Watershed Achievements Report

2007 Annual Report

to the U.S. Environmental Protection Agency
Clean Water Act Section 319 and
Clean Water Partnership Projects in Minnesota

September 2007

Minnesota Pollution Control Agency

Minnesota Pollution Control Agency

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Cover Photo: The St. Croix River at Taylors Falls,
by John Hensel, MPCA.

Minnesota Pollution Control Agency

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Introduction

This year, the Minnesota Pollution Control Agency (MPCA) celebrates its 40th anniversary of protecting Minnesota's environment. For nearly the last half of that history, the MPCA has worked with local and state water resource managers and citizens to restore and protect Minnesota's waters through the state Clean Water Partnership (CWP) and the federal Clean Water Act Section 319 (Section 319) nonpoint source water pollution financial and technical assistance programs. For the better part of the last decade, we have been focusing on using the total maximum daily load (TMDL) approach to address impaired waters, while continuing to implement the CWP and Section 319 programs. This annual publication of Watershed Achievements Report illustrates the progress Minnesotans are making together in addressing water quality through these approaches.

Section 319 Program

Congress appropriated the first Section 319 grant funds in Fiscal Year 1990, establishing a national program to control nonpoint sources of water pollution. About the same time, the state Clean Water Partnership program was started with similar goals. Nonpoint source pollution is caused by rainfall or snowmelt moving over and through the ground carrying natural and man-made pollutants into lakes, rivers, streams and wetlands. Minnesota has used these funds for technical assistance, demonstration, education and implementation projects. These funds have been matched on the local level.

Over the years, the level of federal funding has decreased. In 2002, the MPCA received a total of about eight million dollars ($8,003,400). For 2007, MPCA will be receiving only about six and a half million dollars ($6,638,100). This downward trend in funding for Section 319 is of concern because it limits our ability to address nonpoint source water pollution. We value the funding we have received from the Environmental Protection Agency (EPA) and the progress it has enabled.

Reporting project accomplishments to facilitate shared learning

At the project scale, this report gives details on accomplishments of specific CWP, Section 319, and TMDL watershed projects. Please take the time to read what water resource managers and citizens are accomplishing together on specific water bodies, watersheds, and water pollution issues in the project descriptions that follow. Perhaps these projects are struggling with similar problems that you deal with in your work. Perhaps they have learned lessons and developed approaches that can be helpful to you as well. Perhaps you have information that can help further their work. Contact project representatives to share information and help each other reach the common goal of clean water.

Creating a Clean Water Legacy

As we continue to monitor and assess the water quality of our streams and lakes, we find that many, nearly 40 percent, are impaired by at least one pollutant that prevents them from meeting water quality standards. At the same time, we are also aware that we have been able to monitor and assess only about one-tenth of the state's waters.

These needs for more complete monitoring and assessment of our waters, and for restoration of our many impaired waters have led to legislative action. In the early 2000s, a diverse group of stakeholders from all sectors of Minnesota's water resource users and managers came together to develop a common policy and funding framework to address these needs. This ultimately resulted in the passage of the Clean Water Legacy Act of 2006, which included one-year funding of about $24 million for monitoring and assessment of the state's waters, conducting TMDL studies, and implementation efforts to restore impaired waters.

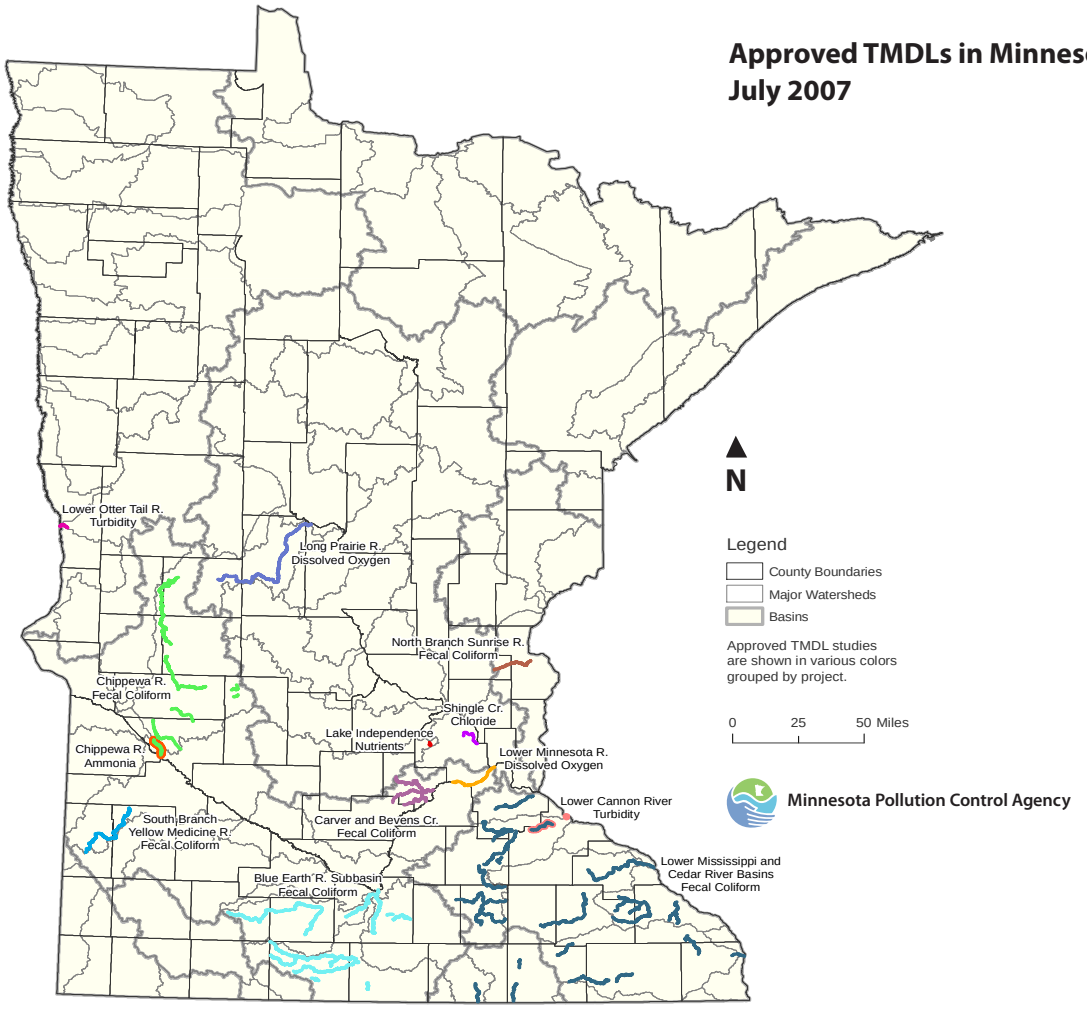
In 2007, the state legislature appropriated an additional two years of increased funding of almost $54 million to continue these activities, with a strong emphasis on completing TMDL studies and improving statewide water monitoring and assessment. This funding will help keep the current momentum growing, as we work together to improve our knowledge of the state of our waters, and to develop plans to restore those waters we know to be impaired.

Progress in Addressing Impaired Waters

At the statewide scale, as we look at what has been accomplished in addressing impaired waters in the aggregate, we see that we have accomplished much in a relatively short period of time. As of mid-2007, together we have:

- Completed 11 TMDL studies addressing 67 impairment listings in six of Minnesota's 10 major drainage basins (see map)
- Completed a statewide mercury TMDL addressing more than 500 impairment listings
- Initiated more than 65 additional TMDL studies addressing more than 250 water bodies, many of which are nearing completion
- Delisted seven impairments (one of these to be delisted in 2008) that have been fixed through watershed improvements that resulted in restored water quality (see map)
- Delisted an additional 15 impairments through additional monitoring and documentation of better water quality than initially thought.

While the number of impaired waters continues to grow as we continue to monitor and assess more waters, and the workload to study and restore impaired waters remains large, these accomplishments are a sign of hope and a source of motivation for the future.

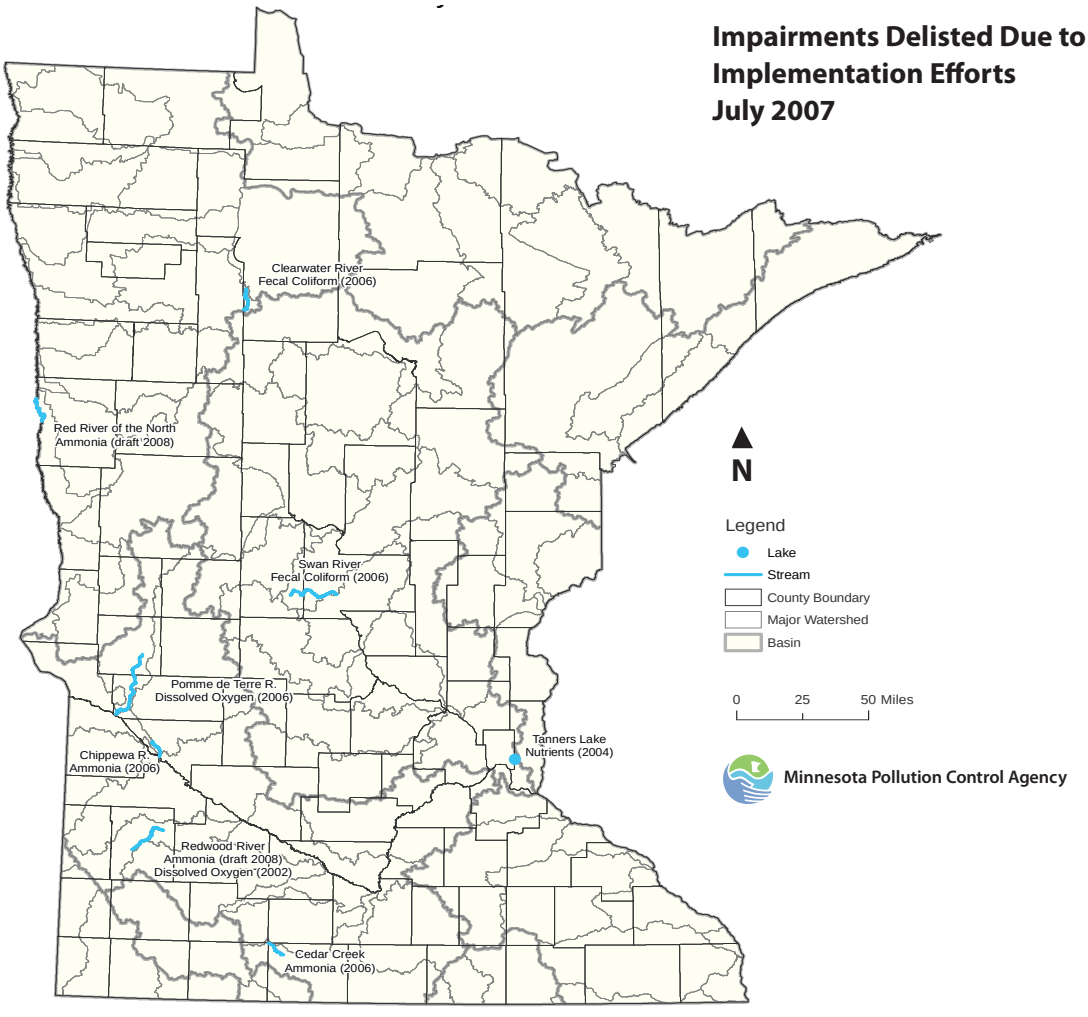


What does the future hold?

The future is always uncertain, but we can get a sense of what it may hold by looking at the past and present. Based on the past 20 years of long-term cooperative efforts of watershed work by citizens and water resource managers, the initial successes of the impaired waters approach over the last half decade, and the current strong, broad-based support for the Clean Water Legacy Act and its continued funding, the future is looking bright. Minnesotans continue to care about their water resources and want to ensure that clean water is available for recreation and enjoyment, economic growth and development. Minnesotans want to maintain the character and sense of place of the Land of 10,000 Lakes. The Clean Water Legacy Act called for the creation of a new Clean Water Council to advise state agencies on how to make these clean water visions and goals a reality. The Council, made up of a diverse group of water resource managers and stakeholders began meeting in early 2007. (See sidebar on page 4)

The current emphasis of watershed efforts is on performing TMDL studies to determine what is causing water body impairments and how to fix them. In the near future, a shift will occur to plan for and implement the actions called for in the TMDL studies. Both activities will continue simultaneously for some time, with the overall emphasis gradually moving from study to action.

Likewise, the current enhancement of our water monitoring programs will enable us to continue identifying more impaired waters that need attention. This means that impaired waters work will continue for decades to come.



With this focus on impaired waters, the Clean Water Legacy Act also calls for attention to protection efforts for waters that are not impaired, to prevent them from becoming impaired. Surely, for Minnesota's waters, an ounce of prevention is worth a gallon of cure. The MPCA continues to evaluate its resources and options to determine how to best address water protection efforts. Perhaps, in light of the large amount of funds available for TMDLs and impaired waters from the Clean Water Legacy Act, it may be appropriate to focus CWP funds on protection efforts in the future. The MPCA will be working with the Clean Water Council to address the issue of supporting water protection efforts.

