

## **2016 Project Abstract**

For the Period Ending June 30, 2019

**PROJECT TITLE:** Integrated Targeted Watershed Planning Tools with Citizen Involvement

**PROJECT MANAGER:** Kimberly Musser

**AFFILIATION:** Minnesota State University, Mankato Water Resources Center

**MAILING ADDRESS:** 135 Trafton Science Center S

**CITY/STATE/ZIP:** Mankato, MN 56003

**PHONE:** (507) 389-5492

**E-MAIL:** kimberly.musser@mnsu.edu

**WEBSITE:** <http://cset.mnsu.edu/wrc/>

**FUNDING SOURCE:** Environment and Natural Resources Trust Fund

**LEGAL CITATION:** M.L. 2016, Chp. 186, Sec. 2, Subd. 04v

**APPROPRIATION AMOUNT:** \$169,000

**AMOUNT SPENT:** \$ 168,883.37

**AMOUNT REMAINING:** \$116.63

### **Sound bite of Project Outcomes and Results**

In 50 words or less, describe the outcomes of your project as they relate to protecting, conserving, preserving, and enhancing Minnesota's air, water, land, fish, wildlife, and other natural resources

The Water Resources Center at Minnesota State University, Mankato used geographic information system (GIS) prioritization and modeling tools to develop pollution reduction strategies in five priority subwatersheds in the Le Sueur River watershed and promoted implementation of the reduction strategies through citizen involvement and outreach. (45 words)

### **Overall Project Outcome and Results**

The Le Sueur River Watershed (LSRW) is one of the leading contributors of pollutant loads in the Upper Mississippi River Basin. The 711,000 acre watershed is listed as a priority watershed for both nitrogen and phosphorus in the *Minnesota Nutrient Reduction Strategy* and is a prolific source of total suspended solids which impacts downstream receiving waters from the Minnesota River to the Gulf of Mexico.

The project goals were to use geographic information system (GIS) prioritization and modeling tools to develop pollution reduction strategies in five priority subwatersheds in the LSRW and to promote implementation of the reduction strategies through citizen involvement and outreach.

The project resulted an inventory handbook of GIS conservation planning and targeting tools to help local conservation partners better understand the diversity of available tools ([link](#)). A statewide survey of GIS tool users was also developed and summarized ([link](#)). Five subwatershed strategies were developed by citizens and conservation partners that illustrate conservation opportunities based on the latest targeting tool outputs, maps and citizen input ([link](#)). The project harnessed the energy of a citizen group, the LSRW [Network](#) to facilitate improvements in one of the most degraded watersheds in the state.

More broadly, this project demonstrates subwatershed scale planning that uses GIS conservation targeting tools integrated with civic engagement—a promising approach and scale for nonpoint source pollution clean-up. The project underscores the power of conservation partners engaging community members around locally relevant problem solving that aligns with existing social networks. Subwatershed groups learned and adapted together while citizen leaders networked with peers, building strong relationships and enduring partnerships. The project also raised awareness statewide about the need to re-create more water storage across the Minnesota River Basin to reduce peak flows that are destabilizing river systems and contributing to water quality problems ([Water Storage Forum](#)).

### **Project Results Use and Dissemination**

Information about this project is housed on the [Le Sueur River Watershed Network](#) and the [Minnesota River Basin Data Center](#) websites. Project reports include an inventory handbook of GIS conservation planning and targeting tools to help local conservation partners better understand the diversity of available tools ([link](#)). A statewide survey of GIS tool users was also developed and summarized ([link](#)). Five Subwatershed Strategy documents were created ([link](#)) that integrate GIS conservation targeting with citizen engagement. Information about Le Sueur River Watershed and priority subwatersheds are summarized on the [Le Sueur River Watershed Network](#) and [MRBDC](#) websites.

The project has resulted in hundreds of one-on-one, small and large group meetings to disseminate information with citizens and conservation partners at subwatershed, watershed, and basin scales. Project staff had the opportunity to share information about the project at international, national, state, regional and local conferences and meetings. International and national highlights include audio interviews housed at the [Museum on Mainstreet, Smithsonian Institute](#), a presentation at the [Soil and Water Conservation Society International Conference](#) in Madison WI; presentations at the Watershed Leaders Network Meeting, Hannibal, Missouri and Dubuque, IA. Statewide highlights include [Governor's Water Quality Town Hall Meeting](#), numerous presentations at [Minnesota Water Resources Conferences](#).

Project staff have made over a dozen presentations and hosted tours regionally and locally to raise awareness about the project and outcomes ranging from local and regional government (County, SWCD, [GBERBA](#)), to state and elected officials ([Minnesota Legislative Water Commission](#), [Clean Water Council](#), [Governor's Office](#)) to conservation groups ([Minnesota River Congress](#), [Friends of Minnesota Valley](#), [Izaak Walton League](#), Clean Water Minnesota). A project highlight was raising the awareness about the need for more water storage statewide by developing and hosting the [Minnesota River Basin Water Storage Forum](#) and website. During the project period, dissemination through media outlets include over 20 newspaper articles, four KEYC television interviews, and three nationally publicized audio interviews. In addition, project partners created the [Le Sueur River Watershed Network](#) website, created four videos, as well as numerous posters and summary maps and other public informational materials.



# Environment and Natural Resources Trust Fund (ENRTF) M.L. 2016 Work Plan

**Date of Report:** August 15, 2019

**Final Report**

**Date of Work Plan Approval:** June 7, 2016

**Project Completion Date:** June 30, 2019

**Does this submission include an amendment request?** No

**PROJECT TITLE:** Integrated Targeted Watershed Planning Tools with Citizen Involvement

**Project Manager:** Kimberly Musser

**Organization:** Minnesota State University, Mankato Water Resources Center

**Mailing Address:** 135 Trafton Science Center S

**City/State/Zip Code:** Mankato, MN 56003

**Telephone Number:** (507) 389-5492

**Email Address:** kimberly.musser@mnsu.edu

**Web Address:** <http://cset.mnsu.edu/wrc/>

**Location:**

*Regions:* Southwest, Southeast

*Counties within Le Sueur River Watershed:*

Freeborn, Waseca, Steele, Faribault, Blue Earth

**Total ENRTF Project Budget:**

**ENRTF Appropriation:** \$169,000

**Amount Spent:**

168,883.37

---

**Balance:** \$ 116.63

**Legal Citation:** M.L. 2016, Chp. 186, Sec. 2, Subd. 04v

**Appropriation Language:**

\$169,000 the second year is from the trust fund to the Board of Trustees of the Minnesota State Colleges and Universities system for the Water Resources Center at Minnesota State University, Mankato, to use geographic information system (GIS) prioritization and modeling tools to develop pollution reduction strategies in five priority subwatersheds in the Le Sueur River watershed and to promote implementation of the reduction

strategies through citizen involvement and outreach. This appropriation is available until June 30, 2019, by which time the project must be completed and final products delivered.

**I. PROJECT TITLE:** Integrating Targeted Watershed Planning Tools with Citizen Involvement

**II. PROJECT STATEMENT:** The Le Sueur River Watershed continues to be one of the leading contributors of pollutant loads in the Upper Mississippi River Basin. The 711,000 acre Le Sueur River watershed is a prolific source of total suspended solids which affects downstream receiving waters including the Minnesota River and Lake Pepin. It is listed as a priority watershed for both nitrogen and phosphorus in the *Minnesota Nutrient Reduction Strategy*. Statewide, there is a need to better target pollution reduction in these high-loading agricultural watersheds. This project will clarify the most effective targeting tools, foster better coordination among public agencies, demonstrate targeted subwatershed conservation planning, and harness the energy of a citizen group to facilitate improvements in one of the most degraded watersheds in the state. National, state and local researchers have identified altered flow regime in the Le Sueur as a major stressor causing accelerated erosion in rivers and streams (Wilcock; MPCA *Watershed Restoration and Protection Strategy* [WRAPS]). These researchers and a locally-led citizen group, Le Sueur River Watershed Network ([lesueurriver.org](http://lesueurriver.org)) concur that the solution lies in re-creating more storage, retention, and infiltration in the watershed in order to hold back water that is destabilizing these systems and contributing to water quality problems.

Many targeting tools are being developed and piloted in different locations across the state. This project will summarize conservation planning tools in a handbook that Local Government Units (LGUs) can use to determine what tool, or combination of tools, will help to more successfully target implementation. This is a logical next step to build upon and integrate data generated by MPCA's WRAPS and Total Maximum Daily Load (TMDL) reports. We will work with the existing joint powers board, Greater Blue Earth River Basin Alliance (GBERBA), local partners and a citizen-led watershed group, Le Sueur River Watershed Network, to support better coordination and communication, and to target implementation in five priority subwatersheds in the Le Sueur River Watershed.

**III. OVERALL PROJECT STATUS UPDATES:**

**Project Status as of December 1, 2016:**

*Watershed Prioritization and Planning Tools*

Researched and compiled existing inventories of watershed prioritization and planning tools and models. Networked with staff from a variety of agencies to gain feedback from model developers and pilot users. Obtained training in models and acquired programs and datasets where available. Initiated and hosted a new GIS group in southern Minnesota – the South Central Minnesota GIS Users Group – creating a forum to foster better communication and information flow.

*Subwatershed Planning*

Staff worked with the Le Sueur River Watershed Network Steering Committee to define approach and prioritize subwatershed phasing as well as planning for the next series of watershed-wide citizen meetings. Started work in New Richland (Boot Creek) subwatershed. The WRC helped form a new subcommittee with local subwatershed partners, provided educational outreach materials to the community, and identified key stakeholders for our next steps. Staff formulated a plan for working in the Bull Run and Freeborn Lake subwatersheds and collected and compiled GIS data and background materials.

*Dissemination*

WRC Staff and Le Sueur River Watershed Network Leaders continued to disseminate information about the

project through events, presentations, media, websites as well as attending multi-state Watershed Leaders Network to share information with other groups working in agricultural watersheds across the Midwest.

**Project Status as of June 1, 2017:**

*Watershed Prioritization and Planning Tools*

Compiled existing inventories of watershed prioritization and planning tools and models. Acquired programs and datasets where available. Continued to network with and learn from experienced users from state agencies and local conservation partners. Continued to help coordinate and share GIS modeling information regionally with new GIS group in southern Minnesota – the South Central Minnesota GIS Users Group.

*Subwatershed Planning*

Started working with local partners and citizens to develop overall approach and outreach strategies in each of the three (3) Phase 1 subwatersheds: New Richland, Bull Run Creek and Freeborn Lake. Continued to collect background information and GIS data and ran targeting tools and models to better understand watershed conditions and BMP opportunity areas. Worked with the Le Sueur River Watershed Network Steering Committee to prioritize subwatershed phasing as well as planning and hosting a watershed-wide meeting.

*Dissemination*

WRC Staff and Le Sueur River Watershed Network Steering Committee members continue to disseminate information and raise awareness about watershed issues and the project through events, presentations, meetings, media, and websites.

**Project Status as of December 1, 2017:**

*Watershed Prioritization and Planning Tools*

Continued to initiate conversations and network with experienced users of watershed planning tools and models to find examples of innovative watershed prioritization efforts to integrate into the summary booklet. Continued to collect data and run tools and models and to update the tool inventory as new information becomes available. Worked with South Central GIS Users Group and South East GIS User Group to organize a joint users group meeting with regional technical users.

*Subwatershed Planning*

Continued to work with local partners and citizens to refine approach and develop outreach strategies in three (3) Phase 1 subwatersheds: New Richland, Bull Run Creek and Freeborn Lake. As data becomes available, we continue to update inventory of background information and GIS data. Created conservation planning scenario maps for Phase 1 subwatersheds to illustrate watershed conditions and identify locations for strategic BMP placement. Worked with the Le Sueur River Watershed Network Steering Committee to develop approaches in Phase 2 subwatershed and hosted a watershed-wide meeting and a watershed-wide tour. Developed outreach materials with citizen-identified information gaps within subwatersheds, as well as across the entire Le Sueur River Watershed.

*Dissemination*

WRC Staff and the Le Sueur River Watershed Network Steering Committee members continue to seek opportunities to disseminate information and raise awareness about watershed issues and the Network's efforts through events, presentations, meetings, media, and websites. Provided subwatershed-planning updates at Greater Blue Earth River Basin Alliance Technical Meetings and to local partners.

## **Project Status as of June 1, 2018**

### *Watershed Prioritization and Planning Tools*

Created a draft handbook for review. It includes a summary of available conservation planning toolsets with a more in-depth review of the specific subwatershed planning tools used to develop subwatershed pollutant reduction strategies. The handbook includes a mix of Excel spreadsheet calculators and GIS-based models. Toolset summaries include answers to commonly asked questions posed by local resource planners and insights from more experienced users. The South Central Minnesota GIS Users Group continues to be a good source of feedback and decision-making regionally and to learn about advances in GIS programs. Continued to collect data and update the tool inventory as new information becomes available.

### *Subwatershed Planning*

The five subwatersheds have been identified and outreach strategies are being clarified and refined as new information becomes available from local conservation partners and citizens. Draft modeled scenario maps were developed and staff is getting feedback about model assumptions and calculations. Background information and maps have been collected and developed for the three Phase 1 subwatersheds (Joint County Ditch (JC) 6 and Waseca County Ditch (CD) 47, Bull Run Creek, and Freeborn Lake). Staff has shared maps about local resources, land uses, water quality impairments, etc. with citizens and local partners. These background maps will be included in subwatershed pollutant load reduction strategies. Phase 2 subwatersheds (Waseca County Ditch (CD) 19 and Le Sueur River-Mankato) have had initial meetings to identify the subwatershed issues and concerns. We are still waiting on data products from a complementary hydro terrain analysis project (being funded through Clean Water Funds), that will provide additional pollutant load reduction information. Next, staff will incorporate data results and to start vetting model outputs and integrating results into subwatershed plans, delineating clear steps that could be replicated in other subwatersheds.

### *Dissemination*

WRC staff and Le Sueur River Watershed Network (Network) Steering Committee members continue to disseminate information and raise awareness about watershed issues through the Network's events, presentations, meetings, media, and website. Staff continue to attend local and regional meetings including GBERBA and Minnesota River Congress meetings to share projects updates. The Network website was updated to include an overview of the subwatershed projects, meeting information, and maps. This website will be the primary repository for the subwatershed reduction strategies.

