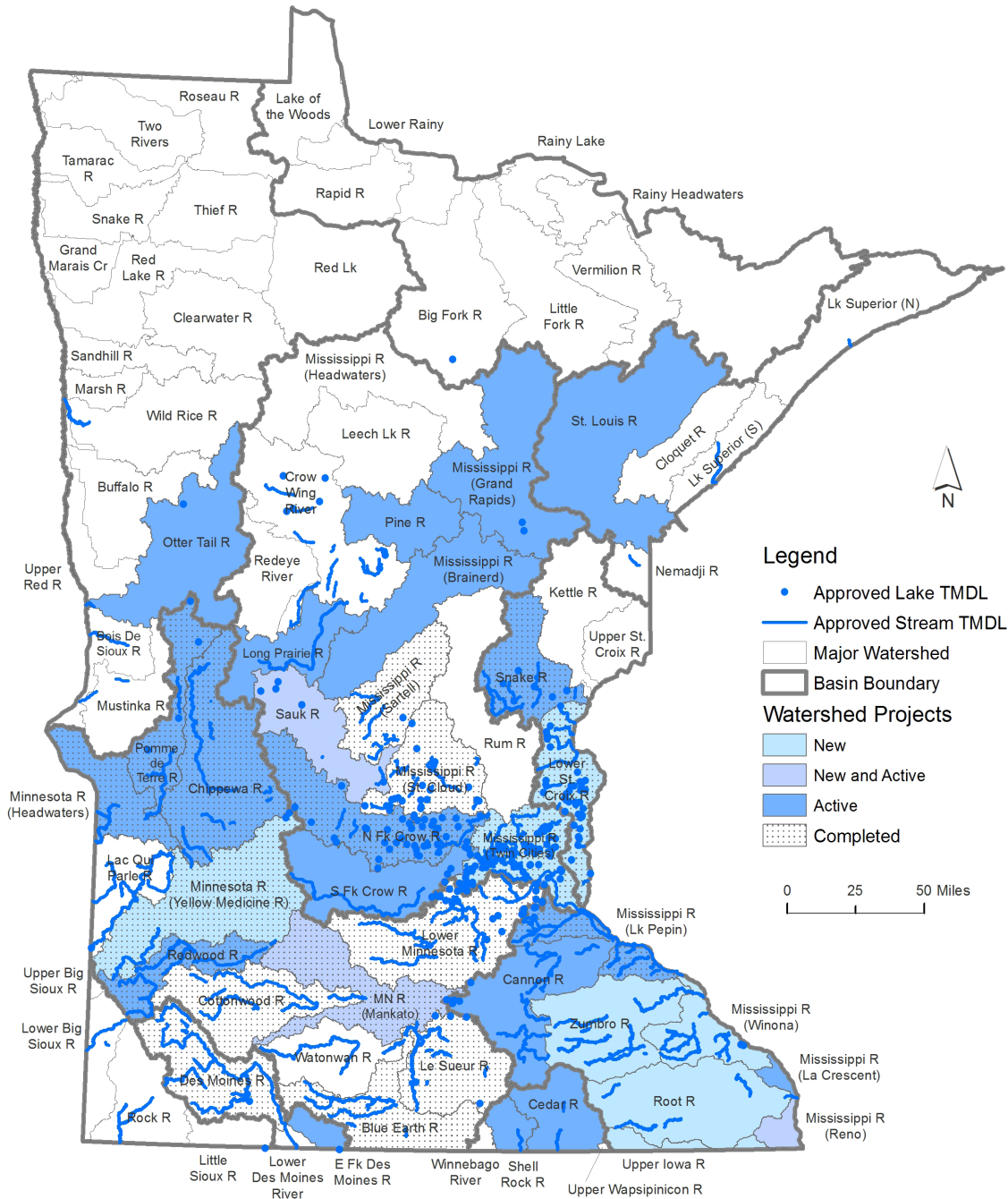
	Project Name	C: Complete A: Active N: New	Year Awarded	Amount
<i>St. Croix River Basin</i>				
	Kanabec Water Resources Protection Project	A	2012	\$ 201,892
	Snake River Watershed Resource Protection Project	A	2012	\$ 400,000
	Forest Lake North Shore Subwatershed Assessment	A	2013	\$ 12,000
	Forest Lake Stormwater Filtration Retrofit	A	2013	\$ 143,025
	Sand and Long Lakes Protection Project	A	2013	\$ 132,000
	Forest Lake Diagnostic Study	A	2015	\$ 52,500
	Kanabec Water Resources Protection Project Phase 2	A	2015	\$ 196,200
	Moody Lake Wetland Rehabilitation Project	A	2016	\$ 81,497
	Snake River Watershed Resource Protection Project	A	2016	\$ 400,000
	Lower St. Croix Targeted Phosphorus Reduction Project	N	2017	\$ 300,000
	Goose Lake TMDL Final Implementation Projects	N	2017	\$ 76,000
	Marine on St. Croix Stormwater Phase 2	N	2017	\$ 92,500
	Pine County SSTS Upgrades	N	2017	\$ 600,000
<b>St. Croix River Basin Total</b>				<b>\$ 2,687,614</b>

	Project Name	C: Complete A: Active N: New	Year Awarded	Amount
<i>Upper Mississippi River Basin</i>				
	Lake McCarrons Sub-watershed BMP Project	A	2012	\$ 275,000
	Targeted Fertilizer Application Reduction Project	A	2012	\$ 245,475
	Targeting BMPs in the Crow River Watershed	A	2012	\$ 1,100,000
	Bald Eagle Lake TMDL Implementation	A	2013	\$ 500,000
	Crooked Lake Basin Restoration Project	A	2013	\$ 665,000
	Crow Lakes Protection and Resource Investigation	A	2013	\$ 124,200
	Crow River Middle Fork Watershed Resource Investigation	A	2013	\$ 63,250
	Lake Koronis Subwatershed Protection Project	A	2013	\$ 197,871
	Long Prairie River Dissolved Oxygen TMDL Implementation	A	2013	\$ 300,000
	North Fork Crow River Septic System/ Feedlot Upgrades	A	2013	\$ 500,000
	Big Sandy and Minnewawa Lakes Phosphorus Reduction	A	2014	\$ 86,100
	Clearwater River Watershed Alternative Tile Intake	A	2014	\$ 45,000
	Osakis Lake Nutrient Reduction - Crooked Lake	A	2014	\$ 286,652
	Shingle Creek DO Reaeration Improvements	A	2014	\$ 93,500
	Mille Lacs Lake Protection - Stormwater Control	A	2014	\$ 85,520
	Pleasant Lake Stormwater Quality Improvements	A	2014	\$ 164,800
	Buffalo Creek - Marsh Water Project	A	2014	\$ 304,540
	Middle Sauk River Targeted Reduction & Outreach	A	2014	\$ 482,215
	Clearwater River Restoration & Protection Phase II	A	2015	\$ 72,000
	MFCRWD Loan Program for BMPs/Septic Upgrades	A	2015	\$ 110,000
	Northwood Lake Water Quality Improvement Project	A	2015	\$ 300,000
	Platte River Restoration/Protection Project	A	2015	\$ 34,900
	Swan River Headwaters Subwatershed Restoration	A	2015	\$ 38,650
	Ardmore Avenue Stormwater Retrofit	A	2015	\$ 33,163
	NE St. Cloud Mississippi River Protection Project	A	2015	\$ 200,000
	SRWD Groundwater Protection Project	A	2015	\$ 260,000
	Crow River SSTS Restoration Project	N	2017	\$ 1,350,000
	Lake Osakis Minor Watershed Nutrient Reduction	N	2017	\$ 300,000
	Lower Sand Creek Corridor Restoration	N	2017	\$ 269,563
<b>Upper Mississippi River Basin Total</b>				<b>\$ 8,487,398</b>

# Summary of statewide watershed project activity

## Projects completed, currently active and awarded

Made possible through a variety of funding sources – EPA Section 319 grants, CWF, and CWP – and the dedication and hard work of our agency partners, the following map represents major watersheds where water quality improvement projects are currently underway, ready to begin, or recently completed in the state.



# Statewide

## Projects completed

Chloride Reduction Outreach Program

eLINK Database Support – FFY 2016

HSPF Scenario Application Manager (SAM) Training and Testing Support

Linking Water Storage BMPs to Watershed Goals

Reducing Phosphorus Runoff from Livestock Farms

Turf and Winter Maintenance Training

Turf and Winter Maintenance Training Amendment

## Chloride Reduction Outreach Program

Chloride impairment in water is becoming more of a problem as impervious surfaces increase and citizens demand safer roads. Research by the University of Minnesota (UMN) determined that 78% of all chloride used as road salt in the Twin Cities area is retained in the environment and continues to accumulate. High concentrations are toxic to fish, macro-invertebrates and birds, and can reduce soil stability and affect terrestrial plants; lower concentrations can affect water chemistry and aquatic community structure, diversity, and productivity. To address this, the MPCA has developed the Twin Cities Area Chloride Management Plan as a tool to reduce chloride use. However, given the high potential that metropolitan areas located outside of the Twin Cities management area face similar water impairments, we saw a need to work with some of these cities in an effort to reduce chloride use.

The purpose of the project was to engage public officials, businesses, and citizens in the Cities of Rochester, Mankato, and St. Cloud in a facilitated planning process that was intended to a) increase their understanding of chloride pollution and ways to reduce it at organizational and personal levels and b) create a collaborative Chloride Reduction Outreach Strategy and Implementation Plan for each City that can be presented to local city councils and county boards and disseminated publicly via the Internet. The outcomes of this project include development of a Project Advisory Committee, three local steering committees, and three local chloride outreach plans.

### Goals

- Overall, the goal of this project was met with resounding success, in that a collaborative planning process was used to engage the target stakeholders and achieve buy-in of local chloride management plans for each city, including education/outreach and training goals for winter maintenance best practice, which is a primary strategy identified in the Twin Cities Metro Area Chloride Management Plan. Over 300 public and private representatives were trained in proper road salting procedures through several workshops in the three local areas.

### Partnerships

- The benefits of this project include building personal relationships established through the Project Advisory



*Publicity campaign for chloride reduction*

Group and local steering committees, and developing a civic engagement process starting at the grassroots level by engaging those who use chlorides (municipal staff, private contractors) and are impacted by chlorides (cities, community members). We believe this approach will over time assist participants in developing a sense of local ownership of water quality problems caused by chloride and, when combined with the local outreach plans developed, result in the implementation of identified strategies and outcomes that have the support of the participants in the project and lead to reduced chloride use in the target communities.

### Financial information

Funding type: Section 319  
Grant amount: \$97,286  
Final in-kind: \$95,497

### Contact information

Steve Woods, Executive Director  
Freshwater Society  
2424 Territorial Road, Suite B  
St. Paul, MN 55224  
621-313-5800  
[swoods@freshwater.org](mailto:swoods@freshwater.org)  
MPCA Project Manager: Shaina Keseley



## eLINK Database Support – FFY 2016

This project provides financial support to the Information Technology (IT) and grant program staff that support the eLINK reporting system and eLINK users. eLINK, the electronic link between state and local governments, is a web-based reporting system that is maintained and supported by the BWSR. eLINK is used by BWSR to track expenditures and accomplishments by local governments with state grant funds. In Minnesota, the same local governments who receive state grant funds from BWSR also receive federal 319 water quality grants via the MPCA. The BWSR and MPCA have long had a coordinating relationship regarding the collection of expenditure and accomplishment reporting data from local governments. To the extent that state water quality agencies can coordinate their administrative requirements, we are all better off.

Specifically, this project provides financial support for BWSR staff to maintain and support the eLINK system. This includes a variety of tasks, such as server administration, database

administration, GIS administration, eLINK configuration, eLINK system reports management, eLINK account administration, eLINK user support, and eLINK user training. These support tasks are ongoing throughout the year.

BWSR staff provided system support and developed guidance materials for the MPCA during the contract. Conor Donnelly provided system technical support and Gwen Steel provided user interface support. During this reporting period, BWSR staff set up new grants in the system, created user accounts for relevant MPCA staff, ran reports for MPCA, and maintained 319 and CWP-specific training materials for distribution to MPCA grant recipients and project managers. BWSR will continue to work with MPCA as we maintain and improve the system.

### Goals

- Provide access and support to local government 319 grant recipients so they can report expenditures and

<a href="#">Home</a>	<a href="#">Easements</a>	<a href="#">Grants</a>	<a href="#">Resource Management and Planning</a>	<a href="#">Conservation Implementation</a>	<a href="#">Wetlands</a>
----------------------	---------------------------	------------------------	--	---	--------------------------

### eLINK

---

#### Web-based Conservation Tracking System Development

**Progress reporting made easier**

Dating back as early as 1986, the Board of Water & Soil Resources (BWSR) has required reports from local units of government that indicate progress made in protecting the state's resources. Throughout the years, the method to complete this reporting has changed, first from paper reports (1986-1996), to floppy disk submission (1997-2002) and finally to the online eLINK database (2003-2012).

In 2012, BWSR started development of a new web-based system to track statewide conservation to replace dated technology and address increased demands. This new system was completed in 2013 and can be accessed here:

**Click Here to Log in to eLINK**

User accounts from the original eLINK system were migrated to the new system. To access an existing account for the first time, click Forgot Password on the log in screen, enter your username and email, and click Reset Password. A new system-generated password will be emailed to you. If you do not receive an email within 10 minutes, please follow the steps below for forgotten usernames.

If you do not remember your eLINK username, email [elinksupport@state.mn.us](mailto:elinksupport@state.mn.us) with a subject line of "Account Assistance" and provide your name and the organization under which you were registered, or the organization for which you work.

With eLINK, BWSR, local government partners, and stakeholders in conservation can track conservation projects and grants, indicators and pollution reduction benefits, cumulative grant funding over a period of years, and map locations of projects on a statewide, or on a county, watershed, or individual-project basis.

---

#### eLINK Training Modules

- **Linking Activities in eLINK:** Seven-minute module describing how to link an activity to multiple grants in eLINK.

#### Links

**eLINK FAQ**

- [Frequently Asked Questions \(FAQ\)](#) (Updated January 27, 2014)

**Pollution Reduction Calculators**

- [Minimal Impact Design Standards \(MIDS\)](#)
- [Hydrologic Soil Group Tool](#)
- [Milk House Waste User's Guide](#)
- [Milk House Waste Estimator](#)
- [Choosing the Best Estimator](#) (posted January 8, 2015)
- [Septic System Improvement Estimator](#)
- [Septic System Improvement Estimator Users Guide](#)
- [Download BWSR Water Erosion Pollution Reduction Estimator](#)
- [Instructions for using BWSR spreadsheet Pollution Reduction Estimator](#) (Sept. 2009)
- [RUSLE 2 \(ARS\) program and guidance](#)
- [MinnFARM](#) (University of Minnesota)

BWSR's eLINK Website

accomplishments back to the state via the eLINK reporting system.

- Provide training to MPCA staff to participate in the set up of 319 grant information.
- Provide data and maps from eLINK to MPCA upon request.

### Project highlights

- Local government staff have been submitting information about their BMP installations and associated pollution reductions via eLINK since 2004. There are more than 300 landowner BMP 319 implementations recorded in eLINK going back to 2004. Accounts were created for new grantees and new MPCA project managers. Team memberships were assigned to applicable records.
- BWSR staff set up Section 319 records for local stakeholders and adding the appropriate MPCA project managers to the team membership of Section 319 grants to allow MPCA to monitor what has been entered. BWSR made minor updates to the guidance document for Section 319 and CWP grantees and project managers. A training video is available for MPCA project managers to instruct them in how to pull reports and find grant data in eLINK.
- MPCA receives data and maps out of the eLINK database annually upon request for inclusion in the annual Watershed Achievements Report submitted to EPA. In February and August of 2016, eLINK staff provided the reported pollution reduction estimates of Section 319 funding projects for download to the Federal GRTS reporting system.

### Partnerships

- The partnership between MPCA and BWSR helps to protect and improve water quality in Minnesota through coordinated grantmaking and data collection. The partnership not only brings funding to the table for system support, but ensures consistent reporting and quantifiable outcomes. Additionally, providing a single tool for collecting pollution reduction estimates eliminates the need for duplicate reporting by local government partners.

### Financial information

Funding type: Section 319

Grant amount: \$60,000

### Contact information

Gwen Steel

Grants & eLINK Specialist

Minnesota Board of Water & Soil Resources

520 Lafayette Rd. N

St. Paul, MN 55155

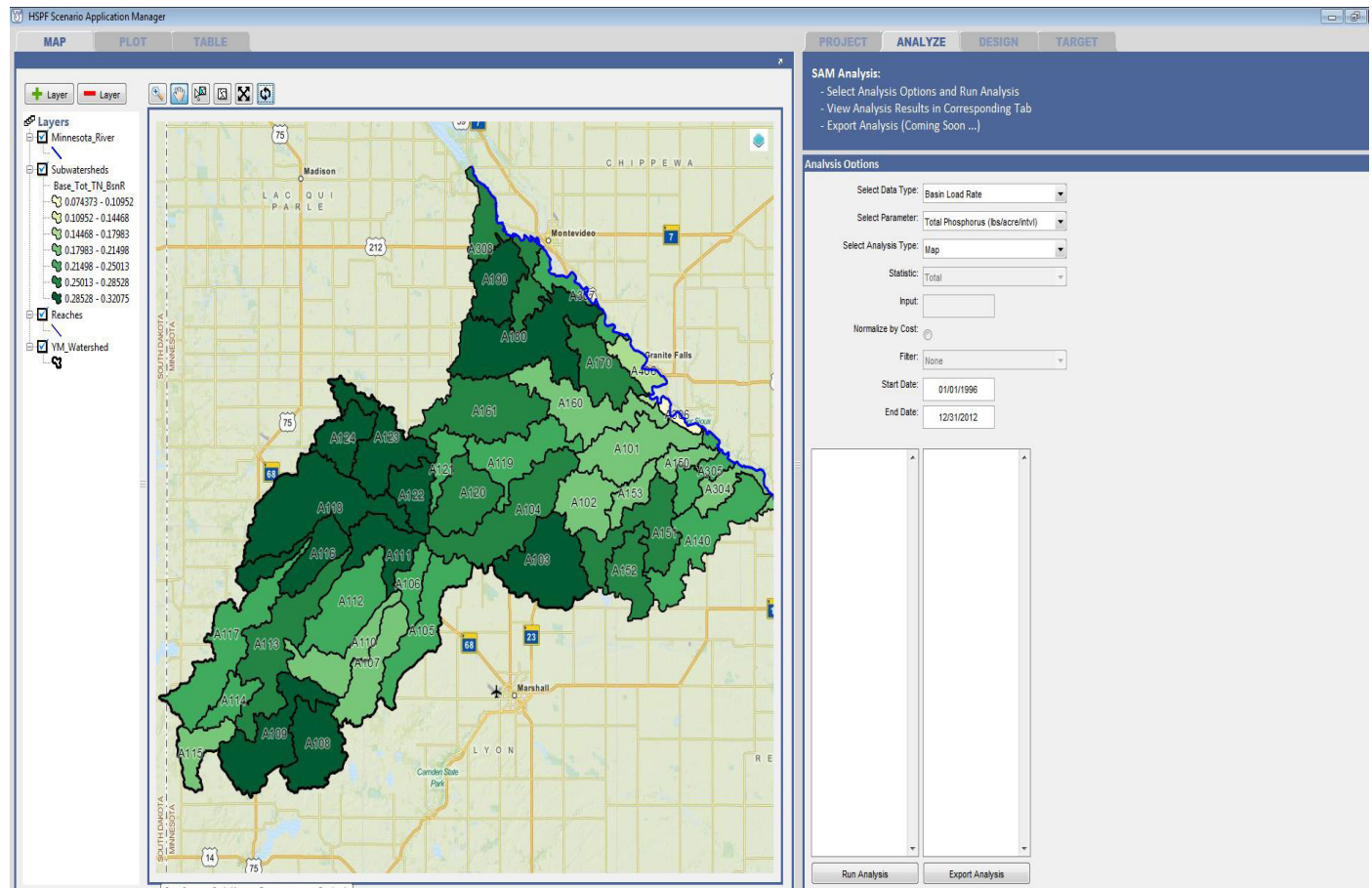
651-600-8390, [Gwen.Steel@state.mn.us](mailto:Gwen.Steel@state.mn.us)

MPCA Project Manager: Pete Fastner

## HSPF Scenario Application Manager (SAM) Training and Testing Support

Minnesota faces many water quality and quantity challenges. State, federal, and local organizations are faced with understanding hydrologic and water-quality problems and targeting cost effective solutions that are based in science. The MPCA has standardized its modeling approach for the development of the WRAPS and TMDL reports required by state and federal law. The MPCA uses the Hydrologic Simulation Program – FORTRAN (HSPF) model to provide a highly effective means to spatially and temporally understand hydrologic and water quality processes over various land surfaces and water bodies. Because HSPF is a continuous model representing the complex physical and chemical processes and interactions, and because it is calibrated over extended time periods, it is conducive to holistically understanding current watershed conditions.

Through careful changes to model inputs, it may be used to evaluate impacts of potential improvements or deterioration from watershed changes and/or the implementation of BMPs, helping pinpoint effective management approaches. However, the complexity of HSPF makes it difficult for non-modeling end users in conservation, implementation, permitting, and stressor identification programs to quickly get the needed information from these models; and thus, be able to test the model against what is known in the field and plan for the future. The MPCA has determined a translator is needed to convert the highly technical results of HSPF into applied analysis for planning and implementing targeted actions to restore or protect water quality in a specific geographic area. To accomplish this translation, the MPCA researched opportunities available and requested the development of a decision-support tool, the Scenario Application Manager (SAM).



HSPF SAM screenshot

## Project highlights

- SAM provides a graphical interface to the HSPF model applications using agreed upon practitioner's language and expands the state's investment in HSPF to a broader audience in support of the development of TMDLs and WRAPS. The tool's framework currently consists of a pre-processor for interactively translating HSPF model application files, a Geographic Information System (GIS) for BMP site selection, a BMP database with pollutant removal efficiencies and associated costs, and scenario analysis, optimization, and reporting capabilities. The decision support tool provides a user friendly, comprehensive approach to achieve the water quality improvement goals set by the TMDL assessments, protection strategies, and watershed restoration programs. It assists in understanding watershed conditions, identifying priority areas and BMPs that will provide the greatest water-quality benefits for each dollar invested. The value of the tool is in its simplification of complex hydrologic and water quality model applications into transparent estimates of the significant pollutant sources in watershed. Users applied their knowledge and expertise of BMP implementation using the tool's interpretation of model results.
- The outcome of this work order was the expanded use of the SAM watershed-scale, decision-support tool through training material development, beta testing updates, and application file development to maximize the MPCA's investment in the HSPF model application development.

## Financial information

Funding type: Section 319

Grant amount: \$29,845

## Contact information

Jason Love

Vice President

RESPEC, Water & Natural Resources

3824 Jet Drive

Rapid City, SD 57709-0725

605-394-6400, [Jason.Love@respec.com](mailto:Jason.Love@respec.com)

MPCA Project Manager: Charles Regan

## Linking Water Storage BMPs to Watershed Goals

In Minnesota, state and regional plans addressing water quality concerns in primarily agricultural watersheds identify water storage as one of the most effective ways to reduce sediment and nutrient loads, flooding, and improve streambank stability. There is not an existing mechanism in place to quantify and incentivize increased water storage on the landscape. This project focused on creating a standardized estimation tool to link water storage benefits of 23 Natural Resource Conservation Service (NRCS) conservation practice standards with estimated reductions in downstream peak hydrography flow rates.

### Project highlights

In order to demonstrate the value of water storage to in-field management and downstream hydrology, 19 water storage practices were implemented. Projects included several Water and Sediment Control Basins (WASCOBs) along reaches of the Sauk River, urban tree planting in the City of Mountain Lake and 655 acres of row crop corn and soybeans seeded with cover crop mixtures in the lakeshed of Lake Crystal, to provide water storage benefits in subsheds of the pilot watersheds: Sauk River, Lower and Middle Minnesota, and Greater Blue Earth River Basin watersheds.

- Cross-sectional partnership among public and private-sector organizations
- Six Water Storage Learning Group meetings
- Standardized estimation tools using existing national and state datasets to quantify benefits of the following BMP categories:
  1. Increase vegetative cover
  2. Increased soil organic matter
  3. Surface impoundments
  4. Subsurface tile drainage water management structures
- Participated in over 15 education, outreach and demonstration events
- Provided technical assistance to several landowners to implement 23 BMPs
- The project developed a standard approach to identify water storage of various BMPs, consequently watershed planners may measure progress of existing water plans and develop priorities for continued



*Conservation Reserve Program (8.5 acres) in Stearns County*

improvements. BWSR's eLINK calculators estimate the annual pollutant reduction from implementation of water storage practices using 319 grant funds is as follows: 220.81 tons of soil; 168.75 tons of sediment; 154.92 pounds of P, whereas the 319 funded water storage calculators estimate 103.86 acre feet of surface runoff. The results assisted technical staff to prioritize projects for funding, and used for dissemination to technical staff, landowners, researchers and watershed planners during education, outreach and demonstration events. The calculators provide policymakers an opportunity to incentivize water storage and examine a market-based approach to manage upstream management for improved downstream stability and conditions.

### Partnerships

- Core Project Team
- Water Storage Learning Group
- HSPF model assistance and data management: Chuck Regan, MPCA
- iGROW (<http://igrow.org/drainage-calculators/>) technical assistance: Chris Hay, South Dakota State University; Gary Sands, UMN
- Farmers in piloting watersheds willing to experiment with water storage practices in their day-to-day farm operations
- Conservation Marketplace Midwest (CMM): Charlene Brooks, CMM Administrator

- Meyer Dairy Discovery Farms, Stearns County in-field management data – Mark Lefebvre, Stearns County Soil and Water Conservation District (SWCD)
- Additional BMP implementation and technical support: Mark Lefebvre, Stearns County SWCD; Grant Pearson, MAWQCP Stearns County SWCD; and Tina Warta, Blue Earth County SWCD and GBERBA

### Financial information

Funding type: Section 319

Grant amount: \$292,140

Final in-kind: \$177,200

Matching funds: \$135,868

### Contact information

Jessica Nelson

135 Trafton Science Center

Mankato, MN 56001

507-389-2704, [Jessica.nelson-1@mnsu.edu](mailto:Jessica.nelson-1@mnsu.edu)

MPCA Project Manager: Nick Gervino

## Reducing Phosphorus Runoff from Livestock Farms

Many water bodies in agricultural areas of Minnesota are listed as impaired because of a high concentration of algae due to excess P. An example is Sauk Lake in Stearns County, the largest dairy county in Minnesota. Sauk Lake is classified as a eutrophic reservoir, fed by the Sauk River and several streams with high P concentrations. Agriculture is the dominant activity in these small watersheds, including Hoboken Creek, which covers 16,800 acres and supports approximately 9,500 animal units. High concentrations of livestock also exist in areas of southeast and southwest Minnesota (dairy and beef respectively). High concentrations of livestock result in frequent applications of manure and potentially excessive soil test P, which can lead to high P concentrations in runoff water. The problem is how to reduce P from reaching surface water bodies in areas with a high density of livestock operations and still maintain a profitable livestock industry.