The goal of clean water throughout Minnesota is not only desirable, but it is also achievable. The seven impairments that have been corrected through cooperative efforts demonstrate this and give us hope. These impairments were addressed by citizens and resource managers working together to upgrade wastewater treatment plants, feedlots, home septic systems, and stormwater treatment systems. Working together on agricultural and urban impacts on water quality, we will restore our state's impaired waters.

Together, we can create a legacy of clean water for future generations!

Clean Water Council

The Clean Water Council consists of 23 members, including 19 appointed by the Governor and four non-voting representatives from the following state agencies: Minnesota Pollution Control Agency, Department of Agriculture, Department of Natural Resources, and Board of Water and Soil Resources.

As of February 21, 2007, 18 of the 19 non-agency members have been appointed by the Governor. The remaining vacancy is for the tribal government representative. Council members with two-year terms expire on January 5, 2009 and members with four-year terms expire on January 3, 2011. For information about the Clean Water Council, contact: Megan Pavek, 651-296-7389.

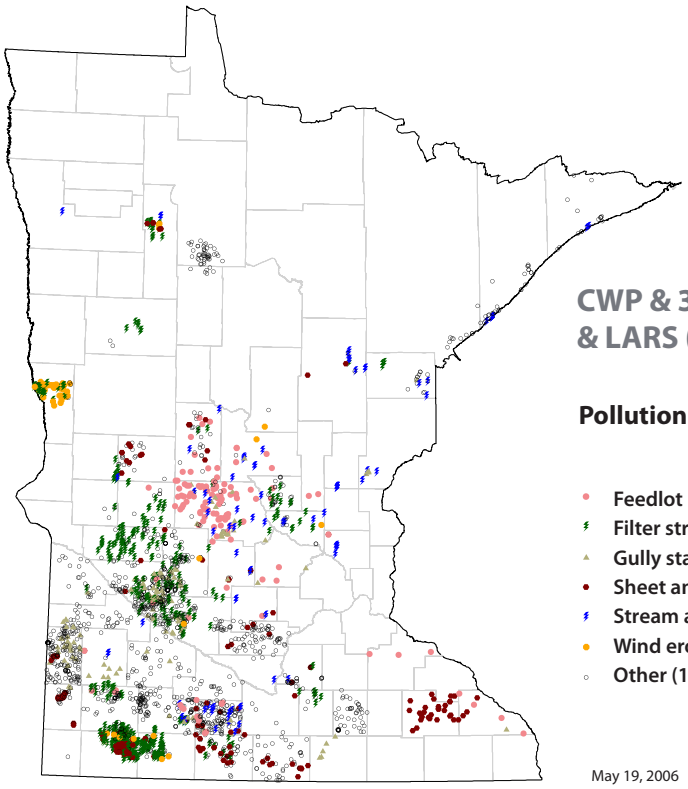
Council Members

- David Bennett - Representing a fishing organization (two years)
- Marilyn Bernhardson- Representing soil and water conservation districts (four years)
- Pamela Blixt - Representing watershed districts (two years)
- Earl Bukowski - Representing rural counties (four years)
- Brian Davis - Representing an environmental organization (two years)
- John Greer- Representing cities (two years)
- Delvin Haag - Representing cities (four years)
- Scott Hoese - Representing a statewide farm organization (two years)
- David Jeronimus- Representing a business organization (four years)
- Christopher Kolbert - Representing a hunting organization (four years)
- Joe Martin - Representing Department of Agriculture (four years)
- William Moore- Representing the Metropolitan Council (four years)
- Gary Pedersen - Representing township officials (four years)
- Steven Pedersen- Representing a business organization (two years)
- Lee Pfannmuller – Representing Department of Natural Resources (four years)
- Gaylen Reetz - Representing Minnesota Pollution Control Agency (four years)
- Louis Smith - Representing lakes and streams nonprofit organization (two years)
- Sarah Strommen - Representing an environmental organization (four years)
- Deborah Swackhamer - Representing state higher education system (two years)
- Steve Woods – Representing Board of Water and Soil Resources (four years)
- Paul Torkelson - Representing a statewide farm organization (four years)
- Robert Vogel - Representing metro-area counties (two years)
- Representative of tribal governments (vacant)

LARS and eLINK results
Section 319 & Minnesota CWP Projects: 1997-May, 2007

The table following shows progress through May 2007 based on previous Local Annual Reporting System (LARS) reporting (1997-2002) and reporting data from eLINK (2003 – May 2007). Based on LARS/eLINK reporting by Clean Water Partnership (CWP) and Section 319 Project Partners, these projects are estimated to have reduced soil loss from 1997 through May 2007 by more than 153,000 tons/year. During the same period, sedimentation was estimated to have been reduced by nearly 60,000 tons/year. Phosphorus loading was estimated to have been reduced by over 240,000 pounds/year.

Pollution Reduction Type	# of BMPs	Estimated Soil Loss Reduction (tons/yr)	Estimated Sediment Reduction (tons/yr)	Estimated Phosphorus Reduction (pounds/yr)
Feedlot	137	0	0	5,619
Filter Strip Project	478	61,206	28,619	32,411
Gully Stabilization	160	10,158	6,058	6,664
Sheet & Rill Erosion Control	173	22,415	19,767	21,609
Stream & Ditch Stabilization	91	4,934	4,934	4,579
Wind Erosion	49	52,201	0	555
Other	1,695	2,344	0	170,451
Total	**2,783**	**153,259**	**59,379**	**241,887**



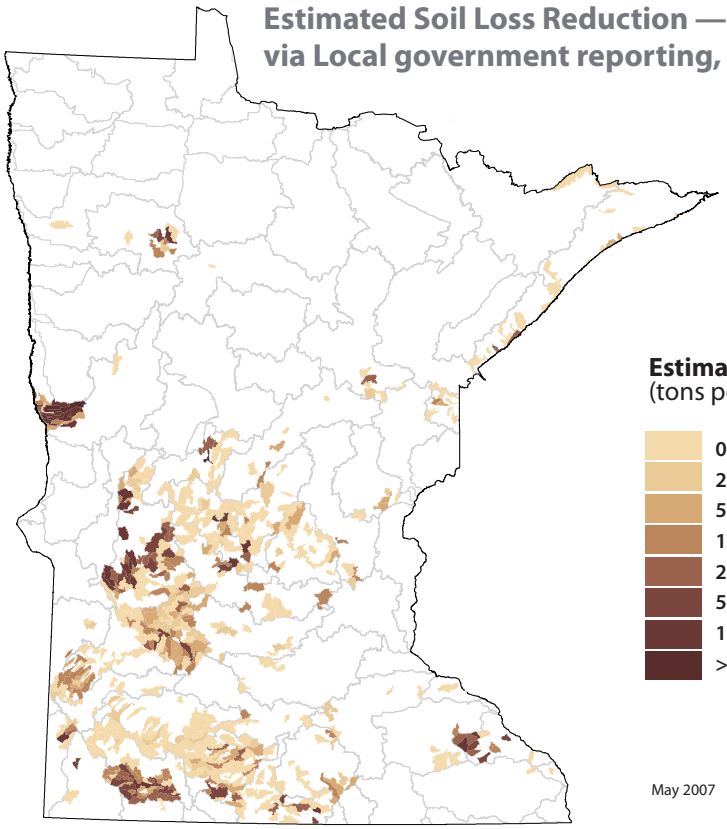
CWP & 319 BMPs eLINK (2003- present) & LARS (1997 - 2002)

Pollution reduction type

- Feedlot (137)
- Filter strip project (478)
- Gully stabilization (160)
- Sheet and rill erosion control (173)
- Stream and ditch stabilization (91)
- Wind erosion (49)
- Other (1,695)

May 19, 2006

Estimated Soil Loss Reduction — CWP/319 BMPs via Local government reporting, eLINK (2003-present) & LARS (1997-2002)

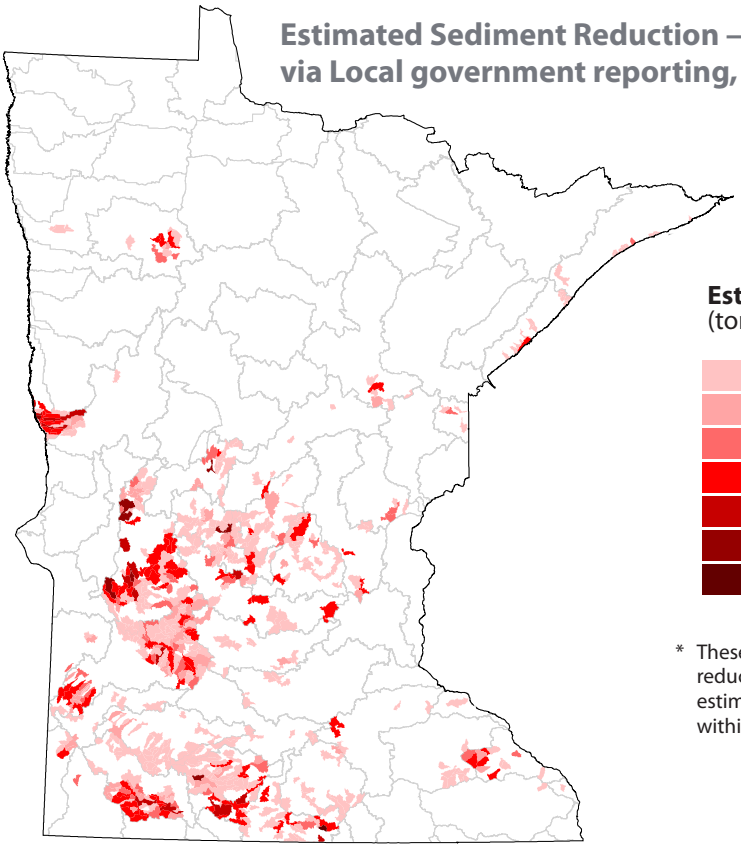


Estimated soil loss reduction by minor watershed
(tons per year)

- 0 - 25
- 25 - 50
- 50 - 100
- 100 - 250
- 250-500
- 500 - 1000
- 1000 - 5000
- >5000

May 2007

Estimated Sediment Reduction — CWP/319 BMPs via Local government reporting, eLINK (2003-present) & LARS (1997-2002)

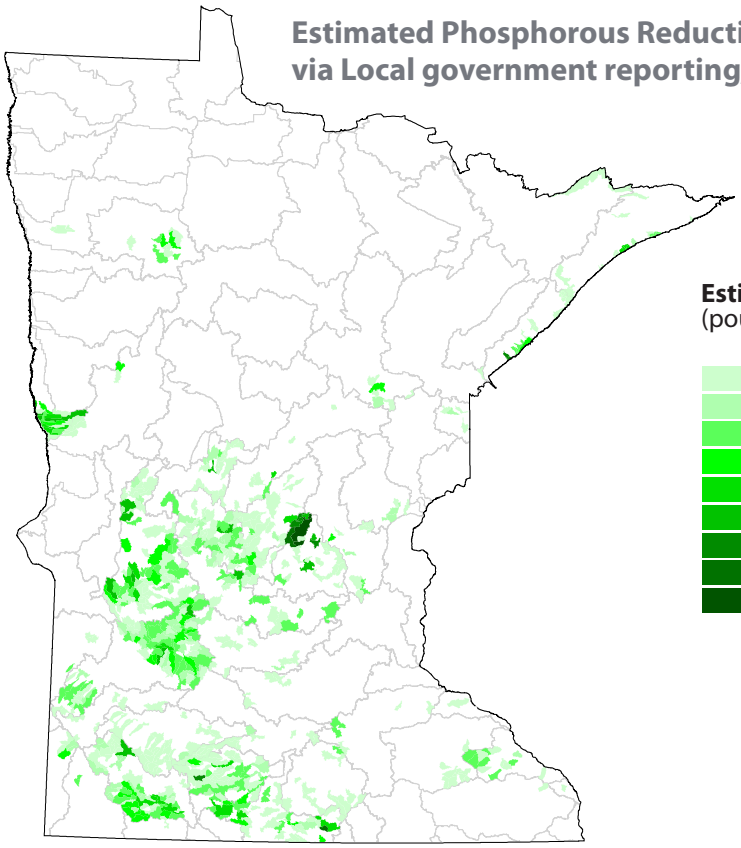


Estimated sediment reduction by minor watershed
(tons per year)*

- 0 - 25
- 25 - 50
- 50 - 100
- 100 - 250
- 250-500
- 500 - 1000
- 1000 - 5000
- >5000

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

Estimated Phosphorous Reduction — CWP/319 BMPs via Local government reporting, eLINK (2003-present) & LARS (1997-2002)

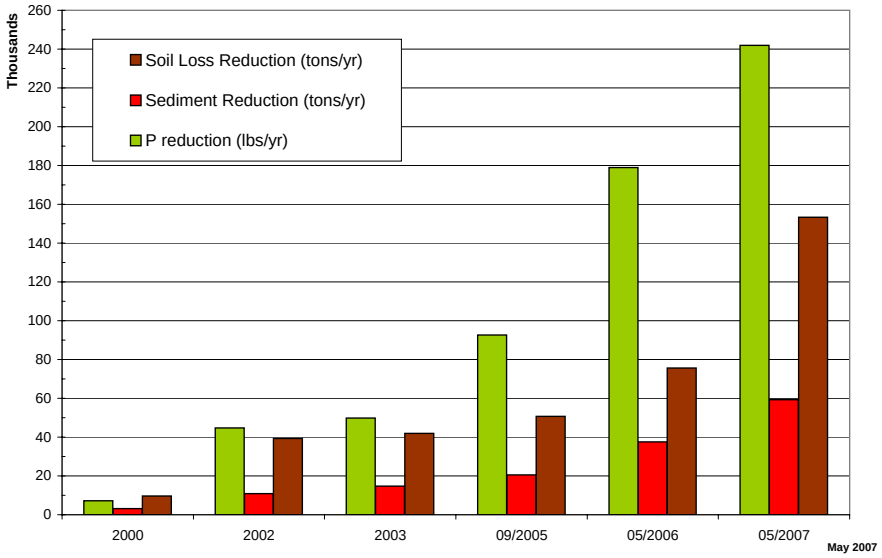


Estimated phosphorus reduction by minor watershed
(pounds per year)*

- 0 - 50
- 50 - 100
- 100 - 250
- 250 - 500
- 500 - 1000
- 1000 - 2500
- 2500 - 5000
- 5000 - 10000
- > 10000

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

CWP/319 Cumulative Estimated Pollution Reduction Benefits via local government reporting, LARS (1997-2002) and eLINK (2003-present)



Project summaries for 2007

This section contains summary reports of projects completed through the end of the state's fiscal year 2007 (June 30, 2007). Each case demonstrates water-quality outcomes in the "Results that Count" section.