## **Project Status as of December 1, 2018**

### *Watershed Prioritization and Planning Tools*

A final guidance document for selecting watershed planning tools has been developed and designed and is under review. The document includes an inventory of watershed and framework models and BMP spreadsheet calculators. Each tool includes a summary description, overview of experience level, outputs, technical requirements, links to access the tool, and contact information. Staff obtained feedback from tool users via a statewide survey and two regional workshops. Staff continues to seek input from pilot users and developers in order to refine and update the document with new and updated information as it becomes available.

### *Subwatershed Planning*

A central focus of work for this time period was subwatershed planning and creating booklets for each of the five subwatersheds. Each subwatershed booklet contains a summary of watershed characteristics that are rich in GIS maps and background data such as water and wetlands, climate, geology and topography, soils, drainage class, soil erodibility, crop productivity index, and land use and management. Staff have hosted numerous meetings in subwatersheds and continue to refine subwatershed goals and pollution reduction strategies. The next step is to continue working with local partners and to assemble and run a suite of modeling tools to characterize pollution reduction for each subwatershed.

*Dissemination*

WRC staff and Le Sueur River Watershed Network (Network) Steering Committee members continue to disseminate information and raise awareness about watershed issues through the Network’s events, presentations, meetings, media, and website. Staff continue to discuss the project at local and regional meetings and presented the project at the Minnesota Water Resources Conference. Staff continue to seek opportunities to share information regionally and statewide.

**Amendment Request submitted December 1, 2018.**

*Budget*

We had four requests to amend budget line items. First, we shifted dollars from the Project Manager to the Associate Director. Due to a change in Project Manager personnel, the Associate Director and GIS Specialist took on some of the duties of the Project Manager.

The second request shifted dollars to provide additional hours for a Student Intern. The Student Intern continued to help prepare GIS and background data, create conservation planning scenario maps and subwatershed summary booklets, and expand upon GIS Tools training documents. Working with local partners, we have learned that they benefit from exposure and training in GIS targeting and modeling tools and subwatershed planning. During the remaining time, staff focused on building local partner capacity for future use of these tools in the region.

The third and fourth request shifted dollars from travel to the student intern allocation and to the printing allocation. There has been a cost savings in travel due to staff using personal cars versus renting a car from MSU Vehicle Services. Additional funds were needed for printing in order to print subwatershed booklets for local citizens and conservation partners as well as for informational materials to support the watershed-wide Water Storage Forum currently being planned.

Summary of Reallocation of Funds:

	<b>Activity 1</b>	<b>Activity 2</b>
Associate Director		2,800.00
Project Manager		(3,757.00)
Student Intern		2,205.00
Equipment/Tools		
Printing		980.74
Travel	(226.12)	(2,002.62)
	(226.12)	226.12

**Amendment Approved by LCCMR 12/20/2018.**

**Overall Project Outcomes and Results:**

The Le Sueur River Watershed (LSRW) is one of the leading contributors of pollutant loads in the Upper Mississippi River Basin. The 711,000 acre watershed is listed as a priority watershed for both nitrogen and phosphorus in the *Minnesota Nutrient Reduction Strategy* and is a prolific source of total suspended solids which impacts downstream receiving waters from the Minnesota River to the Gulf of Mexico.

The project goals were to use geographic information system (GIS) prioritization and modeling tools to develop pollution reduction strategies in five priority subwatersheds in the LSRW and to promote implementation of the reduction strategies through citizen involvement and outreach.

The project resulted an inventory handbook of GIS conservation planning and targeting tools to help local

conservation partners better understand the diversity of available tools ([link](#)). A statewide survey of GIS tool users was also developed and summarized ([link](#)). Five subwatershed strategies were developed by citizens and conservation partners that illustrate conservation opportunities based on the latest targeting tool outputs, maps and citizen input ([link](#)). The project harnessed the energy of a citizen group, the LSRW [Network](#) to facilitate improvements in one of the most degraded watersheds in the state.

More broadly, this project demonstrates subwatershed scale planning that uses GIS conservation targeting tools integrated with civic engagement—a promising approach and scale for nonpoint source pollution clean-up. The project underscores the power of conservation partners engaging community members around locally relevant problem solving that aligns with existing social networks. Subwatershed groups learned and adapted together while citizen leaders networked with peers, building strong relationships and enduring partnerships. The project also raised awareness statewide about the need to re-create more water storage across the Minnesota River Basin to reduce peak flows that are destabilizing river systems and contributing to water quality problems ([Water Storage Forum](#)).

#### **IV. PROJECT ACTIVITIES AND OUTCOMES:**

**ACTIVITY 1:** Evaluate, summarize and disseminate information about watershed prioritization and planning tools

##### **Description:**

Many targeted conservation planning tools are being released in the next year for use by local, regional, and state resource planners (i.e. NBMP and PBMP Calculators, Agricultural Conservation Planning Framework (ACPF), PTMApp, water storage calculators, etc.). Some local implementers in rural watersheds have indicated time and/or resource constraints to experimenting and incorporating these tools into their traditional implementation efforts.

WRC staff will inventory GIS toolsets, calculators, frameworks and watershed models to evaluate their features such as ease of use, pollutant load reductions they quantify, system requirements, and intended use, among others. Since the watershed has been under study for several years, there are rich datasets available for vetting and targeting within the Le Sueur River Watershed. Additionally, many of the pollutant concerns found in the Le Sueur River Watershed are representative of other agricultural watersheds across the state.

The Le Sueur River Watershed has been widely studied and despite the rich history of implementation in the watershed is still identified as one of the state's top contributors of sediment, nitrogen and phosphorus pollution. Feedback will be collected from users that have piloted the inventoried tools, as well as comments from the developers. This information will be synthesized in a summary booklet and disseminated to local government units (LGUs) and Soil and Water Conservation Districts (SWCDs), as well as regional and state resource planners. Topics would include an inventory of tools along with their intended use, necessary input data, technology requirements, and outputs. WRC staff will document user experiences and obtain feedback over the life of the project to produce a guide that clarifies the benefits and challenges of targeting tools. Findings will be shared at conferences, regional meetings, citizen meetings and one-on-one meetings with local implementers interested in learning more about options available to meet their watershed reduction goals.

Greater Blue Earth River Basin Alliance (GBERBA) was recently awarded a 2016 BWSR Clean Water Fund Accelerated Implementation Grant to perform terrain analysis in the Le Sueur River Watershed that will run simultaneously to this proposed LCCMR project. BWSR staff stated that they did not find any significant



overlap in the two proposals and did not have a concern regarding supplanting of CWFs. We will work diligently to ensure that both projects align and inform one another as they progress. These projects have great potential to work synergistically to inform targeted subwatershed pollutant reduction strategies.

**Summary Budget Information for Activity 1:**

**ENRTF Budget:**       \$ 42,050.88  
**Amount Spent:**       \$ 42,050.88  
**Balance:**               \$ 0

<b>Outcome</b>	<b>Completion Date</b>
<b>1.</b> <i>Inventory available prioritization and planning tools developed for use in agricultural watersheds, including GIS toolsets, frameworks, calculators and watershed models.</i>	<i>June 2017</i>
<b>2.</b> <i>Compile data pertinent for running tools in study subwatersheds of the Le Sueur River Watershed.</i>	<i>June 2017</i>
<b>3.</b> <i>Evaluate available tools based on feedback from developers and pilot users around the state, as well as input provided during citizen meetings in study subwatersheds.</i>	<i>June 2018</i>
<b>4.</b> <i>Develop a summary booklet for use by resource planners to determine what toolset(s) will help work towards watershed reduction goals.</i>	<i>June 2018</i>
<b>6.</b> <i>Disseminate findings from evaluation of toolsets to LGUs, SWCDs, state agencies, and other regional resource planners.</i>	<i>June 2019</i>

**Activity Status as of December 1, 2016:**

Researched and compiled existing inventories of watershed tools and models. The inventory matrix includes GIS toolsets, calculators, frameworks and watershed models to evaluate their features such as ease of use, pollutant load reductions they quantify, system requirements, intended use, and other criteria.

Networked with staff from a variety of agencies to gain feedback from model developers and pilot users. Contacts include Minnesota Pollution Control Agency (Dave Wall, Joanne Boettcher); Board of Water and Soil Resources (Matt Drewitz); MNIT GIS Staff (Rick Moore); University of Minnesota Water Resources Center (Ann Lewandowski); USDA National Agriculture Research Station, ACPF (Sarah Porter, Mark Tomer); University of Utah, CSSR (Peter Wilcock and Patrick Belmont).

Sought training in models and acquired programs and datasets where available. Collected advice about efficient file structure and data needs for analysis, targeting, storing and sharing. Began collecting case study examples of models being applied with citizen groups. Trainings include HSPF SAM Training (11-29-16), ACPF update, CSSR overview. Inquired about progress of CWF project for GIS breachline data availability for subwatersheds and learned that data is expected to be available by May 2017.

Initiated and hosted a new GIS users group in southern Minnesota – the South Central Minnesota GIS Users Group. The first meeting was held at MPCA’s Mankato Office on September 22, 2016 with 30 GIS professionals attending from 22 counties and cities across the region. The group identified a desire to better understand available modeling tools and their applications to watershed planning.

**Activity Status as of June 1, 2017:**

*Inventory available prioritization and planning tools*

Completed compiling subwatershed-scale targeting models and tools developed for novice and intermediate users. These include PTMApp, HSPF-SAM, ACPF, NBMP and PBMP, and water storage calculators. For models that require more technical expertise, WRC staff has been working with state agencies and private firms who are

providing technical support to adequately model the five subwatersheds and/or larger Le Sueur River Watershed, depending on what scale the tool was developed to model.

#### *Compile data for running tools in study subwatersheds*

Since the last training sessions (HSPF-SAM, ACPF, etc.), WRC staff has collected available datasets necessary to run the tools, as well as organizing them based on their modeling program application. All datasets required for running the tools have been collected except for products from the Clean Water Funded (CWF) Blue Earth and Le Sueur Hydro Terrain Analysis project. The hydro terrain analysis datasets for the entire Le Sueur River Watershed were expected to be completed by May 2017. Instead these datasets will be made available in December 2017. We have received breachline datasets for Phase I subwatersheds. Next, we anticipate modeling for field-scale targeting by County and SWCD staff.

#### *Evaluate available tools based on feedback from developers and pilot users around the state*

WRC staff has collected and compiled data about available tools within Le Sueur River Watershed. We have contacted researchers with existing inventories available. Summary data about existing tools have been collected from BWSR (Matt Drewitz, 2016 BWSR Academy Presentation); University of Minnesota Water Resources Center (Ann Lewandowski, Tool organizational chart); Minnesota Pollution Control Agency (Dave Wall, Tool ranking matrix).

#### *South Central MN GIS User Group*

WRC Staff continued to help coordinate the South Central GIS User Group meeting for regional and state GIS staff on March 16, 2017 (and upcoming meeting on June 22, 2017). Meeting topics are selected based on feedback from technical and non-technical GIS users. GIS modeling programs and processes were presented by experts. This group will continue to serve as a regional forum to share data about the latest watershed modeling programs and tools.

#### **Activity Status as of December 1, 2017:**

##### *Inventory available prioritization and planning tools*

Continued to update inventory of tools (completed in June 2017) as new information becomes available.

##### *Compiling data for running tools in study subwatersheds*

Identified priorities and interested landowners within subwatersheds and continued to update data inventories as new information becomes available from partners. Final products from the Clean Water Funded (CWF) Blue Earth and Le Sueur Hydro Terrain Analysis project are still pending completion, and expected to be completed in summer 2018. Breachlines acquired from the CWF project was applied in Phase 1 subwatersheds to initiate conversations about conservation planning models and targeting efforts with County, SWCD and citizen partners.

##### *Evaluate available tools based on feedback from developers and pilot users around the state*

Continued to modify and update the summary of targeting models and tools based on conversations with model developers and state agency staff. Evaluated which targeting tools to highlight in the summary booklet based on technical-skill requirements and ease of use with local partners and citizens. Initiated conversations with experienced users of modeling tools and models to identify projects to highlight in the summary booklet. Met with users of the Agricultural Conservation Planning Framework (ACPF) at the International Soil and Water Conservation Society Conference on July 31, 2017 in Madison, WI to learn their process for integrating the toolset into conservation planning. Met with Ann Lewandowski, University of Minnesota Water Resources Center, and Mark Tomer and Jessy Van Horn, Agricultural Research Station, to design a user guide for generalizing landscapes to assist users to determine the best parameters to use in the ACPF program. Followed up with the developers of the ACPF on October 16, 2017 to learn more about updates to the GIS toolset.

#### *South Central GIS User Group*

Facilitated South Central GIS User Group meeting with User Group Steering Committee on June 22, 2017. Planned a Joint GIS User Group with the South East and South Central GIS Users Groups on October 26, 2017. The meetings highlighted resources available for technical and non-technical GIS users, including using drones to collect environmental data and the watershed-modeling tool HSPF-SAM. Metro and regional GIS managers attended and discussed developing unified standards for newly created datasets.

**Activity Status as of June 1, 2018:**

*Inventory available prioritization and planning tools*

Continued to update inventory of tools (completed in June 2017) as new information and versions become available.

*Compiling data for running tools in study subwatersheds*

Pertinent available data has been collected for priority subwatersheds and stored in geodatabases. Final products from the Clean Water Fund (CWF) Blue Earth and Le Sueur River Watershed Hydro Terrain Analysis projects are still pending completion and expected to be completed in 2018. Once we receive these datasets, the files will be organized into existing geodatabases with documentation on the data product.

*Evaluate available tools based on feedback from developers and pilot users around the state*

Narrowed down the available tools to focus on based on ease of use, accessibility and performance for our study. The programs that were not incorporated in the subwatershed reduction strategies will have basic summary and contact information as a reference for resource planners.

*Develop a summary handbook for use by resource planners*

The draft summary handbook includes a comprehensive list of available models, tools and calculators organized thematically based on intended use and scale. The primary tools used to develop the subwatershed pollutant load reductions were vetted based on ease of use and technological requirements. This information is detailed in a section of the booklet along with information from pilot users and developers. The summary handbook also includes a summary of statewide initiatives and factors to consider for improved watershed coordination and planning.

*South Central GIS User Group*

WRC staff facilitated South Central GIS User Group meeting with the User Group Steering Committee on March 8, 2018. The meeting highlighted resources available for technical and non-technical GIS users, including basic BMP targeting using Google and programs developed by Houston Engineering to assist planners with buffer planning.