### Project highlights

- The goal of this education project was to reduce P loading to impaired waters from watersheds with high densities of dairy and/or beef operations, where land for manure spreading is limited and soil test P may be increasing. Farm-gate P balances were analyzed on 19 representative farms to assist producers in selecting appropriate strategies to reduce excessive soil P build-up. They were conducted with the assistance of farmers, agricultural professionals, UMN Extension staff, and others. Nine case studies featuring strategies used on these farms were prepared, delivered at workshops and field days, incorporated into farm magazine articles at the regional and national level, and published on the UMN Extension Manure Management and Air Quality website. Workshops and field days were carried out with staff of Extension, County Feedlot Offices, SWCDs, and producer groups. The farm P balance analyses and case study development began in April 2013. Field days were carried out in the summer of 2014. Small group workshops were conducted in early 2015, and large group presentations were given in 2015 and 2016. Magazine articles were published in 2014-2016. The ongoing contributions of the project are the case studies and magazine articles available on UMN Extension websites. They serve as presentation and reference material for use by conservation and livestock



*Dairy-beef covered feeding facility with slotted floors and pit manure storage.*

production educators and professionals in their work with livestock producers.

- The principal result was to expand the range of BMPs for P runoff reduction and farm production efficiency that is considered by conservation professionals, livestock producers, agricultural professionals, and others involved with livestock management. The farm-gate P import-export balance analysis led to strategies that include adjustment of farm feed and feed supplement imports, fertilizer and manure imports, manure export, feed waste management, manure nitrogen conservation, on-farm production levels of feedgrains and forages, and access to more crop production land through purchase, lease, or manure for feedgrain exchanges. These all help prevent the accumulation of excess P in soils in livestock-dense areas, and are frequently overlooked by conservation staff. These strategies were presented to, discussed with, and made available on-line to conservation professionals and those involved in the livestock industry. The water quality outcomes will depend on the adoption levels of these practices.

### Partnerships

- Partners included livestock producers and their agricultural professionals on the 19 farms selected for farmgate P balance analysis and case study development; UMN Extension Educators, staff of County Feedlot Offices, SWCDs, the Minnesota Milk Producers Association, and the Minnesota State Cattlemen's Association.

**Financial information**

Funding type: Section 319

Grant amount: \$296,317

Final in-kind: \$228,370

Matching funds: \$30,000

**Contact information**

Leslie Everett

Regents of the University of Minnesota

UMN Water Resources Center

173 McNeal Hall, 1985 Buford Ave

St. Paul, MN 55108

612-625-6751, [evere003@umn.edu](mailto:evere003@umn.edu)

MPCA Project Manager: Wayne Anderson



## Turf and Winter Maintenance Training

The turfgrass and winter maintenance training and certification program was originally created to reach maintenance professionals with information about environmental impacts from their work and practices they can implement to reduce these impacts. This amendment and funding were added to expand the number of trainings conducted. As with Fortin Consulting Inc.'s other 319 work, the emphasis is on teaching BMPs of snow and ice control with rock salt and chemicals such as P and nitrogen used in turfgrass maintenance. Nutrients and chloride are immediate issues of concern for Minnesota and many other states due to their negative impacts on the environment, including impaired waters. Currently, 329 Minnesota streams and lakes are on the 2008 TMDL list for nutrient/eutrophication. Thirty percent of sampled groundwater wells in the Twin Cities Metro Area exceed the federal drinking water standard for chloride, and Minnesota has seven streams already on the impaired list for chlorides.

The grant funding allowed us to teach 8 turfgrass maintenance classes, 10 winter road maintenance classes and 24 winter parking lot and sidewalk maintenance classes. In addition, we presented a two hour presentation at the Minnesota Chief Engineers Guild Annual Conference. We were able to train maintenance professionals, public and private, who engage in winter and summer activities which lead to the introduction of nutrients/P and chloride into the environment. We also offered the MPCA test for voluntary Level 1 certification for all three classes.

In-class exercises and surveys shows a minimum reduction of 20% in chlorides and 35% reduction of P.

### Financial information

Funding type: Section 319

Grant amount: \$110,000

Final in-kind: \$181,710

### Contact information

Connie Fortin

President

Fortin Consulting, Inc.

215 Hamel Road

Hamel, MN 55340

763-478-3606, [connie@fortinconsulting.com](mailto:connie@fortinconsulting.com)

MPCA Project Manager: Brooke Asleson



*Turf and winter maintenance training – turf field demo*

## Statewide

### Active projects in 2017

#### HSPF Scenario Application Manager User Group Workshop – 2015

Sponsor: RESPEC

Funding: Section 319 (Grant) \$10,060

Purpose: Provide funding for a SAM User Group workshop to assess the needs of likely users for a watershed-scale, decision-support tool to facilitate prioritization and placement of BMPs to achieve the needed pollution reductions identified by the WRAPS/TMDL reports.

#### Internal Phosphorus Load Reduction with Iron Filings – 2013

Sponsor: UMN

Funding: Section 319 (Grant) \$299,047

Purpose: Determine the effectiveness of iron filings under different conditions at reducing internal P loading, determine the conditions required for iron filings to be effective at reducing internal P loading, and determine the quantity of iron filings that must be placed in the sediments for a successful reduction of internal P loading.

#### Level 2 Winter Maintenance Training – 2014

Sponsor: Fortin Consulting, Inc.

Funding: Section 319 (Grant) \$129,176

Purpose: Create a Level 2 winter maintenance training curriculum, conduct up to 24 Level 2 MPCA certification training courses and/or presentations; train up to 400 senior maintenance professionals and certify the majority; produce specific and substantial organizational changes in maintenance practices as a result of training; and produce and distribute the use of education. We will evaluate success by the number of classes conducted, number of short presentations given in support of the long-term viability of the program, number of individuals trained, number of organizations trained, educational materials produced and distributed, number of individuals certified, estimated pollutant reductions, Winter Maintenance Assessment reports/refinement and course evaluations.

#### Performance of an Agricultural Drainage Tile Filter – 2013

Sponsor: UMN

Funding: Section 319 (Grant) \$256,465

Purpose: This project will measure and evaluate the performance of an engineered enhancement to agricultural drainage tiles that will significantly decrease the release of phosphates to surface waters from agricultural runoff. The innovative filter design would be based on previously developed technology that enables increased phosphate removal by adsorption using iron, in the form of iron filings.

#### Training & Tech Support for Maintenance Staff – 2016

Sponsor: Fortin Consulting, Inc.

Funding: Section 319 (Grant) \$249,971

Purpose: Reduce loading of nutrients and chloride to surface and groundwater from outdoor maintenance activities through presentation of 70-80 BMP instruction workshops (Winter Maintenance for Roads, Winter Maintenance for Sidewalks and Parking Lots, Level 2 Winter Maintenance and Turfgrass Maintenance); 3 webinar events to serve as updates or more detailed information to the BMP information given to those already trained; 3 field information exchanges or demonstrations targeted on particular BMPs that show potential for large reductions in chemical use and identification of new techniques and technologies by maintenance and appropriate environmental professionals, with inclusion of these into workshops if warranted.

#### Turf and Winter Maintenance Training Amendment – 2016

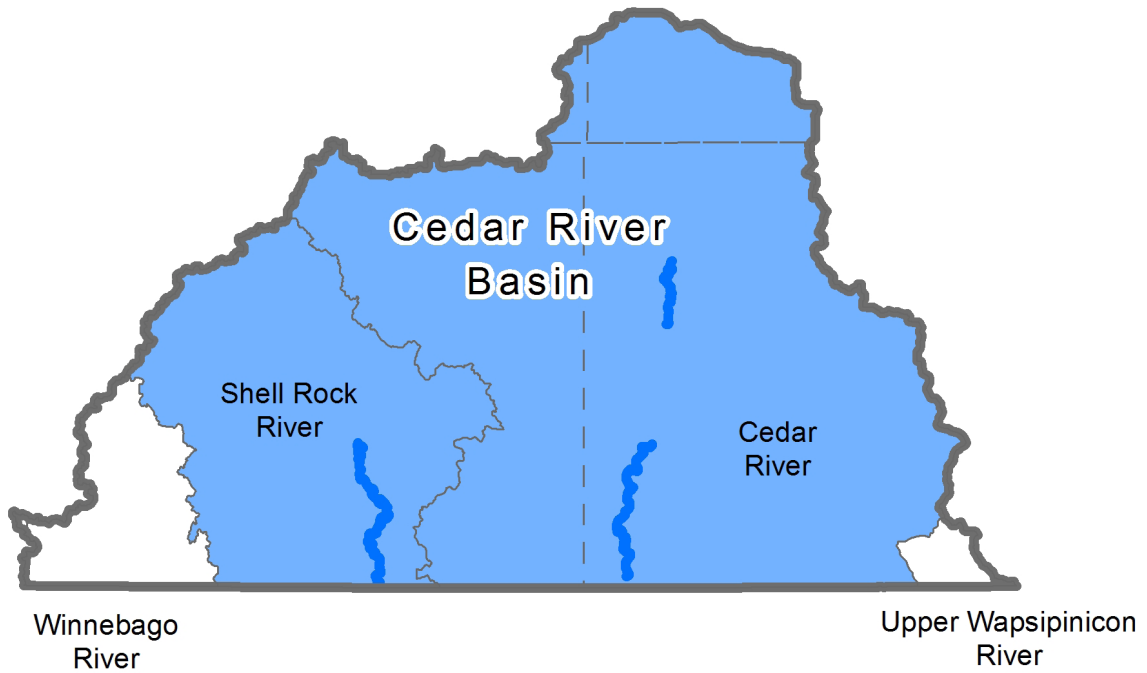
Sponsor: Fortin Consulting, Inc.

Funding: Section 319 (Grant) \$15,000

Purpose: This grant amendment funding providing an additional 3 turfgrass maintenance classes, 2 roads classes and 2 parking lot maintenance classes, and a 2 hour presentation at the Minnesota Chief Engineers Guild Annual Conference. We were able to train an extra 114 maintenance professionals, public and private, who engage in winter and summer activities which lead to the introduction of nutrients/P and chloride into the environment. We also offered the MPCA test for voluntary Level 1 Certification. Past in-class exercises and surveys shows a minimum reduction of 20% in chlorides and 35% reduction of P.

# Cedar River Basin

None were completed in 2017



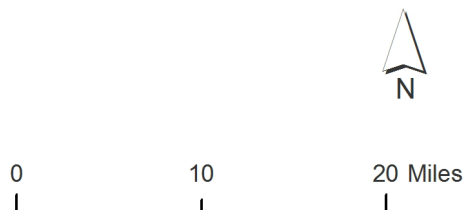
### Legend

- Approved Lake TMDL
- Approved Stream TMDL

- - - County Boundary
- Major Watershed
- ▬ Basin Boundary

### Watershed Projects

- New
- New and Active
- Active
- ▨ Completed



# Cedar River Basin

## Active projects

**No projects were awarded in 2017**

### **Effectiveness of Targeted Dobbins Creek BMPs – 2014**

Sponsor: Cedar River Watershed District

Funding: Section 319 (Grant) \$300,000

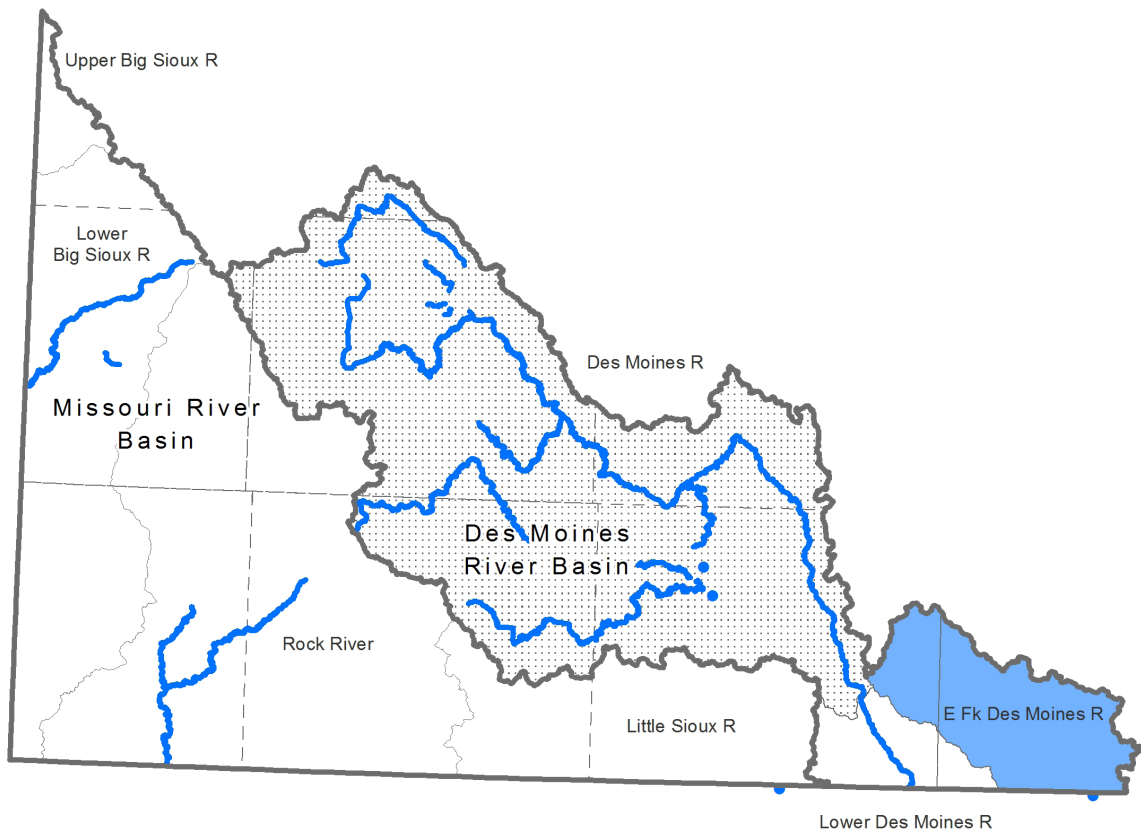
Purpose: Demonstrate the ability of new GIS and Light Detection and Ranging (LiDAR) technology to facilitate water quality and aquatic habitat improvements in waterways receiving agricultural drainage using a suite of targeted conservation practices. The primary focus will be to assess and document targeted BMP performance in reducing sediment, nutrient, and fecal coliform loads, improving index of biological integrity (IBI) scores, and to analyze these changes from financial and watershed perspectives. This project will demonstrate the impact of prioritized, targeted, and tailored BMPs in the Dobbins Creek watershed with respect to hydrologic pathways and processes. This method could serve as a model for future watershed comprehensive BMP implementation projects.

# Des Moines and Missouri River Basins

## Projects completed

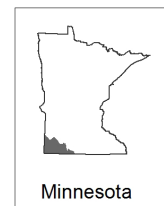
### Des Moines River – Headwaters

- Heron Lake TMDL Phosphorus Reduction Project
- Jack and Okabena Creek Sediment Reduction Project



### Legend

- Approved Lake TMDL
  - Approved Stream TMDL
  - County Boundary
  - Major Watershed
  - Basin Boundary
- Watershed Projects**
- New
  - New and Active
  - Active
  - Completed



## Des Moines – Headwaters

## Heron Lake TMDL Phosphorus Reduction Project

The Heron Lake watershed, a subwatershed of the West Fork Des Moines River (WFDNR) watershed, encompasses approximately 472 mi<sup>2</sup> and is located in portions of Nobles, Jackson, Murray, and Cottonwood Counties in southwestern Minnesota. In December 2008, the EPA approved a Total Maximum Daily Load (TMDL) Report encompassing 32 impairments in the WFDNR watershed. These impairments include P, turbidity, and bacteria. The WFDNR and Heron Lake TMDL Study states the sources contributing to excess P in North and South Heron Lake were divided between point source, primarily wastewater treatment facilities and nonpoint sources, including cropland/pasture runoff and streambank erosion. The primary contributing sources to bacteria were found to be livestock on overgrazed riparian pasture, surface-applied manure on cropland, feedlots lacking adequate runoff controls, and inadequate septic systems. To meet the water quality goals, a 10% to 86% reduction in bacteria, a 20% to 90% reduction in turbidity, and a 79% reduction in P is needed.

Decreasing the amount of P and bacteria entering the Heron Lakes is necessary to meet the TMDL goals. The Heron Lake Watershed District (HLWD) Watershed Management Plan, WFDNR and Heron Lake TMDL Implementation Plan, and county water plans recognize on-the-ground BMPs as being the most effective way to address these nutrients.

From June 2012 through May 2016, HLWD staff worked with watershed landowners to achieve project implementation. During that time period, 27 septic systems were replaced. It is estimated that these replacements will reduce P by 277 lbs/yr, nitrogen by 730 lbs/yr, total suspended solids (TSS) by 5,783 lbs/yr, biochemical oxygen demand (BOD) by 10,468 pounds per year, and bacterial colony forming units (CFU) by 1.93 E+15.

### Partnerships

- Heron Lake Watershed District: project sponsor, project administration, and in-kind contribution
- 27 willing and engaged residents who replaced failing SSTSs



*Mound system installation, NE ¼ of Section 34, Bondin Township, Murray County*

### Financial information

Funding type: CWP  
 Grant amount: \$450,000  
 Final in-kind: \$6,903

### Contact information

Jan Voit, District Administrator  
 Heron Lake Watershed District  
 PO Box 345  
 Heron Lake, MN 56137  
 507-793-2462  
[jan.voit@mysmbs.com](mailto:jan.voit@mysmbs.com)  
 MPCA Project Manager: Katherine Pekarek-Scott

## Des Moines – Headwaters

## Jack and Okabena Creek Sediment Reduction Project

The WFDNR and Heron Lake Total Maximum Daily Load Report (Report) addressed 15 turbidity impairments, 15 fecal coliform impairments, one excess nutrient impairment, and one pH impairment. The Report concluded that streambank erosion contributes 12% of the P loading to the WFDNR watershed in a dry year and 33% during a wet year. The Report also identified streambank stabilization as a needed practice to address turbidity impairments in the watershed.

The HLWD believes that providing watershed landowners with opportunities to learn about erosion control methods, as well as demonstrating their economic and environmental benefits, will produce long-term water quality benefits. With those goals in mind, the HLWD sought funding for streambank stabilization efforts in the form of J-hook weirs, to assist in that effort. J-hooks are a sediment reduction technique that is new to southwestern Minnesota. J-hook weirs are natural, effective, relatively inexpensive, and easily implemented. Benefits include streambank erosion control, restoration, stabilization, sediment and P reduction, habitat gain, and improved water quality.

From December 2012 through September 2015, HLWD staff worked with two watershed landowners to achieve project implementation. During that time three J-hook weir projects were installed through the Jack and Okabena Creek Sediment Reduction Project. It is estimated that these projects reduced P by 1,272.42 pounds per year and sediment by 1,496.96 tons per year.

### Partnerships

- HLWD: project sponsor, project administration, and in-kind contribution
- Ken Williams: installed J-hook weir project and in-kind contribution
- Bob Hartman: installed J-hook weir project and in-kind contribution

### Financial information

Funding type: Section 319

Grant amount: \$20,600

Final in-kind: \$27,756



*Jack Creek J-hook weir project, Section 34, Graham Lakes Township, Nobles County*

### Contact information

Jan Voit, District Administrator  
Heron Lake Watershed District  
PO Box 345

Heron Lake, MN 56137

507-793-2462, [jan.voit@mysmbs.com](mailto:jan.voit@mysmbs.com)

MPCA Project Manager: Katherine Pekarek-Scott

# Des Moines and Missouri River Basins

## Active projects

No projects were awarded in 2017

### Des Moines River Basin

#### Des Moines River – Headwaters

##### Heron Lake TMDL Nutrient Reduction Project – 2016

Sponsor: Heron Lake Watershed District

Funding: CWP (Loan) \$450,000

Purpose: This project will implement 30 SSTS upgrades in the Heron Lake Watershed, resulting in an estimated annual reduction of 304 pounds of P, 3.2 tons of sediment, and 807 pounds of nitrogen. Septic system upgrades are recommended in the West Fork Des Moines River and Heron Lake TMDL Implementation Plan.

##### Heron Lake Third Crop Phosphorus Reduction Effort – 2013

Sponsor: Heron Lake Watershed District

Funding: Section 319 (Grant) \$33,120

Purpose: Provide incentives to establish 200 acres of cover crops on an annual basis during the three-year grant period. This will be done by aerially seeding a third crop, or cover crop, of cereal rye, purple top turnip, and tillage radish. Cover crops reduce erosion, decrease soil compaction, increase water infiltration to prevent runoff, bring leached nitrogen back to the root zone for the following year's crop, increase organic matter, and provide habitat cover. The HLWD also proposes to conduct civic engagement through the development of a steering committee. Processes taught at the Southwest Civic Engagement Cohort will be employed with the committee to brainstorm about the needs, wants, and perceptions of watershed landowners as they relate to water quality improvement, focusing on cover crops. They will also be asked to assist in identifying barriers to making changes and develop strategies for behavior change.

### West Fork Des Moines River

#### WFDMR Targeting and Prioritizing Endeavor – 2015

Sponsor: Heron Lake Watershed District

Funding: CWP (Grant) \$21,955

Purpose: The HLWD proposes to build upon the terrain analysis products developed by Southwest Prairie Technical Service Area 5 (SWPTSA 5) and extend the data products to include BMP suitability, BMP effectiveness, and BMP value datasets. The extended data products are derived by using advanced GIS and engineering methods, developed by Houston Engineering, Inc. (HEI) and applied to the hydrologically corrected Digital Elevation Model (DEM). The outcome of this project will be GIS datasets, summary maps, and a technical memorandum describing the suitability for BMP placement, effect of implementation on priority resources, and the measurable cost-effectiveness of pursuing opportunities to implement BMPs. All of these methods are complimentary to implementation, restoration, and protection strategies identified within the WRAPS process and will aid local civic engagement efforts.