Statewide

- Cation, Anion & Isotope Technical Support
- Educating Local Officials on Water Quality Impacts of NPSP
- Meeting TMDL Goals with the Minnesota Phosphorus Index
- Pond Sediment Characterization Project
- Quantifying the Variability of Stream Health Indicators for TMDL Assessment
- Small-Group Preparation of Nutrient Management Plans

Des Moines Basin

- Heron Lake Watershed District TMDL Seminar

Lake Superior Basin

- The Miller Creek Watershed Implementation Study
- Knife River TMDL Project: Part 1

Lower Mississippi River Basin

- Biological Monitoring in the Whitewater River Watershed National Monitoring Program Project
- Citizen Sediment Monitoring Coordinator to Support TMDLs
- Grazing Management for Trout Stream Improvement
- Lake Volney Improvement Project Phase II
- Targeted Residential Wastewater Treatment Project
- Whitewater Watershed "Paired-Watershed" Monitoring Project

Minnesota River Basin

- BERBI Nonpoint Source Accelerated Implementation
- Carver and Bevens Creek
- Chippewa River Watershed Project Continuation
- East Branch Chippewa River Implementation Project
- Fingerprinting Glacial Sediment
- Development of a Fecal Coliform TMDL for the Greater Blue Earth River Watershed
- Hawk Creek Watershed Project Phase II Continuation
- Hawk Creek Green Corridors Watershed Project
- Indian Creek Clean Water Partnership
- Lac qui Parle River Low Dissolved Oxygen TMDL
- Lily and Center Creeks: Blue Earth River Watershed Project
- Lower Maple River Watershed Project

Red River Basin

- Buffalo-Red River Watershed District Water Quality Demonstration Project
- Detroit Lake Water Quality Improvement Nutrient Reductions

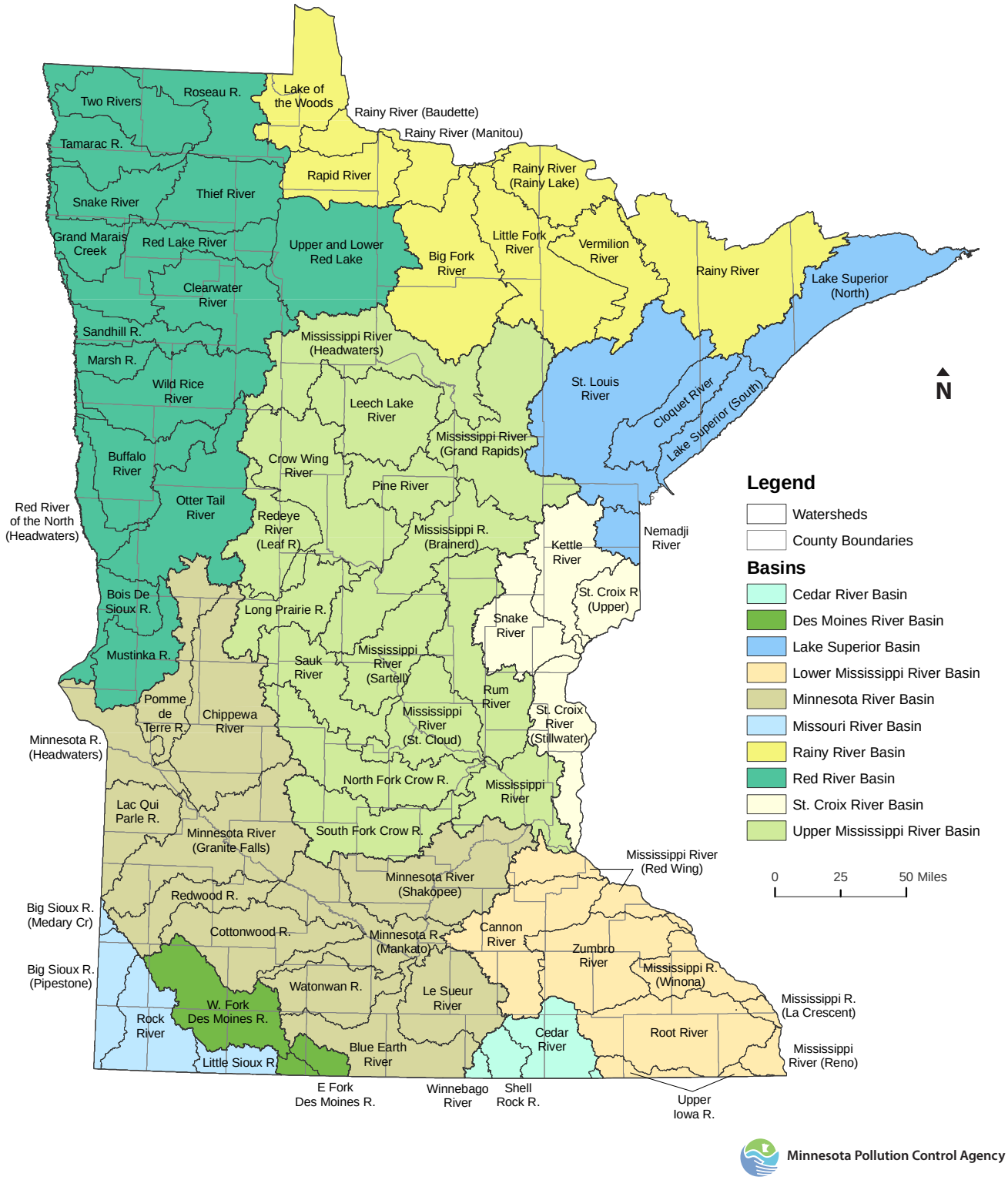
St. Croix Basin

- North Branch Sunrise River Fecal Coliform TMDL

Upper Mississippi

- Beauty Lake Monitoring
- Big Sandy Area Lakes Watershed Management Project
- Crow River Water Quality Data Enrichment Project
- Dairy Milk House Wastewater Treatment Demonstration
- Lambert Creek Water Quality Improvement Project
- Long Prairie River Implementation Project Phase II
- Long and Spring Lakes Restoration Project (Phase II Continuation)
- Lower Sauk River Fecal Coliform TMDL Study
- Manure Management Within Ecologically Sensitive Areas
- Middle Sauk River Rehabilitation Project
- Osakis Lake Watershed Management Project Phase III
- Sauk Lake Storm and Surface Water Resource Investigation
- Shingle Creek Phase II
- Springbrook Sub-watershed Implementation Project
- Upper Mississippi Source Water Protection Project

Basins, Major Watersheds and Counties in Minnesota



Statewide

Cation, Anion & Isotope Technical Support
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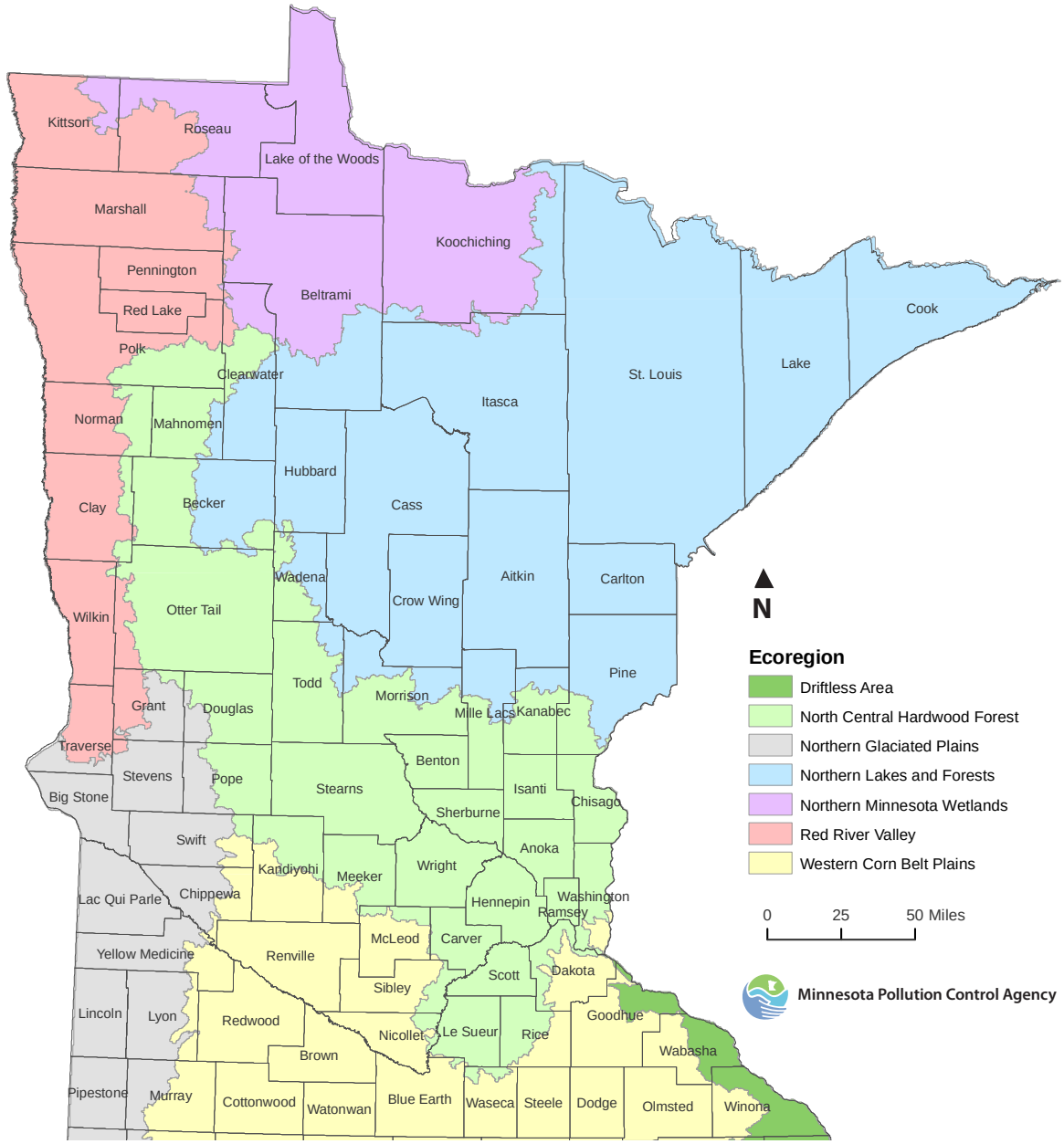
Small-Group Preparation of Nutrient Management Plans

Aquatic Ecoregions and Counties in Minnesota



TMDL Cation, Anion and Isotope Technical Support

The Department of Geology and Geophysics at the University of Minnesota (Twin Cities) received a $64,000 Section 319 program grant to develop numeric, quantifiable goals for environmental improvement, a number of best management practices to be installed, and the pollutant reductions as well as programmatic and social goals in TMDL studies. The project goals were completed between June 2003 and February 2006.

The TMDL Cation, Anion and Isotope project is a technical support effort to impaired water projects throughout Minnesota. The data developed from this contract provides information to technical support staff on hydrologic processes and pathways of water and solute transport. This information is then used to fine-tune monitoring and modeling efforts for specific TMDL studies.