**Activity Status as of December 1, 2018:**

*Inventory available prioritization and planning tools*

Designed and developed a final document that provides an overview of inventoried tools for watershed planning in agricultural landscapes. Staff continues to refine and update inventory of tools as new information and versions become available.

*Compiling data and running tools in study subwatersheds*

The necessary base databases for running watershed tools have been mostly acquired in the five subwatersheds prioritized in this project. The final products from the Clean Water Fund (CWF) Blue Earth and Le Sueur River Watershed Hydro Terrain Analysis projects are still pending completion and required to be made available by December 31, 2018. Once we receive products from the CWF project, our inventory will be complete with the best available hydrology, water quality and targeting datasets. This data will be included in the final subwatershed booklets and made available to conservation partners.

### *Evaluate available tools based on feedback from developers and pilot users around the state*

Staff obtained feedback from pilot users via a survey and two workshops. Staff obtained feedback from water planners, field technicians, and GIS users at County, SWCD and Watershed District offices across the state. Survey respondents were asked six questions in a SurveyMonkey form about users' experience with tools and interest in tools developed for planning in agricultural watersheds. Survey participants had the opportunity to indicate their priority resource concerns (i.e. sediment, nutrients, wildlife, etc.) and what they are looking for in a planning tool. The survey was sent out to 160 conservation professionals and we received feedback from 40 respondents (~25% response rate). The final results from the survey will be incorporated into the *GIS Mapping and Modeling Tools* document. Staff continued to work one-on-one with developers of the watershed planning tools that have garnered interest from users. Information collected from developers will also be integrated into the *GIS Mapping and Modeling Tools* document.

Two workshops were conducted in conjunction with the related CWF Hydro Terrain Analysis project. The first workshop goal was to train conservation staff on how to work with hydro terrain analysis products to gain a better understanding of drainage areas. The second workshop was designed to help conservation staff work with ACPF and PTMApp desktop and web application datasets. The primary goal of these workshops was to teach non-experts how to interpret hydrology, water quality and BMP targeting datasets using watershed planning tools that the state has prioritized.

Feedback from county, SWCD and watershed staff using these methods revealed a need for more training and exposure to watershed planning tools. Respondents noted that if they are expected to use the tools to improve their ability to target projects and practices within their watersheds that they would benefit from more exposure to key tools and more guidance about what combination of tools they should use. They noted that more training time is necessary to support the more holistic watershed approach framework to focus on targeted conservation delivery.

### *Develop a summary handbook for use by resource planners*

Staff designed and developed a final document and continued to refine and update the inventory of tools as new information and versions become available. The *GIS Mapping and Modeling Tools* document includes a list of available models, tools and BMP calculators organized thematically based on intended use and scale, and technological requirements. Staff worked closely with Matt Drewitz, BWSR Outcomes Coordinator, and Dave Wall, MPCA staff responsible for the Minnesota Nutrient Reduction Strategy to frame up the document and develop questions to gather feedback from users around the state. Staff continue to update the document with new information and versions as they become available. For example, both PTMApp and ACPF had updates to the tools throughout the summer (June and September, respectively). Staff attended a workshop in St. Cloud hosted by BWSR (June 13, 2018) to learn about the PTMApp update and intent to include ACPF BMP outputs as a component of the toolbar to estimate pollutant load reductions and estimate construction costs.

## **Final Report Summary:**

### **SUMMARY AND OUTCOMES**

#### ***South Central MN GIS User Group***

This project initiated and helped support a new GIS users group in southern Minnesota – the South Central Minnesota GIS Users Group. The group consists of regional and state GIS staff representing approximately 22 counties and cities across the region. The group met on September 22, 2016, March 16, 2017, June 22, 2017, and March 8, 2018. Staff also planned a Joint GIS User Group with the South East and South Central GIS Users Groups (October 26, 2017). Meeting topics were typically selected based on participant feedback -- both technical and non-technical GIS users. On many occasions, GIS modeling programs and processes were presented by experts, increasing the regional GIS awareness and capacity for using targeting tools. Moving

forward, this group will continue to serve as a regional forum to share data about the latest watershed modeling programs and tools.

### ***Inventory of GIS Modeling and Mapping Tools***

The *GIS Mapping and Modeling Tools* document includes a list of available models, tools and BMP calculators organized thematically based on intended use and scale, and technological requirements. Staff worked closely with both state staff to frame up and refine the document. The document integrates data about existing tools that were collected from BWSR (Matt Drewitz, 2016 BWSR Academy Presentation); University of Minnesota Water Resources Center (Ann Lewandowski, Tool organizational chart); and Minnesota Pollution Control Agency (Dave Wall, Tool ranking matrix). The *GIS Mapping and Modeling Tools* document can be found: <https://mrbdc.mnsu.edu/gis-mapping-and-modeling-tools-inventory>

### ***Survey of GIS Users***

Staff obtained feedback from GIS users and local conservation partners via a survey and two workshops. Water planners, field technicians, and GIS users at County, SWCD and Watershed District offices across the state responded. They were asked questions about their experience with and interest in tools developed for planning in agricultural watersheds. [GIS Tool User Survey](https://mrbdc.mnsu.edu/gis-tool-user-survey-0) results can be found: <https://mrbdc.mnsu.edu/gis-tool-user-survey-0>.

Feedback revealed a general interest in exposure to a wider array of watershed planning tools and for more training. In particular, they were most interested in learning more about: Prioritize Target Measure Application (PTMApp), the Agricultural Conservation Planning Framework (ACPF) and the Phosphorus Best Management Practices (PBMP) Tool. They were also interested in using tools that helped to clarify sediment and nutrient reduction and water storage goals. Most noted that, if they are expected to use the tools to improve their ability to target projects and practices within their watersheds, they would benefit from more exposure to key tools and more guidance about what combination of tools they should use. Overall, there was a strong interest for additional training to support these tools being used to target local conservation delivery.

### ***Workshops***

Numerous workshops and trainings were conducted as part of this project. Two workshops were held in conjunction with a related CWF Hydro Terrain Analysis project. The first workshop goal was to train conservation staff on how to work with hydro terrain analysis products to gain a better understanding of drainage areas. The second workshop was designed to help conservation staff work with ACPF and PTMApp desktop and web application datasets. The primary goal of these workshops was to teach non-experts how to interpret hydrology, water quality and BMP targeting datasets using watershed planning tools that the state has prioritized. Additionally, staff helped support opportunities for local partners to gain specialized training and knowledge via tool-specific training sessions (e.g. HSPF SAM Training, PTMApp Training, ACPF update, CSSR overview). Through the GIS User Group and other meetings, staff was able to create opportunities for local conservation partners to learn more about the models and tools directly from tool developers and experienced users.

### ***STATE SIGNIFICANCE***

In Minnesota, surveys of conservation partners indicate that technical training skills are currently not being met (*Technical Training and Certification Strategy for Conservation Delivery in Minnesota, 2015*). This project helped to bridge that gap regionally by supporting trainings, workshops, and a GIS User Group. Statewide, the [GIS Mapping and Modeling Tools Inventory](https://mrbdc.mnsu.edu/gis-mapping-and-modeling-tools-inventory) can serve as a reference document to raise awareness about the diversity of GIS conservation planning and targeting tools. Insights gained from the [GIS Tool User Survey](https://mrbdc.mnsu.edu/gis-tool-user-survey-0) can help state and federal agencies to plan future trainings and workshops based on conservation partner feedback.

### ***INSIGHTS GAINED***

#### ***Training Needs***

The GIS users surveyed revealed that conservation partners would benefit from additional training and sustained technical support. For example, respondents' comments included: "I struggle to understand the many models and limitations of each." "We need training to use the tools, by a person who can not only use the tool but is able to teach others how to use it." "[There is] so much roll out up front [for new tools] and little-to-no follow up for continued use." These perspectives were echoed by other conservation partners in meetings, trainings, and personal conversations. Many local conservation staff stated that they have busy work programs and limited time to learn, master, and apply the array of complex, highly technical conservation targeting tools.

### ***Challenges – Data Availability and Tool Use***

One of the challenges that we faced in this project was a delay in the availability of hydromodified DEMs that delayed our ability to run GIS models and frameworks. In turn, this caused a challenge in synchronizing our ability to work with local partners on conservation targeting outputs using the latest versions of key models and tools. Due to the complexity and diversity of these targeting tools, another challenge that we frequently heard from partners was that they did not have the time to learn and run the specialized, complex models. Many partners continued to rely on older tools that they were more familiar with instead. It is crucial when introducing new tools and techniques to local partners to plan time, funding, and technical support beyond the project deadlines, so they can experiment and get support as they begin integrating new tools into their work programs.

**ACTIVITY 2:** Engage citizens and local partners to develop targeted pollution reduction strategies in five (5) Le Sueur River Subwatersheds

### **Description:**

WRC staff will work with citizens and local partners within five (5) priority subwatersheds to target and promote Best Management Practices (BMPs) that support pollution reduction strategies.

#### *Within Each Subwatershed*

**Data Collection** - Staff will collect, compile and analyze background and GIS data to explain historical, current conditions, impairments and modeled information in order to more clearly illustrate conservation opportunity areas based on citizen concerns.

**GIS Mapping and Modeling** – Staff will collect, compile, and disseminate GIS, resource and water quality data about each subwatershed. Using the latest GIS modeling tools and calculators, we will identify conservation opportunity areas across the subwatershed. Using tools like the ACPF, staff and local partners will create modeled conservation planning scenario maps.

**Citizen Engagement and Outreach** – Staff will share data with citizens and local partners and learn together about water quality conditions and conservation measures that reduce flow, sediment, nitrogen, phosphorus, and bacteria concentrations. Through a series of interconnected small and large group meetings, field days, and one-on-one meetings, the Le Sueur River Watershed Network (Network) citizens and local staff will develop pollution reduction strategies within each subwatershed. We will use targeted GIS maps to better understand where opportunity areas are for particular practices and learn which conservation practices might be of more interest to local landowners (e.g. conservation tillage, cover crops, water and sediment control basins, restored wetlands, grassed waterways, nutrient management).

**Develop Subwatershed Priorities and Strategies** – Staff, local partners and citizens will work together to develop subwatershed priorities and strategies. Citizens and local partners will identify implementation opportunities and assist local partners in prioritizing efforts and crafting a shovel ready list of BMPs within these subwatersheds. Le Sueur River Watershed Network leaders will reach out to neighbors to increase peer-to-peer networking and help support and implement targeted pollution reduction strategies.

*Phase 1 Subwatersheds* – During year one, we will start working with three (3) subwatersheds within the Le Sueur River Watershed – Bull Run, New Richland, and Freeborn Lake. These subwatersheds have been identified as priority areas for pollutant reductions by MPCA studies (e.g. Le Sueur River WRAPs), local government partners, and have some existing citizen interest and inertia for working together to solve water quality problems.

**Bull Run Creek Subwatershed** – We will partner with Waseca County and Waseca SWCD to address flooding and pollutant load issues in the Bull Run Creek Subwatershed (27,072 acres). Motivated citizens in the Le Sueur River Watershed Network have connections throughout this subwatershed and plan on networking with their watershed neighbors to support targeting projects and practices that will help to solve flooding and other water quality problems across the subwatershed.

**New Richland Subwatershed** – We will partner with Waseca County, Waseca SWCD and the City of New Richland to address flooding issues in the New Richland Subwatershed (32,002 acres). We plan on working together to identify potential practices and projects to promote more water storage that will aid in reducing flooding.

**Freeborn Lake Subwatershed** - We will partner with Freeborn County SWCD and the Minnesota DNR on water quality improvement planning in the Freeborn Lake Subwatershed (25,167 acres). Minnesota DNR is currently working with a network of citizens to develop the *Freeborn Lake Enhancement Plan* to improve water quality and fish and wildlife habitat. We will work together to help identify, target and implement projects and practices that will help improve water quality across the subwatershed.

*Phase 2 Subwatersheds* – Half way through the project (midyear 2), we will start working in two (2) additional subwatersheds yet to be determined. There are many subwatersheds across the Le Sueur River watershed that have been identified as water quality priorities in the WRAPS report (August 2015). Staff will continue to network with all the counties in the Le Sueur River watershed and define two other subwatersheds to focus efforts. We want to have some flexibility to focus on priority subwatersheds that emerge from new watershed modeling efforts, local government priorities, and citizen initiatives.

**Summary Budget Information for Activity 2:**

**ENRTF Budget:**

**\$ 126,949**

**Amount Spent:**

**\$ 126,842.37**

**Balance:**

**\$ 116.63**

<b>Outcome</b>	<b>Completion Date</b>
<b>1.</b> GIS and background data for 5 subwatersheds are collected, compiled and analyzed.	June 2018 (First 3 subwatersheds) June 2019 (Later 2 subwatersheds)
<b>2.</b> Outreach materials for five (5) subwatersheds are developed (e.g. subwatershed resource profiles developed and targeted conservation opportunity areas identified).	June 2018 (First 3 subwatersheds) June 2019 (Later 2 subwatersheds)
<b>3.</b> Modeled conservation planning scenario maps for five (5) subwatersheds using the latest modeling tools (including targeted conservation opportunity areas for BMPs).	May 2019
<b>4.</b> Host subwatershed meetings to explain background issues, describe benefits of targeting and facilitate conversations that clarify goals and conservation opportunities among local staff and landowners: (2 per each of 5 subwatersheds = 10 meetings=300	June 2019

<i>people)</i>	
<b>5. Citizens, local and state partners work together to create pollution reduction strategies in each subwatershed. Citizens and local partners network with subwatershed neighbors to identify implementation opportunities and develop BMP implementation strategies (e.g. shovel-ready list of BMPs) (1 meeting per each of 5 subwatersheds = 5 meetings= 100 people)</b>	May 2019
<b>6. Host Le Sueur River Watershed meetings to explain background issues, describe benefits of targeting and facilitate conversations that clarify goals and conservation opportunities among local staff and landowners and promote implementation strategies through citizen involvement and outreach.</b> - Le Sueur River watershed-wide (3 per year = 9 meetings; ~700 people) - Selected GIS modeling results are ground-truthed with local partners (10 trips per year = 30 trips) - Field days in each of the subwatersheds to demonstrate targeted conservation planning and examples of effective BMPs in agricultural watersheds (6 field days; ~600 people)	June 2019
<b>7. Share results regionally (LGUs and GBERBA) and statewide at conferences, meetings and workshops.</b>	June 2019

**Activity Status as of December 1, 2016:**

*Prioritized subwatershed phasing with Le Sueur River Watershed Network Steering Committee*

Le Sueur River Watershed Network Steering Committee met and prioritized subwatershed phasing and approach (July 12, 2016; September 21, 2016, November 15, 2016). The group decided to focus initially on New Richland (Boot Creek) Subwatershed, in two ditchsheds in particular. Next, we will focus efforts in Bull Run Creek Subwatershed to reach out to key landowners, and organize the farmers and local leaders. We are considering a “farmer-led council” model for this subwatershed. In Freeborn Lake subwatershed we plan to build upon the momentum and discussions Minnesota DNR started with a network of citizens during a lake reclamation project.