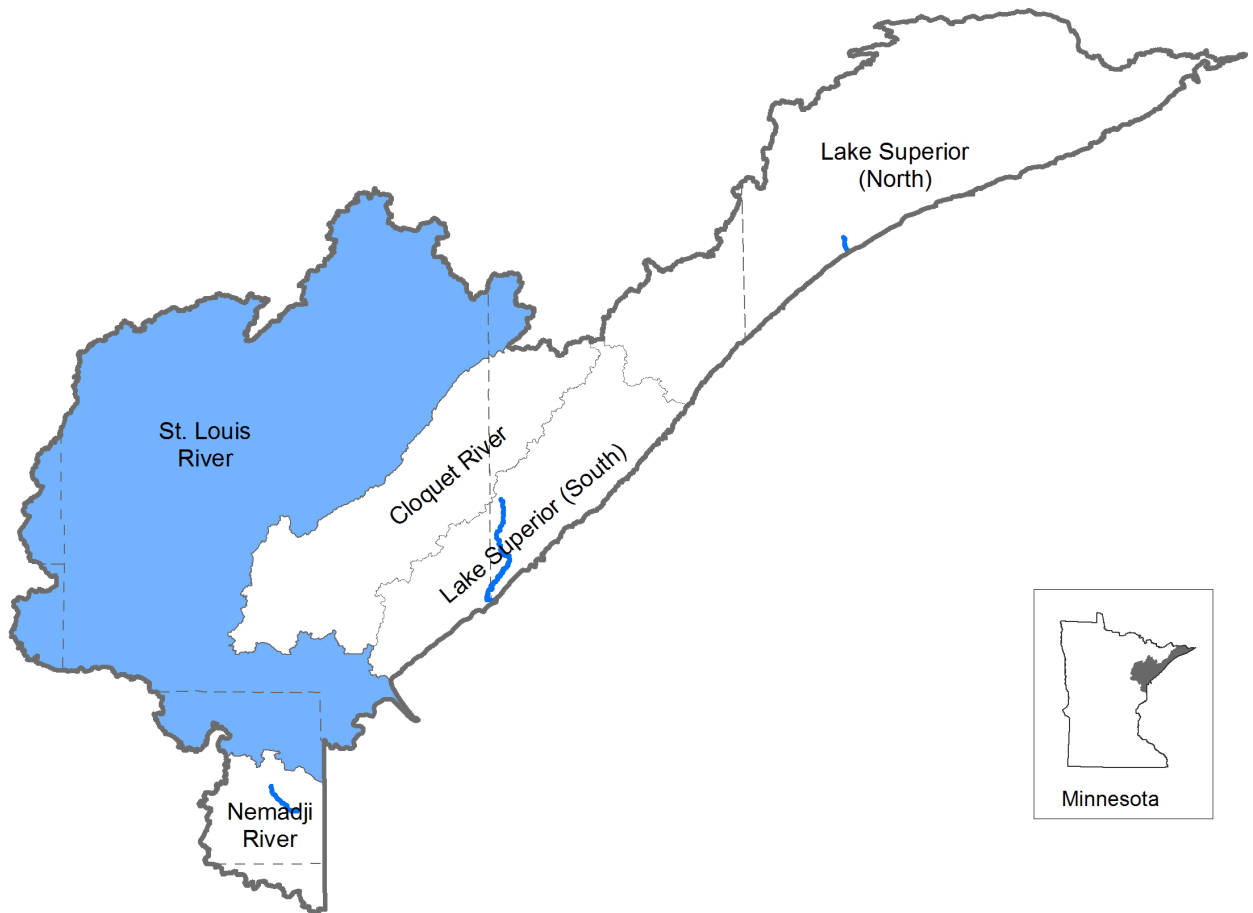
### Missouri Basin

No projects active in Missouri Basin



# Lake Superior Basin

None were completed in 2017



### Legend

- Approved Lake TMDL
- Approved Stream TMDL
- - - County Boundary
- Major Watershed
- ▭ Basin Boundary
- Watershed Projects**
- New
- New and Active
- Active
- ▨ Completed

# Lake Superior Basin

## Active projects

No projects were awarded in 2017

### St. Louis River River Watershed

#### Port Authority Stormwater Study and Concept Design – 2015

Sponsor: Duluth Seaway Port Authority (Port Authority)

Funding: CWP (Grant) \$24,000

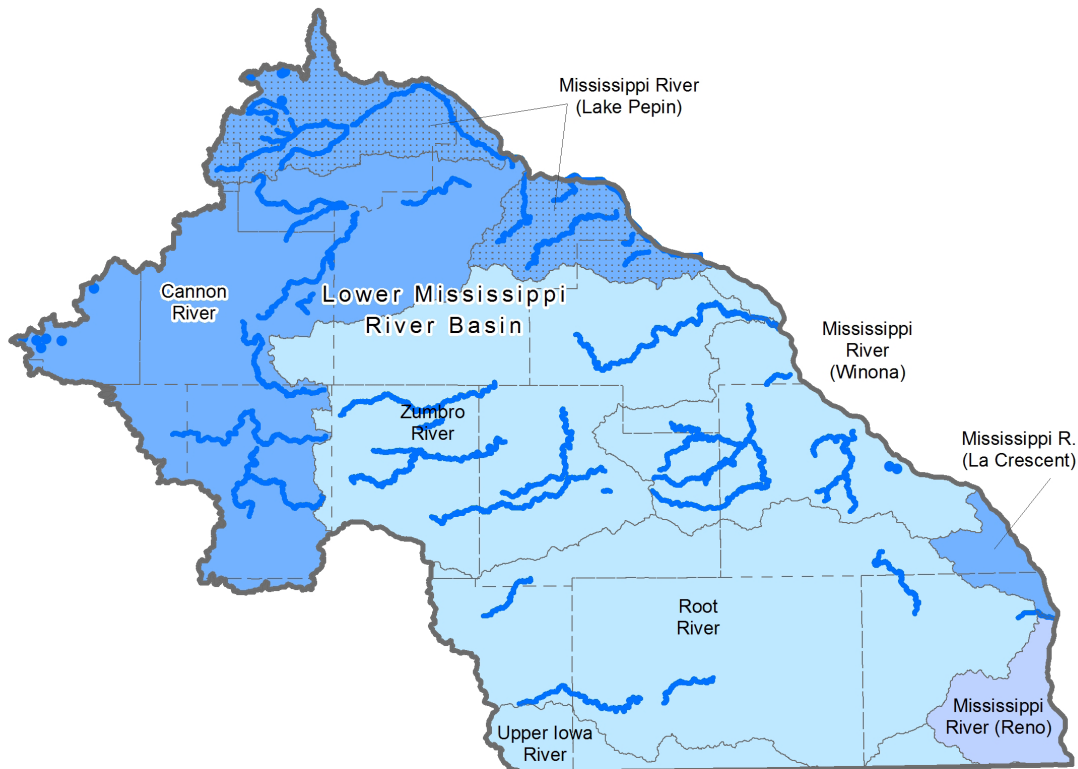
Purpose: This project will evaluate the sources of detected metals and other stormwater constituents, as well as identify and conceptually design effective green infrastructure BMPs to address these concentrations of metals and other constituents in stormwater at the Port Authority's Clure Terminal. The project's first phase includes development and implementation of a sampling plan to investigate stormwater quality within impervious areas for the previously described stormwater constituents; soil borings to determine the soil type; a topographical survey to determine drainage patterns and infrastructure locations; and data gathering of existing infrastructure and the extent of leased areas. A season-long stormwater quality monitoring program will monitor stormwater within the drainage areas that flow directly to the storm sewer, including monitoring of roof runoff and overland flow to determine potential pollutant sources and thus mitigation options. The project's second phase will propose options for effective BMPs within the investigated impervious areas. Another component of this phase will be implementing practices that protect stormwater through education and outreach to the Port Authority's tenants, which represent a variety of commercial and industrial activities.

# Lower Mississippi River Basin

Project completed

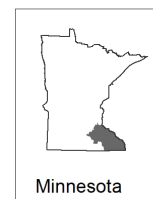
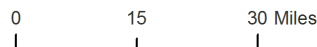
## Project involving multiple watersheds

Dakota County Nitrate Reduction Project



### Legend

- Approved Lake TMDL
  - Approved Stream TMDL
  - County Boundary
  - Major Watershed
  - Basin Boundary
- Watershed Projects**
- New
  - New and Active
  - Active
  - Completed



Project involving multiple watersheds

## Dakota County Nitrate Reduction Project

The purpose of the Dakota County Nitrate Reduction Project was to reduce nitrate in groundwater and surface water, especially in the Vermillion River Watershed. The City of Hastings has experienced rising nitrate levels in its municipal wells and installed a treatment system to meet the drinking water standard of 10 milligrams per liter. At Dakota County nitrate testing clinics, one-fifth to one-third of private drinking water wells tested exceeded the standard. The Vermillion River has elevated nitrate levels.

### Waterbody improved

- Drinking water aquifers of Dakota County and the County's surface water bodies, especially the Vermillion River

### Project highlights

- An earlier CWP project, the Hastings Area Nitrate Study (HANS, 1999-2003), determined that the primary source of the nitrate contamination was row-crop agriculture. This project implemented the Agricultural Outreach and Follow-up Monitoring and Research strategies of the HANS Implementation Plan. The project was in accordance with Dakota County's Comprehensive Plan and supported Hastings' and Vermillion's Wellhead Protection Plans, in addition to the Vermillion River and Cannon River WRAPS reports.
- The project did not result in reductions to the measured nitrate levels in the water resources of the County. However, the project partners worked with cooperating farmers to create and validate new corn fertilizer BMPs, then communicated the results through meetings, field days, and publications. In addition, Dakota County's results and experiences played a significant role in shaping the State of Minnesota's nitrate reduction strategies. Minnesota Department of Agriculture (MDA) has funded two Regional Extension Educators for Agricultural Water Quality, a Dakota County innovation through this EPA 319 grant and its precursors. The Nitrogen Fertilizer Management Plan and the township testing nitrate sampling program have incorporated Dakota County's experiences in addressing this regional problem.



*Fall cover crop in Dakota County*

### Partnerships

- Dakota County (project manager)
- UMN Extension (nitrogen fertilizer research and agricultural outreach)
- MDA (Nitrogen Fertilizer Management Plan, Clean Water Legacy funding)
- Vermillion River Watershed Joint Powers Organization (project partner)
- Dakota County SWCD (project partner)

### Financial information

Funding type: Section 319  
 Grant amount: \$215,307  
 Final in-kind: \$219,928  
 Matching funds: \$161,339

### Contact information

Jill V. Trescott  
 Groundwater Protection Supervisor  
 Dakota County  
 14955 Galaxie Avenue  
 Apple Valley, MN 55124  
 952-891-7019, [Jill.trescott@co.dakota.mn.us](mailto:Jill.trescott@co.dakota.mn.us)  
 MPCA Project Manager: Rachel Olmanson

# Lower Mississippi River Basin

## Active projects

### Projects awarded in 2017

#### Projects involving multiple watersheds

##### Reducing Bacteria from Southeast Minnesota Feedlots – 2017

Sponsor: Southeast Minnesota Water Resources Board (SEMWRB)

Funding: Section 319 (Grant) \$336,000

Purpose: A successful strategy used in the basin to reach runoff reduction goals has been to build local capacity for accelerating producer compliance with state feedlot rules. Employing this strategy in previous regional feedlot projects, SEMWRB completed runoff reduction designs for over 1,500 feedlots, and implemented over 780 feedlot fixes. SEMWRB will build upon this strategy to target efforts to those remaining open lot feedlots under 500 animal units that pose the greatest bacteria pollution potential and priority areas identified in local WRAPS and TMDL implementation plans. This project will target a goal of 30 open lot feedlots. Based on the annual reductions from a previous grant of similar size and scope we estimate the following reductions per year for this project: 71,000 lbs chemical on demand (COD); 1,300 lbs P; 3,900 lbs N; 16,000 lbs BOD and 2.0+E17 fecal CFU.

##### Reducing Runoff from Southeast Minnesota Feedlots – 2013

Sponsor: Southeast Minnesota Water Resources Board (SEMWRB)

Funding: Section 319 (Grant) \$300,000

Purpose: A larger regional effort to comprehensively address sources of fecal coliform bacteria tied to the regional TMDL implementation plan. Local feedlot staff in the 10 counties of southeast Minnesota will provide technical and engineering assistance to design and implement feedlot runoff control activities to treat polluted runoff. Farms will be prioritized based on criteria developed by each county and SWCD. The MinnFARM model will be run by feedlot technicians for each completed fix to determine reductions in polluted runoff from projects implemented. Reduction amounts will be reported using the Feedlot Unified Reporting Form developed for this project.

## Cannon River Watershed

### Building a Culture of Citizen Engagement – 2014

Sponsor: Cannon River Watershed Partnership

Funding: Section 319 (Grant) \$57,620

Purpose: Develop and pilot a process for building local community capacity for engaging in the watershed management process that can be sustained long-term with continuity. Using two subwatersheds currently engaged by CRWP, the process will cross-fertilize and organize diverse perspectives and segments of watershed residents and stakeholders to get watershed management work done in a way that is in tune with community needs, identities, and aspirations. The project will explore new approaches to strategic collaborations and coalitions with local, regional and state programs and organizations.

### Steele County Septic System Loan Program – 2012

Sponsor: Steele County

Funding: CWP (Loan) \$700,000

Purpose: This project will promote and install 70 SSTs in Steele County.

## Lower Mississippi River – La Crescent

### Cedar River Capital Improvement Project Implementation – 2017

Sponsor: Cedar River Watershed District

Funding: CWP (Loan) \$1,000,000

Purpose: Reduce sediment delivery to the Cedar River and its tributaries, through the implementation of 25 targeted flow control and treatment structures in the uplands of the watershed.

## Lower Mississippi River – Lake Pepin

### Mississippi River Lake Pepin Watershed WRAPS Implementation – 2016

Sponsor: Goodhue County SWCD

Funding: Section 319 (Grant) \$87,500

Purpose: Implement BMPs that will effectively make progress towards the reduction goals of 20% TSS as well as the reduction of the other pollutants, specifically through grade stabilization structures, terraces, and WASCOBs.

## Lower Mississippi River – Winona

### Downtown Winona Pre-Mississippi River Rain Garden – 2015

Sponsor: Port Authority of Winona

Funding: CWP (Grant) \$41,324

Purpose: This project will protect the Mississippi River at Winona, Minnesota, by the installation of a downtown Winona parking lot rain garden. This project will improve the Mississippi River water quality by removing an incorrectly sloped, 100% impervious parking lot surface then regrading and resurfacing the parking lot to direct runoff into a central rain garden planted with deep-rooted native vegetation that will filter pollutants such as oil, grease, dirt, debris, broken glass, road salt, sand, and unseen nutrients before any runoff reaches Winona's stormwater system and the Mississippi River. The rain garden will also serve to slow the velocity of runoff and reduce the likelihood of flooding which is a regular concern in Winona.

### Whitewater Watershed Nitrogen Reduction Project – 2017

Sponsor: Whitewater Joint Powers Board

Funding: Section 319 (Grant) \$232,825

Purpose: The priority resource of concern of this project is surface water and project work will focus on nitrogen load reduction through BMPs that minimize nitrate loss through leaching while optimizing row crop yield and maximizing rate of return for participating farmers. Project initiated BMPs include Nutrient Management and Cover Crops. The critical nitrate source areas for this project include nine upstream HUC 14 subwatersheds within the Middle and South Forks that are predominately row-cropped. This project will enhance and complement current nitrogen reduction activities in the region. If these adoption rates were applied to the entire watershed, 504,000 lbs/year would be achieved. A successful nitrogen reduction project will contribute a 126,000 lbs/yr reduction for the entire watershed. An approximate 13% reduction in nitrogen loading for the Mississippi River-Winona HUC-8 suggests a proportional reduction for the Middle and South Forks of the Whitewater Watershed, which would approximate goal attainment per respective TMDLs.

## Zumbro River

### Middle Fork Zumbro River Critical Source Area Restoration – 2016

Sponsor: Dodge SWCD

Funding: Section 319 (Grant) \$219,000

Purpose: Implement 16-18 sediment reducing projects in two targeted subwatersheds with an estimated 200-246 ton of TSS/year reduction to the Middle Fork Zumbro River.

### Zumbro River Ultra-Urban Vol-TSS-FeC Reduction – 2014

Sponsor: City of Rochester

Funding: Section 319 (Grant) \$300,000

Purpose: Reduce turbidity and fecal coliform bacteria loading in the receiving waters for downtown Rochester by identifying feasible volume control locations in the project area and demonstrating green infrastructure designs, benefits, and maintenance practices before redevelopment opportunities arise. In addition to delineating these areas, volume control practices need to be demonstrated to help "sell" their effectiveness and attractiveness and to clarify their maintenance needs.

# Minnesota River Basin

## Projects completed

### Projects involving multiple watersheds

Cottonwood-Redwood River Septic Loan Program  
 Greater Blue Earth Urban Retrofit Initiative

### Blue Earth River Watershed

Collaborative for Sediment Source Reduction:  
 Greater Blue Earth River Basin  
 Elm Creek Tile Outlet Treatment Trains

### Chippewa River Watershed

Lake Minnewaska Phase I Resource Investigation

### Cottonwood River Watershed

Cottonwood Streambank Inventory and Prioritization Project

### Le Sueur River Watershed

Le Sueur Watershed Targeted Conservation Practices

### Lower Minnesota River Watershed

Blackhawk Lake Protection Project  
 Credit River Protection Plan

### Minnesota River – Mankato

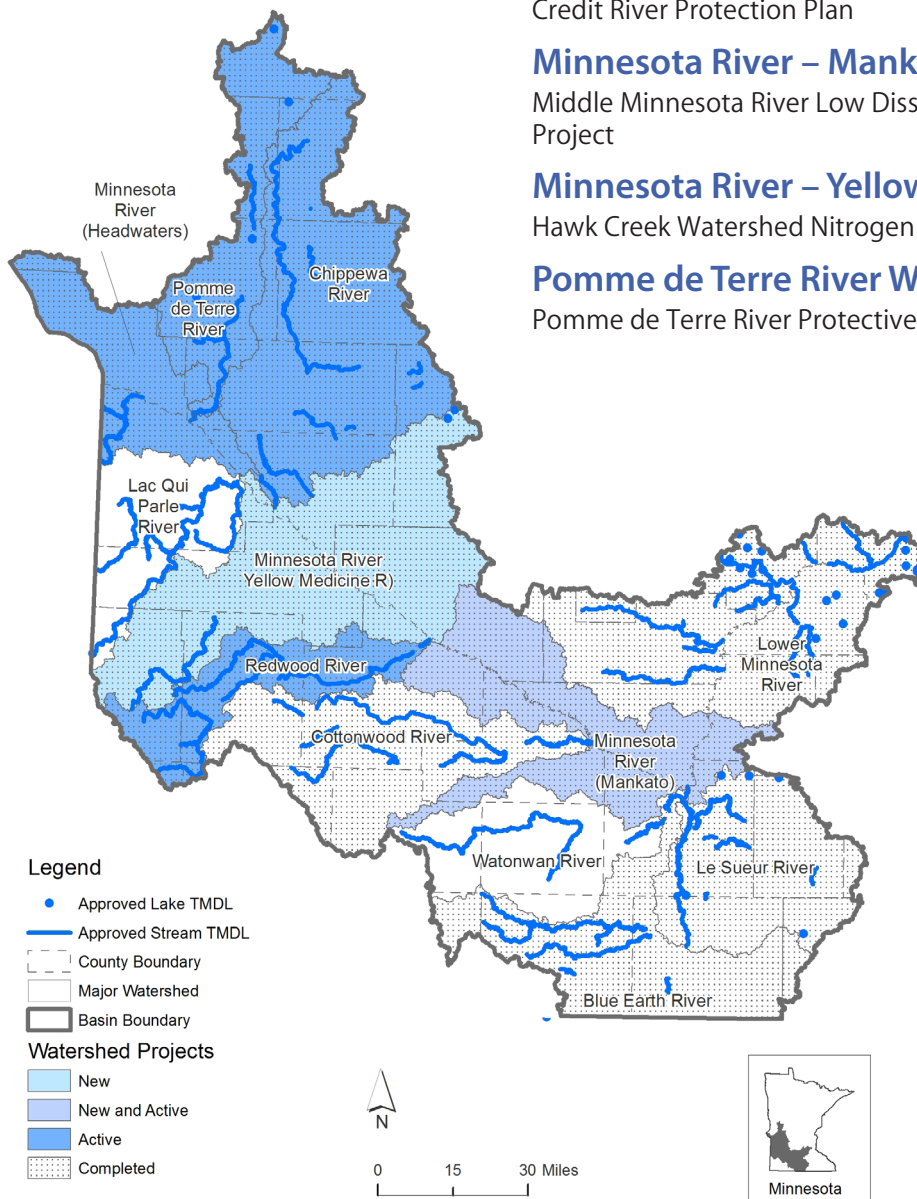
Middle Minnesota River Low Dissolved Oxygen TMDL Project

### Minnesota River – Yellow Medicine River

Hawk Creek Watershed Nitrogen Reduction Project

### Pomme de Terre River Watershed

Pomme de Terre River Protective Buffer Project



Projects involving multiple watersheds

## Cottonwood-Redwood River Septic Loan Program

At the time of the grant/loan application, FLUX32 estimates from the Redwood River sampling site above Lake Redwood, and from the Cottonwood River sampling site at New Ulm, showed respective TP delivery of 116.8 tons annually and 180.51 tons annually to the Minnesota River. These deliveries equal 0.19 tons per square mile (T/mi<sup>2</sup>) loss of P included with 114.5 T/mi<sup>2</sup> loss of sediment for the Redwood River, and 0.14 T/mi<sup>2</sup> loss of P included with 139.67 T/mi<sup>2</sup> loss of sediment for the Cottonwood River. This is directly related to the turbidity impairment and contributes to the Minnesota River P loading (<http://www.pca.state.mn.us/water/tmdl.html>). With the approved TMDL plan for the Lower Minnesota River for P reduction, the implementation of BMPs that reduce the TP contribution from the project area is an important component to de-list the Lower Minnesota River Dissolved Oxygen (DO) TMDL impairment.

### Waterbody improved

- The watersheds of the Redwood River and Cottonwood River encompass approximately 2,020 mi<sup>2</sup> in the Minnesota River Basin. The purpose of this project was to improve water quality through SSTS upgrades within these watersheds that will lead to P reductions necessary to meet goals set forth in the Lower Minnesota River DO TMDL. By targeting the non-compliant septic systems that have a direct discharge to surface water, P (and bacteria) reduction was achieved. Loading reductions of these direct pollutant sources will have a significant effect on improving the water quality of the Redwood and Cottonwood River to the Minnesota River helping the Lower Minnesota River achieve the DO TMDL limit to be delisted.

### Project highlights

- As of June 25, 2016, expenditures of the grant and loans were \$9,000.00 and \$193,370.81 respectively which began June 25, 2013 for the grant. Seventeen SSTSs had been installed (13 in the Cottonwood, 4 in the Redwood) at the time of this report with estimated reductions of 698.11 lbs/yr of TP, 1,279.76 lbs/yr of Total Nitrogen and 1,512.49 lbs/yr of Sediment. In January 2016, amendments were executed to extend the CWP SRF loan period for Redwood County and



*Septic System upgrade in the Cottonwood River Watershed*

Murray County one year with a new ending date of June 17, 2017. A similar amendment was executed with Cottonwood County for an additional \$100,000 in CWP SRF loan funds with an extended deadline of June 17, 2017. However, the grant was not extended. RCRCAs and its partners will continue to promote septic systems loan program beyond the sunset of this grant and loan project.

- In 2014, verified FLUX32 loading from the Redwood River sampling site above Lake Redwood, and from the Cottonwood River sampling site at New Ulm, showed respective TP delivery of 74.8 tons annually and 155.5 tons annually to the Minnesota River. These deliveries equal 0.117 T/mi<sup>2</sup> loss of P, and 0.119 tons/mi<sup>2</sup> loss of P. Although loadings can vary greatly from year to year based on precipitation, the decreasing trend is promising. FLUX32 loadings from 2013, the lowest of recent years, were of 50.6 tons annually (0.08 T/mi<sup>2</sup>) and 60.8 tons annually (0.05 T/mi<sup>2</sup>) to the Minnesota River. The impairment to the Lower Minnesota River has not been delisted, although progress is being made by all upstream partners. No new ordinances or laws directly related to septic systems have been adopted, although the 2015 Buffer Law will establish buffers along watercourses which will reduce the amount of sediment, and attached P, from reaching the watercourse.

### Partnerships

- Redwood County (loan sponsor)
- Redwood County Environmental Office (loan facilitator)



- Murray County (loan sponsor)
- Murray County Environmental Office (loan facilitator)
- Cottonwood County (loan sponsor)
- Cottonwood County SWCD (loan facilitator)

### Financial information

Funding type: CWP (Loan)

Loan amount: \$9,000

### Contact information

Kerry Netzke

Executive Director

Redwood-Cottonwood Rivers Control Area

1424 East College Drive, Suite 300

Marshall, MN 56258

507-532-1325, [kerry.netzke@rcrca.com](mailto:kerry.netzke@rcrca.com)

MPCA Project Manager: Mark Hanson

Projects involving multiple watersheds

## Greater Blue Earth Urban Retrofit Initiative

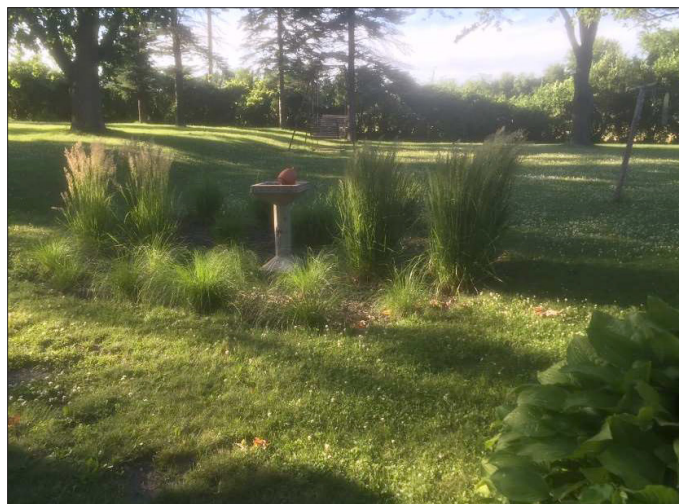
Ninety percent of Faribault County land use is agricultural. Less than 1% is urban development. Half of cities utilize county drainage systems as their storm sewer outlet. Impermeable surfaces are increasing and stormwater infrastructure is generally increased in diameter with each road reconstruction project. There are a number of combined actions and practices that must be addressed to prevent further degradation of our local and regional water bodies.

The Greater Blue Earth River Basin (GBERB) is comprised of the Blue Earth, Le Sueur, and Watonwan River major watersheds, spanning 11 counties in southern Minnesota. The GBERB accounts for 2.05 million acres (excluding Iowa) of which 88% of the land is under cultivation of row crops. While there are a number of studies and draft TMDLs written for GBERB, the only approved TMDL available is the Lower Minnesota River DO TMDL Implementation Plan written in 2006.

According to the 2013 Minnesota Nutrient Reduction Strategy (NRS), GBERB is a high priority concern for reductions in both P and nitrogen. The 2013 Minnesota Nonpoint Source Management Program Plan (NPSMPP) highlights that urban runoff is the third leading source of impairments. Elected officials and landowners don't understand how their actions affect water quality locally and contribute nationally. They feel that their contributions do not matter and therefore do not implement any type of management practices.

All facets, agriculture and urban, are contributing to the pollution issue; therefore, all should contribute reductions. Rural unregulated communities in Greater Minnesota are fighting declining populations, low tax bases, minimal budgets, and overloaded staff.

This initiative concentrated on small, non Municipal Separate Storm Sewer Systems (MS4), communities within Faribault County ranging in population from 73 to 3,350. The main objective of the project was to provide education to residents and elected officials with the ultimate goal of implementing retrofit projects in areas that had little to no prior stormwater controls. A secondary desire of the project was to ensure that the projects developed and utilized were both practical and economical for each site given their individual needs



*Raingarden in the Blue Earth Watershed*

and budgets. For community projects, the goal was to get elected officials to see firsthand the cost benefits of combining green infrastructure with grey infrastructure all in one project. The benefits are not only cost effective but also environmentally responsible.

### Waterbody improved

- Over the past 60 years, the Le Sueur River's flow has roughly doubled, causing drastic changes to the river hydrology, the Blue Earth River is estimated to have similar results. The main goal of implementation projects was to reduce volume.

### Project highlights

- BMPs installed included 10 permeable pavement areas, 22 raingardens, 2 conservation turf sites and 3 bioretention cells. While there were multiple highlights from this project, it was the effective development of partnerships that allowed the project to become as successful as it was. Without the civic engagement efforts that this project provided numerous other projects would not have transpired.
- Calculated reductions included volume reductions of 513,580 cubic feet/year, TP of 10.21 lbs/yr, and TSS 11.57 T/yr. There are additional pollution reductions that likely occurred with this project but were not calculated, including nitrogen and fecal coliform reductions.

- The education and outreach had a large focus and deserves as much attention as the implementation portion of the project. Education was provided at the general level to a broad audience with items such as press releases and yearly newsletters. Outreach topics were considered at a more refined scale and geared to a targeted audience including elected officials through newsletters and mailings. Civic engagement was targeted to interested audiences who received specific information on a select topic. The SWCD currently has a 92% success rate convincing attendees of civic engagement activities into implementing stormwater management projects.