Results that count

The tools developed in this project were applied in central and northern Minnesota: The Groundhouse River Impaired Biota TMDL, the Knife River Turbidity TMDL, and the Low Dissolved Oxygen TMDLs for the Talmadge, Baudette, Ottertail, and Upper Mississippi Rivers.

Financial information

U of M Department of Geology and Geophysics received a $64,000 Section 319 program grant to complete this project.

Contact

Calvin Alexander
University of Minnesota
Department of Geology and Geophysics
310 Pillsbury Dr. SE
Minneapolis, MN 55455

Educating Local Officials on Water Quality Impacts of NPSP

For this project, local officials received education on the connection between water quality and non-point source pollution (NPSP) from land-use activities, primarily shoreland development. They were provided with new tools that will lead to better and more informed land-use decisions and policies established and enforced by local governments to protect water quality. These local officials included county commissioners, planning and zoning boards, boards of adjustment, soil and water conservation supervisors, and township supervisors, in the five county, lake-rich North Central region of Minnesota. Citizens also participated in the varied project elements and have been a significant force in holding local governments accountable for appropriate land-use decisions through direct appeals at public meetings and land-use hearings, as well as exercising their ballot ability to elect officials who will support NPSP activities and actions.

Ultimately, the decisions and actions made by local officials will maintain and improve water quality in the North Central Lakes region, where 26 percent of Minnesota's priority lakes and 46 percent of its Mississippi River Miles are located, by reducing NPSP in the surface waters of this region through better regulation and enforcement of land-use ordinances. The project was part of the North Central Lakes Project, one of four regional projects in Governor Tim Pawlenty's Clean Water Initiative. Educating local officials on water quality impacts of NPSP pollution is a critical strategy that supports Minnesota's impaired waters mandate under the federal Clean Water Act.

Specific goals of the project

This project complemented and supported the ongoing activities of the North Central Lakes Project, including:

- Development of new alternative standards for shoreland management
- Promotion of conservation easements
- Development of lake management plans
- Education for the public on BMPs for non-point source reduction
- Natural resource planning for local governments
- Establishment of a regional sanitary sewer district to manage the waste of over 50,000 rural septic systems.

Results that count

- *Two one-day workshops for local officials* A planning team of local official representatives, state agencies, and non-profits developed the workshops held in the spring and fall of 2005. The Minnesota Lakes Associations partnered with the Government Training Service (GTS) and the Minnesota Environmental Partnership (MEP) as new partners, not in the initial work plan, to develop and subsidize the workshops.
- *Resource materials for decision-makers:* Workshop resource materials to assist local officials in their decision-making processes included: 1) reproduction of a brochure and CD ROM produced by the Minnesota Department of Natural Resources called "A Guide to Using Natural Resource Information In Community Decisions; and 2) a comprehensive list of the shoreland ordinances of the five counties with comparison to state shoreland ordinance were distributed at the local official workshops.
- *Presentations at regional trade association meetings* attended by local officials, including fall 2004 District 11 Regional Meeting of the Minnesota Association of Townships (fall 2005), mid-winter legislative meeting of the Minnesota Association of Counties; and winter 2006 meeting of the Minnesota Association of Planning and Zoning Administrators (2006). Presentations on "Linking Land Use to Water Quality" were made to five lake associations and three county coalitions of lake associations in 2006.
- *Production of DVD, "Minnesota Lakes at Risk"* was completed in late 2005 and distributed to local officials and local lake associations in 2006. It has been aired on public television and numerous local cable access stations. Additional copies were widely requested.

Financial information

The Section 319 Grant totaled $30,000 and was matched with local cash and in-kind funding of $46,961 for a total project cost of $76,961.

Contact

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Meeting TMDL Goals with the Minnesota Phosphorus Index

The purpose of this demonstration project was to develop a tool to help address phosphorous TMDLs in Minnesota. The grantees successfully field-tested and validated the Minnesota Phosphorus Index (MN P Index), developed a user-friendly computer interface, developed education materials and conducted outreach events to train stakeholders on how to use the program.

This EPA Section 319 project began in September 2003 and ended in September 2006.

Results that count

- The MN P Index was validated through verification testing done with available phosphorus datasets.
- A user-friendly computer program was developed for the MN P Index.
- The MN P Index program was field tested and fine tuned.
- A screening tool was developed for the MN P Index to guide users on its appropriate use.
- Cooperation between the University of Minnesota and State and Federal agencies on the development of the MN P Index was greatly improved throughout the duration of this project.
- Hundreds of producers and professionals in the industry were trained on how to the use the software.
- A Web site was developed to help deliver the P Index program and supporting materials to users.

Financial information

Grant amount: $290,000 (Section 319)
Matching funds: $290,000 (in-kind)
Total: $580,000

Contact

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(651) 201-6520
Matt.Drewitz@state.mn.us

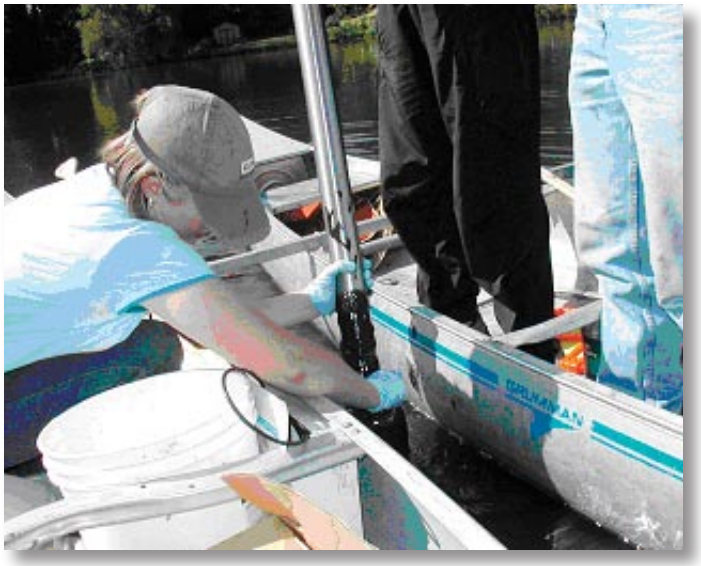
Pond Sediment Characterization Project

The primary purpose of this project was to quantify the physical and chemical characteristics of stormwater pond sediments generated in the Minneapolis and St. Paul metropolitan area. In addition, a survey of state agencies was conducted to determine if and how the use and disposal of dredged sediments was regulated.

Stormwater ponds are a common management practice to control and/or treat urban stormwater. The sediment, which accumulates in the ponds, must periodically be removed because as the sediment increases, the pond increasingly fails to capture suspended sediments in stormwater.

Samples were collected at a total of 10 pond sites in each of five metro counties. Two sediment samples were collected from each pond, yielding a total of 100 pond-sediment samples. Four topsoil samples were collected for comparison purposes. The locations of all pond samples were recorded with a Global Positioning System (GPS). In total, approximately 5,000 analyses were conducted to quantify the physical and chemical characteristics of the sediments.

In addition to comparing pond sediments to nearby topsoil, researchers compared the sediment with published soil metals data for the U.S. and Minnesota, against sediment data generated from reference lakes in Minnesota, and



against soil reference values developed by the MPCA as part of a risk-based approach for decision-making during site investigations and remediation.

Results that count

This study provided specific information about the physical, chemical and biological characteristics of pond sediment. This study was important because, given their age, it is quite likely that many of the existing ponds in the newer suburban areas of the Twin Cities will need to be dredged in the next ten years. This study provides critical information that will guide decisions about sediment removal in these ponds.

Financial information

The 319 Grant amount was $82,111; the local match is $118,525 and the total project cost is $200,636.

Contact

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Metro Plant
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Quantifying the Variability of Stream Health Indicators for TMDL Assessment

This research project began in October 2003, ran three years, and was extended into 2007. The overall goal of this study was to improve TMDL assessments by obtaining a better understanding of the variability of stream health indicators. This study focused on Fish Index of Biotic Integrity (IBI) as a measure of stream health.

A stream's health can be determined by several indicators: dissolved oxygen, its Fish Index of Biotic Integrity, the pH, the level of total suspended solids and turbidity. However, these indicators vary naturally within rivers and streams. This natural variability increases the difficulty in creating a successful Total Maximum Daily Load (TMDL) program. If the natural variability is large, there will be a substantial increase in the work required to list, write, and implement a TMDL study in order to detect a significant improvement in stream health.

To produce predictive models for Fish IBI, special analytical methods (regression equations) were used to determine the "best-fit" combination of potential predictor variables.

The selection of the "best-fit" models was generally done by maximizing a coefficient of determination and model significance and by minimizing standard error. Good predictive relationships for the adjacent paired and single watershed scales were found. The results suggested that regression equations of stream health need to be developed per region or that the observed data need to be "normalized" by reference information.

Results that count

Channel slope and stream power varied substantially with position in the watershed. There appears to be little correlation between Fish IBI scores and channel slope, but a slightly stronger correlation appears to exist with stream power. Stream power is a measure of a stream's erosive potential. Similar to the experiences with the existing data set, more rigorous statistical analyses are likely necessary to gain further insight into the relationships between stream health and localized stream characteristics.

Experiences gained from the project resulted in the following recommendations for future research:

- Development of an index of ecological integrity for stream health. This index needs to incorporate the physical, chemical and biological state of the stream.
- Scale plays an important role in the interpretation of data and in design of effective monitoring networks. Recent theoretical advances in scaling processes should be applied to these problems.
- Fundamental research is also needed to unlock underlying principles of stream ecosystems, especially those principles that have predictive capabilities. Potential progress can be made by further exploring self-organization concepts, non-equilibrium thermodynamics and complexity theory.

Financial information

Total state match funds for the Section 319 grant used for this project was $129,016.

Contact

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Small-Group Preparation of Nutrient Management Plans

The goal for grantee, University of Minnesota Water Resources Center, between January 2003 and June 2006 was to improve nutrient and manure management practices. The number of crop nutrient and manure management plans written by farmers and agricultural professionals in Minnesota increased through a personalized education program, and provided clear access to all necessary information for nutrient and manure management through development of a central Web site.

The target was to directly assist 400 to 600 farmers in writing nutrient management plans in 40 small group sessions. The program for education of producers, agency staff, and agricultural professionals was composed of six tasks: materials development, recruitment, workshop preparation, workshop delivery, post-workshop follow-up and creation of a manure management Web site.

The University of Minnesota Extension Service partners worked with Soil and Water Conservation Districts, county feedlot officers, and livestock producer organizations to invite farmers to participate in workshops where they were assisted in writing a manure and crop nutrient management plan for two or more fields of their own farms.

Results that count

The original proposal target was 40 workshops, while the number attained was 80. The proposal target was 400 to 600 participants in the workshops, but the actual number reached was 843. More than 90 percent of participants were livestock producers, and more than half managed operations with between 300 to 1000 livestock animals.

During the three-hour workshop sessions, participants completed a nutrient management plan for two or more of their own fields. Of those responding to a survey at the workshop, 75 percent indicated they would complete the plan for their whole farm themselves and 21 percent said they would hire a consultant to finish the plan for the whole farm. Only four percent indicated they would not complete the plan (23 percent of the participants did not answer this question).

Financial information

EPA Section 319 funding of $263,040 was supplemented for one year, beginning July 2003, by a $30,000 grant from the Minnesota Department of Agriculture.

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Statewide Projects Currently Active in 2007

Conservation Tillage Demonstration Project - 2003
Sponsor: University of Minnesota
Funding: Section 319 (Grant) $247,200
Purpose: Reduce sediment delivery to surface waters and preserve agricultural soils through increased crop residue cover on row-cropped fields of southern Minnesota.

Evaluating Feedlot Runoff Pollution and Ways to Reduce Impacts - 2003
Sponsor: University of Minnesota
Funding: Section 319 (Grant) $90,000
Purpose: Update and upgrade the FLEval model of feedlot pollution potential for allocation of costs and decision-making.

Lake Pepin TMDL Science Advisory Panel Initiation - 2003
Sponsor: University of Minnesota
Funding: Section 319 (Grant) $20,930
Purpose: Develop and implement process to choose a TMDL science advisory panel and schedule public meetings.