*Hosted meetings in New Richland Subwatershed, formed committee, and developed outreach materials*

Work in the New Richland Subwatershed started in spring 2016 with two large public meetings (February 16, 2016 and April 20, 2016). We are following up on community member’s vision and approach for next steps in this subwatershed that is experiencing serious flooding problems. WRC Staff began forming a New Richland Subwatershed Advisory Board that includes two New Richland City Council members; one Waseca County Commissioner; two community members; two Steele/Waseca County SWCD staff; and one Waseca County Planning & Zoning staff.

WRC Staff hosted a New Richland Subwatershed Advisory Board brainstorming session on July 20, 2016 to define approach and scope of work. The advisory board suggested writing a series of monthly newspaper articles in the *New Richland Star* to provide background information and update community members about the project. Initial submitted articles include an introduction to the project and background on precipitation and flooding trends. Next articles will include background information on subwatershed history and landscape change, history of ditches, ditch maintenance, ditch redetermination of benefits process, and other subwatershed case studies.

WRC Staff hosted a follow up technical planning meeting on August 24, 2016. Key outcomes included discussion about newspaper articles and update on CWF Application Waseca County Planning & Zoning submitted for a Le Sueur River 32025 Minor Watershed BMP Feasibility Study. Advisory board members identified key subwatershed landowners for next one-on-one meetings.

*Collected and compiled GIS and Background data for subwatersheds*

Began collecting and compiling available GIS and background data for three subwatersheds. Networked with GIS



professionals to find available data. Collected and organized datasets from the Le Sueur River Watershed Targeted Conservation practices (319 Grant). Datasets organized by subwatershed include: elevation, soils, county ditch files, potential soil erosion loss, etc. Additional data needs include updated watershed boundaries and hydrology datasets currently being completed through a concurrent CWF project. We inquired about the progress and learned that the breachline inventory will be available for use by May 2017, while water quality and hydrology datasets will be produced by fall 2017.

*Planned large Le Sueur River Watershed Network meeting with steering committee*

Met with the Steering Committee (July 12, 2016, September 21, 2016, and November 15, 2016) to scope out and plan the next Le Sueur River watershed-wide meetings. The vision is to hold a “Year-in-Review” meeting in the winter to update watershed residents. One or two additional watershed meetings are being planned for spring/summer. The vision is to host meetings outside near a river or lake or demonstration site to connect residents with watershed resources and case studies.

**Activity Status as of June 1, 2017:**

*Phase 1 Subwatersheds*

Work during this period focused on refining the approach for each of the Phase 1 subwatersheds, New Richland, Bull Run, and Freeborn Lake.

*1. New Richland Subwatershed (Joint County Ditch 6 and County Ditch 47)*

Subwatershed Advisory Board meetings (January 6, 2017; January 30, 2017; May 10, 2017) have continued to focus on better understanding the network of individuals and groups that have the capacity to manage water flow and improve water quality in this subwatershed that is experiencing flooding problems. WRC staff continues to work with Waseca County and SWCD staff, SWCD Supervisor, and Network Steering Committee members to craft an outreach strategy for landowners. A targeted mailing was determined to be the best way to introduce landowners to the project. Letters were sent to key landowners in the subwatershed that included maps and background information about the initiative. Local partners will follow up with phone calls and SWCD staff field walkovers.

GIS datasets have been compiled and field-scale conservation targeting was completed for the entire subwatershed. The advisory group has poured over the targeting maps and are crafting a strategy that uses components of the output maps for landowner outreach and BMP prioritization. The maps are useful tools to introduce landowners to opportunity areas for potential BMP implementation and to help visualize solution strategies for more upstream water storage. WRC staff toured the watershed with a local resident to field verify potential areas for water storage (May 10, 2017).

WRC staff has been working with project partners to plan for “New Richland Farm and City Days” an educational outreach event planned for July 7, 2017. SWCD and WRC staff are coordinating a booth at the event called “Talking Water” which will include family-oriented water activities and a rainfall simulator provided by Fishers and Farmers Partnership.

*2. Bull Run Creek Subwatershed*

WRC staff continued with one-on-one conversations with landowners that are being adversely impacted by flooding in the agriculturally dominated Bull Run Creek Subwatershed. Landowners’ interviews have revealed an interest in using practices that build soil health, such as reduced tillage and cover crops. WRC and SWCD staff have connected landowners with local experts on in-field management. A CRP project was initiated in the subwatershed that will retire marginal cropland that is frequently flooded. Some subwatershed modeling and additional field-scale targeting work has been performed. These results are currently being reviewed with SWCD and WRC staff to prioritize opportunity areas for water quality and quantity management.

*3. Freeborn Lake Subwatershed*

WRC is networking with local staff in the region (Freeborn SWCD, Freeborn County) and state partners (MDNR) to sculpt an approach and prioritize actions to reduce phosphorus and sediment loading into the impaired lake. The MDNR is in the process of a lake reclamation project for Freeborn Lake. One of the *Freeborn Lake Enhancement Plan* goals is to “work with local, state and federal agencies and citizen and non-profit groups to target implementation of conservation programs and practices in the watershed.” Local partners expressed an interest in learning from other successful lake reclamations in the region so we are collecting case studies to provide residents with a clearer idea of what to expect through the process. Initial strategy steps include building a subwatershed GIS database that will help to better understand phosphorus and sediment sources (septics, feedlots, municipal sources, erodible lands, etc.). Initially, local partners are particularly interested in finding opportunity sites for wetland restoration, saturated buffers and conservation drainage.

#### *Phase 2 Subwatersheds*

Le Sueur River Watershed Network Steering Committee met (February 9, 2017; March 28, 2017; May 15, 2017) and discussed the other two subwatersheds for Phase 2. The group is considering focusing efforts in two subwatersheds where Network Steering Committee members are motivated to work with their neighbors. One is a ditch improvement project located near Farm America where a Network Steering Committee member is working to integrate water storage practices as part of the ditch improvement process. The other subwatershed is located downstream near the Le Sueur outlet. Steering Committee members live along a river reach experiencing rapid river widening that is threatening homes and infrastructure. They are working with their neighbors, local, state and federal officials, and the Network to find solutions.

#### *Large Group Network Meetings*

WRC and the Network Steering Committee organized and hosted a Watershed Network meeting potluck in on March 28, 2017 at the Waldorf Community Center. The meeting highlighted a “Year-in-Review” of the many projects and activities underway across the watershed. WRC Staff provided an overview of the City of Truman’s flood amelioration process so New Richland residents could learn from a regional case study. Local crop consultants, Bernie Paulson and Andy Dimmel, of McPherson Crop Management provided an overview of reduced tillage and cover crop success stories in the region. The meeting was well attended by local residents and the topics fostered engaged discussions. Participants provided feedback that the meeting was informative and interesting. Approximately 40 people attended.

#### **Activity Status as of December 1, 2017:**

##### *Phase 1 Subwatersheds*

Work during this period focused on refining the approach for each of the Phase 1 subwatersheds, New Richland, Bull Run, and Freeborn Lake.

##### *1. New Richland Subwatershed (Joint County Ditch 6 and County Ditch 47)*

Continued to network with the New Richland Subwatershed Advisory Board and met with local leaders and advisory board members.

Gathered updates on ditch projects in Joint County Ditch 6 and County Ditch 47 from Waseca County Ditch Inspector on June 26, 2017. A Le Sueur River Watershed Network Steering Committee citizen member participated in the meeting and enriched the conversation by sharing his experience with farming and ditch engineering.

Hosted a booth with Waseca County and SWCD staff, and Network Steering Committee members, called “Talking Water” at the *New Richland Farm and City Days* an educational outreach event on July 7, 2017. WRC staff coordinated a booth with New Richland Advisory Board and Network Steering Team. The booth included a rainfall simulator provided by Fishers and Farmers Partnership with soil samples taken from local fields. Staff followed up with a farmer in the watershed that is interested in learning more about soil health practices.

On October 4, 2017, an Advisory Board member provided a tour of the subwatershed, to learn more about landscape characteristics, and to meet with city officials and other residents. Provided updates to and shared information with the new New Richland Emergency Management Director and Wastewater Treatment Facility Manager. Following the meeting in New Richland, met in Waseca with Soil and Water Conservation District staff to discuss the feasibility of targeting cover crop implementation in subwatersheds where high runoff risk fields were identified. Attended the City Council meeting to provide updates on October 9, 2017.

Hosted a tour on October 24, 2017 and met with New Richland City officials to discuss ditch condition, improvement and repair process. Connected community leaders with an Izaak Walton League staff who shared flooding reduction strategies from other rural communities in the region.

Met to discuss preliminary engineering for water storage upstream of New Richland. Participants included Waseca SWCD, BWSR and South Central TSA Engineer. During this meeting we identified limited resources available to support staff to conduct a feasibility study and evaluate existing conditions of the ditch systems. WRC staff made poster of water storage locations considered to date to share with advisory board, SWCD staff and BWSR. The poster identifies priorities for targeted water storage placement to stabilize hydrology, improve water quality and protect infrastructure, based on modeled results from ACPF and local knowledge from citizens.

### *2. Bull Run Creek Subwatershed*

WRC staff continued networking with landowners to learn more about local conditions and attitudes. Many subwatershed residents attended the Watershed-wide meeting on March 28, 2017 that included background information about hydrology, diverse watershed problems and solutions, and soil health. Following this meeting, citizens connected with SWCD staff and presenters to evaluate opportunities to integrate more conservation practices into their operations. Subwatershed residents were particularly interested in learning more about reduced tillage and cover crops. In response, staff has been networking with conservation partners to seek grants in order to provide financial support for more experimentation with cover crops. Continued collection of water quality and quantity data at outlet of the subwatershed.

### *3. Freeborn Lake Subwatershed*

Staff continued to network with local staff in the region (Freeborn SWCD, County) and state partners to sculpt an approach for the subwatershed. Staff attended the Freeborn Lake Reclamation meeting on August 17, 2017 to provide information about the Network and to meet subwatershed residents and local officials. A Network Steering Committee member took video documentation of the lake before the reclamation and offered to take residents on a lake paddle.

## *Phase 2 Subwatersheds*

### *4. Outlet / Knick Point Subwatershed*

Le Sueur River Watershed Network Steering Committee met July 19 and August 30, 2017, and discussed an approach for a subwatershed located downstream near the Le Sueur River outlet. Steering Committee members live along a river reach that is experiencing rapid river widening, threatening their home and severely impacted other nearby homes and infrastructure. Network leaders are working with their neighbors, local, state and federal officials to find solutions.

Network leaders provided a tour of their property and their neighborhood that includes other houses condemned due to river channel widening. WRC staff also organized a river paddle in the area so Steering Committee members and other watershed residents could personally experience firsthand the rapidly changing river in this reach (June 16, 2017).

In order to share their story with a wider audience, WRC staff video-taped Network leaders describing the rapid changes in their property and neighborhood (November 24, 2017). The video will include historic aerial photos and drone imagery to depict the river channel change and loss of property.

#### *Large Group Network Meetings*

Watershed Tour – On October 27, 2017 WRC staff organized and led a watershed overview tour for Izaak Walton League staff, a retired state representative, numerous state staff (MPCA, MDNR), local steering committee members (16 people). We met with city staff and officials in New Richland and St Clair and heard stories about dramatic flooding problems due to intense rainfall events and flashier river flows. The group reviewed aerial photos of landowners with property and homes threatened by rapid river channel change.

#### *Watershed –wide Meeting*

WRC and the Network Steering Committee planned, organized and hosted a Watershed Network meeting potluck on December 5, 2017 at the Waldorf Community Center. The meeting highlighted people living, working and recreating in the Le Sueur River Watershed. WRC Staff provided an overview of many projects and activities underway across the watershed, DNR Hydrologist provided an overview of watershed flow issues, Steering Committee members Don and Becky Waskosky told their story watching the Le Sueur River change dramatically in recent years near their home. The meeting was well attended by local residents and the topics fostered engaged discussions. Participants provided feedback that the meeting was informative and interesting (approximately 35 people attended).

#### **Activity Status as of June 1, 2018:**

##### *Subwatershed Research, Modeling and Mapping*

A central focus of work for this time period was collecting GIS and background data for all 5 subwatersheds and creating modeled conservation planning scenario maps using the most suitable suite of modeling tools for each subwatershed.

##### *Phase 1 & 2 Subwatersheds*

Modeled conservation results were completed and uploaded to ArcGIS Online for review by local partners for Phase 1 subwatersheds (JC6 & CD47, Bull Run Creek, and Freeborn Lake). Modeling of Phase 2 subwatersheds (Le Sueur River-Mankato and Waseca County Ditch (CD) 19) was completed and will be uploaded for review. WRC staff sought feedback and comments from partners to further refine conservation scenario maps for each of the five subwatersheds. Each subwatershed has slightly different resource concerns, topography, land use and size of contributing area so toolsets parameters were tailored for each subwatershed.

##### *GIS Scenario Maps*

Drafts of conservation planning scenario maps and outreach materials for the five subwatersheds were created and compiled into documents for review by citizens, local and state partners. These documents will be presented back to their respective subwatersheds for feedback about assumptions made during modeling and the value of resource profile content for current conditions of the subwatershed.

On April 25, 2018 WRC staff convened a meeting with new staff at Waseca County and SWCD office, a recently elected county commissioner, and community members to provide a project overview and determine next steps in the planning process. Four of the five subwatersheds originate in or include drainage area within Waseca County so WRC staff has been working closely with local partners to improve communication and facilitate discussions about conservation opportunities in these subwatersheds. The group is planning another educational event at *New Richland Farm and City Days* this summer to continue to raise awareness about upstream flood reduction strategies. Due to high citizen interest last year, the group is planning to get a rainfall simulator to illustrate runoff and soil loss on different soils from conventional to reduced-till to prairie soils. Like last year, they plan to use soil samples taken from local fields.