### **Financial information**

Funding type: Section 319

Grant amount: \$270,250

In-kind: \$87,626

Matching funds: \$149,037

### **Contact information**

Michele Stindtman

Faribault County SWCD

415 S Grove St., Suite 8

Blue Earth, MN 56013

507-526-2300

[Michele.stindtman@co.faribault.mn.us](mailto:Michele.stindtman@co.faribault.mn.us)

MPCA Project Manager: Paul Davis

## Blue Earth River Watershed

## Collaborative for Sediment Source Reduction: Greater Blue Earth River Basin

The Minnesota River generates 80-90% of the suspended sediment eventually deposited in Lake Pepin. Up to 50% of that sediment load comes from the 3,540 mi<sup>2</sup> GBERB. When the GBERB TMDL was issued in 2012, there were 39 river reaches within the GBERB listed as impaired for turbidity under section 303(d) of the Clean Water Act. Reduction of sediment loading and turbidity from GBERB will require a large investment in management and conservation actions to reduce sediment inputs as well as peak river flow. The goal of this project is to develop a basis for evaluating and prioritizing different management actions for reducing sediment loading. The resulting product is intended to support watershed-scale prioritization, which we have identified as a gap in the currently available methods.

### Waterbody improved

- This project focuses on the GBERB in the counties of Blue Earth, Brown, Cottonwood, Faribault, Freeborn, Jackson, Martin, and Watonwan in Southern Minnesota. The primary water courses in the Greater Blue Earth are the Le Sueur, Cobb, Maple, Watonwan, and Blue Earth Rivers. The Blue Earth is tributary to the Minnesota River at Mankato, Minnesota.

### Project highlights

- We have developed a sediment budget that quantifies sediment sources in the GBERB. The budget is constrained by measured sediment loads at stream gages and by sediment fingerprinting information that indicates the fraction of sediment that comes from upland fields vs. near-channel sources. We have developed a relation between river discharge and near-channel sediment supply that can be used to relate flow reduction from water conservation measures to reductions in sediment loading. We have developed an innovative, reduced complexity model that links different portfolios of management actions to changes in sediment loading. This model was developed in association with a stakeholder group drawn from state and local agencies, industry groups, and local farmers.
- We have identified near-channel sediment sources (primarily eroding bluffs) as the largest source of



Contour buffer strips. (From USDA, 2011)

sediment in the GBERB. Because bluffs are the largest sediment source, the biggest reductions in sediment loading require either bluff stabilization or reductions of peak river flows. The Management Option Simulation Model has been used with project stakeholders to evaluate different portfolios of management actions for reducing sediment loading. Water conservation measures are the most favorable approach because they address the cause of the erosion, rather than the symptom, and because water conservation provides other ecosystem benefits, such as reducing nutrient loading and providing habitat.

### Partnerships

- MDA
- MPCA
- BWSR
- Minnesota Department of Natural Resources (DNR)
- UMN
  - Dept. of Soil, Water, and Climate
  - Dept. of Bioproducts and Biosystems Engineering
  - Minnesota Extension
- Greater Blue Earth River Basin Association
- Blue Earth County Commissioner
- Blue Earth County Planning Office

- Waseca County SWCD
- Blue Earth County SWCD
- U.S. Army Corps of Engineers
- U.S. Department of Agriculture, NRCS
- Minnesota Agricultural Water Resource Center
- Minnesota Corn Growers Association
- Minnesota Soybean Growers Association
- Individual farmers (4)

### Financial information

Funding type: Section 319

Grant amount: \$296,822

Final in-kind: \$250,497

### Contact information

Jeffrey Marr

Associate Director

University of Minnesota

2 Third Ave SE

Minneapolis, MN 55414

612-624-4427, [marrx003@umn.edu](mailto:marrx003@umn.edu)

MPCA Project Manager: Paul Davis



*Low flow in the Ditch 57 Rate Control Weir – Blue Earth County, MN (Source: ISG)*

## Blue Earth River Watershed

## Elm Creek Tile Outlet Treatment Trains

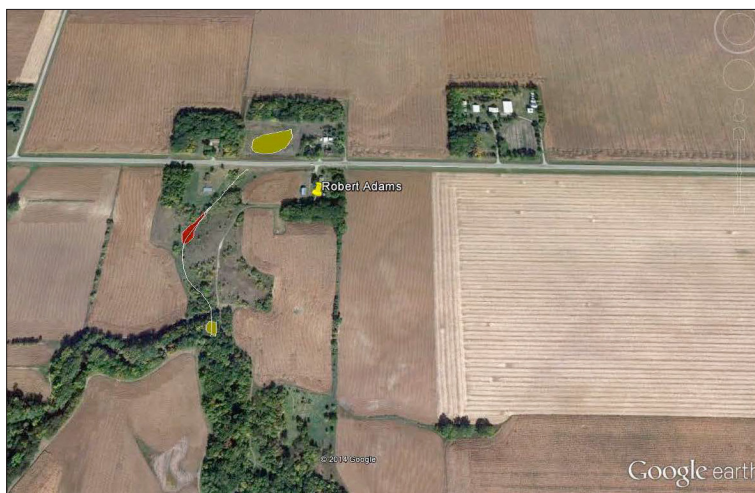
The impact of this project is to reduce water quality and quantity impacts from agricultural production systems that are intensely farmed (corn/soybeans) and contain extensive drainage systems. The primary focus will be on redesign of tile outlets using an innovative treatment train approach that addresses water traveling through drainage systems. A treatment train is simply a series of upland, riparian and in-stream practices that work together to cumulatively leverage pollution reductions from agricultural drainage systems. Current tile outlet discharge to a stream bypasses standard buffers or filter strip BMPs, thus failing to utilize the best available science.

### Waterbody improved

- This project developed and demonstrated an innovative approach to increase adoption of emerging management and pollutant load reduction practices associated with agricultural tile drainage systems and specifically tile outlets within the Elm Creek Watershed (HUC 0702000909) in south central Minnesota. Rural Advantage staff and UMN faculty and students in cooperation with SWCD and NRCS staff have been working with landowners in the watershed on a variety of research, education and conservation practice implementation activities over the past decade or so resulting in a strong trust relationship developed between partners. This project built from previous efforts and was developed from observations and discussion with landowners and expressions of desire for conservation practices they have interest in adopting. In 2011 and 2012, two subwatersheds in the Elm Creek Watershed was selected for the NRCS National Water Quality Initiative (NWQI) project. Elm Creek has been selected as one of four pilots for the new Minnesota Agricultural Water Quality Certification Program and will be implementing the program over the next three years.

### Project highlights

- This approach considers the water movement through the drainage system starting with upland treatment of the cropland where rainfall occurs, treatment at or near



Johnson-Adams Site

the tile outlet, and in-stream treatment just below the outlet. The combination of these practices is called a treatment train. Because these practices would not be intrusive, but would complement and are expected to increase productivity in current agricultural production systems, we expect increased adoption.

- The first tier in the tile outlet treatment train is the upland area where crops are grown. The second tier is the area at or near the tile outlet. The third or final tier in the tile outlet treatment train is the in-stream treatment methods.
- During the project timeframe the project team was able to identify three sites for potential demonstration of the Tile Outlet Treatment Train (TOTT). Listed in order from infield to the stream.
  - **Johnson-Adams Site** – cover crops, restored wetland, three rock chutes, compacted brush into the channel, sediment basin, bio-reactor, water that doesn't go through the bio-reactor travels down a drop structure and then is treated with a saturated buffer.
  - **Darwin Roberts Site** – perennial vegetation in restored oxbow, floating treatment wetland\*, flood plain retention and treatment, and saturated buffer.
  - **Loren Schoewe Site** – retirement of 35 acres and planted to perennial vegetation, drop structure, redirect tile outlet flow to an old oxbow, large floating treatment wetland\*.  
\*BioHaven® Floating Islands



Loren Schoewe Site

- In addition, we were able to establish five cover crop demonstration sites and five saturated buffer demonstrations utilizing Walton Family Foundation Funding within the Elm Creek watershed.
- Outreach events were held that included neighborhood field days (surrounding farmers to the site) at the cover crop sites, GBERBA meeting presentations and field tour, public field day, presentation at cover crop meeting, corn and soybean day in Fairmont (twice), presentations at Minnesota Water Resources Conference, two articles in the *Agri-news*, three articles in *Conservation Update* in the *Fairmont Photo Press* and landowner mailings.
- This project helped to show that Tile Outlet Treatment Trains can help us meet our water quality goals. Water quality improvement can be significant when a combination of practices are put together that match the field situation/condition. Results suggest that organic carbon presence and hydraulic residence defined Nitrogen-Nitrate (N/N) reduction.
- In this study, we found that N/N oxbow reduction ranged from 3% to 86%; N/N small wetland reduction ranged from 3% to 66% and N/N saturated buffer trench reduction ranged from 7% to 90%. Other larger wetlands showed nearly 100% reduction where most of the tile outlet water was retained in the wetland.

## Partnerships

- **Watershed Recovery, LLC** – Dr. Joe Magner – Dr. Magner led the development of the monitoring and design of the TOTT for each site. He used several graduate students from the UMN – St. Paul to assist in completing the research and design work as part of their studies.
- **University of Minnesota (UMN)** – CINRAM [Center for Integrated Natural Resources and Agricultural Management] – Dr. Dean Current – Dr. Current led the components on developing a discussion forum with UMN student.

## Financial information

Funding type: Section 319

Grant amount: \$165,000

Final in-kind: \$5,062

Matching funds: \$131,348

## Contact information

Linda Meschke

President

Rural Advantage

1243 Lake Avenue, Suite 222

Fairmont, MN 56031

507-238-5449, [linda@ruraladvantage.org](mailto:linda@ruraladvantage.org)

MPCA Project Manager: Paul Davis

## Chippewa River Watershed

## Lake Minnewaska Phase I Resource Investigation

The Lake Minnewaska project explored the land use in the watershed, point and nonpoint pollution sources, agriculture practices used, lakeshore development, septic system compliance, and water quality trends. The steep terrain in the contributing subwatersheds and multiple drainage ways and tributaries contribute to the concern. Gullies and ravine erosion are a large source but identifying which areas are contributing during storm events that exceed standards in that event will be important. Lake Minnewaska is not currently impaired but these tributaries and drainage ways have contributed and in some cases are exceeding standards in storm events. The data gathered will also help to inform implementation efforts and we will be able to then monitor progress and improvements. The lake has highly developed shorelines and high volume of recreational activity.

### Waterbody improved

- The purpose of the project is to protect Lake Minnewaska from becoming impaired. The Pope SWCD coordinated monitoring of the tributaries with citizen volunteers and the Chippewa River Watershed. Education and promotional efforts were completed in target areas to obtain buy in from landowners to complete projects. A tour was conducted and website updates were done to inform the public of projects and practices. Newsletters and articles in the paper have featured projects completed and the monitoring that has been done. Lake Minnewaska has seen improvement on at least one tributary on the south side of the lake in the secchi tube readings. A total of 17 BMPs were implemented in this one sub watershed as a result of the projects.

### Project highlights

- This project included information which was made available to the public through a website update, newsletters, tour, and direct mailings.
- The SWCD also completed a Terrain Analysis (PTMapp) for the subwatershed to identify areas where projects should be implemented on a field scale to address the gully and ravine pollution concerns. The SWCD will



*Sampling location for Lake Minnewaska*

- continue to implement BMPs in these subwatersheds with the information gained.
- Monitoring was completed which has provided more details to the stormwater conveyances affecting Lake Minnewaska.
- A modeling project was undertaken with the City of Glenwood to complete a P8 and a Stormwater Management Model of the stormwater conveyance system. This is underway and was secured through a CWF grant through BWSR.
- Designs were completed for project implementation including water and sediment basins and ravine repairs.
- There were also several secondary benefits to the project including a total of three CWF grants obtained through the BWSR to implement BMPs to address gully and ravine erosion. A total of 36 projects have been or are being implemented as a result of monitoring information gained by this project. These BMPs include: 32 WASCObS, 1 grade stabilization structure, 1 rock inlet, 10+ alternative intakes, 1 grassed waterway, and 1 wetland creation. The additional investigation done with the help of the MPCA funding has helped to inform the implementation process. This data has shown improved clarity. In addition, there has been no downstream flooding and landowners have indicated no moisture in their basements.
- The Pope SWCD coordinated monitoring of the tributaries with citizen volunteers and the Chippewa River Watershed. The Chippewa River Watershed did



intensive monitoring for Lake Minnewaska at three main tributaries feeding Lake Minnewaska.

- Education and promotional efforts were completed in target areas to obtain buy in from landowners to complete projects. A tour was conducted and website updates were done to inform the public of projects and practices. Newsletters and articles in the paper have featured projects completed and the monitoring that has been done.

### Partnerships

- The Pope SWCD worked with the following groups including: Lake Association, Glacial Lakes Environmental Trust Fund, County Commissioners, Water Plan Task Force, and Planning and Zoning staff to gain a better understanding of the resource concerns. The SWCD also coordinated monitoring with the Chippewa River Watershed project and worked on projects with the NRCS local office.

### Financial information

Funding type: CWP

Grant amount: \$94,341

In-kind: \$99,967

### Contact information

Holly Kovarik

Manager

Pope SWCD

1680 Franklin Street North

Glenwood, MN 56334

320-634-5327, [Holly.kovarik@mn.nacdnet.net](mailto:Holly.kovarik@mn.nacdnet.net)

MPCA Project Manager: Paul Wymar

## Cottonwood River Watershed

## Cottonwood Streambank Inventory and Prioritization Project

Annual TSS loading from the Cottonwood River in 1997 was estimated at over 330,000 tons, or 252 tons per square mile. The TP was estimated at 505 tons. Throughout the study period, flow weighted mean concentrations of TSS and nutrients on the main stem and most tributaries exceeded expected values for minimally impacted ecoregion streams. By 2008, annual FLUX32 calculations from the Cottonwood River sampling site at New Ulm showed a TP delivery of 143.38 tons annually to the Minnesota River. This is equal to 0.109 T/mi<sup>2</sup> loss of P included with 83.52 T/mi<sup>2</sup> loss of TSS ([www.rcrca.com](http://www.rcrca.com)). This is directly related to the turbidity impairment and contributes to the Minnesota River P loading.

### Waterbody improved

- The Cottonwood River Watershed encompasses 1,312.23 mi<sup>2</sup> and is one of thirteen major watersheds in the Minnesota River Basin. The River originates on the Coteau des Prairies, flowing eastward approximately 152 miles to the Minnesota River with a drop in elevation of about 750 feet. This topography results in periodic spring and summer flooding in the central portion of the watershed. At times, damages are severe. A related implication is rapid transport of sediment and attached nutrients from inadequately treated cropland during spring snowmelt and spring and summer rainfall events. Rapid transport of sediment and attached nutrients stems from cropland during spring snowmelt and spring and summer rainfall events.
- The purpose of this project is to facilitate watershed land-use changes within these watersheds that will lead to P reductions necessary to meet goals set forth in the Lower Minnesota River DO TMDL. Implementing groundwater infiltration and P reducing conservation practices through new funded best management practices will help achieve reductions outlined in the TMDL plan and the respective rivers' implementation plans. The impairment to the Minnesota River has not been delisted.



*City of Springfield – Streambank Stabilization (2016)*

### Project highlights

- As of August 31, 2016, this project completed 5 grade stabilizations, 34 WASCObS, 9,965 feet of grassed waterway, and 1,629.2 feet of streambank stabilization with estimated pollution reductions of: 1,050.63 lbs/yr of TP, 1,055.95 T/yr of soil saved, and 1,063.38 tons/yr of sediment captured. The cost-share from this grant assisted in \$757,951.88 of BMPs installed in the watershed.
- A prioritization ranking form was developed using the best available information for projects reducing the transport of sediment and nutrients. During this grant, the Terrain Analysis for the entire Cottonwood River watershed was completed by Houston Engineering Inc. As future projects are considered for implementation and cost-share, the Terrain Analysis data will be coupled with the ACPF tool to target these projects on a field-scale level.
- In 2014, verified FLUX32 loading from Cottonwood River sampling site at New Ulm measured TP delivery of 155.5 tons annually to the Minnesota River. This delivery is equal to 0.119 T/mi<sup>2</sup> loss of P. Although loadings can vary greatly from year to year based on precipitation, the decreasing trend is promising. FLUX32 loadings from 2013, the lowest of recent years, were 60.8 tons annually (0.05 T/mi<sup>2</sup>) to the Minnesota River. The impairment to the Lower Minnesota River has not been delisted, although progress is being made by all upstream partners. New soil loss ordinances have been adopted in addition to the 2015 Buffer Law that will establish buffers along watercourses. Both of these endeavors will reduce the amount of sediment, and attached P, from reaching the State's watercourses.

## Partnerships

- Brown SWCD & NRCS; Cottonwood SWCD & NRCS; Lyon SWCD & NRCS; Redwood SWCD & NRCS
  - These partners provided project assistance by referring cooperators to RCRCAs as well as processing additional cost-share funding at the federal, state and local levels.
- Area II Minnesota River Basin Projects, Inc.
  - This partnering joint powers organization provided engineering of the grade stabilization and WSCBs projects that exceeded the ability of RCRCAs staff.

## Financial information

Funding type: Section 319

Grant amount: \$297,000

Matching funds: \$275,668

## Contact information

Kerry Netzke

Executive Director

Redwood-Cottonwood Rivers Control Area

1424 East College Drive, Suite 300

Marshall, MN 56258

507-532-1325

[kerry.netzke@rcrca.com](mailto:kerry.netzke@rcrca.com)

MPCA Project Manager: Mark Hanson

## Le Sueur River Watershed

## Le Sueur Watershed Targeted Conservation Practices

The Le Sueur River watershed is listed for numerous impaired waters on the 303(d) List. River reaches within the watershed have been listed as impaired for turbidity, *E. coli*, mercury and pesticides. Also, the Le Sueur River watershed has been identified as the largest sediment contributor within the Minnesota River Basin, and is a part of the Greater Blue Earth River basin, which has been described as a disproportionately large contributor of sediment and turbidity. Historically, BMPs have been used in agriculture for several decades to greatly reduce levels of soil erosion and transport. Due to the voluntary nature of implementation activities, practices are often installed based on individual application as opposed to a targeted effort to use BMPs on environmentally sensitive areas. For this reason, the Le Sueur River has been the focus of numerous research and outreach projects. This project allowed a unique opportunity to investigate and analyze a host of BMP practices at various scales and areas to review and predict the potential for effectiveness, using outputs for historical studies and datasets.

## Waterbody improved

- The best available science was used to analyze the Le Sueur River Watershed using GIS and incorporating public participation in the decision-making for prioritizing BMPs. Multiple watershed maps were developed showing priority ranking of practices and focus areas based on environmental sensitivity variables, such as slope, soil type, land use, distance to surface water, overland flow potential, stream gradient, and erosion potential. This information, analyzed and synthesized and shared in several community meetings to empower citizens to generate solutions that best fit their watershed needs.

## Project highlights

- Cross-sectional partnership among public and private-sector organizations, and citizen-led watershed efforts
- Geomorphic assessment data from 2013-2016 was developed for public consumption in Google Earth
- BMP identification in approximately 20% (130,766 acres) of the Le Sueur River Watershed
- Collection of GIS layers and publications supporting targeted watershed planning
- Participated in and coordinated over 20 education, outreach and demonstration events



*Wetlands on the Brad Cook Farm near the Le Sueur River*

- Three years of crop residue management data
- Targeting of practices provided a new opportunity to maximize water quality benefit while minimizing financial inputs and as a result technical staff can gain a better understanding of the landscape and prioritize projects for funding. BMPs opportunities can now be illustrated on the landscape and prioritized based on citizen-led watershed efforts in partnership with local conservation technicians in targeted watersheds. The findings in this grant funded study were developed for public consumption and to engage a wide audience to empower citizens to choose management practices that best manage upstream and downstream stability and conditions.

### Partnerships

- Local leaders in targeted subwatersheds collaborating with us to develop citizen-led solutions to leave a legacy of improvements in the Le Sueur River Watershed.

### Financial information

Funding type: Section 319

Grant amount: \$82,491

In-kind: \$80,657

### Contact information

Jessica Nelson

Watershed Outreach & GIS Specialist

Minnesota State University, Mankato

135 Trafton Science Center S

Mankato, MN 56001

507-389-5492, [jessica.nelson-1@mnsu.edu](mailto:jessica.nelson-1@mnsu.edu)

MPCA Project Manager: Joanne Boettcher

## Lower Minnesota River Watershed

**Blackhawk Lake Protection Project**

Before the City of Eagan urbanized, 38-acre Blackhawk Lake (DNR #19-0059) was smaller than it is today. Its rural watershed was only about 200 acres. Eagan expanded its storm sewer system significantly in the 1970s and 1980s, resulting in an enlarged lake that now receives drainage indirectly from over 7,500 acres of the city. The lake is among Eagan's top-priority lakes for water quality protection and public recreation opportunities. Although Blackhawk is not listed as impaired, opportunities within the watershed to protect the lake's water quality from impairment are limited because the very large urban catchment is essentially fully developed.

**Waterbody improved**

- This project focused on enhancing community stewardship of Blackhawk Lake by implementing activities and BMPs at adjacent Black Hawk Middle School and Deerwood Elementary School.

**Project highlights**

- The project developed and presented student educational programs and materials; developed and presented a community education and involvement program; conducted pre- and post-project surveys and reports; conducted collaborative site analysis, BMP selection and design; implemented selected BMPs (i.e., sediment removal and an iron-enhanced sand filter at Pond BP-29.6; excavation of Pond BP-29.61; three infiltration/bioretention basins and a vegetated swale by Deerwood Elementary School; and a water-quality sump with an energy dissipator and skimmer at a catch basin); developed an operation and maintenance procedures manual for BMPs; and developed a model of TP and volume reductions. A soil-compaction analysis of 13-plus acres of the ISD196 campus' sport-field turf was also conducted when it fortuitously became available during the project.
- Educational programs were presented to 1,583 students and teachers. Water quality presentations were given to students to discuss the project and the importance of watershed residents to do their part to help Blackhawk Lake. The community education program was performed 10 times directly to 650 visitors. Student evaluations showed deep growth in topic knowledge, including correctly defining P and



*Iron-Enhanced Sand Filter – Pond Bench Learning Site*

understanding eutrophication. Data also showed the program increased knowledge and enthusiasm for the project. The post-project survey found over half of students remembered the messages conveyed through school presentations and curriculum integration. The water quality model estimates the project's BMPs will remove about 5 lbs/yr TP load from Blackhawk Lake, which is about 50% less than the pre-project TP load of 10 lb/yr.

**Partnerships**

- CLIMB Theatre, subcontractor
- Dakota County SWCD, technical consultant
- Gun Club Lake Watershed Management Organization, project co-sponsor
- ISD #196: Black Hawk Middle School; Deerwood Elementary School, project partner
- MPCA, state agency grantor
- Toro Company, project contributor

**Financial information**

Funding type: CWP

Grant amount: \$46,500

In-kind: \$32,487

Matching funds: \$105,822

**Contact information**

Eric Macbeth  
Water Resources Manager  
City of Eagan  
3830 Pilot Knob Road  
Eagan, MN 55122-1452  
651-675-5300, [emacbeth@cityofeagan.com](mailto:emacbeth@cityofeagan.com)  
MPCA Project Manager: Rachel Olmanson

## Lower Minnesota River Watershed

### Credit River Protection Plan

Credit River is located in Scott County, Minnesota with the headwaters starting in New Market township, draining north through the city of Savage to the Minnesota River. In 2002, the Credit River was listed as impaired for aquatic life based on turbidity (found to be associated with suspended solids). However, a study initiated by the Scott Watershed Management Organization (Scott WMO) and the MPCA in 2008 found that the river no longer exceeded the state standard for turbidity. This is likely due to changes in the watershed since it was originally listed in 2002. So instead of a TMDL, the MPCA agreed to remove the Credit River from the 303(d) list for turbidity in 2012, and the end product of the study changed to a Protection Plan. The Protection Plan was approved by the MPCA in 2011, and adopted by the Scott WMO as part of its Comprehensive Water Resource Management Plan.

#### Waterbody improved

- The primary purpose of this project was to begin implementing the Protection Plan (<http://www.scottcountymn.gov/749/Credit-River>). The water quality concern addressed by this project is to keep the River from becoming impaired again, with implementation targeting BMPs that build resiliency.

#### Project highlights

The project started mid-2013 continuing for three years and was largely successful. Three targeted capital projects (a grade stabilization, a streambank stabilization and a wetland buffer restoration) were completed on public land. Eleven native grass plantings, two rain gardens, a riparian buffer, a stream bank stabilization, a lined waterway, an underground outlet, a water and sediment control basin, and a terrace were installed on private land. Estimated pollution reductions for all activities are 1,375 pounds of nitrogen, 688 pounds of P, 658 tons of sediment and 1,005 tons of soil saved. A stormwater reuse system was constructed, and hundreds of citizens were activity engaged in implementing or learning about conservation. One area that was not successful was the promotion and completion of Small Acreage Management Plans. After several attempts to promote this effort produced no interest by landowners, funding was instead shifted and additional BMPs were completed.



*Credit River*

#### Partnerships

Major partners were the Scott SWCD and the cities of Prior Lake and Savage.

#### Financial information

Funding type: CWP

Grant amount: \$225,000

In-kind: \$11,314

Matching funds: \$215,692

#### Contact information

Paul Nelson

Environmental Services Program Manager  
Scott Watershed Management Organization

200 4th Avenue West

Shakopee, MN 55379

952-496-8475, [pnelson@co.scott.mn.us](mailto:pnelson@co.scott.mn.us)

MPCA Project Manager: Chris Zadak

## Minnesota River – Mankato

## Middle Minnesota River Low Dissolved Oxygen TMDL Project

The grant work area drains approximately 158,320 acres of land to the Minnesota River. This project addressed the nutrient P as it relates to the low DO impairment identified in the Lower Minnesota River DO TMDL Implementation Plan. Significant sources of P have been identified as coming from storm drain runoff, wastewater treatment plant (WWTP) effluent, ag-field runoff, livestock operations, and failing septic systems. A primary goal of this project was to promote and implement BMPs that decrease P runoff and increase water infiltration in agricultural and urban areas in an effort to achieve the water quality conditions outlined in the Lower Minnesota River DO TMDL. Another goal of this project was to continue efforts to educate the public on the importance of P reduction by maximizing public input and water stewardship through educational and outreach activities. The grant work area is located in the Middle Minnesota River Watershed (07020007) and includes those portions of the watersheds of Birch Coulee Creek, Purgatory Creek, Three-Mile Creek, Fort Ridgely Creek, and Little Rock Creek that lie within Renville County. It also includes the small areas between those respective watersheds that drain directly to the Minnesota River. This project area encompasses 158,320 acres that drains to the Minnesota River. Although this area does not have a lone major Minnesota River tributary, Birch Coulee, Fort Ridgely, and Little Rock Creeks are significant waters, each with watersheds in excess of 40,000 acres. The Minnesota River currently does not meet federal water quality standards and the Lower Minnesota River is currently listed as impaired on the Federal 303(d) impaired waters list for DO content. Since the 1990s, efforts have been underway to restore the Minnesota River to suitable fishing and swimming conditions. This project addressed the nutrient P as it relates to the low DO impairment identified in the Lower Minnesota River DO TMDL Implementation Plan. Significant sources of P have been identified as coming from storm drain runoff, WWTP effluent, ag-field runoff, livestock operations, and failing septic systems.