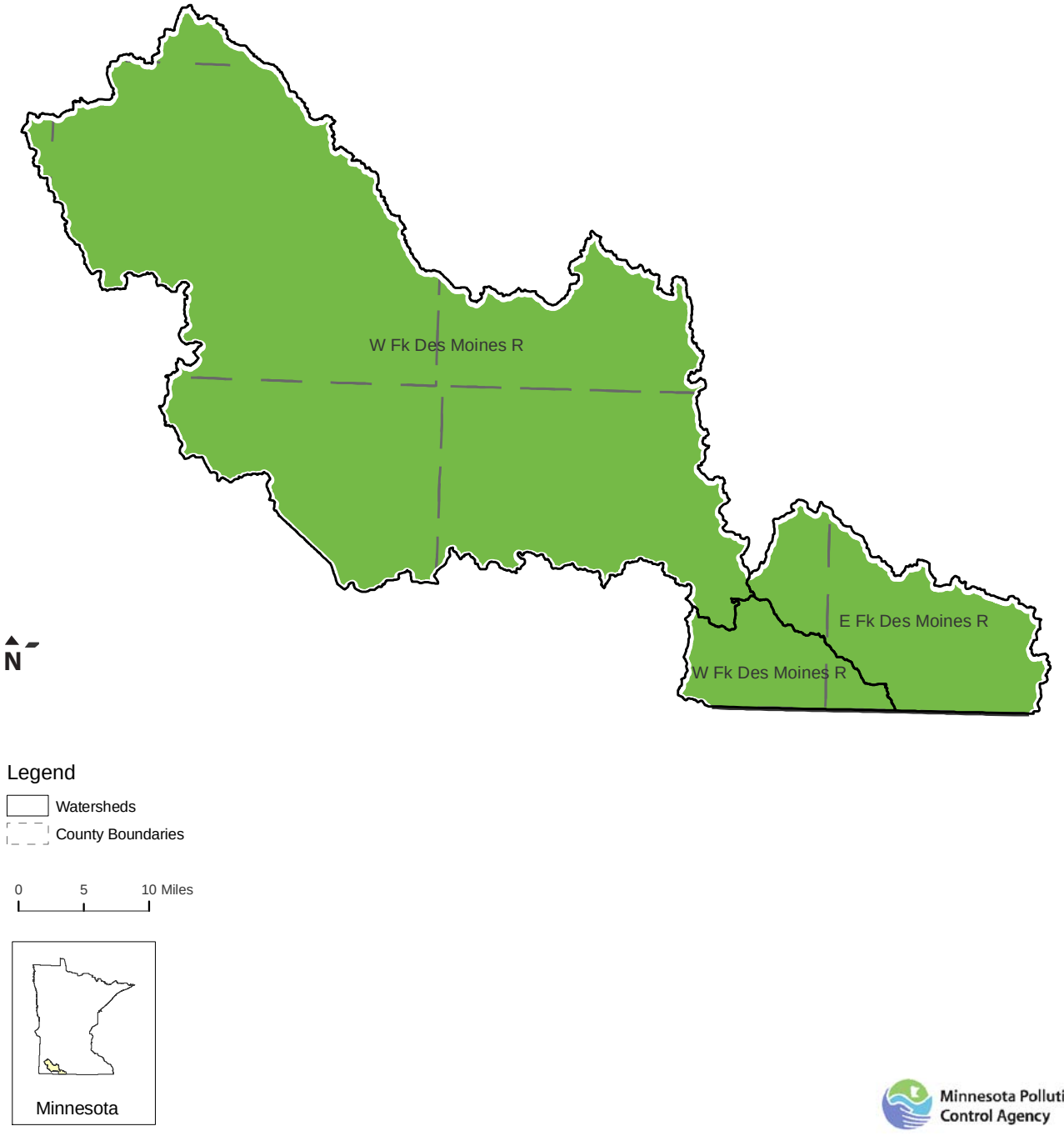
Local Nitrate Testing and Educational Outreach for Private Well Owners – 2003
Sponsor: Minnesota Department of Agriculture
Funding: Section 319 (Grant) $110,000
Purpose: Assist local entities in providing nitrate water testing services and water-quality outreach on a county level.

On-Farm Manure Management Demonstration - 2004
Sponsor: University of Minnesota
Funding: Section 319 (Grant) $279,600
Purpose: Adopt best management practices and new technology for field application of manure.

Winter Parking Lot/Sidewalk Maintenance Training and Certification - 2006
Sponsor: Fortin Consulting, Minneapolis
Funding: Section 319 (Grant) $80,000
Purpose: Provide training for staff working in winter road maintenance to reduce the amount of road salt in runoff to surface and groundwater.

Des Moines River Basin

Heron Lake Watershed District TMDL Seminar



Minnesota Pollution Control Agency

Heron Lake Watershed District TMDL Seminar

The West Fork Des Moines River watershed is one of the major drainage basins of the Minnesota River and is impaired for 38 pollutants. The Heron Lake Watershed is a sub-watershed of the West Fork, and the watershed district is the local unit of government that implements cost-sharing, incentive, and loan programs that enable landowners and agricultural producers to address nonpoint source pollution.

While there is a great deal of information about TMDLs in general, the Heron Lake Watershed District (project sponsor) realized that there was no step-by-step guide on what to do after a water body is identified as impaired. They also wondered, "What responsibility does local government have to landowners, producers, industry, and citizens in the watershed of an impaired lake or stream?" They believed more information was needed to develop and implement effective TMDL plans.

So the district partnered with the Minnesota Pollution Control Agency (MPCA) to develop a two-day educational seminar explaining the TMDL program. Specific topics included identifying and listing impaired waters; developing effective TMDL plans; implementing TMDLs; and the effect that TMDLs would have on local producers and their agricultural operations.

Goals for this project were:

- Strengthen the network of educators, agency personnel, and agricultural producers
- Suggest, utilize, and monitor improvements to local sustainable agriculture programs, including current water quality programs
- Provide an opportunity for landowners and producers to gain a better understanding of best management practices
- Conduct the two-day seminar – which could serve as a framework for other outreach around the state – and measure its effectiveness with follow-up surveys
- Offer the MPCA possible solutions to any difficulties encountered as TMDL work progresses.

Results that count

- Seminar held March 22-23, 2005; 69 attendees
- Quarterly survey evaluation summaries indicate that the majority of attendees were able to put the information to use within nine months
- Results of pre-tests and post-tests given each day show that:
  - ~ Local agency personnel's TMDL knowledge increased 36 percent the first day;
  - ~ landowner knowledge increased 25 percent the second day
- Attendees said the seminar reinforced basic understanding of TMDLs and that a TMDL is an ongoing process; mentioned that program assistance talks were helpful, and that public involvement is paramount
- 74 percent of local government agency personnel and 48 percent of the landowners were interested in future seminars or workshops.

Financial information

$3,486 in Section 319 grant funding and $6,555 in matching funds supported this project.

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Projects Currently Active in 2007 in the Des Moines River Basin

Beaver Creek Watershed Improvement Project Continuation - 2005
Sponsor: Murray County
Funding: CWP (Grant) $62,122; CWP (Loan) $178,800
Purpose: Develop manure management plans, design and implement grassed waterways, restore wetlands, complete sediment control/water retention structures, prepare demonstration plots for fertilizer applications, protect priority lands, upgrade septic systems, establish stream bank protection and continue monitoring, outreach and education.

Development of TMDLs for the Heron Lake Watershed Project - 2003
Sponsor: Heron Lake Watershed District
Funding: Section 319 (Grant) $3,750
Purpose: Provide administrative, stakeholder involvement and technical support for the development of TMDLs and an implementation plan for the Heron Lake Watershed. Impairments that are being addressed include fecal coliform bacteria, turbidity and excess nutrients in Heron Lake.

Development of TMDLs for the West Fork Des Moines River Watershed Project – 2002, 2003
Sponsor: Cottonwood County
Funding: Section 319 (Grant) $40,779
Purpose: Provide administrative, stakeholder involvement and technical support for the development of TMDLs and an implementation plan for the West Fork Des Moines River Watershed. Impairments that are being addressed include fecal coliform bacteria and turbidity.

Elk Creek Conservation Tillage Incentive Program - 2006
Sponsor: Heron Lake Watershed District
Funding: CWP (Grant) $28,200
Purpose: Enlist landowners within the project area to change their tillage practices. Options include no-till, strip-till, minimum-till, ridge-till and forage residue management, which will prevent further soil and nutrient loss and decrease nonpoint-source pollution in the watershed.

Heron Lake Alternative Tile Intake Cost-Share Program - 2006
Sponsor: Heron Lake Watershed District
Funding: Section 319 (Grant) $36,000
Purpose: Reduce sediment in runoff from farm fields by replacing open tile intakes with subsurface rock intakes.

Heron Lake Watershed District – CWP Project - 2003
Sponsor: Heron Lake Watershed District
Funding: Section 319 (Grant) $161,750
Purpose: Implement best management practices such as vegetative cover, riparian and field buffer strips, windbreaks, feedlot compliance, nutrient management planning, compliant septic systems and wetland wildlife habitat restoration.

Des Moines River Basin Projects Awarded in 2007

Section 319 Projects

Heron Lake Watershed District – BMP Program for Alba Township
Sponsor: Heron Lake Watershed District
Funding: $40,800
Purpose: The goal of this project is to decrease water movement, reduce erosion, and improve water quality throughout approximately 23,000 acres in Alba Township through changing tillage methods from conventional tillage to conservation tillage. Conventional tillage is the main practice undertaken on the silty clay loam soils. Creating an awareness among landowners about the relationship between soil conservation and water quality will be critical to the project's success.

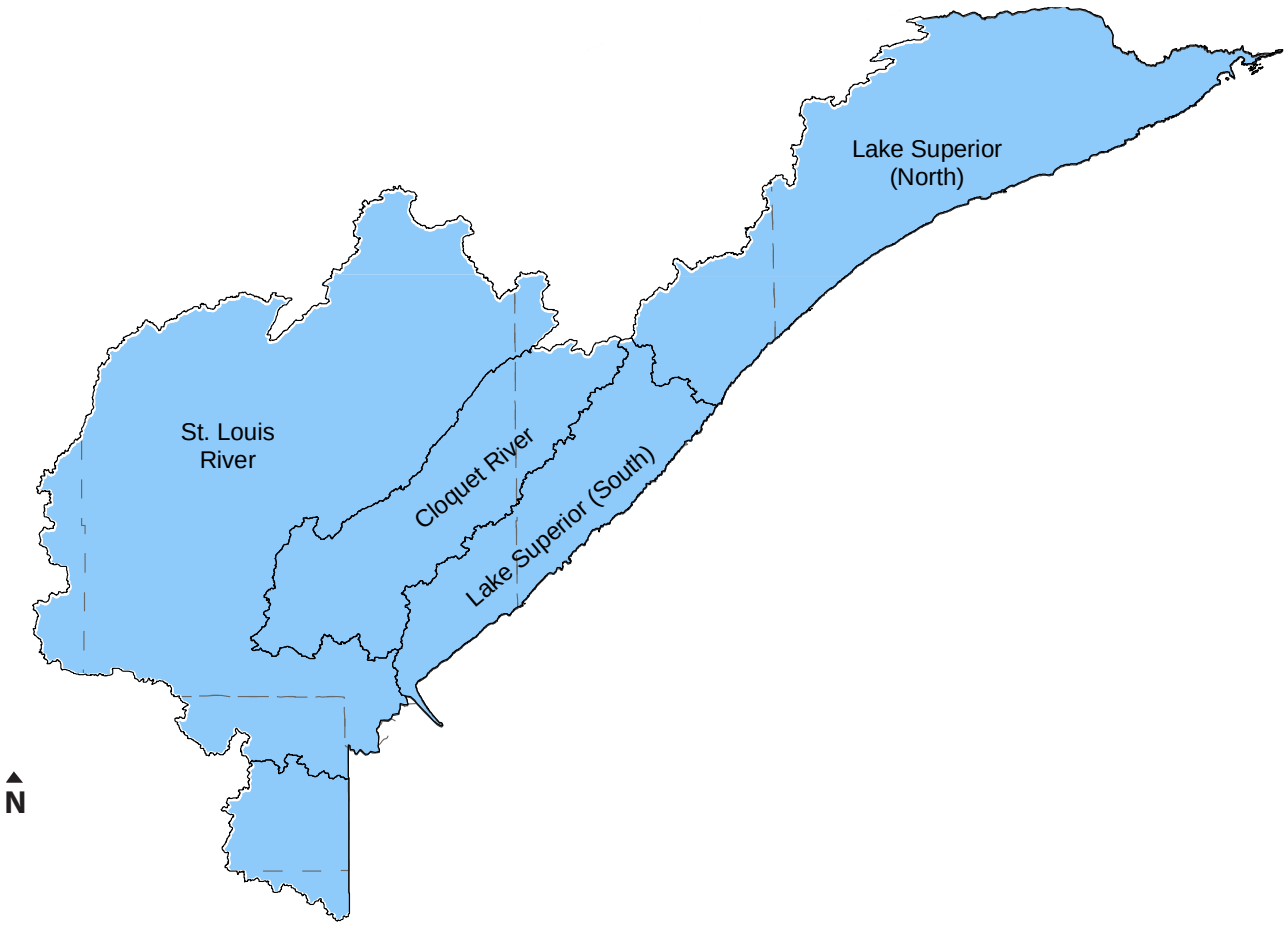
Heron Lake Watershed District – Fulda Lakes Project
Sponsor: Heron Lake Watershed District
Funding: $55,800
Purpose: The Heron Lake watershed is rural and agricultural. In a watershed such as this, agricultural best management practices (BMPs) are crucial. Landowners are hesitant to try new methods. The goal of this project is to improve the water quality in Fulda Lakes through the use of cost share and incentive programs, and education of residents and landowners.