Staff hosted a follow-up meeting on May 22, 2018 with state agency staff, Waseca County and SWCD staff to share the subwatershed planning framework and scenario maps and to get feedback about how to refine them to be most useful for next steps and future planning.

#### *Watershed-wide Meetings*

WRC and the Network Steering Committee hosted a watershed-wide Network meeting potluck on December 5, 2017 at the Waldorf Community Center. WRC Staff provided an overview of many projects and activities underway across the watershed, DNR Hydrologist explained watershed flow issues and research results, Steering Committee members Don and Becky Waskosky explained the dramatic changes in their neighborhood as the Le Sueur River channel widening threatens their home, other homes and infrastructure in the neighborhood (approximately 35 people attended).

The Le Sueur River Watershed Network Steering Committee met on February 1, 2018 to discuss progress in each subwatershed and to strategize how to create “industrial scale” water storage. MPCA staff provided an overview of water quality standards and used water quality samples to demonstrate the range in turbidity over the monitoring season. Many of the Steering Committee members found value in seeing the large seasonal variation in water clarity and how it relates to the standards. Members discussed the potential for soil health practices, such as reduced tillage and cover crops, to increase water storage and prevent topsoil from washing into adjacent streams. Soil health and cover crops could be the “industrial scale” storage the group has been talking about and could protect soils and reduce runoff during the March-May peak flow period.

On April 10, 2018 Steering Committee members and local staff met to continue the conversation about subwatershed work and strategize how to improve information flow about soil health practices. Farmers on the steering committee noted that there seems to be a transition in social acceptance and growing interest in soil health practices, cover crops and reduced tillage. The group brainstormed how to fill the information and technical assistance gap for farmers. The group is exploring how to provide a cover crop program that includes technical assistance to landowners who are interested in experimenting. Another area of focus for the group is creating opportunities for watershed residents to experience area rivers and lakes and other natural areas. The group was planning another watershed-wide meeting, but due to weather conditions and delayed planting schedules decided to postpone it until later this summer.

#### **Activity Status as of December 1, 2018:**

##### *Subwatershed Research, Modeling and Mapping*

A central focus of work for this time period was creating subwatershed booklets for each of the five subwatersheds. Each booklet contains a summary of watershed characteristics that are rich in GIS and background data. The booklets include GIS maps and summary data about water and wetlands, climate, geology, topography, soils, drainage class, soil erodibility, crop productivity index, and land use and management. Since each subwatershed has different landscape characteristics and pollutant reduction goals, staff has reviewed tools and potential combinations of tools to consider for each subwatershed. We have started to assemble a suite of modeling tools to characterize pollution reduction for each subwatershed, including PTMApp products from CWF hydro terrain analysis project and ACPF conservation scenario outputs produced by WRC staff. In addition, other BMP calculators and scenario management tools will be incorporated depending on the goals and types of practices.

##### *Subwatershed Planning Meetings*

##### *Freeborn Lake Subwatershed*

In the Freeborn Lake Subwatershed, staff hosted a meeting with Minnesota Department of Natural Resources (MDNR) on November 15, 2018 to share subwatershed booklets with the citizen group and gain feedback from

residents about priority goals and potential pollutant reduction strategies. MDNR provided an update on the lake reclamation project. Approximately 30 people attended.

#### *New Richland Subwatershed*

Staff and the Le Sueur River Watershed Network members hosted a booth at *New Richland Farm and City Days* (July 7, 2018) to raise awareness about the persistent flooding problems in the city and to seek feedback from citizens about upstream flood reduction strategies. A key attraction at the booth was a rainfall simulator that illustrated the striking difference of runoff and soil loss on different soils from conventional to reduced-till to prairie soils. Soil samples taken from local fields. Approximately 40 participants were directly engaged at the booth, while the entire community was made aware from the newspaper article and discussion around the event.

#### *Bull Run Creek and Farm America (CD-19) Subwatersheds*

Met with local conservation partners in Waseca County to share subwatershed booklets and obtain feedback about tools and potential combinations of tools for use in each subwatershed pollution reduction scenario (June 11, 2018; July 9, 2018; August 9, 2018; November 20, 2018). Staff are particularly interested in learning more about ACPF and PTMApp outputs. Approximately 7-12 people attended.

#### *River Park Drive (Outlet) Subwatershed*

Network Steering Committee members met with neighbors of the River Park Drive neighborhood where many houses are threatened by river widening and change (August 1, 2018). The group toured the neighborhood, heard testimonials from landowners and had a meeting to discuss how to share information and outreach strategies. The group also paddled a stretch of the river and saw the devastating impacts rapidly eroding banks and bluffs and downed trees. Approximately 12 people attended.

#### *Watershed-wide Meetings*

Staff worked with conservation partners to develop a “Hydrology and Sediment Field Trip” targeted for local, state, and federal elected officials (September 28, 2018). The goal of the tour was to enable decision makers and managers learn first-hand from landowners, county officials, and scientists about hydrology and sediment issues from multiple perspectives. Participants were able to learn about hydrology and geomorphic trends (Carrie Jennings, Research and Policy Director at the Freshwater Society and Researcher, University of Minnesota); Landowner stories of bank erosion and property loss (Don and Becky Waskosky & Doug Sargent, landowners); and public infrastructure impacts and county response (Mike Maurer, Blue Earth County Emergency Management Services). The tour was well received and attended by 39 people including federal, state and local elected officials and watershed residents.

Le Sueur River Watershed Network steering committee leaders have been meeting with a group of soil health friendly farmers in the watershed. The vision for the initiative grew from a group of Network partners who attended the Watershed Leaders Network (August 5-7, 2018) in Missouri. They were inspired from other groups in the Upper Mississippi River multi-state region about the power of producer-led initiatives in other states to promote soil health. The broad goal of the soil health initiative they are developing is to provide technical and financial support to producers interested in experimenting with cover crops.

Staff is working with the Le Sueur River Watershed Network Steering Committee to plan another watershed-wide meeting in January or February 2019 to provide updates, share information, and obtain feedback about the soil health initiative. Another major watershed-wide event being planned and developed with a Minnesota GreenCorps Member is a *Water Storage Forum* scheduled for March or April 2019.

## Final Report Summary:

### **SUMMARY & OUTCOMES**

#### ***Watershed Meetings - Large Group LSRW Network Meetings***

Staff worked with citizens and conservation partners to plan and host seven large Le Sueur River Watershed meetings to improve information flow and build relationships among watershed residents and conservation partners. During these meetings, participants learned about background watershed issues, conservation opportunities, and the benefits of conservation targeting.

*Watershed Year in Review: Meeting and Potluck* (March 28, 2017) - Waldorf Community Center. Topics included: LSRWN and local partner update; City of Truman's flood amelioration; an overview of reduced tillage and cover crop success stories in the region by local crop consultants, McPherson Crop Management (Approximately 40 people attended).

*Watershed Tour* (October 27, 2017) - Watershed overview tour for nonprofit conservation partners and legislators (Izaak Walton League staff, state representative, state staff, local steering committee members). Tour stops included: Met with city staff and officials in New Richland and St Clair and heard stories about dramatic flooding problems in their cities and toured, and met with citizens impacted by erosion (Approximately 22 people attended).

*Watershed Stories: Meeting and Potluck* (December 5, 2017) - Waldorf Community Center. The meeting highlighted people living, working and recreating in the Le Sueur River Watershed. Topics included: LSRWN update; DNR Hydrologist provided an overview of watershed flow issues, Don and Becky Waskosky told their story watching the Le Sueur River change dramatically in recent years in their neighborhood (Approximately 35 people attended).

*Hydrology and Sediment Field Trip* (September 28, 2018) – Along the lower reaches of the Le Sueur River Targeted for local, state, and federal elected officials The goal of the tour was to enable decision makers and managers learn first-hand from landowners, county officials, and scientists about hydrology and sediment issues from multiple perspectives. Participants learned about hydrology and geomorphic trends (Carrie Jennings, Research and Policy Director at the Freshwater Society and Researcher, University of Minnesota); Landowner stories of bank erosion and property loss (Don and Becky Waskosky & Doug Sargent, landowners); and public infrastructure impacts and county response (Mike Maurer, Blue Earth County Emergency Management Services) (Approximately 39 people including federal, state and local elected officials and watershed residents attended).

*Water Storage Forum* (April 4, 2019) – Mankato, MN.

Staff partnered with Minnesota GreenCorps to plan and host a water storage forum. Staff networked with local, state and federal partners and formed an advisory committee (January 22, 2019, February 4, 2019, February 22, 2019, March 3, 2019 and March 4, 2019). The goal of the forum was for conservation partners and citizens to learn together about water storage and the diversity of solutions to slow the flow of water to the Minnesota River. Research shows the long-term solution to improve Minnesota River water quality is to reduce peak flows and store more water on the landscape. This can take many forms from improved soil health and multi-purpose drainage management, to upland impoundments and urban rain gardens. The morning included an overview of Minnesota's climatic trends, the latest research about water storage, and an overview of the diversity of water storage techniques. The afternoon highlighted water storage case studies, learning from local examples across the river basin (150 people attended). Website: <https://mrbc.mnsu.edu/water-storage-forum>

*Watershed Update: Community Dinner & Meeting* (June 27, 2019) – Indian Island Winery

This soil health themed watershed-wide meeting included the following topics: Watershed and LSRWN updates; leaning from Iowa about landowner-renter agreements; panel discussion of citizen leaders and conservation

partners who are advancing cover crop and other soil health practices in the watershed: Freeborn and Faribault Soil Health Team, Minnesota Soil Health Coalition and Minnesota Office of Soil Health (MOSH).

#### *Watershed Soil Health Initiative (Numerous meetings)*

LSRWN steering committee leaders, local partners and a group of soil health farmers in the watershed have been framing up a new soil health initiative in the watershed. A vision for a new initiative grew from a group of LSRWN leaders who attended the Watershed Leaders Network (August 5-7, 2018) in Missouri. They were inspired by other groups in the Upper Mississippi River multi-state region about the power of producer-led initiatives in other states to promote soil health. The LSRWN is working with Waseca SWCD staff and Minnesota Soil Health Coalition to frame up the initiative, learning from other successful soil health groups in the area. The broad goals of the soil health initiative is to provide peer, technical and financial support to producers interested in experimenting with cover crops.

#### ***Le Sueur River Watershed Network (LSRWN) Steering Committee Meetings***

A primary goal of this project was to continue to support the momentum of a group of citizen leaders that formed during the MPCA WRAPs process—The Le Sueur River Watershed Network (LSRWN). Staff hosted LSRWN steering committee meeting to continue the information flow with citizen leaders and conservation partners, to set goals and frame up next steps, to work together on subwatershed initiatives, and to plan informational meetings and tours. Beyond the LSRWN meetings, staff had numerous one-on-one meetings with watershed residents and local staff throughout the project timeline.

2016 Meetings: July 12, 2016; September 21, 2016; and November 15, 2016.

2017 Meetings: February 9, 2017; March 28, 2017; May 15, 2017; July 19, 2017; and August 30, 2017.

2018 Meetings: February 1, 2018; April 10, 2018; April 25, 2018; May 22, 2018; August 1, 2018; August 20, 2018; August 30, 2018

2019 Meetings: March 12, 2019; May 22, 2019; June 27, 2019

#### ***Subwatershed Planning***

This project focused efforts in five subwatersheds (HUC 10, HUC 12). The goal in each subwatershed was to network with citizens and conservation partners and host meetings to explain background issues, describe benefits of targeting and facilitate conversations that clarify goals and conservation opportunities. In each subwatershed, citizens, local and state partners worked together to create pollution reduction strategies to identify implementation opportunities. Subwatershed Strategies can be found: <http://mrbdc.mnsu.edu/le-sueur-river-watershed-subwatershed-strategies>

#### *New Richland Subwatershed - Hosted meetings, formed subcommittee, and developed outreach materials*

Two large public meetings were held to clarify flooding problems and opportunities in spring 2016 (February 16, 2016 and April 20, 2016) (Approximately 80 and 50 people attended). A smaller New Richland Subwatershed Advisory Board was formed consisting of key public officials, local partners and citizens. They met numerous times to clarify opportunities and define next steps (July 20, 2016, August 24, 2016; January 6, 2017; January 30, 2017; May 10, 2017, February 14, 2019). A targeted mailing was sent to key landowners in the subwatershed that included maps and background information about the project. Local partners will follow up with phone calls and SWCD staff field walkovers (Spring and Summer 2017).

WRC staff toured the watershed with local residents to field verify potential areas for water storage (May 10, 2017). Staff gathered updates on ditch projects in Joint County Ditch 6 and County Ditch 47 from Waseca County Ditch Inspector (June 26, 2017). Met with city officials and local staff (multiple meetings); provided updates to City Council Meeting (October 9, 2017); and toured the watershed with advisory board member (October 4, 2017). At “New Richland Farm and City Days” (July 7, 2017, July 7, 2018), staff hosted a booth and talked to residents about the subwatershed to raise awareness about the persistent flooding problems in the city and to seek feedback from citizens about upstream flood reduction strategies. A key attraction at the booth was a



rainfall simulator that illustrated the striking difference of runoff and soil loss between different local soil samples (conventional to reduced-till to prairie soils) (Over 120 people were directly engaged). WRC staff hosted a tour and attendees met with New Richland City officials to discuss ditch condition, improvement and repair process (October 24, 2017). WRC staff met numerous times with local and state partners, developed targeted water storage poster maps and other outreach materials, and worked on grant for engineering study to identify water storage upstream of New Richland.

WRC staff convened a meeting with new staff at Waseca County and SWCD office, a recently elected county commissioner, and community members to provide a project overview and determine next steps in the planning process (April 25, 2018). Four of the five subwatersheds originate in or include drainage area within Waseca County so WRC staff continues to work closely with local partners to facilitate discussions about conservation opportunities in these subwatersheds (March 4, 2019; March 19, 2019; May 25, 2019).