### Waterbody improved

- This project focused on implementation of BMPs that elevate DO levels in watercourses by reducing P in agricultural and urban areas and/or increasing



*A cover crop field in the Middle Minnesota River Basin*

groundwater infiltration, thereby increasing stream base flows. This project implemented 24 BMPs with 11 landowners. Through numerous activities, the Hawk Creek Watershed Project (HCWP) provided information to and engaged citizens about the water quality of the watershed and the opportunities to restore and protect it. The Middle Minnesota River Watershed is still not to ecoregion standards and HCWP will continue the goals of BMP implementation and increased watershed citizen involvement to improve the water quality of the watershed.

### Project highlights

- This project implemented 24 BMPs (13 alternative intakes, 14.7 acres of buffers, 1 diversion/retention project, 3 gully/grade/bank stabilizations, 80 acres of cover crops, 1 sediment control basin/1 side inlet) with 11 landowners/landowner entities and resulted in an estimated annual reduction of 534.68 pounds of P and 327.40 tons of sediment. HCWP staff produced and mailed three newsletters and five postcards to Middle Minnesota Watershed residents. HCWP staff also held 19 meetings/field days and several educational and outreach activities in which Middle Minnesota Watershed residents participated. The HCWP website was also active to provide information on current HCWP happenings, cost-share funding, and education and outreach. Major partners included landowners, the Renville County Ditch Authority, the Renville County Water and Household Hazardous Waste Management Department, the Renville County Environment and



Community Development, and the Renville County SWCD. The activities accomplished through this grant are identified in the Renville County Local Water Plan and have helped the County to move closer to accomplishing the objectives and goals of its Plan. HCWP staff procured another grant in the same area to continue the work of this grant implementing BMPs and doing education and outreach.

### Partnerships

- Board of Water and Soil Resources – A BWSR representative was responsible for working with SWCD staff to ensure efficient completion of cost-share agreements.
- Hawk Creek Watershed Project – Staff were responsible for overall grant program administration, including BMP implementation, education and outreach, budgets, and reporting.
- Hawk Creek Watershed Project Board of Directors – The Board of Directors is comprised of one appointed County Commissioner from each of the three counties involved with the Project. The Board of Directors met regularly with the HCWP staff to discuss and make decisions regarding financial, policy, and personnel issues.
- Hawk Creek Watershed Project Citizen Advisory Committee – The Citizen Advisory Committee met regularly with HCWP staff. At these meetings, active citizens, agency personnel, county officials, community officials, and active and retired agricultural producers shared thoughts, ideas, and concerns for the watershed.
- Hawk Creek Watershed Project Local Work Group (LWG) – The LWG is made up of technical personnel from Renville, Chippewa, and Kandiyohi Counties, as well as state and regional agency representatives. The LWG met regularly with HCWP staff to discuss and prioritize water quality projects.
- Renville County and Renville County SWCD
- Natural Resources Conservation Service
- Landowners and local media

### Financial information

Funding type: Section 319

Grant amount: \$245,475

In-kind: \$574,703

### Contact information

Heidi Rauenhorst  
Coordinator  
Hawk Creek Watershed Project  
Renville County Courthouse, Lower Level  
500 E DePue Avenue  
Olivia, MN 56277  
320-523-3666, [heidi@hawkcreekwatershed.org](mailto:heidi@hawkcreekwatershed.org)  
MPCA Project Manager: Bryan Spindler

Minnesota River – Yellow Medicine River

## Hawk Creek Watershed Nitrogen Reduction Project

The Hawk Creek Watershed drains approximately 623,105 acres of land in Chippewa, Kandiyohi, and Renville Counties and is comprised of a main tributary (Hawk Creek) and several other streams that flow directly to the Minnesota River, including Chetomba, Sacred Heart, Beaver, Middle, Timms, Smith, and Palmer Creeks. Several streams in the watershed are listed as impaired on the EPA's 303(d) Impairment List.

The primary water quality concern this project addressed was nitrogen and P levels within the watershed with common sources of nitrogen and P in our waterways coming from eroding soils and runoff from animal feedlots, fertilizers, wastewaters, subsurface drainage, and failing SSTS.

### Project highlights

- This project produced 58 SSTS upgrades that were implemented to address and remediate sources of pollution in the Hawk Creek Watershed and Minnesota River. These SSTS upgrades were implemented through partnerships with the Hawk Creek Watershed Project (HCWP), Chippewa County, Kandiyohi County, and Renville County from June 2013 – June 2016. Failing SSTS are priority concerns in the local water plans for all three counties in the watershed and SSTS upgrades are action steps to reach their goal of protecting and improving surface water quality. These water quality improvements will be continued through recently approved SSTS loan funding that will be available soon.
- A total of 58 SSTS were upgraded through this project. The estimated pollutant reductions of these 58 SSTS upgrades are: 530 lb/yr P, 1,105 lb/yr nitrogen, 11,744 lb/yr TSS, and 3.57E+15 colony forming units (CFU) bacteria. These upgraded SSTS no longer contribute the amount of pollutants entering the Hawk Creek Watershed and the Minnesota River that they once did when they were failing.

### Partnerships

- Chippewa County – loan sponsor
- Kandiyohi County – loan sponsor
- Renville County – loan sponsor

### Financial information

Funding type: CWP Loan  
Grant amount: \$10,000  
Loan amount: \$1,050,000

### Contact information

Heidi Rauenhorst  
Coordinator  
Hawk Creek Watershed Project  
Renville County Courthouse, Lower Level  
500 E DePue Avenue  
Olivia, MN 56277  
320-523-3666, [heidi@hawkcreekwatershed.org](mailto:heidi@hawkcreekwatershed.org)  
MPCA Project Manager: Mike Weckwerth

## Pomme de Terre River Watershed

## Pomme de Terre River Protective Buffer Project

The Pomme de Terre Watershed is located in west-central Minnesota and is the northern-most tributary to the Minnesota River. The Pomme de Terre River and associated lakes are listed on the 303(d) impaired list for numerous impairments that include turbidity, excess nutrients, and biology (with the earliest year added to list in 2006 and the latest in 2012). The major water quality problem identified was phosphorous and sediment, which was determined to be a result of minimal buffers and failing or outdated septic systems.

### Waterbody improved

- This project addressed the risk of impairment in the northern portion of the watershed by implementing 117.51 acres of protective buffers. It also addressed excess nutrients watershed-wide by assisting landowners through a low interest loan in upgrading failing septic systems. Numerous activities and outreach to landowners and citizens were also done to help address the problem and to educate the citizens and landowners.

### Project highlights

- A total of 117.51 acres were enrolled into perpetual easements in the northern portions of the watershed resulting in an estimated reduction of 1,092.84 tons of sediment/year. In addition, four outreach activities were taught throughout the watershed and reached 50 participants.
- With the completion of this project, the overall buffer enrolled into permanent easement in the watershed has increased. These permanent easements now provide year round ground cover, and serve as perpetual filtration for runoff. The estimated environmental impact for the 117.51 acres of buffer increase is 1,092.84 tons of sediment/year. All the projects and activities designed were completed to satisfaction of the work plan. This project has raised the awareness of water quality issues and has increased the knowledge of watershed residents on watershed topics.



*Pomme de Terre River protective buffer project*

### Financial information

Funding type: CWP Grant

Grant amount: \$216,600

Matching funds: \$313,816

### Contact information

Jared House

Project Coordinator

Pomme de Terre River Association

12 Hwy 28 East, Suite 2

Morris, MN 56267

320-589-4886, Ext. 109, [Jared.house@pdriver.org](mailto:Jared.house@pdriver.org)

MPCA Project Manager: Paul Wymar

# Minnesota River Basin

## Active projects

### Projects awarded in 2017

#### Projects involving multiple watersheds

##### Chippewa Countywide Septic System Upgrades – 2017

Sponsor: Chippewa County

Funding: CWP (Loan) \$200,000

Purpose: Provide low interest loans up to 20 homeowners throughout Chippewa County for upgrading their individual septic systems, continually working towards improving water quality and threats to drinking water and human health because diseases and infections may be transferred to people and animals directly and immediately by failing SSTS.

##### GBERBA Conservation Drainage Partnership Program – 2015

Sponsor: Greater Blue Earth River Basin Alliance (GBERBA)

Funding: CWP (Grant) \$147,200

Purpose: Alternative side-inlets (categorized as grade stabilization structures) are an effective alternative to the classical side-inlet pipe. Instead of a horizontal pipe through the spoil bank, alternative side-inlets may utilize a drop structure with a water quality inlet on the surface. The water quality inlet allows water to temporarily pond, decreasing the stormwater's sediment carrying capacity by as much as 95%. Twenty-seven shovel-ready projects will reduce peak downstream flows and annually prevent 23.5 tons of soil and sediment and 23.5 pounds of P from entering ditches. The trash guard of the water quality inlet also prevents field residue from leaving the field. Additional water treatment (nitrogen) is likely with the setting of the water quality inlet in the grassed buffer of the drainage ditch.

##### Greater Blue Earth Nonpoint Reduction Initiative – 2014

Sponsor: Faribault SWCD

Funding: CWP (Grant) \$364,163

Purpose: Provide education, outreach and civic engagement necessary for the development of structural and non-structural BMPs needed to improve water quality within the Greater Blue Earth River Basin. General education will have a regional focus to landowners.

Outreach efforts will be focused on regional officials, staff and landowners. Civic engagement efforts will have a smaller watershed scale focus with efforts resulting in structural BMPs being placed on the land and non-structural BMPs being adopted. Provide cost-share assistance to landowners within the Greater Blue Earth River Basin to implement NPS reduction BMPs. Provide technical assistance to landowners and administration for this grant. Develop and deliver education, outreach and civic engagement efforts.

##### Greater Blue Earth River Basin TMDL Implementation – 2016

Sponsor: GBERBA

Funding: Section 319 (Grant) \$400,000

Purpose: Cover 1,500 open tile intakes, reducing sediment and P loading by 15,000 tons and 15,000 pounds in 10 years respectively, contributing 16% to the listed TMDL plan goal. In addition, this project will implement 3,000 acres of cover crops, reducing sediment by 201 tons, P by 570 pounds, and nitrates by 19,800 pounds.

##### Lac qui Parle-Yellow Bank SSTS Loan Program – 2017

Sponsor: Lac qui Parle-Yellow Bank Watershed District

Funding: CWP (Loan) \$500,000

Purpose: Provide low interest loans to up to 45 homeowners throughout the Lac qui Parle-Yellow Bank Watershed District area for upgrading their individual septic systems. This project will result in an estimated annual reduction of 210 pounds of P, 1.4 tons of sediment and 675 pounds of nitrogen and biological oxygen demand, five day 5,060 pounds per year.

## Blue Earth River

### Blue Earth River Dissolved Oxygen: Managing Flows & Nutrients – 2014

Sponsor: Faribault County SWCD

Funding: Section 319 (Grant) \$234,334

Purpose: Design a drainage watershed water quality treatment system through a mix of management and implementation practices to strike a balance between improved drainage need and local water quality benefit, while serving as an example site across the Greater Blue Earth River Basin. Install targeted BMPs to reduce the amount of P, nitrogen, and sediment reaching the Blue Earth River, including 2 woodchip bioreactors, 1 sediment basin, 5 water control structures, 6 alternative

surface intakes, and 1 saturated buffer. Establish up to 75 acres of cover crop demonstration plots. Host a minimum of one workshop/field day on BMP installation and/or cover crops/soil health. Create short videos so landowners, elected officials and LGUs can see the installation process and how the practice works beneath the surface. Design and install signage at cover crop plots and BMP installation sites. Create and distribute promotional materials and advertisements as necessary.

#### **Blue Earth River Green Infrastructure Project – 2014**

Sponsor: City of Winnebago

Funding: CWP (Grant) \$10,000 and CWP (Loan) \$1,000,000

Purpose: Design and implement a region bioretention basin within the 25 block reconstruction project area, promote and implement green infrastructure activities throughout the City of Winnebago to reduce stormwater volume entering critical infrastructure, implement voluntary landowner BMPs found in the Minnesota Stormwater Manual, prepare an in-project area video on disconnect inflow and infiltration issues between the structures and main connection and develop SWCD grant program education and civic engagement within the City of Winnebago and project area.

### **Chippewa River**

#### **Chippewa River Accelerated Restoration – 2012**

Sponsor: Chippewa County

Funding: CWP (Loan) \$900,000

Purpose: This project will promote and install 90 SSTS, rural and agricultural BMPs in the Chippewa River watershed.

#### **Chippewa River Phosphorus Reduction Practices – 2013**

Sponsor: Chippewa River Watershed Project

Funding: Section 319 (Grant) \$279,518

Purpose: Address P loading sources within the watershed and effectively reduce the amount of pollutant load entering the local priority waters within the watershed and lower the Chippewa River Watershed's contribution to the Minnesota River. The utilization of alternative surface tile intakes, drop side inlets, cover crops, livestock exclusion (fencing), pasture management/planned grazing, and WASCObS will provide the best options for landowners to make site and management specific choices for reducing P.

#### **Chippewa River Sediment Reduction – 2016**

Sponsor: Chippewa River Watershed Project

Funding: Section 319 (Grant) \$285,878

Purpose: Implement 25 structures to control sediment, runoff and associated gullies on cropland. Estimated sediment yield reductions 50% on acres contributing to each structure; have 15 cooperators adopt cover crops on 600 acres in their operations to protect soils from water and wind erosion from fall harvest to spring planting and to improve soil health properties. Estimated sediment yield reductions between 50-90% on affected acres; develop 2 grassed or lined sites for the protection of gullies and washout areas to control erosion and sedimentation near surface waters. Estimated sediment delivery yield reductions 60% on contributing acres; complete 3 sites to help prevent the formation or advancement of gullies while reducing sediment delivery to downstream waters; develop 5 sites to include practices and methods that control and treat livestock related sediment delivery to surface waters.

#### **Chippewa River Watershed Protection – 2015**

Sponsor: Chippewa River Watershed Project

Funding: CWP (Grant) \$296,965 and CWP (Loan) \$350,000

Purpose: Stabilize 235 feet of streambank with bio-engineering techniques, install 10 shoreline restorations, install approximately 3/4 mile of livestock exclusion fencing, enroll 30 acres of buffer strips, upgrade septic systems, and other recognized BMP's for reducing pollutant loading that may be brought forth by landowners that would have a direct impact on protecting water quality. Program evaluation tools will be developed to evaluate other key activities within program elements such as bus tours, field days, and public meetings. Levels of nutrients and sediments will be monitored on an ongoing basis to compare with the 15 years of historic data available and point to any increasing or decreasing trends in water quality. Using BWSR's calculation tools it is estimated that 235 feet of streambank stabilization will reduce P by 68 lbs/yr and delivery of sediment by 59 T/yr. Shoreline restorations reduce P by 35.05 lbs/yr and sediment by 41.25 T/yr, buffer strips reduce P by 3,416 lbs/yr and sediment by 2,867 T/yr, sediment basins reduce sediment by 75 T/yr and reduce P by 90 lbs/yr, livestock exclusion fencing saves three tons of soil per year and reduces P by three lbs/yr, and cover crops reduce 620 lbs/yr of P and reduce sediment by 414 T/yr.

## Le Sueur River

### Le Sueur River WRAPS Implementation Endeavor – 2016

Sponsor: Faribault County SWCD

Funding: Section 319 (Grant) \$347,950

Purpose: Implement stormwater BMPs, such as bioretention, filtration, infiltrations, iron enhanced sand filters, permeable pavement, water re-use, and urban forestry, in four cities; develop and engineer a structural BMP to store and treat surface water runoff on community property in the Bass Lake subwatershed; increase perennial vegetation; agricultural BMPs, such as conservation tiling, riparian corridor management (bank stabilization, saturated buffer), increased vegetated cover and nutrient management BMPs. Appropriate BMPs will also be implemented on the land in any of the watersheds listed as a high priority.

## Lower Minnesota River

### Carp Management in Spring Lake & Prior Lake – 2015

Sponsor: Prior Lake - Spring Lake Watershed District

Funding: CWP (Grant) \$67,323

Purpose: Capture and surgically implant 30 adult carp throughout three lakes with high frequency radio transmitters. In addition to radio tagging, all remaining carp will be marked with a fin clip and returned to the lake to allow us to complete a mark/recapture population estimate. Radio tagged carp will be tracked to determine if migration routes exist and where barriers may be sited to restrict carp from potential nursery sites and spawning habitat and identify potential aggregation areas. Once a significant aggregation of carp has been located, removal will be completed. During the removal, a count of the recaptured carp will be completed to generate a population estimate, combining the information with a weight and length subsample to obtain a biomass estimate. This value can then be used to gauge if additional removals are needed. By quantifying the amount of carp that are present post-removal, a TP load reduction can be estimated and compared to the amount specified in the 2012 TMDL for Spring and Upper Prior Lakes. Spring/Summer spawning tracking data will inform decisions on where we may be able to site carp barriers as part of our integrated pest management (IPM) strategy to inhibit carp recruitment. Barriers will be placed in identified locations after sufficient spawning period data has been collected. Carp will be tracked post barrier

installation in 2017 to determine the effectiveness of the barriers and allow us to determine if any modifications may be necessary.

### High Island Creek – McLeod County SSTS Project – 2013

Sponsor: McLeod County

Funding: CWP (Loan) \$120,000

Purpose: This project will work to address non-compliant SSTS in McLeod County's portion of the HICW through the allocation of loan funds to rural homeowners. Overall, this specific project strives to implement three SSTS upgrades per year for the next three years.

### Lake Waconia Stormwater BMP Enhancement – 2014

Sponsor: Carver County Water Management Organization (CCWMO)

Funding: CWP (Grant) \$93,000

Purpose: Mitigate P and TSS loading to Lake Waconia by enhancing urban stormwater treatment with the installation and inspection (to follow guidelines of the Minnesota Stormwater Manual) of up to five bioretention areas, a sand iron filtration bench, and approximately 90 feet of installed permeable pavers. Monitor practice outlet prior to BMP installation to assess TP and TSS event-based loading. Install flow meter to gather in-pipe, event based, and storm hydrographs. Collect event samples for processing. Compile and analyze data to determine event based TP and TSS loading.

### Lower Prior Lake Protection Project Implementation – 2014

Sponsor: Prior Lake-Spring Lake Watershed District

Funding: CWP (Grant) \$142,522

Purpose: A reduction in watershed P loading to Lower Prior Lake by 33 lb/yr, or 10% of the total drainage area P load of 326 lb/year, to maintain or improve water quality conditions (as monitored in the central basin) by up to 10% within 10 years of initiation of implementation activities, which include infiltration areas, water control structure, rain gardens, shoreline restorations and filter benches. Through community outreach activities, watershed residents will understand that immediate P reduction actions result in future benefits to water quality. Tangible benefits of watershed BMPs implemented now may only appear in long-term, future trends, and not until full BMP establishment (in particular, vegetation).

### **Minnesota River and Sand Creek Improvement Project – 2016**

Sponsor: Scott County/Scott Watershed Management Organization

Funding: Section 319 (Grant) \$565,000

Purpose: Complete 30 to 35 structural BMPs, 20 to 25 acres of nonstructural BMPs, 550 acres of cover crops, 4 near channel capital stabilization projects, monitoring of Sand and Roberts Creeks, trend analysis for Sand Creek, 2 landowner surveys, and 8 to 10 riparian vegetation improvement projects in critical watershed areas.

### **Quarry Creek Collaborative – 2015**

Sponsor: Scott County/Scott Watershed Management Organization

Funding: CWP (Loan) \$1,998,800

Purpose: This project will reduce sediment to the Minnesota River, control erosion and reduce sedimentation in Quarry Creek, and protect private land and public infrastructure. Stabilization techniques proposed are designed to significantly reduce flow rates and velocities, channel incision, the migration of knick points and head cuts, such that sediment erosion will be reduced by at least 75% to 80% within the stabilized areas. The project activities include stabilizing 2 knick points, thousands of feet of channel armoring and turf reinforced mat, a couple dozen grade control/rock weir structures, and 1 large detention basin. Landowners are contemplating a native prairie planting, grassed waterways, and several WASCObS in the areas tributary to the ravines. With the heavy rains of mid-June 2014 there is significant damage to ravines and creeks like Quarry Creek throughout the area and the project will serve as an example.

### **Rush River Watershed – Nicollet County SSTS Project – 2013**

Sponsor: Nicollet County

Funding: CWP (Loan) \$150,000

Purpose: This project will work to address non-compliant SSTS systems in Nicollet County's portion of the Rush River Watershed through the allocation of loan funds to rural homeowners. Overall, this specific project strives to implement five SSTS upgrades per year for the next three years.

### **Scott Watershed Management Organization TMDL Implementation – 2013**

Sponsor: Scott Watershed Management Organization

Funding: Section 319 (Grant) \$298,512

Purpose: Implement BMPs that are part of citizen engagement efforts that support implementation plans for Cedar and McMahon Lakes Excessive Nutrients and the Lower Minnesota River DO TMDLs. BMPs to be promoted include: harvestable filter strips, alternative tile intakes, water and sediment basins, grassed waterways, grade control, wet detention ponds, native vegetation plantings, wetland restoration, riparian vegetation improvements, and shoreline restoration and stabilization. Much of the funding is for staffing to provide the technical assistance necessary to promote and implement the BMPs. One specific project included on public land converts roughly 19 acres of cropland near Cedar Lake to native vegetation. A citizen engagement event using volunteers to complete the seeding and planting will be coordinated with this effort. A second citizen engagement/community capacity building effort that will be completed is a customer service survey with landowners who participated in the cost share/incentive program.

## **Minnesota River – Mankato**

### **Mankato Watershed – Renville County FY17 Improvement Project – 2017**

Sponsor: Hawk Creek Watershed Project

Funding: Section 319 (Grant) \$297,000

Purpose: BMPs will reduce P and erosion as determined through research of the hydrology, geomorphology, land use, connectivity, water chemistry, and biology of the area. The BMPs will improve water quality, aquatic and riparian habitat, increase biodiversity, and enhance hydrology. The estimated pollutant reductions for BMPs are 300-800 pounds of P/year and 200-700 tons of sediment/year. Educational efforts will include effects of altered hydrology and the importance of retaining water to reduce nutrient export and water quantity.

### **Middle Minnesota Watershed, Implementation of Conservation Practices – 2011**

Sponsor: Cottonwood County

Funding: CWP (Loan) \$1,400,000

Purpose: Coordinate the CWP loan program in southern Minnesota counties to demonstrate the influence low

interest SSTS loans has on the rate of SSTS compliance. It is anticipated that 120-160 new systems will be installed. Each of these systems will be financed through low interest loans which will be administered by individual counties: Blue Earth, Brown, Cottonwood, Nicollet, Redwood, Renville and Sibley.

#### **Middle Minnesota Watershed SSTS Loan Project – 2014**

Sponsor: Renville County

Funding: CWP (Grant) \$10,000 and CWP (Loan) \$950,000

Purpose: The project will provide second-tier low interest loans to landowners for the replacement or upgrade of 65-85 noncompliant septic systems located in the Middle Minnesota Watershed. This project will serve as a means to financially assist landowners in Renville, Cottonwood, Redwood, Nicollet, and Le Sueur counties to continue eliminating noncompliant septic systems and improving water quality.

#### **Renville County MN River Mankato Watershed Protection – 2014**

Sponsor: Hawk Creek Watershed Project

Funding: CWP (Grant) \$306,750

Purpose: To address nutrients in surface waters coming from the most common origins of upland sources (eroding soils and runoff from fields, animal feedlots, and urban areas) and near-channel sources (ravines, gullies, bluffs, and streambanks). Multi-beneficial, targeted BMPs, such as buffer strips, grassed waterways, grade/gully stabilizations, streambank and shoreline stabilizations, tile intake protection practices, controlled drainage, wetland restorations/protection, and feedlot runoff reduction practices will be a priority in order to prevent impairments and degradation. Based on past project pollutant reductions, the estimated pollutant reductions through this grant are 680 pounds of P per year and 255 tons of sediment per year.

#### **Seven Mile Creek Assessment and Implementation – 2017**

Sponsor: Gustavus Adolphus College

Funding: Section 319 (Grant) \$475,524

Purpose: The SMC watershed was identified as a NWQI watershed by the NRCS and, in 2014, BWSR designated it as one of its Targeted Watershed Demonstrations. These concentrated monitoring funds will show that targeting conservation in agricultural landscapes can produce measureable improvements in stream metrics.

This monitoring project is to create an expanded and coordinated monitoring program designed to capture change at multiple scales, with the hope of applying those lessons to similar landscapes across the upper Midwest.

### **Minnesota River – Yellow Medicine River**

#### **Hawk Creek – Minnesota River Phosphorus Reduction – 2013**

Sponsor: Hawk Creek Watershed Project

Funding: Section 319 (Grant) \$228,992

Purpose: Cost-share assistance will be available for BMPs that focus on and are proven to be effective in reducing P, such as, but not limited to: side inlets, alternative tile intakes, conservation drainage systems, WASCObS, grade stabilizations, streambank stabilizations, feedlot waste reduction projects, rain gardens, and lakeshore buffers. Another goal is to build on established relationships through increased authentic civic engagement activities to increase conversations and collaboration with a more diverse community.