Clean Water Partnership Projects

None

Lake Superior Basin

Miller Creek Watershed Implementation Study
Knife River TMDL Project: Part 1



Legend

Watersheds
County Boundaries

0 10 20 Miles

Minnesota Pollution Control Agency

Miller Creek Watershed Implementation Study

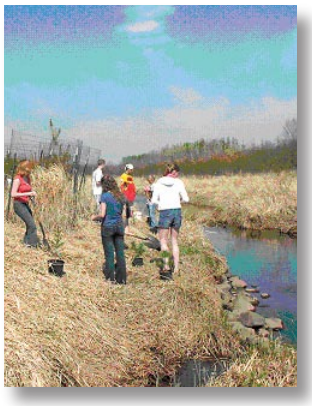
Miller Creek is an urban trout stream located in the Lake Superior basin that flows through the cities of Duluth and Hermantown. The watershed has seen significant commercial development in recent years. The Department of Natural Resources conducts stream trout surveys and habitat assessments each year and tells us that brook trout continue to reproduce in Miller Creek, but their numbers are declining. This is particularly true in the creek segments adjacent to the most intense development.

Disruptions caused by this development have included the filling of wetlands, the removal of riparian cover and the introduction of large volumes of stormwater runoff from paved surfaces. The environmental effects have included benthic impairment in some areas; high concentrations of sediment, heavy metals and chlorides; and increased water temperature. Miller Creek in particular suffers from high stream temperature, sand and sedimentation loading, and high chloride levels.

Goals for this CWP Phase II project are:

- Monitor creek water temperature
- Identify sites contributing sediment to the creek; identify riparian areas devoid of vegetation
- Plant trees along the creek to stabilize eroding areas, increase riparian vegetation and provide shading/ woody debris in the future
- Do outreach and education on best management practices.

Results that count



- Planted 900 trees in Miller Creek riparian areas
- Installed 80 feet of stream bank habitat structures (lunker structures)
- Innovative stormwater management structure – which demonstrates infiltration and bioretention – completed and installed at Lake Superior College
- Completed three direct mailings to Miller Hill-area businesses regarding installing best management practices (BMPs)
- Held one workshop for businesses and the public to learn more about nonpoint source BMPs.

Financial information

A CWP Phase II grant of $30,000 was matched by local, in-kind contributions of $30,000.

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Knife River TMDL Project: Part 1

The scenic Knife River, impaired for turbidity, was the site of the first phase of a two-part project to generate an U.S. Environmental Protection Agency-approved TMDL for the northeastern Minnesota River. Completed between April 2003 and September 2006, the project was a collaborative effort sponsored by the South St. Louis Soil and Water Conservation District, the Knife River Stewardship Committee and the Minnesota Pollution Control Agency.

The goals for the project were:

- To develop a TMDL document for turbidity for the Knife River
- To assess the river for pH impairment
- To create a framework to apply to other TMDL studies for North Shore (Lake Superior watershed) streams identified as impaired on Minnesota's 303(d) Impaired Waters list.

Results that count

- Pulled together existing data, collected three additional years of stream monitoring data, generated needed GIS layers, and gathered geomorphology information
- Preliminary analysis of the data indicates that most turbidity exceedances occur when water is running high. This indicates that large stream banks are collapsing during storms and spring melts
- Completed Part 1 of the TMDL study and are prepared to begin work on the TMDL document.

Financial information

A Section 319 grant of $72,472.12 was spent on monitoring, data collection and staff time.

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Projects Currently Active in the Lake Superior Basin in 2007

Knife River Watershed TMDL Project, Phase 2 - 2004
Sponsor: South St. Louis Soil and Water Conservation District
Funding: Section 319 (Grant) $31,000
Purpose: Complete monitoring, assessment, modeling and development of land use data to identify potential pollutants in order to develop TMDLs for turbidity.

Miller Creek Watershed Implementation - 2006
Sponsors: City of Duluth and South St. Louis Soil and Water Conservation District
Funding: CWP (Grant): $31,000
Purpose: Funding for this project brings continued tree planting to prevent solar radiation from reaching the stream, installation of streambank stabilization and stream habitat structures, completion of annual stream trout surveys and habitat assessments, and installation of an innovative stormwater practice; provides information regarding BMPs and Miller Creek's water quality for Miller Hill-area businesses and the public; maintains the sediment trap installed in Miller Creek in 2004; and removes sediment via street sweeping before it reaches the stream.

Miller Creek Watershed TMDL Project – 2003, 2004, 2005
Sponsor: South St. Louis Soil and Water Conservation District
Funding: Section 319 (Grant) $115,190
Purpose: Monitor, model and develop land use data to identify potential pollutants in order to develop a TMDL for impaired biota and temperature.

Nemadji River Basin Project Continuation - 2004
Sponsor: Carlton County
Funding: CWP (Grant) $156,314
Purpose: Continue education and outreach activities, coordinate GIS staff training and data acquisition, continue monitoring, provide cost share and technical assistance for reforestation, replace culverts and implement stream bank erosion controls.

Lake Superior Basin Projects Awarded in 2007

Section 319 Projects

Duluth Residential Stormwater Reduction Demonstration Project for Lake Superior Tributaries - $167,383

Sponsor: City of Duluth

Funding: $167,383

Purpose: This project will demonstrate the effectiveness of residential Best Management Practices (BMPs) at reducing stormwater runoff problems for Lake Superior tributaries. We will install residential BMPs in a subwatershed in an older residential neighborhood and compare the runoff to that of a similar control subwatershed without stormwater BMPs. Water flow, temperature, and turbidity measurements will be taken within storm sewers in both subwatersheds before and after BMP installation. Resident knowledge of runoff issues, solutions, and responsibilities will be evaluated at the beginning and end of the project.

Restoring Impaired Superior Tributaries: Stormwater BMP Evaluation, Education and Outreach

Sponsor: Regents of the University of Minnesota

Funding: $103,553

Purpose: Trout streams along Lake Superior's North Shore are important parts of the region's tourism and recreation industry. Miller, Amity and Kingsbury watersheds in Duluth, MN are among 12 designated trout streams within the Duluth city limits. Miller and Amity are impaired (303d) for turbidity and Miller is also impaired for temperature. Kingsbury is noted for its high summer temperatures. Stormwater runoff from residential neighborhoods leads to excessive stream bank erosion creating turbidity in these systems. The project will quantify the reduction in turbidity and suspended sediment concentration and embedded sediment that result from best management practices to fix runoff related problems in sensitive Lake Superior tributaries.

Clean Water Partnership Projects

None

Lower Mississippi River Basin

Biological Monitoring in the Whitewater River Watershed National Monitoring Program Project
Citizen Sediment Monitoring Coordinator to Support TMDLs
Grazing Management for Trout Stream Improvement
Lake Volney Improvement Project Phase II
Targeted Residential Wastewater Treatment Project
Whitewater Watershed "Paired-Watershed" Monitoring Project

Minnesota Pollution Control Agency

Biological Monitoring in the Whitewater River Watershed

National Monitoring Program Project

This project was comprised of three individual biological monitoring studies during the 2004, 2005, and 2006 field seasons. The studies provided a continuation and expansion of work begun in 1994 to collect baseline information on the biological and physical integrity of streams within the Whitewater River watershed as part of the Whitewater River Watershed National Monitoring Program (NMP) project. The Whitewater River NMP project was established to evaluate the effectiveness of various best management practices (BMPs) using NMP guidance that encouraged the use of paired-watershed monitoring designs and biological monitoring in streams.

During 2004, stream sites within the Whitewater Watershed that were assessed for their physical and biological characteristics in 1998 were reassessed for comparison to the 1998 findings. During 2005, an intensive, longitudinal survey of the physical and biological characteristics of the South Branch Whitewater River was undertaken. During 2006, filling of stream pools by fine sediments was assessed at stream sites in the Whitewater River and Garvin Brook watersheds.

Results that count

The relationships between the fish IBI and various stream habitat variables observed in the 2004 study suggest that the best coldwater fish assemblages in the Whitewater River watershed were found in shallow stream sites with more riffle than run habitat, good riparian buffer, and lack of cover for large fish. Relationships between the invertebrate IBI and various stream habitat variables suggest that the best invertebrate assemblages in the Whitewater River watershed were found in larger streams with clean substrate, good pool-riffle habitat, and non-shaded streambed with long grasses overhanging the banks. When examined together, stream size, the abundance of fine sediments, abundance of riffle and run habitats, buffer width, and the type of riparian vegetation influence the types and abundances of fish and invertebrates in these streams. Although observable changes in agriculture and development have occurred within the watershed in the years between 1998 and 2004, these changes have not yet had any significant effects on either the habitats or biota of streams in this area.

The longitudinal study in 2005 found a number of patterns along the river. In general, upstream sites had poor fish habitat and poor fish assemblages; whereas, downstream sites mostly had good habitat ratings. The fish IBI at most of the sites on upper reaches of the South Branch Whitewater River was rated as poor or very poor, whereas sites on the lower reaches received fair or good ratings. Fine sediments, embeddedness, and lack of instream cover and riparian buffers were the factors most likely affecting fish communities in the upper stream segment. The better fish habitat and fish

assemblages in the lower reaches are likely the result of higher flows of cold water, reduced fine sediment and embeddedness, wider riparian buffers, and better instream habitat. Invertebrate IBI ratings were fair to very poor at all of the South Branch sites.

In 2006, researchers examined the filling of stream pools with fine sediments in 25 pools in streams in and near the Whitewater River watershed. Stream pools in the watershed displayed high variability in the extent to which they have filled with fine sediments. Some, like the Middle Branch, have lost little pool volume to fine sediment, but others, like Trout Valley Creek, have lost more than 70 percent of their volume. Significant loss of pool volume certainly will reduce the ability of these streams to support abundant, sustainable trout populations.

Financial information

This study was made possible by funding from the Minnesota Pollution Control Agency through an EPA Section 319 program grant. The contract budget was $50,737.

Contact

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Citizen Sediment Monitoring Coordinator to Support TMDLs

The Lower Mississippi River Basin (includes the Cedar River Basin) is located in southeastern Minnesota. Its geographic extent has 12 major watersheds and includes all or part of 17 counties. Land use is varied, with nearly two-thirds under cultivation. Crops include corn, soybean and hay. Farm animals include dairy and beef cattle, hogs and sheep. Human population within the basin is increasing and as a result, urban areas and commercial development is growing. Agricultural activities and urban growth have the potential to adversely affect water quality (Lower Mississippi River Basin Planning Scoping Document, 2001).

Volunteer stream monitoring efforts are growing in southeastern Minnesota. The largest effort is the Citizen Stream Monitoring Program (CSMP) administered through the Minnesota Pollution Control Agency (MPCA). More than 120 volunteers in southeastern Minnesota participated in this program in 2005. The Citizen Sediment Monitoring Coordination to support turbidity Total Maximum Daily Loads (TMDLs) project has two main goals.

- To address the increasing need to support volunteer-based monitoring efforts
- To better prepare for stream sediment TMDLs in the region.

Results that count

To implement the project, a Citizen Sediment Monitoring Coordinator was hired at the Winona State University Water Resources Center. Tasks completed include working with county and watershed personnel that oversee existing volunteer monitoring networks, enhancing existing volunteer programs with CSMP "Plus" efforts, writing watershed-scale reports for volunteers within the watershed, and organizing volunteer appreciation events. The project's prioritized objectives as detailed in the (Citizen Sediment Monitoring Coordinator to Support Turbidity TMDLs) work plan are as follows.

High priority objectives:

- Work with county staff who oversee existing county-based Citizen Stream Monitoring (CSM) networks
- Work with watershed personnel who oversee existing watershed-based CSM networks

- Contact leading CSM people in Minnesota to assess appropriate methods and processes to use in the basin
- Target watersheds with a high number of impairments for additional monitoring
- Establish a CSM "Plus" program to train select volunteers to collect additional data and/or water samples for lab analysis in well-established networks
- Prepare watershed-scale reports for each major watershed in the Lower Mississippi River Basin
- Work with the MPCA staff (Rochester and St. Paul) to facilitate the development of TMDL efforts, and specifically the use of CSM methods for long-term trend and effectiveness evaluation
- Plan recognition events for volunteers on a yearly basis, and work with the media and public information specialists on related stories and articles.

Mid-priority objectives:

- Coordinate with Minnesota Department of Natural Resources (MDNR) on integration with bio-monitoring sites
- Coordinate with the appropriate state agencies and Long Term Resource Monitoring Program (LTRMP) personnel to better develop relationships between transparency tube (TT) readings and other sediment-related parameters
- Serve as a link between the basin and the statewide CSMP.

Lower priority objectives:

- Work directly with citizen volunteers on their sites and data
- Recruit volunteers in subwatersheds where there are few or no current sites monitored
- Recruit and maintain volunteers for critical streams and important tributaries.

Financial information

This project received $72,260 in Section 319 grant funding.

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Grazing Management for Trout Stream Improvement

The MPCA identified several reaches of trout streams in the Lower Mississippi River Basin that are impaired for turbidity and fecal coliform. The stream reaches involved in this project are mainly located in Wabasha, Winona, Houston and Fillmore Counties. Many are listed in the 1998 MPCA Impaired Waters List.