#### *Bull Run Creek Subwatershed*

Partners had numerous one-on-one conversations with landowners that were being adversely impacted by flooding in the agriculturally dominated Bull Run Creek Subwatershed. Partners networked with landowners to learn more about local conditions and attitudes. Many subwatershed residents attended the watershed-wide meeting in the subwatershed (March 28, 2017) that included background information about hydrology, diverse watershed problems and solutions, and soil health. Following this meeting, citizens connected with SWCD staff and presenters to evaluate opportunities to integrate more conservation practices into their operations.

Landowners' interviews revealed an interest in using practices to build soil health, such as reduced tillage and cover crops. In response, staff has been networking with conservation partners to seek grants in order to provide financial support for more experimentation with cover crops and to connect landowners with local experts on in-field management. A CRP project was initiated in the subwatershed that will retire marginal cropland that is frequently flooded.

WRC staff met with local conservation partners in Waseca County to share subwatershed booklets and obtain feedback about tools and potential combinations of tools for use in each subwatershed strategy (June 11, 2018; July 9, 2018; August 9, 2018; November 20, 2018; March 19, 2019; May 25, 2019). Staff are particularly interested in learning more about ACPF and PTMApp outputs.

#### *Farm America Subwatershed*

The LSRWN Steering Committee met (February 9, 2017; March 28, 2017; May 15, 2017) and discussed a subwatershed strategy for Farm America Subwatershed. A LSRWN Steering Committee member lives in the subwatershed and is motivated to provide an example of water storage on his property. Gene Sheffert lives along a ditch system near Farm America and is working to integrate a water storage pond as part of the ditch improvement process.

Staff met with citizens and local conservation partners in Waseca County and Farm America staff to share subwatershed booklets and obtain feedback about tools and potential combinations of tools for use in each subwatershed pollution reduction scenario (June 11, 2018; July 9, 2018; August 9, 2018; November 20, 2018; March 19, 2019; May 25, 2019). WRC Staff prepared summary maps using ACPF and PTMApp outputs.

#### *Freeborn Lake Subwatershed*

WRC staff networked with local staff in the region (Freeborn SWCD, Freeborn County) and state partners (MDNR) to sculpt an approach and prioritize actions to reduce phosphorus and sediment loading into the impaired lake. The MDNR conducted a lake reclamation project for Freeborn Lake – [Future of Freeborn Lake](#). One of the *Freeborn Lake Enhancement Plan* goals is to “work with local, state and federal agencies and citizen and non-profit groups to target implementation of conservation programs and practices in the watershed.”

Local partners are particularly interested in clarifying potential sites for wetland restoration, saturated buffers and conservation drainage.

WRC staff attended the Freeborn Lake Reclamation meeting (August 17, 2017) to provide information about the LSRWN and to meet subwatershed residents and local officials. A LSRWN Steering Committee member took video documentation of the lake before and after the reclamation and offered to take residents on a lake paddle. WRC staff hosted a meeting with MDNR (November 15, 2018). MDNR provided an update on the lake reclamation project. WRC staff shared subwatershed booklets with the citizen group and gained feedback from residents about priority goals and potential pollutant reduction strategies (Approximately 30 people attended). WRC staff met with Freeborn SWCD to provide project updates, discuss subwatershed booklets and pollution reduction strategies (June 6, 2019).

#### *River Park Drive (Outlet) Subwatershed*

LSRWN Steering Committee leaders live along a river reach that is experiencing rapid river widening, threatening their home as well as severely impacted other nearby homes and infrastructure. Network leaders are working with their neighbors, local, state and federal officials to find solutions.

Network leaders have provided numerous tours of their property and their neighborhood that included other houses condemned due to river channel widening. WRC staff organized a river paddle in the area so LSRWN Steering Committee members and other watershed residents could experience firsthand the rapidly changing river in this reach (June 16, 2017) (Approximately 20 people attended). LSRWN Steering Committee met and discussed a strategy for this subwatershed located downstream near the Le Sueur River outlet (July 19, 2017; August 30, 2017). In order to share their story with a wider audience, staff video-taped citizen leaders and MDNR staff describing the rapid changes in their property and neighborhood (November 24, 2017). The video includes historic aerial photos and drone imagery to depict the river channel change and loss of property.

LSRWN Steering Committee members met with neighbors of the River Park Drive neighborhood where many houses are threatened by river widening and drastic change in topography (August 1, 2018). The group toured the neighborhood, heard testimonials from landowners and had a meeting to discuss information and outreach strategies. The group also paddled a stretch of the river and saw the devastating impacts of rapidly eroding banks and bluffs and downed trees (Approximately 12 people attended).

In order to raise awareness of subwatershed issues with local, state, and federal elected officials, partners organized a *Hydrology and Sediment Field Trip* (September 28, 2018). The goal of the tour was for decision makers and managers to learn first-hand from landowners, county officials, and scientists about hydrology and sediment issues from multiple perspectives. Participants learned about hydrology and geomorphic trends (Carrie Jennings, Research and Policy Director at the Freshwater Society and Researcher, University of Minnesota); Landowner stories of bank erosion and property loss (Don and Becky Waskosky & Doug Sargent, landowners); and public infrastructure impacts and county response (Mike Maurer, Blue Earth County Emergency Management Services) (Approximately 39 people attended). Subwatershed residents impacted by bluff erosion shared their story about “why water storage matters” at the Water Storage Forum (April 4, 2019) (Approximately 150 people attended).

#### ***GIS Analysis and Mapping***

Modeled conservation results (data and maps) were completed and uploaded to ArcGIS Online for review by local partners. WRC staff sought feedback and comments from partners to further refine conservation scenario maps for each of the five subwatersheds. Each subwatershed has slightly different resource concerns, topography, land use and size of contributing area so toolsets parameters were tailored for each subwatershed.

Drafts of conservation planning scenario maps and outreach materials for the five subwatersheds were created and compiled into documents for review by citizens, local and state partners. WRC staff hosted numerous

follow-up meetings with state agency staff, County and SWCD staff to share the subwatershed planning framework and scenario maps and to get feedback about how to refine them to be most useful for next steps and future planning.

## **INSIGHTS GAINED - CHALLENGES**

### ***Challenges - Personnel, staff turnover and timing***

“Human capital”, defined as skilled and trained personnel in leadership, is crucial to effective implementation (*Successful Watershed Management in the Midwest: Getting to Scale (Rao, 2019)*). Some subwatersheds had staff turnover (Waseca, Freeborn) which impaired progress due to a lack of local personnel. Other subwatersheds had a lack of technical engineering services or limited access to NRCS staff during the project period to support engineering review. This limited implementation of conservation programs and delayed the ability to work in some areas. We realized the importance for flexibility and timing with subwatershed planning. Based on local needs and readiness, some watersheds were more “ripe” for planning and implementation than others.

### ***Challenges – Social capital and sustained funding to build relationships and trust***

Research underscores that building “social capital” in subwatershed planning is critical for effective implementation (Rao, 2019). Types of activities that support growth of social capital include finding and encouraging citizen leadership to champion watershed initiatives within their own communities. We learned that improving information flow and strengthening coordination among local government units, supporting landowners and managers, and local citizens all requires a considerable investment of time and behind-the-scenes coordination.

There is currently gaps in funding to support citizen engagement with Minnesota’s watershed approach between the WRAPS and One Watershed, One Plan in the Le Sueur River Watershed. We are grateful for LCCMR funding to help sustain momentum and cohesion with this citizen group - Le Sueur River Watershed Network. In general, there are limited funding sources to sustain citizen engagement at the subwatershed planning level over time which can be a vital scale for implementation (Konopacky, 2017; Rao, 2019).

Sustained and predictable funding for local conservation partners at SWCD and county level is critical to support the additional time-consuming one-on-one and small group relationship and network building. Social science research evidence is mounting (Davenport, Pradhananga) that building relationships and trust is a key component of any successful watershed implementation effort. Supporting and investing in building citizen networks, raising awareness and building capacity can pay off with increased conservation delivery over time (Nelson, 2017).

### ***Challenges – Awareness and political will***

We learned that a central challenge is simply the need to raise public awareness about water quality and quantity issues in this highly-impaired watershed. We found the need to improve information flow for citizens as well as local and state elected officials. One of the major focuses for the River Park Drive Subwatershed Strategy was to raise awareness about the need for water storage at all scales – subwatershed, watershed, and statewide. The network of local and state partners that formed the Water Storage Forum Steering Committee underscored this critical need to raise awareness among citizens, local partners, and policy makers about the need for water storage to slow flows and reduce pollutant loading in this high-loading watershed.

### ***Challenges - Funding***

Another challenge that we found on many scales is the need for funding to support water storage. Research indicates the need to implement more temporary water storage higher in the watershed (Wilcock, 2017). We found challenges with existing federal and state programs – both limited funding and inflexible funding

programs to meet the needs. For example, one of the LSRWN Steering Committee member stepped forward to volunteer his land as an example for temporary water storage along a ditch system, exactly the type of storage that research shows will help, but finding funds has been a challenge (Farm America Subwatershed). Another challenge faced was finding funds for a water storage engineering study for a city experiencing frequent flooding (New Richland Subwatershed). Waseca County was ultimately successful in procuring a grant, but it took a couple years.

### **Challenges - Data availability**

Another challenge that we faced in this project was obtaining terrain analysis data from another project. Deliverables were delayed, which in turn delayed our ability to run targeting tools until later in the project.

## **INSIGHTS GAINED – BENEFITS OF APPROACH**

### **Promising approach and framework**

Planning at subwatershed scale, aligning citizens and local conservation partners, and using conservation targeting tools can be effective building blocks for NPS watershed clean up. This project approach aligns with the framework proposed in *The Healthy Watershed Framework: A Blueprint for Restoring Nutrient-Impaired Waterbodies through Integrated Clean Water Act and Farm Bill Conservation Planning and Implementation at the Subwatershed Level* (Konopacky, 2017).

The Framework “requires stakeholder engagement and local problem solving, resource prioritization, and high-ordered collaboration.” The Framework also stresses the importance of greater transparency as well as the use of GIS to facilitate improved and efficient electronic data collection, storage, processing, management, and sharing. This project provides an example of subwatershed planning using ARS’s ACPF watershed planning tool and accompanying soil and land use databases to develop HUC 12 maps for watershed plans.

This approach and framework is aligned with Minnesota’s Watershed approach. A nested management structure has been successful elsewhere –“watershed managers at HUC 8 would conduct watershed assessment and prioritization, and watershed coordinators at HUC 12 and similar local scales would lead more detailed planning and implementation efforts” (Rao, 2019).

### **Promise of subwatershed scale citizen engagement**

Research shows that implementation at a smaller subwatershed scale tends to be necessary for success and aligns with social networks (Rao, 2019). This project highlights the important role that citizens can play in raising awareness about issues, connecting local conservation partners with community members, and strengthening relationships and trust. In our region, there is a relatively untapped power of building and sustaining citizen networks. Investing in relationships building is a proven strategy to support more conservation delivery and promotion of new policies. As noted in *Inspiring Action for Nonpoint Source Control*, “with NPS pollution control, being locally relevant, engaging local community members, building strong relationships and enduring partnerships, and learning and adapting quickly are just as important as technical rigor, financial assistance, and other more conventional tools” (Nelson, 2017).

### **Sustained funding to build relationships and trust**

Research supports the benefits of investing in human capital at the local level and watershed leadership includes both citizens and watershed professionals. Building “social capital” in subwatershed planning is critical for effective implementation (Rao, 2019). Encouraging citizen leadership to champion watershed initiatives within their own communities is a promising approach to improve the flow of knowledge and information from different sources, to strengthen coordination, and improve trust that ultimately leads to more implementation.

Sustained, predictable funding for local conservation partners at SWCD and county level is critical to support the additional time consuming one-on-one and small group relationship and network building. The *GIS Tool User*

Survey revealed that conservation partners were interested in obtaining more training on targeting tools and outputs so they can communicate better with citizens. Social science research evidence is mounting (Davenport, Nelson, Pradhananga) that building relationships and trust is a key component of any successful watershed implementation effort. Supporting and investing in building citizen networks and raising citizen awareness and local capacity holds great promise for increased conservation delivery over time.

## **References**

Konopacky, J., L. Ristino. 2017. *The Healthy Watershed Framework: A Blueprint for Restoring Nutrient-Impaired Waterbodies Through Integrated Clean Water Act and Farm Bill Conservation Planning and Implementation at the Subwatershed Level.*

[https://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=3052983](https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3052983)

Nelson, P. M. Davenport, and T. Kuphal. 2017. *Inspiring Action for Nonpoint Source Control: A Manual for Resource Protection.*

<https://freshwater.org/wp-content/uploads/2017/03/InspiringAction.pdf>

Rao, Amulya, Power, R. 2019. *Successful Watershed Management in the Midwest: Getting to Scale.*

<https://northcentralwater.org/files/2019/04/successful-watershed-management-in-the-midwest-FINAL.pdf>

Wilcock, P. et al. 2017. *Collaborative for Sediment Source Reduction – Greater Blue Earth River Basin Summary of Findings.*

<https://www.lcc.leg.mn/lwc/Meetings/2017/170327/Final%20Collaboration%20for%20Sediment%20Source%20Reduction%20Findings.pdf>

## **V. DISSEMINATION:**

Data gathered during this project will be disseminated over three years to watershed residents, regional partners and other interested parties through a series of interconnected one-on-one and group meetings. Outreach materials will include presentations, subwatershed reports and summary materials, maps, and website updates.

*Le Sueur River Watershed* – A primary audience for the information generated in this project will be residents within the Le Sueur River Watershed and the focused subwatersheds in particular. A broader audience will be reached online by regularly updating the Le Sueur River Watershed Network website (<http://lesueurriver.org/>). Information will be shared at Le Sueur River Watershed Network Meetings, Steering Committee meetings, and in other local government and citizen meetings.

*Regionally* – Results will be shared regionally with county and SWCD staff across southern Minnesota. We will be working with partners in the Greater Blue Earth River Basin Alliance (GBERBA) and will share information at their technical and/or policy meetings. Throughout the project, we will work with the regional GIS User group as well as posting events and information on the Minnesota River Weekly Update.

*Minnesota River Basin* – Information about the project will be disseminated to partners across the 37-county Minnesota River Basin via a variety of organizations such as the Minnesota River Congress, Minnesota River Alliance, Friends of the Minnesota Valley, CCMR, Lake Pepin Legacy Alliance, MPCA Watershed Network, Southwestern/Southeastern Civic Engagement Cohorts and others.