#### **Hawk Creek Watershed Dissolved Oxygen Restoration Project – 2014**

Sponsor: Hawk Creek Watershed Project

Funding: Section 319 (Grant) \$237,585

Purpose: The goal of this project is to reduce P levels, increase base flows, and reduce sediment volume entering the Minnesota River via the Hawk Creek Watershed through restorative BMP implementation with 10 local landowners in strategic targeted locations as identified in the Lower Minnesota River DO TMDL Implementation Plan. BMPs with multiple benefits, such as improving water quality, habitat, and hydrology, will be a priority. Based on past project pollutant reductions, the estimated pollutant reductions through this grant are 680 pounds of P per year and 255 tons of sediment per year. A Volunteer Citizen Monitoring Network of approximately 25 volunteers will be maintained and water quality and precipitation data will be collected and analyzed. The data collected will be added to long-term data to help identify water quality trends. Interactions with volunteers will strengthen citizen involvement in watershed issues and solutions. This project will utilize outreach and education to target BMP implementation and the decision making process of watershed issues.



### **Hawk Creek Watershed FY16 Implementation Project – 2016**

Sponsor: Hawk Creek Watershed Project

Funding: Section 319 (Grant) \$190,054

Purpose: In strategic targeted locations complete 8 alternative intakes, 8 side inlets, 20 acres of buffers, 2 agriculture waste projects, 3 streambank/grade stabilizations, 1,500 acres of cover crops, and 1 WASCOb. These BMPs will achieve an estimated annual reduction of 9,002 pounds of P and 2,480 tons of sediment from entering the Minnesota River via the Hawk Creek Watershed. The civic engagement/outreach component will use effective and practical techniques to increase public involvement and input in local decision-making processes and water quality improvement efforts. This increased public participation will promote local leadership and build local water quality management capacity.

### **Hawk Creek Watershed Improvement Project – 2017**

Sponsor: Hawk Creek Watershed Project

Funding: Section 319 (Grant) \$397,000

Purpose: This project addresses excessive P and low DO. Reduced P levels, increased base flow, and reduced sediment volume will be instrumental in correcting the impairment of low DO levels in the Minnesota River. The BMPs will be selected based on their ability to reduce P and erosion; eligible practices include, but are not limited to, side inlets, alternative tile intakes, WASCObS, grade stabilizations, streambank stabilizations, feedlot waste reduction projects, lakeshore buffers, and/or cover crops. These BMPs improve water quality and improve aquatic and riparian habitat, increase biodiversity, and enhance hydrology. The estimated pollutant reductions for BMPs are 1,000-2,000 pounds of P/year and 1,000-2,000 tons of sediment/year. Education and outreach activities will be used to increase engagement, relationships, and willingness to participate in water quality improvement.

### **Hawk Creek Watershed Subsurface Sewage Treatment System (SSTS) Upgrade Implementation – 2016**

Sponsor: Hawk Creek Watershed Project

Funding: CWP (Loan) \$1,050,000

Purpose: The project will utilize low interest loan funds to landowners for the replacement or upgrade of 75 noncompliant septic systems located in the Chippewa, Kandiyohi, and Renville County portions of the Hawk Creek Watershed. This project will result in an estimated

annual reduction of 240 pounds of P, 5,300 pounds of TSS, and 600 pounds of nitrogen. In the Lower Minnesota River DO TMDL Implementation Plan SSTS upgrades are recommended for reducing pollution.

### **Pomme de Terre River**

#### **Pomme de Terre WRAPS BMP Implementation Project – 2016**

Sponsor: Pomme de Terre River Association

Funding: Section 319 (Grant) \$285,000

Purpose: Install 20 rain gardens, 33 WASCObS, 4 shoreline restorations, 4 agricultural waste pit closures, and 90 acres of wetland restorations. The BMPs/conservation projects to be implemented will reduce sediment by 1,304.00 T/yr and P by 1,304.86 lbs/yr. It will also increase participation in watershed management activities through educating local schools, lakeshore residents, farm groups, outdoor sport groups, and recreation club members.

#### **Pomme de Terre WRAPS Implementation Project – 2014**

Sponsor: Pomme de Terre River Association

Funding: Section 319 (Grant) \$275,000

Purpose: This project will continue the BMP implementation process for the Pomme de Terre Watershed. Opportunities to reach landowners and citizens of the watershed will be leveraged through this project and will include an outreach program to inform citizens, city officials, and other individuals about water quality issues and solutions. The outcome will be a reduction of 1,220 lbs/yr of P and 1,100 tons/yr of sediment. The BMPs installed will provide 10 years of protection from agricultural and urban non-point source pollution. By addressing P and sediment concerns, this project will have a positive impact on aquatic life for both macroinvertebrates and fishes by reducing turbidity within the river. In addition, project coordination with partnering LGUs will be strengthened with continued cooperation.

## Redwood River

### Redwood River Turbidity Reduction Project – 2015

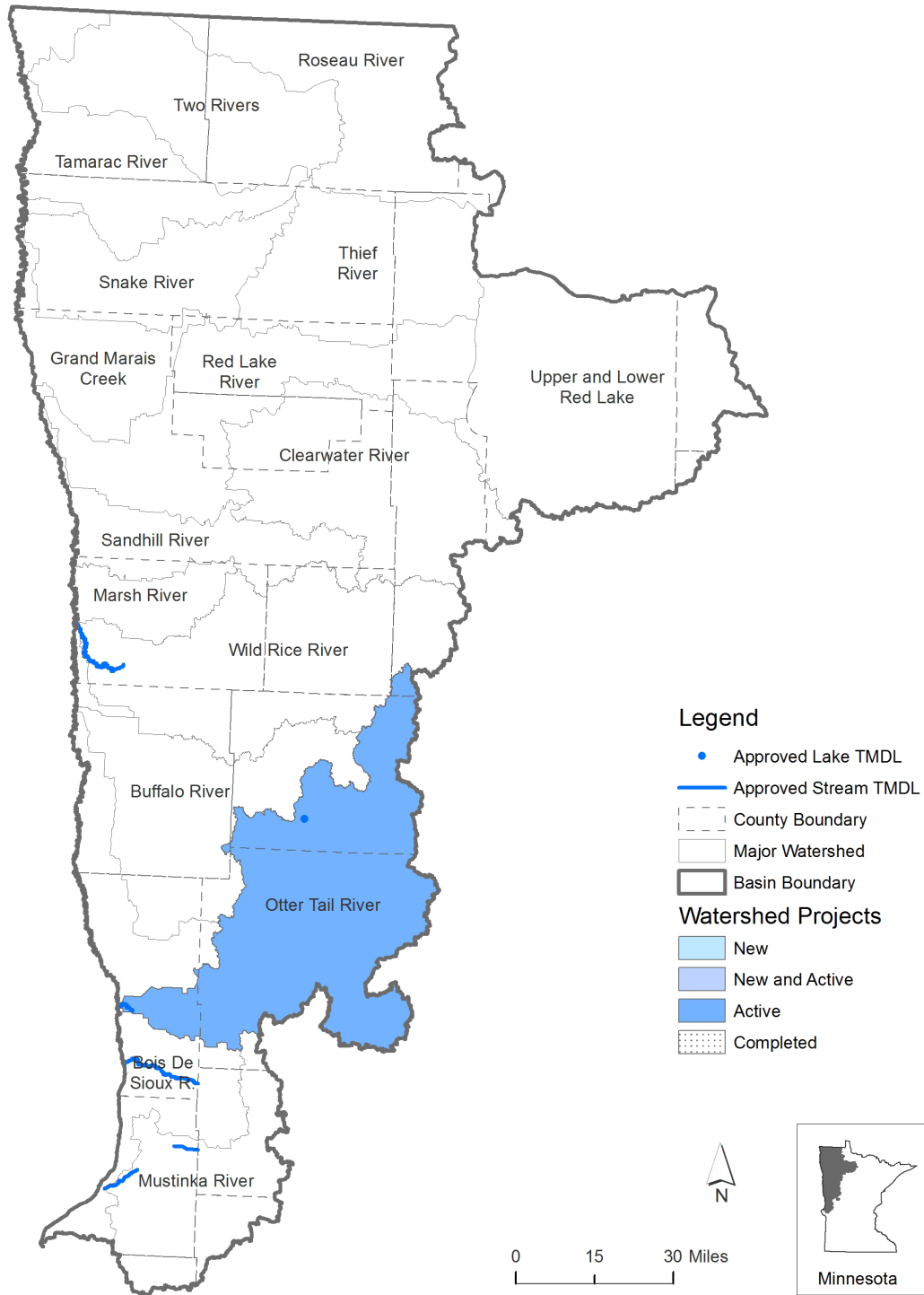
Sponsor: RCRCA

Funding: CWP (Grant) \$150,512

Purpose: Assist at least 12 cooperators to achieve total reductions of 715 tons/year of sediment and 715 lbs/year of P. This project will take further steps to provide funding, up to 70% cost-share, to cooperators to restore high priority erosion areas and to retain water in upland areas which retards flow into the system. Proposed conservation practices of WASCObS, grassed waterways, grade stabilizations and streambank stabilizations are in direct agreement with the planned activities by the partnering water management plans. In order to help determine which BMPs are most effective, which BMPs are needed, and which BMPs cooperators are most willing to implement, two civic engagement meetings will be hosted by this project. Dialogue will be facilitated by a past cooperator who can attest to the benefits provided by his personal BMP installations. The perceptions of past and future cooperators will be sought as to how they see the watershed restoration progressing, and to recommend methods to continue restoration efforts with greater public involvement. The results of these meetings will help identify the public concerns and will tailor future conservation approaches.

# Red River Basin

None were completed for 2017



# Red River Basin

## Active projects

### Bois de Sioux River Watershed

#### Red River Basin Reservoir Nutrient Load Reduction – 2014

Sponsor: Red River Basin Commission

Funding: Section 319 (Grant) \$289,998

Purpose: Determine if vegetated flood storage reservoirs (current and future) can provide a 50% reduction in nutrient loading to selected tributaries that feed the Red River. This project will explore the use of flood-water impoundment structures for nutrient reduction by redesigning the cell management to reroute the stream flow through vegetated treatment cells. It is expected that the treatment cells will capture and hold nutrients both in sediment and in the vegetation (i.e., cattails); however, the nature of nutrient movement and storage is dynamic. This project will attempt to clearly define nutrient flux in the contributing watershed and both inside and outside of the impoundment's cells. This project will serve as a test pilot to aid with future nutrient control BMP design.

# St. Croix River Basin

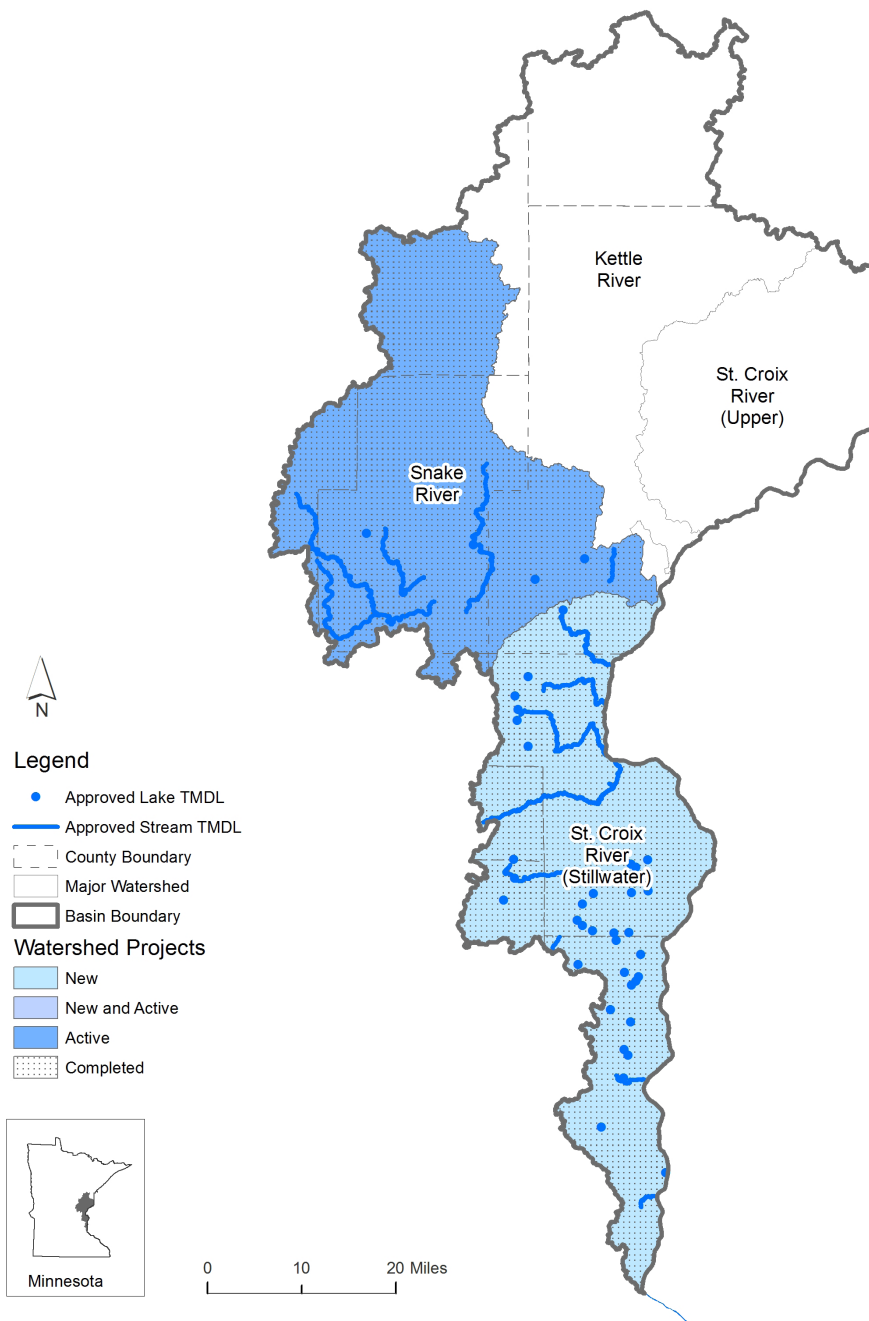
## Projects completed

### Lower St. Croix River Watershed

Forest Lake North Shore Sub-Watershed Assessment  
 Forest Lake Stormwater Filtration Retrofit (Hilo Lane)  
 Sand and Long Lake Enhancement Project Continuation

### Snake River Watershed

Kanabec Water Resources Protection Project



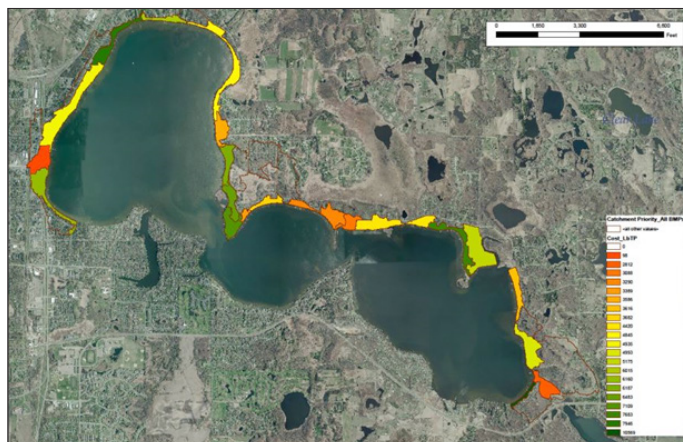
## Lower St. Croix River Watershed

## Forest Lake North Shore Subwatershed Assessment

Forest Lake (82-0159-00) is located in the Comfort Lake-Forest Lake Watershed District (CLFLWD) and adjacent to the City of Forest Lake in northern Washington County. It has a surface area of 2,220 acres and is the largest lake in the CLFLWD and the largest lake wholly in Washington County. This lake is an important recreational and ecological resource with three public access sites, good water quality, and a healthy fish and aquatic plant community. While Forest Lake is not on the impaired waters list for excess nutrients, P levels are near the threshold for the North Central Hardwood Forests ecoregion. The watershed of Forest Lake is 8,160 acres and dominated by open water lake surfaces, medium-density residential, wetlands, and forested land cover. The more developed area of the City of Forest Lake is situated along the west and southern shores of Forest Lake, and discharges stormwater to Forest Lake through numerous stormwater outfalls dispersed around the lake perimeter. The lake outlets at the north end of the westernmost basin into the Sunrise River, where it eventually flows through Comfort Lake toward the St. Croix River. Although Forest Lake is currently meeting the state standards, there are periods during the growing season when P and secchi depth standards are exceeded due to excess nutrient in the water.

### Project highlights

- This project identified 10-15 feasible projects within the 5.4 mile project area that will be capable of treating the 1" rainfall event and runoff from their directly contributing subwatersheds. This will help meet the District's long term goal of achieving a summer average in-lake concentration of 30 µg/L of P, continuing to improve the lake's water quality, and preventing any further degradation.
- Given that the goal of this project was to identify BMPs for future implementation, Forest Lake was not physically improved by this project. A variety of proposed structural and nonstructural BMPs were identified totaling 72.85 lbs of TP reduction (37% reduction from Existing Conditions modelling) with the single most cost effective practice identified being an increase of street sweeping of all major roads to 4x annually. This project produced a 223 page report detailing the subcatchments within FL-01 that were analyzed for annual pollutant loading along



Forest Lake BMP prioritized rankings by catchment

with a detailed recommendation section describing the conceptual retrofits that were identified. This document can be found here: [http://www.cflwd.org/documents/FORESTLAKENORTH-SWAREPORT\\_final.pdf](http://www.cflwd.org/documents/FORESTLAKENORTH-SWAREPORT_final.pdf)

### Partnerships

- The CLFLWD partnered closely with the Washington Conservation District who were involved heavily in each of the project's objectives.

### Financial information

Funding type: CWP  
 Grant amount: \$12,000  
 Final in-kind: \$1,055  
 Matching funds: \$15,897

### Contact information

Mike Kinney  
 District Administrator  
 Comfort Lake – Forest Lake Watershed District  
 44 Lake St. South, Suite A  
 Forest Lake, MN 55025  
 651-395-5850, [Michael.kinney@cflwd.org](mailto:Michael.kinney@cflwd.org)  
 MPCA Project Manager: Chris Zadak

## Lower St. Croix River Watershed

## Forest Lake Stormwater Filtration Retrofit (Hilo Lane)

Although Forest Lake is currently meeting state standards, there are periods during the growing season when P and secchi depth standards are exceeded. This project will treat runoff from a 14-acre area of urban development before discharging into Forest Lake. This will help meet the District's long term goal of achieving a summer average in-lake concentration of 30 µg/L of P, continuing to improve the Lake's water quality, and preventing any further degradation.

### Waterbody improved

- Forest Lake (82015900) is located in the CLFLWD and adjacent to the City of Forest Lake in northern Washington County. It has a surface area of 2,220 acres and is the largest lake in the CLFLWD and the largest lake wholly in Washington County. This lake is an important recreational and ecological resource with three public access sites, good water quality, and a healthy fish and aquatic plant community. While Forest Lake is not on the impaired waters list for excess nutrients, P levels are near the threshold for the North Central Hardwood Forests ecoregion. The watershed of Forest Lake is 8,160 acres and dominated by open water lake surfaces, medium-density residential, wetlands, and forested land cover. The more developed area of the City of Forest Lake is situated along the west and southern shores of Forest Lake, and discharges stormwater to Forest Lake through numerous stormwater outfalls dispersed around the lake perimeter.

### Project highlights

- The purpose of this project is to design and retrofit an existing stormwater management facility in the City of Forest Lake to increase the amount of treatment realized by the feature. The project will work to complete excavation and reshaping of the existing stormwater treatment feature and add an iron-enhanced sand filtration bench to the existing feature for increased stormwater treatment. The project will also work to reshape and stabilize the actively eroding channels that convey runoff from a 14 acre area to the treatment feature. Additionally, the project will include a shoreline stabilization piece to address issues



*Channel stabilization in progress with erosion control*

related to erosion on Forest Lake where the stormwater treatment feature outlets. The designed and installed project will result in an 11.9 lb/yr reduction of P to Forest Lake, DNR Lake ID: 82-0159-00.

- Though the majority of project construction has yet to occur, several components have been completed to date including tree trimming/removal and channel stabilization. Several trees and shrubs impeded project construction and were therefore trimmed or removed in accordance with the City of Forest Lake's Woodland Preservation Regulations. Channel reshaping and stabilization also occurred with the addition of multiple rock check dams along the corridor to reduce flow velocity and erosion. The remainder of project construction including stormwater feature excavation and reshaping, installation of the iron-enhanced sand filtration bench, and shoreline stabilization will be completed in Fall/Winter 2016.

### Partnerships

- The City of Forest Lake was a major partner on this project as they signed a cooperative project agreement with the CLFLWD and helped coordinate easement vacation and acquisition. The City previously had a large easement on the parcel on which the stormwater feature is located. For the purpose of the project, the City vacated a large portion of that easement. This enabled the CLFLWD to obtain an easement on that property, and prevent the majority of the property from being covered by easements.
- The individual homeowners in the project area were each major partners as well due to their involvement

with land access from the beginning of the project. A few of the homeowners communicated with District staff regularly and assisted with neighborhood meeting coordination.

- The MPCA could, of course, be listed as a project partner as well due to the involvement with grant financing.

### Financial information

Funding type: CWP

Grant amount: \$41,615

Final in-kind: \$6,591

Matching funds: \$57,838

### Contact information

Mike Kinney

District Administrator

Comfort Lake – Forest Lake Watershed District

44 Lake St. South, Suite A

Forest Lake, MN 55025

651-395-5850, [Michael.kinney@clflwd.org](mailto:Michael.kinney@clflwd.org)

MPCA Project Manager: Chris Zadak



## Lower St. Croix River Watershed

## Sand and Long Lake Enhancement Project Continuation

Sand (#82-0067) and Long (#82-0030) Lakes are both classified as shallow lakes and located in Northern Washington County. The lakes were delisted from the 303(d) list in 2010, as they are currently meeting the state water quality standards. However, the Carnelian-Marine-St. Croix Watershed District (CMSCWD) and residents are dissatisfied with the quality of the lakes given continued algal blooms. In addition to legacy phosphorus loading from past agricultural landuses, these watersheds are under pressure to develop and therefore subject to further P loading and degradation.

### Waterbody improved

- As determined in the CWP Diagnostic Study, Sand and Long Lakes have the potential to exceed lake water quality standards due to excess nutrient loading. Excess nutrient loading can ultimately cause a shallow lake to shift from the clear to the turbid state with little warning. Shallow lake protection focuses on removing the stressors that cause a lake to shift from the clear state to the turbid state. The first step is to control the external P loads to the lake, followed by restoration of the lake's macrophyte, zooplankton, and fish communities.

### Project highlights

- The focus of this implementation project was to construct a major capital improvement in the Sand Lake watershed. An iron-enhanced sand filter (IESF) was constructed to reduce annual external TP loading by an estimated 72 lbs/yr. In addition, in-lake monitoring continued in both lakes including water quality sampling, sediment core analysis, fish surveys, and aquatic plant surveys. Two additional restoration efforts were completed including a shoreland restoration on Long Lake and a prairie restoration in the Sand Lake watershed.
- Preliminary performance monitoring of the Sand Lake IESF indicates removal of approximately 90% of both dissolved and TP. Arguably, it is too early to conclude whether this monitoring indicates that the external load reduction goal for Sand Lake has been achieved, but these results are extremely encouraging. CMSCWD plans to continue to monitor the IESF and shift BMP implementation focus to Long Lake, where the data



*Porkubansky Sand Lake Prairie Conversion*

collected indicates that in-lake aquatic invasive species management is warranted.

### Partnerships

- Carnelian-Marine-St. Croix Watershed District – oversight, review, grant administration, and management of shoreline and prairie restoration projects
- Emmons & Olivier Resources, Inc. – macrophyte surveys, CIP engineering and design, construction observation and iron enhanced sand filter monitoring
- Washington Conservation District – water quality monitoring
- St. Mary's University – fish surveys
- Citizen Advisory Committee – input on implementation planning
- Sand Lake Homeowners Association
- Long Lake Homeowners Association

### Financial information

Funding type: CWP  
 Grant amount: \$132,000  
 Final in-kind: \$4,775  
 Matching funds: \$127,271

### Contact information

Jim Shaver, District Administrator  
 Carnelian-Marine-St. Croix Watershed District  
 P.O. Box 188, 21150 Ozark Ave.  
 Scandia, MN 55073  
 651-433-2150, [jshaver@cmscwd.org](mailto:jshaver@cmscwd.org)  
 MPCA Project Manager: Chris Klucas/Rachel Olmanson

## Snake River Watershed

## Kanabec Water Resources Protection Project

The Kanabec SWCD has been actively working to improve the Snake River Watershed through the implementation of BMPs. The initial work was focused on the impaired watershed; however, just focusing on the impaired water bodies will not be enough to improve the overall health. This study provided a better understanding of where to target limited resources in the unimpaired sections of the watershed in order to provide the biggest impact.

### Waterbody improved

- With this grant the Snake River Watershed (07030004) implemented 21 BMPs. This grant's resulted in a TP reduction of 1,194 lbs/yr and a soil savings of 1,261 tons/yr. These reductions will assist the larger St. Croix Watershed reach their goal of 20% P reduction by 2020.

### Project highlights

- In 2012, the SWCD sponsored a water quality learning event for 90 Girl Scouts.
- A civic governance process is now in place to work with key stakeholders in the local communities.
- A complex Waste Management Systems was installed
- BMPs completed included 540 acres conservation tillage, 2 diversions, 4 critical area plantings, 224 feet of WASCObS, 183 acres of cover crop, 1 lined waterway, a waste management system, a gravel road erosion control treatment, 0.5 acres of brush management, 369 acres of nutrient management plans, 6 acres of tree/shrub plantings, 1,299 acres of forestry stewardship plans, 3 wells decommissioned, 183 acres cover crops, 857 acres of pest management, 135 acres of prescribed grazing projects and 456 acres of upland wildlife plantings. This grant aided in practice implementation in the unimpaired reaches of the Snake Watershed within Kanabec County.

### Monitoring summary

- Three lakes, six rivers, and five stormwater outlets were monitored for water quality parameters to determine if they were meeting water quality standards. Hay Creek, Bean Brook, the unnamed tributary on Highway 76, and Mora Lake exceeded various water quality standard.



*Snake River*

### Partnerships

- Two lake associations were critical partners. The Ann and Lewis Lake Association were instrumental to further promote implementation through the practice of civic organizing. These partners took an active role to help us meet our goals. Also the NRCS provided additional practice implementation towards match on the grant.