The main purpose of this project was to demonstrate the effect properly managed grazing has on turbidity and fecal coliform impairments in trout streams. Several of the grazing plans completed through this project are in close proximity to affected streams. The monitoring protocol developed by MPCA during this project will be instrumental in TMDL studies and evaluation of progress in reaching water quality goals. This project helped accomplish goals stated in the Basin Plan Scoping Document for the Lower Mississippi River Basin by encouraging better pasture management as well as improved management of perennial crops on sensitive areas of the landscape.

Results that count

- Completed 121 managed rotational grazing plans on 10,023 acres of pasture
- Established an improved monitoring protocol for streams in this region of the state
- Trained three service providers in the project area to help with the continued planning and application of managed rotational grazing systems
- Demonstrated the importance of well-managed grazing lands in Minnesota

- Producers in this project area have a much greater appreciation for managed rotational grazing systems as a result of the outreach and educational activities that resulted directly from this project

Financial information

The Section 319 Grant totaled $129,295 and was matched with local in-kind funding of $151,546 for a project total of $280,841.

Contact

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Lake Volney Improvement Project Phase II

Lake Volney is a eutrophic 277-acre lake with a 1,906-acre agricultural watershed. The lake is located near the interface of the North Central Hardwood Forests and Western Corn Belt Plains ecoregions. The landscape is rolling to steeply sloping with interspersed poorly drained swales and sloughs. Historically, the watershed was covered with hardwoods and, upon settlement, cleared for agricultural use. The water quality of this lake has been degraded by man's activities over a period of decades.

LeSueur County conducted a Phase I Diagnostic and Feasibility study of the lake and watershed in 1995. The implementation plan for that study identified strategies to reduce nutrient loading and the Lake Volney Improvement Project developed from there.

Primary goals of the project included:

- Coordination of watershed activities within the Lake Volney Watershed
- Reduce watershed nutrient loading to the lake
- Reduce lake sediment nutrient recycling
- Increase public awareness of water quality issues
- Continue monitoring and evaluation activities.

Results that count

- Developed a Resource Committee composed of watershed residents, lakeshore owners, and cooperating agencies and sponsors. The committee assisted with implementing the workplan, oversaw watershed activities, and helped direct the future implementation goals
- Reassessed all wetlands in the watershed to determine where the most benefit could be gained from restoration and the potential impacts to existing farm and homestead sites
- Paid incentives on two harvestable buffers along a drainage ditch
- Upgraded 20 individual sewage treatment systems in the watershed.
- Provided assistance and incentives to landowners for manure and soil testing as well as BMP implementation relevant to nutrient concentrations
- Educated homeowners on the operation and maintenance of individual sewage treatment systems
- Educated homeowners through mailings, news releases and presentations on the importance of a healthy watershed ecosystem. "Lakescaping" with native vegetation, as well as other buffers and best management practices were the main focus
- Lake Volney was monitored ten times between May and September in 2005.

Financial information

The $125,000 Clean Water Partnership grant was matched with $299,833 in local cash and in-kind funding for a total project cost of $424,883.

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Targeted Residential Wastewater Treatment Project

The project employed two Wastewater Facilitators and a Wastewater Educator to work with small undersewered communities in eleven southeastern Minnesota counties. The project partners proposed to double the average rate of remediation of individual sewage treatment systems considered "imminent threats to public health" from 300 to 600 per year within three years. Successful implementation would achieve a 60 percent bacteria reduction in the project area by the year 2012.

Wastewater Facilitators provided professional assistance to communities with inadequate sewage treatment. The facilitators had strong skills in group process, understood the principles of sewage treatment and the range of options for treatment, and were knowledgeable about the legal and financial aspects of community wastewater treatment solutions.

The project team prioritized their work by targeting the following audiences:

- Owners of ISTS that pose an "Imminent Threat to Public Health and Safety (IPHT)" and high environmental risk
- Residents of undersewered communities that pose a high environmental health risk
- Residents of watersheds with known high levels of contaminants
- Elected officials including county commissioners, SWCD supervisors, and township officers
- Local government staff.

Results that count

- Twenty-nine communities in eleven counties received technical assistance
- Task force members in nine communities provided feedback through an opinion survey. Those surveyed overwhelmingly placed the highest value on the help they received from the facilitators, followed by education and funding. Respondents commented that they could not have made significant progress without the facilitator to help guide the process.
- The University of Minnesota Extension assisted with the following educational activities:
  - ~ 47 Homeowner Education classes
  - ~ 20 newsletter and newspaper articles
  - ~ 20 Small Community Wastewater Process trainings
  - ~ 3 Basin-wide staff workshops/tours
  - ~ ISTS Staff Training (train the trainer) in Operation and Maintenance – 5 counties
  - ~ Development of the Do-it-Yourself Septic System Evaluation.

It is too soon to tell whether water quality standards have been met, however, the project created momentum among many of the counties in the Basin to revise ordinances to step up the level of ISTS compliance. Although small community wastewater planning typically takes three to seven years to complete, a number of small communities in the project area have made significant progress toward solving wastewater issues. The work begun by the facilitators and University of Minnesota Extension Educator during the 3 years of the project has continued uninterrupted thanks to additional 319 funding awarded to the Cannon River Watershed Partnership.

Financial information

The Section 319 Grant totaled $530,000 and was matched with local cash and in-kind funding of $784,592 for a total project cost of $1,314,592.

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Whitewater Watershed "Paired-Watershed" Monitoring Project

Between January 2004 and September 2006, University of Minnesota staff members, graduate students, and undergraduate students assisted the Minnesota Pollution Control Agency in the operation of a small watershed monitoring project near St. Charles, Minnesota. This work was a continuation of a ten-year project that is a part of the U.S. EPA National Monitoring Program.

The specific goals for this portion of the project were to evaluate the effect of surface and ground water interactions in affecting water quality coming from the two small paired-watersheds.

The Whitewater Watershed U.S. EPA Section 319 National Monitoring Program Project was developed to evaluate the effectiveness of best management practices in improving water quality. The overall project used a paired-watershed monitoring design to compare the use of BMPs in a treatment watershed versus a control watershed where no management practices were changed.

Results that count

This project discovered distinct differences in how the two watersheds generate stormwater runoff. The larger of the two watersheds was found to generate runoff mainly off its surface. In contrast, the smaller watershed had a predominantly subsurface flow according to the same types of measures. This difference in source waters for the watershed is not due to differences in land uses between the two watersheds, but mainly due to the karst geology of the region.

With a runoff model developed by the U.S. Army Corps of Engineers, and rainfall and evapotranspiration and streamflow data for these watersheds, researchers were able to adequately predict the surface runoff generated during rainstorm events. However, the model was not able to predict the ground water discharge response observed on one of the watersheds. Additional work will need to be performed with this model to determine the cause for the shortcomings in ground water prediction.

This information will be incorporated into a final report for the National Monitoring Program project next year.

Financial information

The project cost was $98,396 (Section 319).

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Projects Currently Active in 2007 in the Lower Mississippi River Basin:

Byllesby Reservoir Phosphorus TMDL Project - 2003
Sponsor: Cannon River Watershed Partnership
Funding: Section 319 (Grant) $63,500
Purpose: Monitor, model and develop land use data to identify potential pollutants in order to develop a total maximum daily load for excessive nutrients, particularly phosphorus.

Cannon River Wastewater Project - 2005
Sponsor: Cannon River Watershed Partnership
Funding: Section 319 (Grant) $300,000
Purpose: Provide financial incentives for assessment and engineering feasibility studies of current wastewater conditions.

Cost-Share Incentives for Small Feedlot Fixes - 2004
Sponsor: Hiawatha Valley Resource Conservation and Development Association
Funding: Section 319 (Grant) $242,000
Purpose: Provide a 50-percent cost share for feedlot fixes for 220 feedlots.

Dakota County Non-point Source Reduction Project - 2004
Sponsor: Dakota County
Funding: Section 319 (Grant) $191,539
Purpose: Initiate an intensive one-on-one farmer outreach program, purchase permanent conservation easements along the Vermillion River and its tributaries; and expand water-quality monitoring of both groundwater and the Vermillion River.

Designing Feedlot Improvements in Targeted Areas under the Open Lot Agreement - 2004
Sponsor: Southeast Minnesota Water Resources Board
Funding: Section 319 (Grant) $300,000
Purpose: Provide financial and technical assistance for designing low-cost solutions for feedlot runoff.

Improved Livestock Management in Riparian Areas - 2003
Sponsor: Minnesota Department of Agriculture
Funding: Section 319 (Grant) $185,000
Purpose: Implement managed grazing systems; conduct intensive monitoring; evaluate forage conditions, habitat, stream-bank conditions and macro-invertebrates in the streams; conduct field days at participating farm sites; develop and refine educational materials.

Jefferson-German Lakes Water Quality Improvement Project Continuation - 2004
Sponsor: Le Sueur County
Funding: CWP (Grant) $55,000; CWP (Loan) $250,000
Purpose: Upgrade best management practices for priority feedlots, devise solutions for highly erodible lands in four priority sub-watersheds, provide loan funding to upgrade nonconforming individual septic treatment systems, continue water quality monitoring/data analysis, assistance in updating the Le Sueur County water plan, planning best management practices demonstration sites and developing information materials.

Lower Mississippi Feedlot Runoff Control - 2006
Sponsor: Southeast Minnesota Water Resources Board
Funding: Section 319 (Grant) $300,000
Purpose: Hire technicians to assist eligible open livestock feedlots and provide some funds for low-cost improvements to reduce runoff.

Lower Vermillion River Watershed Turbidity TMDL Project – Phase 3 – 2003, 2004
Sponsor: Dakota County Soil and Water Conservation District
Funding: Section 319 (Grant) $176,128
Purpose: Complete monitoring, modeling and development of land use data to identify potential pollutants in order to develop a total maximum daily load for turbidity.

Reduction of Fecal Coliform Bacteria from Human Sources (TMDL Implementation Project) - 2003
Sponsor: Southeast Minnesota Water Resources Board
Funding: Section 319 (Grant) $154,000
Purpose: Assess unsewered communities, fund engineering feasibility studies and create record-keeping and communication functions among county staff, ISTS owners and pumpers.

South Branch Root River Watershed Fecal Coliform Bacteria Reduction Project - 2006
Sponsor: Fillmore County
Funding: Section 319 (Grant) $299,420; CWP (Loan) $300,000
Purpose: Reduce fecal coliform levels by 20 percent, turbidity/total suspended solids by 10 percent, reduce harmful bacteria by 65 percent and sediments by 30 percent in southeastern rivers and stream within 10 years.

South Branch Whitewater River Watershed Bacteria Reduction Project - 2005
Sponsor: Whitewater Joint Powers Board
Funding: Section 319 (Grant) $174,660
Purpose: Upgrade septic systems, implement best management practices to reduce bacteria runoff, complete managed grazing plans, bring feedlots into compliance with state rules, install vegetative buffers along river corridors, and provide education and outreach.

Southeast Minnesota Milk House Wastewater Treatment Demonstration - 2004
Sponsor: University of Minnesota
Funding: Section 319 (Grant) $183,822
Purpose: Install different milk house wastewater handling systems on cooperating dairy farms for evaluation and demonstration. In southeastern Minnesota, different soils, karst conditions, topography and cultural practices drive the need for this type of research and demonstration.

Steele County Septic System Loan Program - 2004
Sponsor: Steele County
Funding: Section 319 (Grant) $66,000; CWP (Loan) $500,000
Purpose: Provide administrative and financial assistance low-interest loans for individual land owners to upgrade inadequate septic systems.