*Statewide* – Project information and datasets will be shared statewide at conferences, meetings and workshops where possible (e.g Minnesota Water Resources Conference, GIS/LIS conference). We will also network, share findings, and learn from other watershed groups at other state and national meetings when possible.

**Description:****Status as of December 1, 2016:**

WRC staff and two Le Sueur River Watershed Network (Network) Steering Committee members have been participating and sharing the Network story with other watershed groups in the multi-state Watershed Leaders Network hosted by Fishers & Farmers Partnership for the Upper Mississippi River Basin.

Network Steering Committee members and WRC staff continue to participate in the Minnesota River Congress, serving as Action Board Members, attending meetings (July 12, 2016; September 19, 2016; August 24, 2016; November 15, 2016) and hosting an information table at the Congress Meeting on November 17, 2016. Network leaders and WRC staff hosted a Le Sueur River Watershed Network Table and presented at the community celebration and dedication of the Mankato Flood Wall Mural (Mni Mural) on August 24, 2016.

WRC Staff developed outreach materials for the Le Sueur River Watershed Network website as well as for the Watershed Network Leaders website to share updates with other groups working in agricultural watersheds across the Midwest.

**Status as of June 1, 2017:**

Network Steering Committee members and WRC staff continue to participate in the Minnesota River Congress, serving as Action Board Members as well as attending meetings, hosting an information table and presenting at the Congress Meeting (May 18, 2017). WRC staff provided outreach and education at the Waseca Farmer's Forum (March 9, 2017); provided an overview of the Le Sueur River Watershed issues at a meeting with local and state elected officials addressing infrastructure concerns (April 20, 2017); and integrated Le Sueur Watershed Network stories into a "Watershed Trends" talk (April 7, 2017). There were numerous newspaper articles in the Mankato Free Press providing information about Le Sueur River Watershed issues. During this time period, we also had meetings with Izaak Walton League, Friends of the Minnesota Valley, Lake Pepin Legacy Alliance and publicized information in the MPCA Watershed Network News.

**Status as of December 1, 2017:**

We continue to find opportunities to share information about the project and to learn from other watershed initiatives in other state, national and international meetings when possible.

*Le Sueur River Watershed* – WRC staff is enriching, updating and expanding Le Sueur River Watershed Network website (<http://lesueurriver.org/>) to disseminate information about watershed issues and to share subwatershed planning process and products. Information continues to be shared at Le Sueur River Watershed Network Meetings, Steering Committee meetings, and at other local government and citizen meetings.

*Regionally* – WRC staff attends and shares information at Greater Blue Earth River Basin Alliance (GBERBA) Technical Advisory meetings. We continue to co-host the regional GIS User group as well as posting events and information on the Minnesota River Weekly Update. We also had opportunities to share information about the Le Sueur River Watershed Network with an emerging watershed group in the Watonwan River Watershed.

*Minnesota River Basin* – Network Steering Committee members and WRC staff continue to participate in the Minnesota River Congress, serving as Action Board Members as well as attending meetings, hosting an information table and presenting at the Congress Meeting (November 16, 2017). There were numerous newspaper articles in the Mankato Free Press providing information about Le Sueur River Watershed issues. During this period, we also continued to meet and share information with Izaak Walton League, Friends of the Minnesota Valley, Lake Pepin Legacy Alliance, McKnight Foundation, BWSR's Working Land Initiative, Conservation Marketplace Midwest, and others.

*Statewide, National, International* – Project information has been shared statewide at the Soil and Water Conservation Society Conference in Madison, WI on July 31, 2017. Additionally, WRC staff and two Le Sueur River Watershed Network Steering Committee members have been participating, sharing stories and learning from other watershed groups in the multi-state Watershed Leaders Network hosted by Fishers & Farmers Partnership for the Upper Mississippi River Basin (November 28-29, 2017) in Dubuque, IA. WRC Staff was able to present the Le Sueur River Network approach at the Governor’s Water Quality Town Hall Meeting in Mankato (August 16, 2017). Many Network Steering Committee members attended and advocated for practices and programs that “slow the flow” in the region.

**Status as of June 1, 2018:**

A central focus during this reporting period was creating a framework and preparing conservation planning scenario maps for each subwatershed. WRC staff worked with the University of Minnesota Water Resources Center to prepare a proposal to share preliminary subwatershed planning results at the University of Minnesota Water Resources Conference.

*Le Sueur River Watershed* – The Le Sueur River Watershed Network website (<http://lesueurriver.org/>) was updated with historic and current information and subwatershed web pages were created to house final products such as subwatershed strategies and meetings notes. Staff continues to share information at Steering Committee and subwatershed meetings (February 1, 2018; April 10, 2018; April 25, 2018; May 22, 2018), one-on-one meetings with watershed residents and local staff, and within non-priority subwatersheds as requested by collaborators. For example, staff has continued to work with Izaak Walton League and local partners to raise awareness about opportunities for additional water storage during drainage improvement projects.

*Regionally* – WRC staff attends and shares information at Greater Blue Earth River Basin Alliance (GBERBA) Technical Advisory meetings. Staff continues to co-host the regional GIS User group to promote information share regionally about new GIS tools and techniques. Staff and steering committee members presented the Le Sueur River Watershed Network story on a panel at the Minnesota State University, Mankato “We Have Ag” Colloquium Series.

In order to share Network steering committee members Don & Becky Waskosky’s story more broadly, WRC Staff created a video. The landowners tell their compelling story of dramatic bluff erosion and property loss in their backyard and across their neighborhood (e.g. approximately 30 feet of their backyard eroded in one event). The visually-rich video uses drone imagery and animations to illustrate the dramatic bluff erosion that threatens homes and infrastructure in the area.

*Minnesota River Basin* – Network Steering Committee members and WRC staff continue to participate in the Minnesota River Congress, serving as Action Board Members as well as attending meetings, hosting an information table, and presenting at the Congress Meeting (May 17, 2018). Staff continues to post events and share information on the Minnesota River Weekly Update and MPCA Watershed Professionals Network.

*Statewide, National, International* – WRC staff continues to meet with state agencies (MDH, MDA, MPCA, MDNR, BWSR), and nonprofits (Conservation Marketplace Midwest, Izaak Walton League, Friends of Minnesota Valley, Coalition for a Clean Minnesota River) to identify opportunities to collaborate and to gain feedback and advice about subwatershed planning and next steps. Several of these subwatersheds would benefit from alternative programs and practices that support local efforts to reduce flows. Increasingly we are hearing an interest in finding flexible funding sources (e.g. environmental markets or reward systems) to compensate individuals for conservation practices that reduce peak flows within their subwatershed or drainage system.

**Status as of December 1, 2018:**

*Le Sueur River Watershed* – Staff continued to update and expand the Le Sueur River Watershed Network website (<http://lesueurriver.org/>). Staff continues to share information at Steering Committee and subwatershed meetings (August 1, 2018; August 20, 2018) one-on-one meetings with watershed residents and local staff (June 21, 2018; August 9, 2018; August 15, 2018; August 30, 2018; September 17, 2018; October 9, 2018; November 20, 2018; November 30, 2018) and within non-priority subwatersheds as requested by collaborators. For example, staff has continued to work with Izaak Walton League, the Freshwater Society and other conservation partners to raise awareness about the need for additional water storage during drainage improvement projects.

*Regionally* – WRC staff continues to attend and share information at Greater Blue Earth River Basin Alliance (GBERBA) Technical Advisory meetings and to support the regional GIS User group to promote information share regionally about new GIS tools and techniques (August 22, 2018; September 11, 2018; September 27, 2018).

*Minnesota River Basin* – Network Steering Committee members and WRC staff continue to participate in the Minnesota River Congress, serving as Action Board Members as well as attending meetings, hosting an information table, and presenting at the Congress Meeting (July 19, 2018; November 8, 2018). Staff continues to post events and share information on the Minnesota River Weekly Update and MPCA Watershed Professionals Network.

*Statewide, National, International* – WRC staff continues to meet with state agencies (MDH, MDA, MPCA, MDNR, BWSR), and nonprofits (Conservation Marketplace Midwest, Izaak Walton League, Freshwater Society, Friends of Minnesota Valley, Coalition for a Clean Minnesota River) to identify opportunities to collaborate and to gain feedback and advice about subwatershed planning and next steps.

WRC Staff had the opportunity to share project research findings at the Minnesota Water Resources Center Conference: “Linking the Science with Local Land Management Decisions Using ACPF” (October 16, 2018) and at the Keynote session with Amit Pradhananga and Paul Nelson “Achieving Clean Water Through Relationship Building: A Social Scientist’s Water Restoration and Protection Strategy” (October 17, 2018).

Staff is developing a series of videos to more broadly disseminate key watershed issues. We have already produced a video that clarifies the impacts of increased flow on downstream citizens. We are working on a series of additional videos that distill the scientific research conducted by Patrick Belmont from Utah State University summarizing the river widening and increasing sediment delivery that he has documented across the watershed. Another video will provide an overview of some key solution strategies to slow the flow by increasing water storage, particularly targeted in upland areas of the watershed.

Project information has been shared statewide at the Soil and Water Conservation Society Conference in Madison, WI on July 31, 2017. Additionally, WRC staff and two Le Sueur River Watershed Network Steering Committee members have been participating, sharing stories and learning from other watershed groups in the multi-state Watershed Leaders Network hosted by Fishers & Farmers Partnership for the Upper Mississippi River Basin (November 28-29, 2017) in Dubuque, IA. WRC Staff was able to present the Le Sueur River Network approach at the Governor’s Water Quality Town Hall Meeting in Mankato (August 16, 2017). Many Network Steering Committee members attended and advocated for practices and programs that “slow the flow” in the region.

### **Final Report Summary:**

Information about this project is housed on the [Le Sueur River Watershed Network](#) and the [Minnesota River Basin Data Center](#) websites. Project reports include an inventory handbook of GIS conservation planning and targeting tools to help local conservation partners better understand the diversity of available tools ([link](#)). A



statewide survey of GIS tool users was also developed and summarized ([link](#)). Five Subwatershed Strategy documents were created ([link](#)) that integrate GIS conservation targeting with citizen engagement. Information about Le Sueur River Watershed and priority subwatersheds are summarized on the [Le Sueur River Watershed Network](#) and [MRBDC](#) websites.

The project has resulted in hundreds of one-on-one, small and large group meetings to disseminate information with citizens and conservation partners at subwatershed, watershed, and basin scales. Project staff had the opportunity to share information about the project at international, national, state, regional and local conferences and meetings.

### ***Le Sueur River Watershed***

A primary audience for the information generated in this project are residents within the Le Sueur River Watershed and the focused subwatersheds in particular. The Le Sueur River Watershed Network website was developed and expanded (<http://lesueurriver.org/>) to disseminate information about watershed issues and to share subwatershed planning process and products. Information was shared at Le Sueur River Watershed Network Meetings, Steering Committee meetings, and at many other local government and citizen meetings. WRC staff convened and hosted approximately 18 LSRWN Steering Committee meetings during the project period to continue momentum in this citizen-led watershed group. Each subwatershed also had many one-on-one, small and large group meetings to support information dissemination.

### ***Regionally***

Staff shared project information and updates regionally with county, SWCD, state partners across southern Minnesota. Staff attended [Greater Blue Earth River Basin Alliance](#) (GBERBA) technical and/or policy meetings to share updates. WRC staff shared the LSRWN story with an emerging watershed group in the Watonwan River Watershed. This project resulted in the development and support of a regional [South Central GIS User group](#) to promote information share regionally about new GIS tools and techniques. Staff continues to co-host the regional GIS User group.

Project staff have made over a dozen presentations and hosted tours regionally and locally to raise awareness about the project and outcomes ranging from local and regional government (County, SWCD, [GBERBA](#)) to conservation groups ([Minnesota River Congress](#), [Friends of Minnesota Valley](#), [Izaak Walton League](#)). Meeting examples include the dedication of the Mankato Flood Wall Mural, Mni Mural (August 24, 2016); “We Have Ag” Colloquium Series (March 27, 2018); and Waseca Farmer’s Forum (March 9, 2017). Staff also presented to state elected officials addressing infrastructure concerns (April 20, 2017); and integrated Le Sueur Watershed Network stories into a “Watershed Trends” talk (April 7, 2017), among many others.

WRC staff continues to share information by posting events and information on the Minnesota River Weekly Update and MPCA Watershed Professionals Network and other state agency and non-profit websites as possible.

### ***Minnesota River Basin***

Information about the project was disseminated to many diverse partners across the 37-county Minnesota River Basin. Beyond local and state conservation partners, WRC staff have met and shared information with other researchers, organizations and nonprofits connected to the Le Sueur River Watershed (Izaak Walton League, Friends of the Minnesota Valley, Coalition for a Clean Minnesota River (CCMR), Lake Pepin Legacy Alliance, McKnight Foundation, BWSR’s Working Land Initiative, MPCA Watershed Network, Conservation Marketplace Midwest, Southwestern/Southeastern Civic Engagement Cohorts, and researchers from Utah State University, University of Minnesota, University of Minnesota, Duluth) among others.

LSRWN Steering Committee members and WRC staff participated in the [Minnesota River Congress](#), serving as Action Board Members as well as attending meetings and hosting LSRWN information tables (July 12, 2016;

September 19, 2016; August 24, 2016; November 17, 2016; May 17, 2018; November 16, 2017; July 19, 2018; November 8, 2018, May 16, 2019) and presenting at Congress Meetings (September 19, 2016, July 19, 2018; November 8, 2018; May 16, 2019).

### ***Statewide, National, International***

Project information and datasets were shared at state, national and international conferences and meetings. International and national highlights include three audio interviews housed at the [Museum on Mainstreet, Smithsonian Institute](#). LSRWN steering committee members and WRC staff represented LSRW Network at two multi-state [Watershed Leaders Network](#) meetings hosted by Fishers & Farmers Partnership for the Upper Mississippi River Basin (Dubuque, IA. November 28-29, 2017; Hannibal, Missouri. August 6-7, 2018). Staff presented an *Update on the Agricultural Conservation Planning Framework: New Tools, Training Resources, and Watershed Engagement Efforts* at the [Soil and Water Conservation Society International Conference](#) (Madison, WI. July 30-August 2, 2017).