### Financial information

Funding type: CWP  
 Grant amount: \$186,342  
 Final in-kind: \$335,921  
 Matching funds: \$2,104

### Contact information

Deanna Pomije  
 District Manager  
 Kanabec SWCD  
 2008 N Mahogany St, Ste 3  
 Mora, MN 55051  
 320-679-3781, [deanna.pomije@mn.nacdnet.net](mailto:deanna.pomije@mn.nacdnet.net)  
 MPCA Project Manager: Rachel Olmanson

# St. Croix River Basin

## Active projects

### Projects awarded in 2017

#### Projects involving multiple watersheds

##### Pine County SSTS Upgrades – 2017

Sponsor: Pine County

Funding: CWP (Loan) \$600,000

Purpose: This project will upgrade 20 septic systems per year over the three-year loan period. Septic systems are recognized as an acceptable means for treating wastewater and this project will annually prevent 50 pounds of P, 200 pounds of nitrogen and  $97.4 \times 10^{16}$  (quintrillion) CFU of fecal coliform and *E. coli* from entering the groundwater in Pine County.

#### Lower St. Croix River Watershed

##### Forest Lake Diagnostic Study – 2015

Sponsor: Comfort Lake - Forest Lake Watershed District (CLFLWD)

Funding: CWP (Grant) \$52,500

Purpose: The primary outcome from this project is a comprehensive list of targeted implementation activities throughout the watershed, ranked by P reduction cost-benefit. This quantitative data will allow the CLFLWD and partnering organizations to implement activities that will maximize water quality protection/restoration. This project will also help achieve the actions identified for Forest Lake in the 2014 Sunrise River WRAPS report. The administrative outcomes for the project include a comprehensive work plan, timely invoicing, and meeting reporting and other grant requirements. The social outcomes for this project include educating lakeshore owners and City of Forest Lake residents on the connection between stormwater runoff and lake water quality. Additional elements of this project include a field inventory of stormwater outfall locations and conditions around the perimeter of Forest Lake, targeted monitoring of major stormwater outfalls and stream tributaries to refine watershed pollutant loading estimates that were modeled in the previously completed stormwater retrofit analysis, and collection of lake sediment samples in each of the three bays of Forest Lake to determine if internal loading is likely to be a problem in the future.

##### Goose Lake TMDL Final Implementation Projects – 2017

Sponsor: Carnelian-Marine-St. Croix Watershed District  
Funding: Section 319 (Grant) \$76,000

Purpose: The purpose of this project is to design and install up to four stormwater-quality improvement practices to reduce P loading to Goose Lake. Prioritization and outreach efforts have resulted in the identification of six locations discharging excessive P to Goose Lake, of which one has been completed and the second will be installed in 2017. This project will complete the final 38 lbs/yr watershed P contributions to Goose Lake identified in the 2012 Multi-Lakes TMDL Plan. The Multi-Lake TMDL Plan for Goose Lake, approved in 2012, identifies a 50% (77 pounds) reduction of P from watershed runoff and a 9.4% (22 pounds) reduction of internal load of P is needed to achieve a target in lake P concentration of 40 micrograms per liter. The Watershed District, working in partnership with landowners, has completed the installation of three projects achieving approximately 50% of the targeted load reduction.

##### Lower St. Croix Targeted Phosphorus Reduction Project – 2017

Sponsor: Carnelian-Marine-St. Croix Watershed District  
Funding: Section 319 (Grant) \$300,000

Purpose: The purpose of this project is to design and implement a ravine stabilization and wetland restoration project in the City of Marine on St. Croix in Washington County draining to the St. Croix River and Lake St. Croix. This is 100% of the unstable ravines in the Marine Landing Creek subwatershed. The proposed practices will reduce P loading by approximately 17 lbs/yr as part of ongoing efforts to reduce annual P discharges. Residential stormwater runoff carries P from grass clippings, fertilizers, leaves, and pet waste from the city streets to Marine Landing Creek and the St. Croix River. Typically, stormwater runoff flows through unvegetated and unpaved road aprons, increasing erosion and sediment loads discharged directly to the St. Croix River. In addition, uncontrolled stormwater runoff is eroding a ravine in the headwaters of Marine Landing Creek and is contributing additional sediment and P to the St. Croix River.

**Marine on St. Croix Stormwater Phase 2 – 2017**

Sponsor: Carnelian-Marine-St. Croix Watershed District

Funding: Section 319 (Grant) \$92,500

Purpose: The purpose of this project is to design and implement a ravine stabilization and wetland restoration project in the City of Marine on St. Croix in Washington County draining to the St. Croix River and Lake St. Croix. The approximate length of ravine to be stabilized is 375 feet, which is 100% of the unstable ravines in the Marine Landing Creek subwatershed. The approximate area of wetland restoration is 2+/- acres. The proposed practices will reduce P loading by approximately 17 lbs/yr as part of ongoing efforts to reduce annual P discharges from the City of Marine on St. Croix into the St. Croix River and Lake St. Croix.

**Moody Lake Wetland Rehabilitation Project – 2016**

Sponsor: CLFLWD

Funding: Section 319 (Grant) \$81,497

Purpose: Acquire or obtain a conservation easement on approximately 10 acres of land to permanently remove cattle, construct a grassed waterway and 50 foot buffer strip to infiltrate and filter runoff, and excavate an average of 12 inches of soil from a targeted area of wetlands near Moody Lake.

**Snake River Watershed****Kanabec Water Resources Protection Project Phase 2 – 2015**

Sponsor: Kanabec SWCD

Funding: CWP (Grant) \$196,200

Purpose: This project includes surface water monitoring of six rivers/tributaries and three lakes in the watershed that are currently un-assessed. The outcomes expected through this monitoring will provide a baseline of data to help prioritize and focus on future project areas for protection. This project will also include the implementation of 16 approved BMPs in protection areas which include feedlot runoff treatment and control, manure storage pit closures, livestock fence exclusion from streams, heavy use protection areas for cattle crossings, roadside runoff/erosion control, critical area seeding, sediment basin, gully erosion control, wetland restoration, reduced tillage methods, cover crops, nutrient management, well abandonment and closures, streambank and shoreline protection, riparian vegetative buffer enhancements, and other approved BMPs that

protect water quality. The measureable outcomes and non-point source pollutant reduction goals expected from these BMPs are: 76 T/yr of TSS, 76 T/yr of soil loss savings, 14,000 lbs/yr of P reductions and 18,000 lbs/yr of nitrogen reductions. This project also includes outreach, education, civic engagement, and civic organizing, to include key stakeholders, citizens and landowners in the process. Additional activities include the development of ten forest stewardship plans for landowners in areas that need protection to provide an inventory, assessment and mapping of the various forest cover types, and include management recommendations for reforestation practices, harvesting, wildlife habitat improvement, and overall protection of the forest resources. Finally, the agricultural BMP loan program will be used to assist landowners with BMPs that protect and improve water quality.

**Snake River Watershed Resource Protection Project - 2016**

Sponsor: Snake River Watershed Management Board

Funding: CWP (Loan) \$400,000

Purpose: This project will implement 27-33 SSTS upgrades within the Kanabec County portion of the Snake River Watershed. Septic systems are recognized as an acceptable means for treating wastewater and this project will prevent 136 pounds of P, and 574 pounds of nitrogen from entering the groundwater in the Snake River Watershed. These activities were documented in the Snake River Watershed WRAPS, Groundhouse River Fecal Coliform and Biota (Sediment) TMDL Implementation Plan, the Ann River TMDL study (phase II) and Stressor I.D. report and the Snake River Watershed TMDL study.

**Snake River Watershed Resource Protection Project – 2012**

Sponsor: Snake River Watershed Management Board

Funding: CWP (Loan) \$400,000

Purpose: This project will promote and install 40 SSTSs and other rural BMPs in the Snake River Watershed.

# Upper Mississippi River Basin

## Projects completed

### Mississippi River – St. Cloud

Targeted Fertilizer Application Reduction Project

### Mississippi River – Sartell

Platte River Restoration/Protection Project

### Mississippi River – Twin Cities

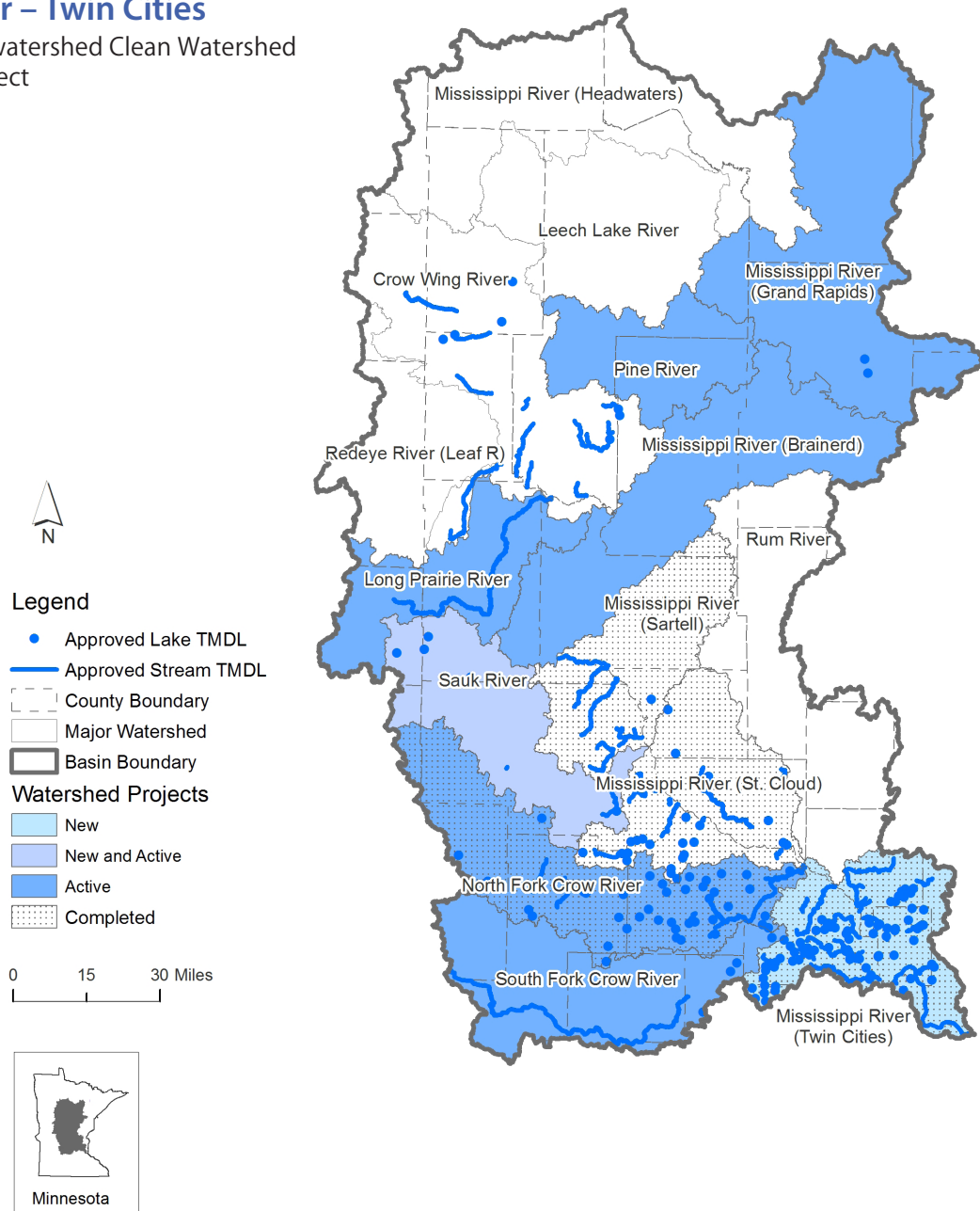
Lake McCarrons Subwatershed Clean Watershed Partnership BMP Project

### North Fork Crow River

Crow Lakes Protection and Resource Investigation

Crow River Middle Fork Watershed Resource Investigation

Lake Koronis Subwatershed Protection Project



## Mississippi River – St. Cloud

## Targeted Fertilizer Application Reduction Project

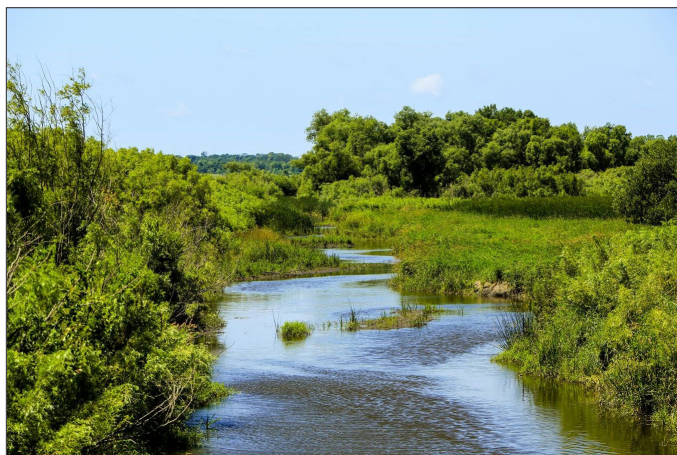
Several water bodies within the Clearwater River Watershed District are impaired for excess nutrients. The dominant land use in the area is row crops (corn and soy beans). Limiting nutrient application, especially in sensitive areas adjacent to water bodies, is one way to reduce downstream loads. Many farmers in the area were using uniform application rates for fertilizer. Using gridded soil testing and variable rate fertilizer application in order to identify and apply the exact field needs can optimize nutrient use and minimize export.

### Waterbody improved

- The Clearwater River between Clear Lake and Lake Betsy as well as Lake Betsy and Clear Lake are the direct receiving water bodies within the target program area. However, given the riverine nature of the system, downstream waters also benefit from load reductions in upstream waters.

### Project highlights

- This grant project established a BMP known to optimize nutrient inputs to farms in an area where the practice had not been widely adopted. Implementation of this practice assists in reducing nutrient loads downstream while helping to optimize yields. Further, the program used a novel delivery approach in that instead of having government staff registering program participants, it relied on the local cooperatives and their existing relationships with farmers.
- This project resulted in the enrollment of 17,728 unique acres of corn and soy beans in the target area (61% uptake of the practice), as well as additional uptake outside the practice area driven by the success of the practice in the target area. Total acres (23,310) throughout the study were included in the gridded soil testing and variable rate application (some of the fields that enrolled early participated twice over the entire period of the study). Comparing the standard application rates in sensitive areas to the application rates based on gridded soil testing – there was a reduction in P application annually of between 900 and 7,600 pounds.



*Clearwater River*

### Partnerships

- Farmers in priority areas – enrolled in the program and reported results
- Local farmer cooperatives supported project implementation by promoting program
- These cooperatives conducted soil testing, variable rate application and reported results
- Centra Sota Cooperative, Watkins, Minnesota
- Cold Spring Cooperative, Cold Spring, Minnesota
- Consumers Cooperative Association, Litchfield, Minnesota
- Clearwater River Watershed District & District Engineer Wenck – Project Owner and Project Engineer

### Financial information

Funding type: Section 319

Grant amount: \$227,607

Final in-kind: \$38,151

Matching funds: \$148,062

### Contact information

Cole Loewen  
Administrator  
Clearwater River Watershed District  
75 Elm Street East, PO Box 481  
Annandale, MN 55302  
320-274-3935, [cole.loewen@crwd.org](mailto:cole.loewen@crwd.org)  
MPCA Project Manager: Phil Votruba

Mississippi River – Sartell

## Platte River Restoration/Protection Project

Erosion had caused 7,300 cubic feet of soil loss over past few years at this site on the Platte River in the Upper Mississippi River Basin. The bank was sloughing off into stream and threatening the property owners yard area considerably and resulted in a loss of more than 15 feet. The curve in the river and the bridge abutments were escalating the issue along with the new normal extreme storm events. The bridge stability was also becoming a concern.

### Project highlights

- In late fall of 2014, County Commissioner Randy Winscher brought a problem to the attention of Morrison SWCD and the Morrison County Public Works Department. On the Platte River just outside of city limits of Royalton, Minnesota the river had scoured into the privately owned property of George Lancaster who had lost 15 or more feet of riverbank. The problem was escalating undermining the integrity of a county owned bridge to the north of the property.
- The SWCD took the lead in organizing all partners, the DNR, MPCA, Army Corps of Engineers, Morrison County Public Works, and secured the permits and enlisted the engineering assistance through the West Central Technical Service Area, Ross Reiffenberger and Luke Herkenhoff. DNR Fisheries had been pushing for more bio-engineering projects to be used rather than total armoring so the design called for both. Rock rip-rap was to be placed under the north and south bridge abutments. A series of two rock stream barbs, an extensive root was structure placement on the Lancaster riverbank, and cedar tree revetments were installed to work simultaneously to control the erosion. In addition, cedar revetments provide fishery habitat.
- The bids were let and awarded to Honer Construction. Construction was completed in October 2015. Half of the funding was secured through a CWP grant from MPCA. The remaining funding came from the Public Works Department, the private landowner, and state cost share through the Morrison SWCD.



*Completed river barb – Lancaster side*

- In spring of 2016, a riparian buffer/rain garden was completed by the landowner with some financial assistance through the CWF appropriated for such practices in 2013 and extended for one year in 2015. List of some of the plantings in the buffer included: Little & Big Bluestem, Iris, False Sunflower, Sneezeweed, Lupinus, Blanket Flower, Blazing Star, Peony, Coneflower, and Black-Eyed Susan, to name a few.
- This is an outstanding example of how multiple partners addressed a problem and made it happen in less than one year. The site was featured on the legislative tour on August 10, 2016.
- The river has stabilized, fisheries has already seen improvement, and the bridge was also stabilized. 39.6 tons of sediment and 33.6 pounds of P annually are kept from impacting the Platte River. All partners had a sense of cooperation and accomplishment in a relatively short time frame.

### Partnerships

- Morrison SWCD – State Cost Share Funds
- Morrison County Public Works
- MPCA CWP
- Landowner
- WCTSA
- DNR and Army Corps of Engineers

**Financial information**

Funding type: CWP

Grant amount: \$34,900

Final in-kind: \$8,618

Matching funds: \$50,403

**Contact information**

Helen McLennan

District Manager

Morrison SWCD

16776 Heron Road

Little Falls, MN 56345

320-616-2479 Ext. 116, [Helen.mclennan@mn.nacdnet.net](mailto:Helen.mclennan@mn.nacdnet.net)

MPCA Project Manager: Phil Votruba



## Mississippi River – Twin Cities

## Lake McCarrons Subwatershed Clean Watershed Partnership BMP Project

Lake McCarrons is an 81-acre lake located in the southeast corner of Roseville, Minnesota. It is classified as a deep lake with a maximum depth of 57 feet. The Lake McCarrons subwatershed drains 1,044 acres of primarily residential land use (60%) and is within the Capitol Region Watershed District (CRWD). Lake McCarrons is not impaired, and has some of the best lake water quality in the metro area. However, recent monitoring data indicate a downward trend in water clarity and suggest eutrophication from excess P loading has impacted water quality, aquatic health, and recreational use. The Villa Park Wetland System in Roseville, Minnesota discharges into Lake McCarrons, and continues to be a significant source of P to Lake McCarrons. In order to improve the effectiveness of the treatment wetlands, volume reduction best management practices must be implemented in the upstream watershed.

### Waterbody improved

- In partnership with the City of Roseville, CRWD and SRF Consulting Group, Inc. determined the priority BMP that best met the P load reduction was an underground infiltration system below the softball fields and parking



*Modular Concrete Cistern Installation*

lot within Upper Villa Park behind the B-Dale Club at 2100 Dale Street North. This system is expected to achieve the 45 pound load reduction goal set for Villa Park. An additional five pounds per year load reduction is also expected to be obtained through a predictive/adaptive underground stormwater storage system that either pumps stormwater into an above ground irrigation system or, if rainfall is predicted, proactively empties the underground cistern into the underground infiltration system.



*Installation of the Final Cistern Segment*

## Project highlights

There are four major elements included in this project.

1. A 58,690 cubic foot infiltration system comprising four parallel lines of 10-ft diameter perforated metal pipes with connecting manifolds.
2. An underground 100,000-gallon precast segmental concrete cistern used to store stormwater for irrigation.
3. A pumping system that extracts water from cistern and pumps it to the existing irrigation system that serves the softball field above.
4. A predictive/adaptive system that controls the connection between the cistern and the infiltration system.

When the softball field irrigation system calls for irrigation, a sensor determines if there is water in the cistern and, if present, utilizes filtered stormwater for irrigation. If the cistern is empty, the system automatically switches to municipal water. The cistern size and system operation is designed to meet up to 90 percent of irrigation needs during a normal rainfall year and stores approximately two weeks of irrigation water.



*Time camera shot – lapse screen cistern*

## Financial information

Funding type: CWP

Grant amount: \$275,000

Final in-kind: \$53,864

Matching funds: \$934,572

## Contact information

Forrest Kelley

Regulatory Division Manager

Capitol Region Watershed District

1410 Energy Park Drive, Suite 4

Saint Paul, MN 55108

651-644-8888, [forrest@capitolregionwd.org](mailto:forrest@capitolregionwd.org)

MPCA Project Manager: Brooke Asleson

## North Fork Crow River Watershed

## Crow Lakes Protection and Resource Investigation

The Crow River Organization of Water (CROW) has a long history of assessing water quality in its lakes and streams. Many of these water resources are impaired and do not meet state water quality standards, but there are some key resources that enjoy good water quality. From the perspective of the Upper Mississippi River Basin, the Crow River is one of its major tributaries from a water and nutrient loading standpoint. The Crow Lakes Protection and Resource Investigation Project worked with key lakes and identified implementation strategies for their protection and improvement.

### Waterbody improved

- The project focused on 10 lakes: Minnie-Belle, Manuella, Stella, Lake Washington, Francis, West Sylvia, East Sylvia, John, Charlotte, and Martha. These recreational lakes are adjacent to park lands in both Meeker and Wright Counties. These lakes are a significant component because locally they provide quality water to the North Fork Crow River, but is a regional component to the Mississippi River for the Minneapolis Water Plant intakes and provides most of the flow to the lower Mississippi Recreational area and the lower Mississippi Wildlife Refuge before flowing into Lake Pepin.

### Project highlights

- Best Management Activities depend on the characteristics of each lake and corresponding watershed. Protection activities were prioritized in each watershed based on factors that are currently having the greatest impact on water quality and ecological function for each lake. Protection strategies developed will complement the TMDL like model with implementation efforts to focus on comprehensively managing the lakes as a chain. This project completed implementation plans for 100% of the non-impaired chain of lakes in the North Fork Crow River Watershed.
- Water quality goals achieved in this project include ten lake assessments completed with specific load reductions. Protection strategies to manage each lake, but also focus on comprehensively managing the chain as a system.



*Lake Charlotte*

### Partnerships

- Project and Education Outreach Partners:
  - East & West Lake Sylvia, Lake Francis, Charlotte Lake, Lake Minnie-Belle, Lake Manuella, Lake Stella, Lake Washington, Lake Martha, Lake John
  - Citizens and Landowners
- Distribution of information – Lake associations:
  - Wright Coalition of Lakes (COLA)
  - Meeker County Association of Lakes (LARA)
- CROW Technical Committee Members:
  - City of Hutchinson, Renville County and SWCD, McLeod County and SWCD, Kandiyohi County and SWCD, Sibley County and SWCD, Carver County Land & Water Resources and SWCD, Wright County and SWCD
- CROW Joint Powers Board
- Wenck Associates

### Financial information

Funding type: CWP

Grant amount: \$123,317

Final in-kind: \$104,931

Matching funds: \$45,706

### Contact information

Diane Sander

Watershed Coordinator

Crow River Organization of Water (CROW)

311 Brighton Ave Suite C

Buffalo, MN 55313

763-682-1933 Ext. 3, [Diane.sander@mn.nacdnet.net](mailto:Diane.sander@mn.nacdnet.net)

MPCA Project Manager: Scott Lucas

## North Fork Crow River Watershed

## Crow River Middle Fork Watershed Resource Investigation

The Middle Fork Crow River Watershed District (District) was formed by order of the Minnesota BWSR on April 27, 2005, in accordance with Minn. Stat. ch. 103D. The Middle Fork Crow River watershed is approximately 275 mi<sup>2</sup> and contains a number of economically and ecologically important lakes with increasing population and development pressures. The hydrology of the watershed has been highly altered with nine dams creating reservoirs rather than natural lake systems, 15 ditches totaling nearly 140 miles of open channels, and a significant number of drained or filled-in wetlands. The formation of the District was necessary because of degradation of water resources in recent decades and the need to address issues including erosion, sedimentation, and BMPs. This grant opportunity provided staff the tools to maintain a rigorous monitoring regimen and to continue educational resources for those in the local community.

Land use pressures and hydraulic changes have led to the degraded water quality for many of the lakes, while others are in need of protection from non-point sources of pollution. This project focused on protecting high quality lakes and restoring lakes with poor water quality by providing educational opportunities that link people to the resources, monitoring the waterways identified as ecologically sensitive to reduce non-point pollution sources, and targeting specific lake management projects identified in prior diagnostic studies.

### Waterbody improved

- Analysis on Lake Water Quality Status and Goals Met, Grade A, B, or C

### Project highlights

- This project continued improving water quality by utilizing a comprehensive approach that involved citizens actively engaging in their local resources through monitoring, and providing educational opportunities in all age groups and interests. The project continued the monitoring efforts established during the two diagnostic studies and previous CWP grants. Monitoring at existing and newly identified locations will continue to be important in determining local contributions to the continued degradation and impairment of these waters.
- Thousands of area students have been taught through the District's integrated STREAM program. Local volunteers continued to gain knowledge of local monitoring practices and continued to serve as land stewards of our District lakes and streams. All samples were analyzed at certified labs, results were submitted to MPCA and annual evaluation of monitoring data was conducted to spot trends, identify hot-spots or emerging issues, determine impacts of land-use improvements implemented by this project, and report annually on the state of the waters to our stakeholders.

### Partnerships

- Crow Organization of Water – Partner in education activities and BMP installation
- Kandiyohi, Meeker, Pope, Stearns County SWCD – Partner in education activities

Lake	TP Status and goal*	Secchi Status and Goal*	Chlorophyll a Status and Goal*	Overall Goal**
Calhoun	Y	N	Y	B
Diamond	N	N	N	C
Elkhorn	Y	N	Y	B
George	Y	Y	Y	A
Green	Y	Y	Y	A
Long	Y	Y	N	B
Monongalia	Y	Y	Y	A
Nest	N	Y	N	C

\*Y = yes, N = no

\*\*A = all goals met, B = two of three met, C = non met

- DNR – Partner in education activities
- MPCA – Partner in monitoring, analysis, and evaluation
- Minnesota Senate Districts: 13 and 18 – Partner in outreach activities
- Minnesota House Districts: 13A, 13B and 18B – Partner in outreach activities
- Prairie Woods Environmental Learning Center – Partner in education activities
- North Fork Crow River Watershed District – Partner in education activities
- School Districts New London-Spicer, Belgrade-Brooten-Elrosa, Atwater-Cosmos-Grove City – Partner in education activities

### Financial information

Funding type: CWP

Grant amount: \$63,250

Final in-kind: \$217,461

### Contact information

Margaret Johnson

Administrator

Middle Fork Crow River Watershed District

189 County Road 8 NE

Spicer, MN 56288

320-796-0888, [margaret@mfcrow.org](mailto:margaret@mfcrow.org)

MPCA Project Manager: Scott Lucas

## North Fork Crow River Watershed

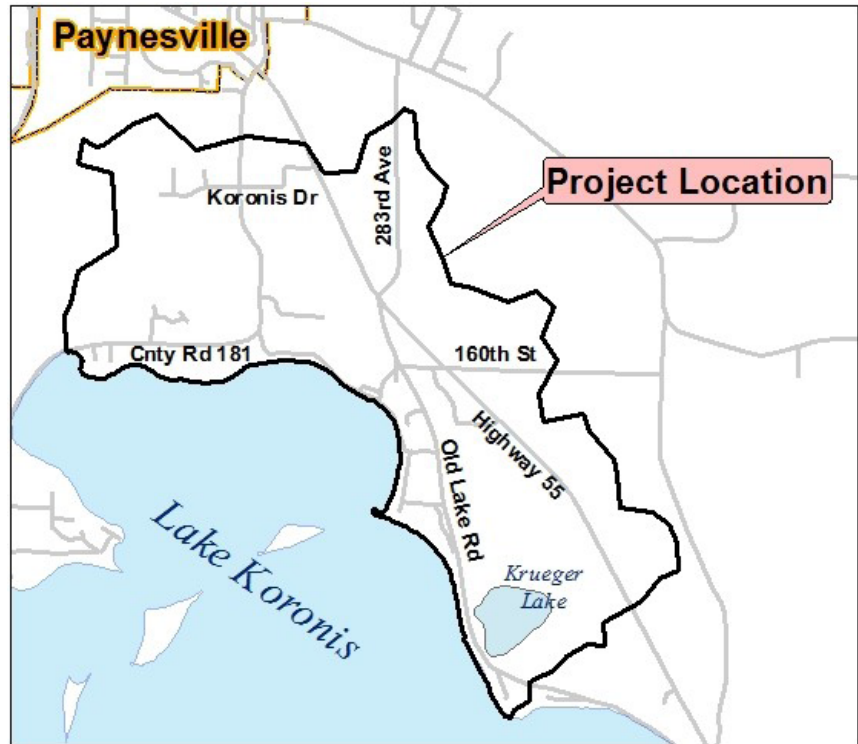
## Lake Koronis Subwatershed Protection Project

Lake Koronis is located about one mile south of Paynesville, Minnesota in the North Central Hardwood Forest Ecoregion of Minnesota and covers 2,958 acres. Lake Koronis has many inlets and one outlet. The main inlet is the North Fork Crow River flowing in through Rice Lake and Mud Lake on the southeast shore. Water flows out of Lake Koronis along the south shore. The North Fork Crow River takes an easterly path, eventually merging with the Middle Fork and South Fork Rivers and forming the Crow River near Rockford, Minnesota.

The area for the Lake Koronis Subwatershed Protection Project was targeted because it has the largest amount of hard surfaces (roof tops, roads, driveways, etc.) of all the subwatersheds that drain directly into Lake Koronis. All the hard surfaces in this area greatly increases the potential for sediment and other stormwater pollutants to enter the Lake. The goal of the project was simple. It was to work with the property owners on or near Lake Koronis to create natural buffers, fix shoreline erosion issues, and capture excess runoff. The three hundred plus property owners within the targeted area were invited to participate to help protect this regional and state significant resource.

When this project started in 2013, the focus was to help protect the water quality of Lake Koronis and prevent Lake Koronis from becoming impaired. Currently the average TP is less than the impaired level of 40 µg/L, but it is not far below 40 µg/L and in some years it has been over 40 µg/L. The transparency data through 2010 shows no trend over the prior 10 years. The goal is to keep the TP in the lake below 40 µg/L and show a positive trend.

One large threat to the water quality of Lake Koronis is coming from non-point sources such as soil erosion. Residential and agricultural land use along with shoreline erosion are the biggest contributors. With approximately 13,000 linear feet of eroding shoreland and around 300 property owners in the subwatershed, this area is the most highly developed area around Lake Koronis. This



*Project location*

area has the largest amount of impervious surfaces which are known to contribute to water quality problems. The best method to reduce the amount of sediment entering the lake is by educating the public and implementing water quality BMPs.

### Waterbody improved

- The Stearns County SWCD hired a consultant (Short Elliot Hendrickson, Inc.) to help us evaluate and identify priority sites for BMPs. The project was discussed and a strategy was created to utilize our local partner's (Koronis Lake Association and Paynesville Township) knowledge of water related issues. The project area was toured to identify potential project locations. Invitations and publications were created, distributed and published about the project. Property owners were solicited through mailings and using our local partners to go door to door. A website was created which identified other actions that people can take to help protect our water quality if they did not want to participate in the project. The BMP installations occurred in the spring of 2016 up against the grant deadline. The practices have had minimal time (couple months) to start showing a positive impact to the water quality of Lake Koronis.

## Project highlights

- Raingardens, permanent shoreline buffers, slope stabilization and shoreline erosion control projects were installed. A public stormwater educational campaign was also used to try to change people's habits to improve the water quality of Lake Koronis. Both these options were used to help meet the goals and objectives of the Stearns County Local Water Management Plan, North Fork Crow River Watershed Management Plan and the MPCA's Upper Mississippi River Basin Plan. Local partnerships were strengthened over the three year grant period.
- The Stearns County SWCD, North Fork Crow River Watershed District, Crow River Organization of Water, Natural Resources Conservation Service and Pheasants Forever will continue to build off of this project in the future and actively promote our water quality programs in the NFCRWD watershed.
- Eleven stormwater BMP projects were completed with seven different landowners resulting in an annual estimated pollution reduction of 230 pounds of TP and 229 tons of TSS. The projects consisted of three raingardens, two steep slope stabilizations, two shoreline erosion control projects and four shoreline buffers. The existing vegetation and/or buffers were converted from turf or improved and expanded, planted with local ecotype native plant materials and permanently protected through a deed restriction.

## Partnerships

- Stearns County SWCD
- North Fork Crow River Watershed District
- Natural Resources Conservation Service
- Stearns County Environmental Services Department
- West Central Technical Service Area Engineers
- Koronis Lake Association
- MPCA
- Crow River Organization Water
- Paynesville Township

## Financial information

Funding type: CWP

Grant amount: \$197,871

Final in-kind: \$65,896

Matching funds: \$205,575



*Lake Koronis*

## Contact information

Wayne Cymbaluk  
Water Resource Specialist  
Stearns County SWCD  
110 2<sup>nd</sup> Street S. Suite 128  
Waite Park, MN 56387  
320-251-7800, Ext. 126, [wayne.cymbaluk@mn.nacdnet.net](mailto:wayne.cymbaluk@mn.nacdnet.net)  
MPCA Project Manager: Scott Lucas

# Upper Mississippi River Basin

## Active projects

### Projects awarded in 2017

#### Projects involving multiple watersheds

##### Crow River SSTS Restoration Project – 2017

Sponsor: Crow River Organization of Water (CROW)

Funding: CWP (Loan) \$1,350,000

Purpose: This project will focus on addressing excess nutrients and bacteria on a comprehensive scale through the Crow River watershed. To achieve this goal up to 115 SSTS will be installed to mitigate pollution sources and transport. This project will result in an estimated annual reduction of 340 pounds of P, 7,566 tons of TSS, and 834 pounds of nitrogen.

#### Clearwater River Watershed

##### Clearwater River Watershed Alternative Tile Intakes Project – 2014

Sponsor: Clearwater River Watershed District

Funding: Section 319 (Grant) \$45,000

Purpose: This project will install up to 120 open tile intakes that filter out nutrients and sediments, providing 700 pounds per year of TP load reduction from priority crop land. It will also document reduction in farmer and tile contractor resistance to the use of alternative tile intakes. Educational materials will be produced, demonstrating the benefits, effectiveness and utility of alternative tile intakes from environmental and economic standpoints, as well as applicability throughout the state.

#### Long Prairie River

##### Long Prairie River Dissolved Oxygen TMDL Implementation – 2013

Sponsor: Todd SWCD

Funding: Section 319 (Grant) \$300,000

Purpose: Implement 25-30 BMPs in the Long Prairie Watershed and increase DO levels such that they are consistently above 5 mg/L. This would delist the Long Prairie as an impaired water body. Morrison, Douglas, and Todd SWCDs will be the primary partners on the project since they are the primary counties with land in the watershed. It is anticipated that projects implemented will annually reduce 1,409 pounds of P, 716 tons of

sediment and 6,771 pounds of nitrogen from reaching the Long Prairie River system. These reductions will decrease algae growth and result in higher DO readings.

#### Mississippi River – Brainerd

##### Platte River Restoration/Protection Project – 2015

Sponsor: Morrison SWCD

Funding: CWP (Grant) \$34,900

Purpose: Through a combination of rock, streambarbs and bio-engineering, the stream channel will be slightly modified to deflect the river's energy away from the bridge abutments and the eroded banks. Through this combination of practices erosion will be reduced and long term stabilization can be achieved. The bio-engineered components and riparian buffer will also add aquatic and pollinator habitat with water quality benefits. The water quality improvements predicted are decreased water turbidity, decreased sediment load of the river by 39.6 T/yr, and stabilization of the north bank of the river.

##### Swan River Headwaters Subwatershed Restoration – 2015

Sponsor: Todd SWCD

Funding: CWP (Grant) \$38,650

Purpose: Grant dollars would be used to install riparian buffers and restore a series of sediment ponds to keep nutrient rich runoff from flowing into several local lakes and the Swan River. Riparian landowners in this area, both agricultural producers and shoreland residents, have agreed that work is needed and are willing to implement these strategies to restore water quality in this area. These projects would improve conditions for fish and invertebrate communities. The efforts outlined in these projects would increase cooperation between the shoreland and agricultural communities and encourage a conservation ethic throughout this area.

#### Mississippi River – Grand Rapids

##### Big Sandy and Minnewawa Lakes Phosphorus Reduction – 2014

Sponsor: Aitkin County SWCD

Funding: Section 319 (Grant) \$86,100

Purpose: This project will implement P reduction



strategies for the Big Sandy Lake Watershed, as outlined in the Big Sandy Lake and Lake Minnewawa TMDL Implementation Plan. BMP demonstration projects will be installed, including 2 rain gardens and 5 shoreline stabilization projects. Estimated reduction in P pollution of 9,145 lbs/yr and sedimentation of 5,165 T/yr. One hundred rain barrels will be distributed at a reduced cost to critical landowners. Septic system inventories will provide county staff, as well as lake residents, with critical information needed to further address the issues related to improper septic system maintenance. Education activities will increase awareness of and concern about consequences of landuse practices that have environmental impacts. Water quality data will be collected on nine lake sites within the Big Sandy Watershed.

## Mississippi River – St. Cloud

### Clearwater River Restoration & Protection Phase II – 2015

Sponsor: Clearwater River Watershed District

Funding: CWP (Grant) \$72,000

Purpose: District staff will update an existing bacteria and TSS source inventory through a desktop survey and field reconnaissance to identify and prioritize project locations to reduce sediment and bacteria loading to the River. Projects will be prioritized for preliminary design based on their potential for load reduction to the Clearwater River. The district will finalize design and permitting for projects with signed agreements and high cost benefit in terms of bacteria and TSS load reductions. Construction will be complete by spring of 2018. The District will use the projects as demonstrations to promote participation in agricultural programs and projects

### NE St. Cloud Mississippi River Protection Project – 2015

Sponsor: City of St. Cloud

Funding: CWP (Grant) \$200,000

Purpose: The proposed project will increase pervious surfaces, create disconnection of impervious areas prior to entering the storm sewer system (i.e., Mississippi); implement alternative green landscaping, and bioretention facilities. Alternative landscaping techniques/BMPs will be implemented throughout the drainage area where site characteristics make sense. This may include, but is not limited to: incorporating trees into landscaped areas, tree boxes, pervious pavement, grass swales, vegetated filter strips, etc. Targeted areas include: where the City plans to re-stabilize pervious surfaces;

where the City plans to install bioretention or other volume reduction BMPs; areas adjacent to reconstructed catch basins and/or retrofit sump catch basins (tree boxes); and, where the City plans to landscape existing paved and/or gravel areas. The education of property owners and citizens will also be an important aspect of the project to ensure long term function of the BMPs and future participation by other property owners. Projects implemented as part of this grant will be promoted and highlighted to educate and encourage participation in future projects for this area. Furthermore, the projects will improve the aesthetics of the old rundown industrial/commercial area bringing additional attention and educational efforts. The City plans to submit follow-up presentations on the implemented BMPs and the impacts to the Mississippi River to area stakeholder and citizen groups.

### Pleasant Lake Stormwater Quality Improvements – 2014

Sponsor: City of Annandale

Funding: CWP (Grant) \$164,800

Purpose: The City of Annandale intends to plan and implement stormwater infiltration systems, including trenches, sump manholes and perforated pipes, to settle out solids, to increase water detention times, to reduce stormwater discharge volumes and to prevent the discharge of nutrients and sediment from urban runoff into local water bodies. Water quality results will help determine effectiveness of BMPs.

## Mississippi River – Twin Cities

### Bald Eagle Lake TMDL Implementation – 2013

Sponsor: Rice Creek Watershed District

Funding: CWP (Loan) \$500,000

Purpose: This project proposes to use aluminum sulfate (alum) to control internal P loading to Bald Eagle Lake. Over the lifespan of the alum treatment, expected to be 15-20 years, 1,195 pounds of P will be removed.

### Lower Sand Creek Corridor Restoration – 2017

Sponsor: Coon Creek Watershed District

Funding: Section 319 (Grant) \$269,563

Purpose: The main stem of Sand Creek is impaired for aquatic life impairments. Excess P, TSS, habitat alterations, and altered hydrology were identified as the primary stressors to Sand Creek's biota. To meet pollution standards, the watershed must meet annual load reductions of approximately 36 tons of TSS and 813

pounds of TP per year. To address the remaining non-point sources of TSS and TP in Sand Creek, in-channel BMPs are necessary to prevent further channel incision and bank erosion. This project will implement multiple streambank and in-stream BMPs to reduce sediment and nutrient loading and to improve in-stream and riparian habitat. A one-half mile of river, identified as a TSS loading hot spot, will have targeted practices installed to address bank erosion, which contributes an estimated cumulative annual TSS load of 372 tons attributable to streambank erosion. The proposed BMPs will reduce approximately 75% of the bank erosion in the project area. Additional TSS and TP load reductions can be expected from preventing further channel incision with grade control structures and from enhancing riparian vegetation to treat overland flow.

#### **Northwood Lake Water Quality Improvement Project – 2015**

Sponsor: Bassett Creek Watershed Management Commission

Funding: CWP (Grant) \$300,000

Purpose: This project will treat stormwater runoff from over 110 acres of currently untreated urban land. At the east end of the lake project components include a structural treatment device for pre-treatment of runoff, underground stormwater re-use chamber (160,000 gallons capacity), pump house, distribution system to irrigate 6.4 acres of adjacent ball fields, and a system overflow directed into a series of linear rain gardens prior to discharging into Northwood Lake. At the west end of Northwood Lake, a wet ponding basin will be constructed in a green space area between Trunk Highway 169 and Jordan Avenue. Stormwater runoff from rear yards and Jordan Avenue draining from the south will be directed into the pond for treatment before discharging into an existing storm sewer pipe tributary to Northwood Lake. This project is expected to remove 22 lbs of P per year in addition to other pollutants associated with stormwater runoff and snowmelt. Additional benefits of the project include water conservation through the storage and use of stormwater as irrigation water for adjacent ballfields. It is estimated that up to 3.8 million gallons of drinking water may be conserved annually due to irrigation using stormwater captured through this project.

#### **Shingle Creek DO Reaeration Improvements – 2014**

Sponsor: Shingle Creek Watershed Management Commission

Funding: Section 319 (Grant) \$93,500

Purpose: Design and construct reaeration structures and stream improvements and conduct preconstruction and post construction water quality and biological monitoring to document improved water quality and biotic integrity of the stream. The desired outcome would be a stream that meets the state DO standard downstream of each project area. This will be analyzed by completing pre- and post-construction longitudinal DO and continuous DO surveys. Documenting a post-construction macroinvertebrate community composition that includes more sensitive taxa would be an indication of the desired response to improved DO conditions. The education and outreach component will be measured based on hits to the project's website and social media accounts.

#### **North Fork Crow River**

##### **MFCRWD Loan Program for BMPs/Septic Upgrades – 2015**

Sponsor: Middle Fork Crow River Watershed District

Funding: CWP (Grant) \$10,000 and CWP (Loan) \$100,000

Purpose: The project goal is to reduce the impacts of stormwater runoff and sediment and nutrient loading into the Middle Fork Crow River by implementing a variety of BMPs including stormwater retrofits, streambank restorations, conservation agricultural projects, and septic system upgrades. This will be done by evaluating current water quality impacts, implementing BMPs already in the planning stages, and promoting BMPs to landowners with the support of a low interest loan program.

##### **North Fork Crow River Septic System/Feedlot Upgrades – 2012**

Sponsor: North Fork Crow River Watershed District

Funding: CWP (Loan) \$500,000

Purpose: The CWP Loan Program will finance ongoing efforts to upgrade 45-50 noncompliant septic systems in the watershed area of Rice and Koronis Lakes and undertake two to three cooperative feedlot manure management projects such as manure pit upgrades, installing storage ponds, pumps, liners, and clean water diversions.

**Targeting BMPs in the Crow River Watershed – 2012**

Sponsor: Crow River Organization of Water

Funding: CWP (Loan) \$1,100,000

Purpose: This project will promote and install 110 SSTS, agricultural and rural BMPs in the Crow River watershed.

**Rum River****Mille Lacs Lake Protection – Stormwater Control – 2014**

Sponsor: Aitkin County SWCD

Funding: CWP (Grant) \$85,520

Purpose: This project will implement five stormwater control demonstration BMPs and educate watershed landowners regarding stormwater control. These projects will serve to change behavior and perceptions of how stormwater may be managed, and demonstrate how easy changes may have a positive impact on land stewardship and water quality protection. One hundred rain barrels will be distributed at a reduced cost to critical landowners. These will serve as examples to numerous area residents, resulting in benefits that include control of stormwater runoff and increased awareness of the water quality impacts of untreated stormwater runoff. Education activities will increase awareness of and concern about consequences of improper stormwater management practices and their environmental impacts. Participants will become knowledgeable regarding stormwater and water quality BMPs developing a new understanding of their environment. All efforts combined will engage the local citizens and further the project goal of protecting the water quality of the Mille Lacs Lake Watershed. Involvement of citizen volunteers will increase their confidence and ability to address stormwater management and water quality concerns. Support of their efforts will lead to long term involvement of the citizens and foster their continued leadership in the local community.

**Sauk River****Crooked Lake Basin Restoration Project – 2013**

Sponsor: Sauk River Watershed District (SRWD)

Funding: CWP (Loan) \$665,000

Purpose: This project will use CWP loan funds to purchase 1,280 acres from 12 landowners in order to install a ditch weir which will hold back water to re-establish the lake basin. Under management, a restored Crooked Lake will provide 2,200 acres of submerged and emergent plants that will filter and take up nutrients and stabilize sediments from Judicial Ditch 2 (JD2).

**Lake Osakis Minor Watershed Nutrient Reduction – 2017**

Sponsor: Todd County SWCD

Funding: Section 319 (Grant) \$300,000

Purpose: These funds would be used to bring approximately 5-7 feedlots into compliance. This would be done by the construction and installation of approximately 30 completed and certified best management practices including: properly abandoning waste ponds, clean water diversions (curbs, earthen berms and gutters), vegetated filter strips, stacking slabs and nutrient management plans to bring existing livestock operations into compliance with current feedlot regulations. These BMPs would reduce P by 120 pounds per year from reaching Lake Osakis. Additional water quality benefits would include reducing nitrogen contributions by 360 pounds per year, 480 pounds per year BOD, 6,486 pounds per year COD and fecal coliform.

**Middle Sauk River Targeted Reduction and Outreach – 2014**

Sponsor: SRWD

Funding: CWP (Grant) \$332,214.50 and CWP (Loan) \$150,000

Purpose: A farmer-led Council will be developed and meetings will be held up to four times to guide the SRWD in the development of the Hayed Buffer Program and participate in public outreach efforts to promote the program. The project will install 40-50 acres of vegetative buffers under the established Hayed Buffer program, reducing an estimated 126.6 tons of sediment per year. Landowners participating in the Hayed Buffer program will supply feedback on the program by completing the Hayed Buffer Survey developed by the Farmer-led Council. The project will implement two streambank restorations and four erosion control practices to target an estimated sediment reduction of 3.3 to 6.6 T/yr. Stream samples will be collected and compared to archived data. Stream modeling will be completed to determine load reduction and the success of the CWP project.

**Osakis Lake Nutrient Reduction – Crooked Lake – 2014**

Sponsor: SRWD

Funding: Section 319 (Grant) \$286,652

Purpose: Entice landowners, using additional incentives, to secure their enrollment into the Reinvest in Minnesota program, or other similar programs to restore the Crooked Lake basin. Approximately 1,200 acres would be restored to a standing water basin. Under management,

a restored Crooked Lake would provide 3,291 acre-foot of storage, resulting in increased storage, decreased nutrient transport, flood mitigation and increase wildlife habitat. The restored basin would enhance the quality of water flowing through JD2, which directly outlets to Osakis Lake. A fully restored shallow lake would have a potential load reduction of 2,135 lbs/yr of TP and 562,575 lbs/yr of TSS. Seventy-two lakes samples and 30 stream samples will be collected and compared to archived data. Data from the JD2 sites and lakes sites will be compiled and submitted to MPCA for EQuIS and posted on SRWD's website for public review. Stream modeling will be completed to determine load reduction and the success of the restoration project.

#### **SRWD Groundwater Protection Project – 2015**

Sponsor: SRWD

Funding: CWP (Grant) \$10,000 and CWP (Loan) \$250,000

Purpose: Educate the local residents of the importance of groundwater protection and provide financial assistance to those who need to properly abandon their unused well or to upgrade their nonconforming septic system to prevent nutrients and other contaminants from impacting groundwater and surface water through groundwater permeation. Agencies within each of the five counties will take the lead on conducting the septic inspections throughout the Sauk River watershed. Incentive dollars (grant funds) will be offered to watershed residents that have an unused well, cistern or underground reservoir to properly abandon the system. The SRWD will work with the local county agencies to provide public outreach to watershed residents informing them of the impact that unused wells and substandard septic systems have on drinking water and surface water.

### **South Fork Crow River**

#### **Ardmore Avenue Stormwater Retrofit – 2015**

Sponsor: City of Medina

Funding: CWP (Grant) \$33,163

Purpose: The installation of a filtration basin to treat stormwater prior to entering Lake Ardmore and Lake Independence, will result in a reduction of the TP and TSS load contributed to these waterbodies from a portion of the neighboring developed area. Lower TP and TSS loads also reduces chlorophyll-a concentrations in-lake, an indirect measure of the amount of algae within these lakes. Lower P and chlorophyll-a concentrations improve water clarity (Secchi depth) as well and allow

the lakes to support the designated uses assigned to them. This project will serve as a city-led example of a stormwater retrofit for a 6.8 acre tributary area that can be replicated on a smaller scale by private property owners. Native plantings installed with the proposed BMP will facilitate bioretention and plant uptake. The filtration basin includes a drain-tile due to poorly draining soils. However, the proposed engineered mix of sand and compost within the basin will provide water quality treatment of the lawn and impervious runoff.

#### **Buffalo Creek – Marsh Water Project – 2014**

Sponsor: Buffalo Creek Watershed District

Funding: CWP (Grant) \$10,000 and CWP (Loan) \$294,540

Purpose: The Marsh Water Project includes the construction of a stormwater wetland BMP, placed in-line with the existing ditch, to treat stormwater from agricultural, industrial, and residential land uses. Since few (if any) vegetative buffers, ponds, or other BMPs exist along the drainage system, nutrient concentrations are relatively high at the proposed BMP site, enabling substantial reductions as a result of the BMP through both particle settlement and absorption from the wetland plantings. Total anticipated yearly pollutant removals for the stormwater wetland BMP is 23 tons of TSS and 67 pounds of TP.



520 Lafayette Road North  
St. Paul, MN 55155  
651-296-6300 or  
Toll-free 800-657-3864  
[www.pca.state.mn.us](http://www.pca.state.mn.us)

### Regional Offices

#### **MPCA Brainerd Office**

7678 College Road  
Suite 105  
Baxter, MN 56425  
218-828-2492 or  
Toll-free 800-657-3864

#### **MPCA Detroit Lakes Office**

714 Lake Avenue  
Suite 220  
Detroit Lakes, MN 56501  
218-847-1519 or  
Toll-free 800-657-3864

#### **MPCA Duluth Office**

525 Lake Avenue South  
Suite 400  
Duluth, MN 55802  
218-723-4660 or  
Toll-free 800-657-3864

#### **MPCA Mankato Office**

12 Civic Center Plaza  
Suite 2165  
Mankato, MN 56001  
507-389-5977 or  
Toll-free 800-657-3864

#### **MPCA Rochester Office**

18 Wood Lake Drive SE  
Rochester, MN 55904  
507-285-7343 or  
Toll-free 800-657-3864

#### **MPCA Marshall Office**

504 Fairgrounds Road  
Suite 200  
Marshall, MN 56258  
507-537-3001 or  
Toll-free 800-657-3864

#### **MPCA Willmar Office**

1601 East Highway 12 East  
Suite 1  
Willmar, MN 56201  
320-441-6965 or  
Toll-free 800-657-3864