Statewide highlights include numerous presentations at [Minnesota Water Resources Conferences](#) in St. Paul including 2018 keynote session with Amit Pradhananga and Paul Nelson *Achieving Clean Water Through Relationship Building: A Social Scientist's Water Restoration and Protection Strategy* (October 17, 2018); and *Linking the Science with Local Land Management Decisions Using ACPF* (October 16, 2018). Staff was able to talk about the project at the [Governor's Water Quality Town Hall Meeting](#) (August 16, 2017). A goal of the project was to raise awareness with state and elected officials and project partners had opportunities to host tours, support meetings, and present information for the [Minnesota Legislative Water Commission](#), [Clean Water Council](#), and the [Governor's Office](#).

Project staff worked with and disseminated information to state agencies (MDH, MDA, MPCA, MDNR, BWSR), and nonprofits (Conservation Marketplace Midwest, Izaak Walton League, Friends of Minnesota Valley, Coalition for a Clean Minnesota River) to identify opportunities to collaborate and to gain feedback and advice about subwatershed planning and next steps. Several of these subwatersheds would benefit from alternative programs and practices that support local efforts to reduce flows. Increasingly we are hearing an interest in finding flexible funding sources (e.g. environmental markets or reward systems) to compensate individuals for conservation practices that reduce peak flows within their subwatershed or drainage system. Project partners also developed educational materials and tours in other parts of the watershed as requested by collaborators. For example, WRC staff has continued to work with Izaak Walton League, the Freshwater Society and other conservation partners to raise awareness about the need for additional water storage in the Le Sueur River Watershed.

A project highlight was raising the awareness about the need for more water storage statewide by hosting a day-long [Minnesota River Basin Water Storage Forum](#) and website <https://mrbc.mnsu.edu/water-storage-forum>. WRC staff partnered with Minnesota GreenCorps to plan and host a water storage forum. The goal was for conservation partners and citizens to learn together about water storage and the diversity of solutions to slow the flow of water to the Minnesota River. Research shows the long-term solution to improve Minnesota River water quality is to reduce peak flows and store more water on the landscape. The morning included an overview of Minnesota's climatic trends, the latest research about water storage, and an overview of the diversity of water storage techniques. The afternoon highlighted water storage case studies, learning from local examples across the river basin (150 people attended)(Mankato, MN. April 4, 2019).

### ***Newspaper Articles and Media***

During the project period, dissemination through media outlets include over 20 newspaper articles, four KEYC television interviews, and three nationally publicized audio interviews that providing information about Le Sueur River Watershed issues. A detailed list of articles and media exposure is included in the *River Park Drive*

*Subwatershed Strategy.*

*Videos*

To highlight watershed issues, partners created four videos, as well as numerous posters and summary maps and other public informational materials. One video depicts LSRWN Steering Committee members telling their compelling story of dramatic bluff erosion and property loss in their backyard and throughout their neighborhood. The visually-rich video uses drone imagery and animations to illustrate the dramatic bluff erosion that threatens homes and infrastructure in the area. WRC produced three additional videos that distill the scientific research conducted by Patrick Belmont from Utah State University. These videos summarize the river widening and increasing sediment delivery that has been documented across the Le Sueur River Watershed and an overview of some key solution strategies to slow the flow by increasing water storage, particularly targeted in upland areas of the watershed.

**VI. PROJECT BUDGET SUMMARY:**

**A. ENRTF Budget Overview:**

<b>Budget Category</b>	<b>\$ Amount</b>	<b>Overview Explanation</b>
Personnel: (Wages and Benefits) Director/Interim Director: \$36,000 (87% Salary and 13% Fringe); 27.5% FTE for years 1 and 2 with 11% FTE for 3rd year.  Project Manager: \$93,277 (61% Salary and 39% Fringe); 53% FTE each year for 3 years.  GIS Specialist: \$20,550 (64% salary and 36% Fringe); 17% FTE each year for 2 years.  Student Intern (academic year): \$7,056 (100% Salary and 0% Fringe); 45.5% FTE each of the 2 academic years.	\$158,131	Planning, coordination, reporting, administration, and educational outreach  Watershed analysis and civic engagement  GIS Watershed Analysis and Modeling  Student Intern (during academic year)
Professional/Technical/Service Contracts:	0	
Equipment/Tools/Supplies: Education and Outreach 9 Watershed meetings: room rentals @100= \$900; advertising-postage/printing and mailing (150/meeting=\$1,350);  15 Subwatershed meetings supplies \$4,050- to be used for postage, mailing, advertising, room rental and refreshments	\$ 6,300	9 Watershed (Large group) meetings (3/year) 15 Subwatershed meetings
Capital Expenditures over \$5,000:	\$0	
Fee Title Acquisition:	\$0	
Easement Acquisition:	\$0	
Professional Services for Acquisition:	\$0	

Printing: GIS and Subwatershed and informational booklets; meeting materials	\$3,223	Printing meeting materials and informational booklets
Travel Expenses in MN: Meetings with Citizen and Local Resource Managers: 40 trips @ \$55 each (MSU vehicle rental)  Field Verification of GIS: 10 trips @ \$55 each (MSU vehicle rental)  Meetings and Field Days: 15 trips @ 55 each (MSU vehicle rental)	\$1,346	State vehicle used for meetings with citizen and local resource managers as well as field days
Other:	\$0	
<b>TOTAL ENRTF BUDGET: \$169,000</b>		

**Explanation of Use of Classified Staff:**

**Explanation of Capital Expenditures Greater Than \$5,000:** N/A

**Number of Full-time Equivalents (FTE) Directly Funded with this ENRTF Appropriation:**

	FTE	FTE	FTE
	1st yr	2nd yr	3rd yr
Associate Director	0.15	0.20	0.42
Project Manager	0.20	0.44	0.445
GIS Specialist	0.18	0.25	0.40
Student Intern	0	0.455	0.52
	<u>0.53</u>	<u>1.345</u>	<u>1.785</u>

**Number of Full-time Equivalents (FTE) Estimated to Be Funded through Contracts with this ENRTF Appropriation:**

**B. Other Funds:**

Source of Funds	\$ Amount Proposed	\$ Amount Spent	Use of Other Funds
<b>Non-state</b>			
Le Sueur River Watershed Targeted Conservation Practices	\$35,696	\$35,696	Secured. Project ended in August 2016.
Linking Water Storage Calculators	\$10,000	\$10,000	Secured. Project ended in August 2016.
<b>State</b>			
MSU Administration - Grant administration and other resources	\$6,000	\$	Secured
Local, state and federal staff time and Le Sueur River Watershed Network and citizen steering committee	\$ TBD	\$	TBD

<b>TOTAL OTHER FUNDS:</b>	<b>\$51,696</b>	<b>\$</b>	
---------------------------	-----------------	-----------	--

**VII. PROJECT STRATEGY:**

**A. Project Partners:**

Supported by this project: Water Resources Center, Minnesota State University, Mankato staff and student  
 Supported by other projects & staff time: Le Sueur River Watershed Network (citizen-led group);  
 Greater Blue Earth River Basin Alliance (Joint Powers Board of 11 counties in the Le Sueur, Blue Earth and  
 Watonwan River watersheds); Freeborn County/SWCD, Waseca County, Steele County/SWCD, Faribault  
 County/SWCD, Blue Earth SWCD.

**B. Project Impact and Long-term Strategy:**

The project will help to inform a longer-term strategy to reduce pollutant loads in high-loading watersheds in the state. Over time the aim is to reduce the number and types of impairments and to improve water quality. Clarifying the many targeting tools available and creating a framework for using them will help local watershed professionals (e.g. watershed organizations, counties, soil and water conservation districts, etc.) better understand the tools and target their efforts. Citizens will have a clearer idea what conservation opportunities are within their subwatershed and which are the most effective and cost-efficient BMPs. This local consultative process with landowners based on targeted opportunity areas is a promising route to achieve pollutant reduction goals identified in the *Le Sueur River Watershed Restoration and Protection Strategy*.

**C. Funding History:**

<b>Funding Source and Use of Funds</b>	<b>Funding Timeframe</b>	<b>\$ Amount</b>
MPCA – Le Sueur River Watershed Civic Engagement, cash	June 27, 2011-September 30, 2013	\$ 137,787
McKnight Foundation, cash	December 12, 2013-December 31, 2014	\$ 25,000
MPCA GreenCorps Program, in-kind service, 1 FTE	FY 2014-2015	
Le Sueur River Watershed Targeted Conservation Practices	November 8, 2013 – August 31, 2016	\$ 82,491

**VIII. FEE TITLE ACQUISITION/CONSERVATION EASEMENT/RESTORATION REQUIREMENTS:**

**A. Parcel List: N/A**

**B. Acquisition/Restoration Information: N/A**

**IX. VISUAL COMPONENT or MAP(S):**

**X. RESEARCH ADDENDUM:**

**XI. REPORTING REQUIREMENTS:**

Periodic work plan status update reports will be submitted no later than December 1st and June 1st of each year of the three-year project.

Specific dates include:

- December 1, 2016
- June 1, 2017
- December 1, 2017
- June 1, 2018

- December 1, 2018

A final report and associated products will be submitted between June 30 and August 15, 2019.

**Final Attachment A:**  
**Environment and Natural Resources Trust Fund**  
**M.L. 2016 Project Budget**

**Project Title:** Integrated Targeted Watershed Planning Tools with Citizen Involvement

**Legal Citation:** M.L. 2016, Chp. 186, Sec. 2, Subd. 04v

**Project Manager:** Kimberly Musser

**Organization:** Water Resources Center Minnesota State University, Mankato

**M.L. 2016 ENRTF Appropriation:** \$169,000

**Project Length and Completion Date:** 3 years, June 30, 2019

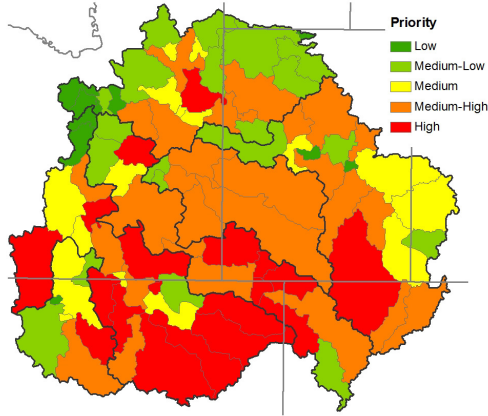
**Date of Final Reporting:** 08/15/19



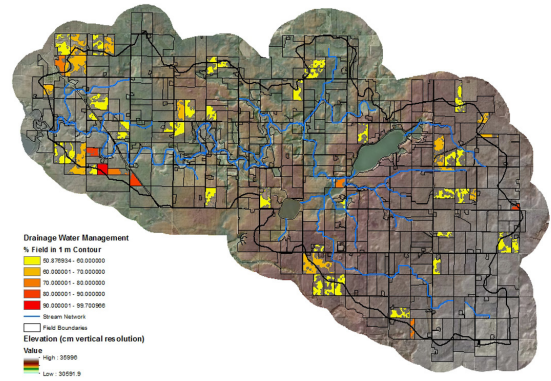
	Activity 1 Budget	Amount Spent	Activity 1 Balance	Activity 2 Budget	Amount Spent	Activity 2 Balance	TOTAL BUDGET	TOTAL SPENT	TOTAL BALANCE
<b>ENVIRONMENT AND NATURAL RESOURCES TRUST FUND BUDGET</b>									
<b>BUDGET ITEM</b>									
<b>Personnel (Wages and Benefits)</b>	<b>40,577.00</b>	40,577.00	-	<b>117,554.00</b>	117,554.00	-	158,131.00	158,131.00	-
<i>Associate Director: \$38,800 (89% Salary and 14% Fringe); 15.0% FTE first year; 20.0% FTE second year and 42.0% FTE for third year.</i>	6,049.23	6,049.23	-	32,750.77	32,750.77	-	38,800.00	38,800.00	-
<i>Project Manager: \$89,520.00(58%salary and 34% fringe); 20% FTE first year, 44% second year and 44.5% for third year.</i>	27,983.10	27,983.10	-	61,536.90	61,536.90	-	89,520.00	89,520.00	-
<i>GIS Specialist: \$20,550 (64% salary and 36% Fringe); 18% first year, 25% second year and 40% third year</i>	6,544.67	6,544.67	-	14,005.33	14,005.33	-	20,550.00	20,550.00	-
<i>Student Intern (academic year): \$9,261.00 (100% Salary, no fringe); 0% first year, 45% second year and 52% third year.</i>	-	-	-	9,261.00	9,261.00	-	9,261.00	9,261.00	-
<b>Equipment/Tools/Supplies</b>	<b>450.00</b>	450.00	-	<b>5,850.00</b>	5,848.36	1.64	6,300.00	6,298.36	1.64
Room Rental for Large Group Meetings -9 meetings@ 3/yr @100 ea		334.00			931.00			1,265.00	
Advertisement - Large Group Meeting mailings: 150/meeting, 3 meetings/year = 9 meetings		92.64			1,348.37			1,441.01	
Subwatershed Meeting Supplies - 15 Subwatersheds 15 subwatershed meeting supplies to include postage, mailing, advertising, room rental and refreshments		23.36			3,568.99			3,592.35	
<b>Printing</b>	<b>700.00</b>	700.00	-	<b>2,522.74</b>	2,522.74	-	3,222.74	3,222.74	-
<i>GIS and SubWatershed Booklets</i>		222.36			1,395.22			1,617.58	
<i>Meeting materials</i>		477.64			1,127.52			1,605.16	
<b>Travel expenses in Minnesota</b>	<b>323.88</b>	323.88	-	<b>1,022.38</b>	907.39	114.99	1,346.26	1,231.27	114.99
<i>Meetings with Citizen and Local Resource Managers: 40 trips @ \$55 each (MSU vehicle rental)</i>		323.88			748.16			1,072.04	
<i>Field Verification of GIS: 10 trips @ \$55 each (MSU vehicle rental)</i>					55.00			55.00	
<i>Meetings and Field Days: 15 trips @ 55 each (MSU vehicle rental)</i>					104.23			104.23	
<b>COLUMN TOTAL</b>	<b>42,050.88</b>	<b>42,050.88</b>	<b>-</b>	<b>126,949.12</b>	<b>126,832.49</b>	<b>116.63</b>	<b>169,000.00</b>	<b>168,883.37</b>	<b>116.63</b>

# Targeted Watershed Planning & Citizen Engagement

## 1. Inventory GIS Prioritization and Modeling Tools and Prioritize Subwatersheds



## 2. Develop Pollution Reduction Strategies in Five Priority Subwatersheds



## 3. Citizens and Local Partners Develop and Implement Subwatershed Strategies