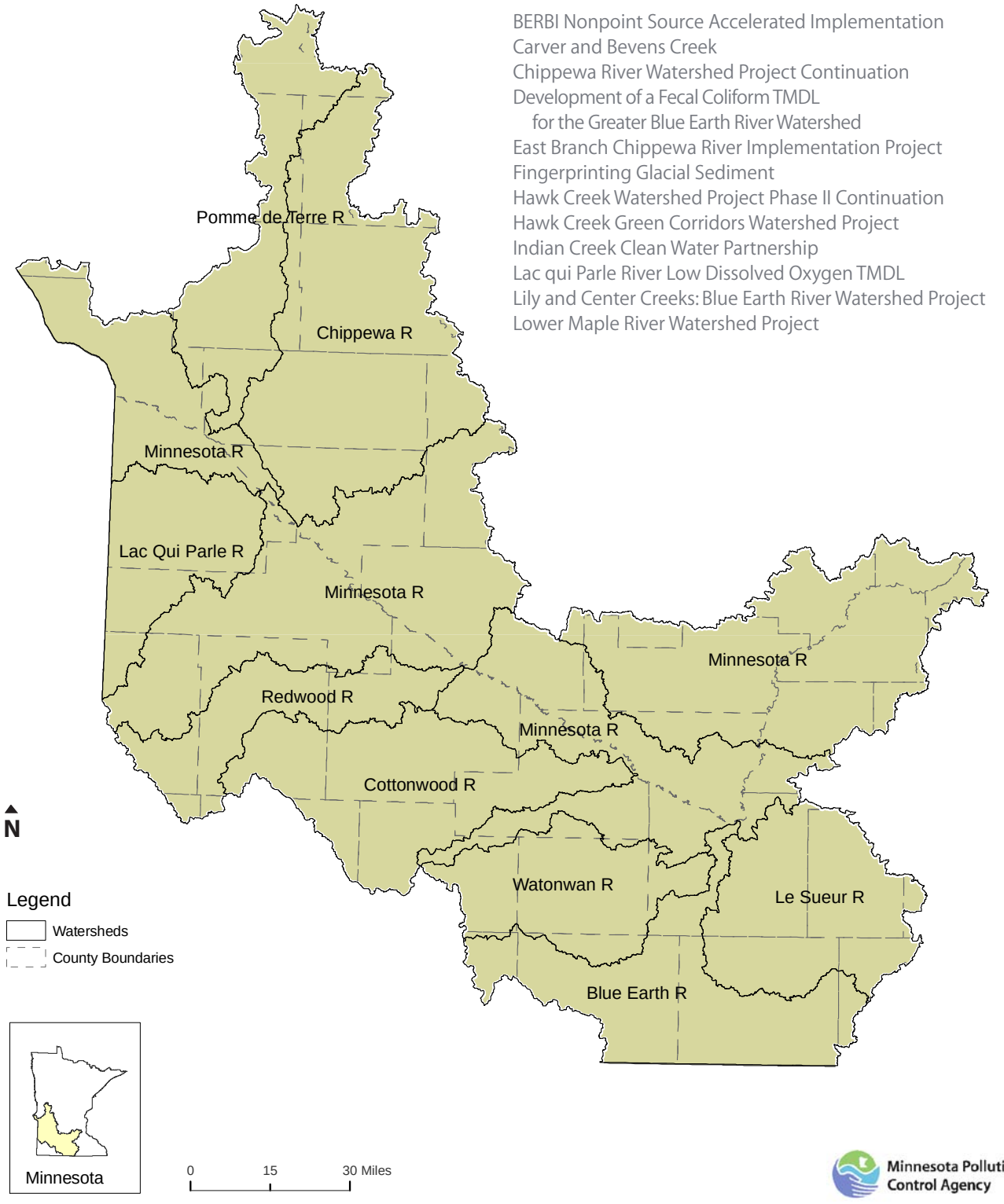
Straight River Fecal Coliform Reduction Project - 2003
Sponsor: Cannon River Watershed Partnership
Funding: Section 319 (Grant) $256,750
Purpose: Sign eligible feedlot owners to the MPCA Open Lot Agreement and develop practices that comply with 7020 feedlot rules, install 1,500 acres of buffers and filter strips per year, and promote additional best management practices to reduce fecal coliform bacteria entering the Straight River.

Targeted Feedlot Open Lot Implementation Engineering Assistance - 2006
Sponsor: Southeast Soil and Water Conservation District Technical Support Joint Powers Board
Funding: Section 319 (Grant) $300,000
Purpose: Provide engineering technical assistance and work with producers who sign up for the Open Lot Agreement.

Vermillion River and Chub Creek ISTS Inspection and Upgrade Program - 2006
Sponsor: Dakota County
Funding: Section 319 (Grant) $160,500
Purpose: Inspect individual sewage treatment systems near streams, provide incentives for improvements.

Volunteer Nitrate Monitoring Network in Target Areas Demonstration - 2005
Sponsor: Southeast Minnesota Water Resources Board
Funding: Section 319 (Grant) $275,000
Purpose: Develop and test a process for obtaining long-term trend data for nitrate occurrence in private drinking water supplies by training homeowners to sample for nitrates and ship their samples to specified county locations.

Minnesota River Basin



BERBI Nonpoint Source Accelerated Implementation
Carver and Bevens Creek
Chippewa River Watershed Project Continuation
Development of a Fecal Coliform TMDL
for the Greater Blue Earth River Watershed
East Branch Chippewa River Implementation Project
Fingerprinting Glacial Sediment
Hawk Creek Watershed Project Phase II Continuation
Hawk Creek Green Corridors Watershed Project
Indian Creek Clean Water Partnership
Lac qui Parle River Low Dissolved Oxygen TMDL
Lily and Center Creeks: Blue Earth River Watershed Project
Lower Maple River Watershed Project

Minnesota Pollution Control Agency

BERBI Nonpoint Source Accelerated Implementation

The Greater Blue Earth River Basin is located in South Central Minnesota and includes the Watonwan, Blue Earth and LeSueur River watersheds. This Blue Earth River Basin Initiative (BERBI) project accelerated implementation of conservation practices that address nonpoint sources of pollution within the basin. Accelerated implementation allows the basin to meet the objectives of Minnesota Watermarks 2000 as well as local TMDL and national Hypoxia Reduction goals.

This project employed a cost-share delivery model, established by BERBI and similar to that developed by the Board of Soil and Water Resources, to ensure efficiency and transparency in tracking implementation activities. The BERBI Nonpoint Source Accelerated Implementation project utilized this model in all areas except technical review. A joint committee of the Three Rivers Resource Conservation and Development Council, the Greater Blue Earth Basin Alliance and BERBI completed technical review of the project.

There were four main components to this project, including:

- Cost-sharing (75:25) for traditional and innovative conservation practices
- Purchasing 20-year easements to remove land from annual corn/soybean tillage and plant it to perennials (a precursor to the 3rd crop initiative)
- Providing an Agricultural Waste Pit Abandonment Training and Demonstration; and
- Coordinating implementation activities to build and strengthen alliances among government units, private sector representatives and local landowners/ operators.

The fourth activity listed is vitally important in looking toward the future and attempting to address nonpoint source issues related to agriculture. Commodity groups, private industries and agricultural producers must collaborate to develop and implement solutions. With this in mind, a small amount of local grant funding was available to build connections among other groups working on watershed issues in the basin.

Specific project goals include:

- Reducing sediment by 26,000 tons per year and phosphorous by 27,000 pounds per year over a three-year period
- Converting 150 "environmentally sensitive " acres from corn and soybeans to perennials
- Providing pit-abandonment training to local officials so they can pass information on to their constituents
- Developing partnerships among public entities, private sector representatives and landowners to accelerate adoption of agricultural Best Management Practices
- Strengthening alliances among all groups working on non point source issues in the region.

Results that count

- Completed twenty-six traditional implementation cost share projects including thirteen agricultural waste projects, five stream bank stabilization projects, four terrace/sediment blocks, three waterways, and one grade stabilization
- Completed seventeen innovative implementation cost share projects including six tile intake conversions, four

wetland restorations, four innovative stream/stream bank projects and three water storage retention projects
- Initiated seventeen 20-year easements converting 120.8 acres of environmentally sensitive land to perennial crops
- Ag Waste Pit Abandonment Training conducted by the Watonwan Soil and Water Conservation District. Fourteen local and state government officials attended the training
- The local grants initiative awarded fifteen groups a total of $ 11,974.44 to support non point source pollution objectives and community education.

Financial information
The Section 319 Grant totaled $671,250 and was matched with local cash and in-kind funding of $831,813 for a total project cost of $1,503,063.

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Carver and Bevens Creek

Carver County, located west of Minneapolis, was awarded an EPA Section 319 program grant for TMDL development in Carver and Sibley Counties between July 2003 and June 2006. The grant initially called for the creation of six draft TMDLs, but was expanded later to include four additional lakes. The grantee accomplished the project goals of both the initial and the amended work plan.

In all, the grantee completed ten draft TMDLs. The Carver Lake and Bevens Lake (which includes Silver Lake) Fecal Coliform TMDLs studies are nearly complete, the TMDLs for Eagle Lake, Miller Lake, Maria Lake and Burandt Lake are nearly complete, and the TMDL studies for Reitz Lake, Goose Lake and Hydes Lake have been submitted for EPA approval.

Results that count
The TMDL studies project produced several key benefits, including public meetings, the mapping of sub-watersheds within the county, a partnership with Sibley County on the Bevens Fecal Coliform TMDL, the submittal for de-listing Bevens Creek for chloride impairment, the STORET entry of all county surface-water data and the organization of the Reitz Lake Association.

As a result of the nearly approved Carver, Bevens and Silver Lakes Fecal Coliform TMDLs, the grantee has applied for state funding to implement the TMDL.

Financial information
The Section 319 grant amount, $243,420, was supplemented by the county's in-kind contribution that cost the equivalent of $98,000.

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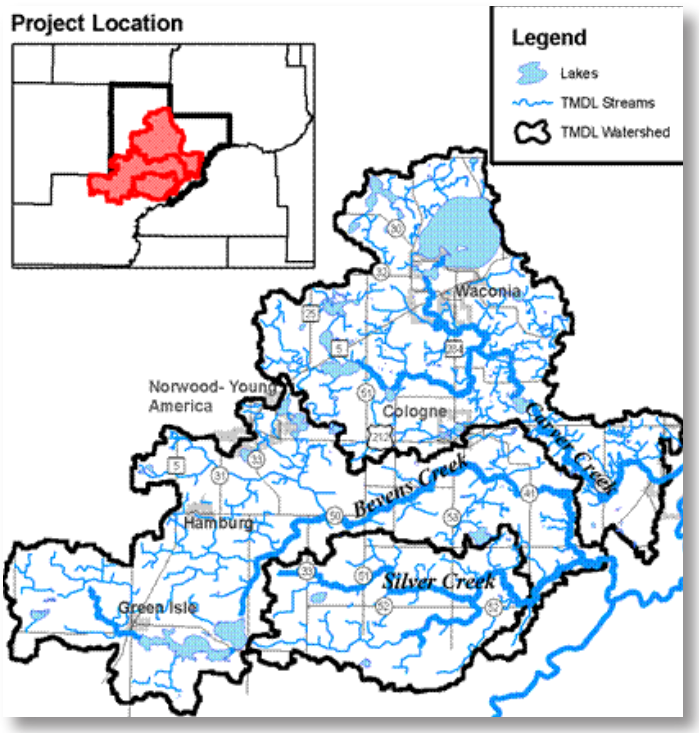

Chippewa River Watershed Project Continuation

At 2,080 square miles, or 1,331,200 acres, the Chippewa River is the largest watershed in the Minnesota River Basin. Because nonpoint source pollution is the principal determinant of water quality in the watershed, and nonpoint source pollution is dispersed, the size of the watershed substantially increases the difficulty of achieving quick, measurable results. The Chippewa River Watershed Project completed a diagnostic study and implementation plan of the entire watershed in 2001. This continuation project moved the implementation work plan forward by delineating the watershed into six major priority subbasins with grant funds for implementation projects being applied for each year systematically through the list of priority subbasins. Activities pursued include administration and fiscal management, overall continued coordination of the entire Chippewa River Watershed, continuation of the water quality/quantity monitoring program, facilitation of the local work group (composed of cooperating partners) and retention of the established citizen monitors and recruitment of additional monitors.

Major objectives

- Facilitate monthly meetings with the executive committee, supervision of CRWP staff, office management, development of the implementation plan work plan, and submission of semi-annual/annual reports
- Distribute data, project goals, objectives, information on best management practices through participation in SWCD field days, numerous conferences, county fairs, newsletters, e-newsletters, water festivals and demonstrations in schools
- Collect and analyze water quality and flow data
- Hold training sessions to recruit additional citizen monitors with nine added to the existing citizen monitoring network
- Facilitate monthly meetings with Local Work Group
- Acquire low interest loan money for septic system upgrades in Chippewa, Swift, and Pope Counties.

Results that count

- Built capacity with local elected officials and cooperating partners and landowners in the watershed
- Obtained grants for best management practices that offer solutions for increased water quality. The continued coordination of the watershed partners has led to one of the most inclusive, cohesive group of partners presently working in the Minnesota River Basin. Partnership with the MN Department of Natural Resources
- Became a partner in a Working Lands Initiative program focused on a nine section area in Pope County for removal and control of invasive species for grassland/pasture management and provide grazers support
- The funding received for the six priority subbasins and the continuation of those projects allows the Chippewa River Watershed Project to continue beyond the end date of this grant agreement
- Developed an agreement with the Southwest Initiative Foundation and began working on raising funds to create an endowment fund for the Chippewa River Watershed Project.

Financial information

$279,211 Clean Water Partnership grant, $200,000 CWP loan funds, $519,187 local in-kind, for a total project budget of $998,397.

Contact

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Development of a Fecal Coliform TMDL for the Greater Blue Earth River Watershed

Located in South Central Minnesota, the Greater Blue Earth River Basin (BERB) includes the Watonwan, Blue Earth and LeSueur Rivers. This total maximum daily load (TMDL) project focused on fecal coliform bacteria, a major pollutant of concern in the BERB. The TMDL addresses 17 impaired reaches. In addition to the 17 impaired reaches, monitoring from 2004 showed another four reaches that would be eligible for listing in 2008. TMDLs for these four reaches are included in the final report. The project also involved several smaller scale research projects, including assessment of fecal coliform sources in a minor watershed, monitoring of a straight pipe septic system, monitoring of an unsewered community and tile monitoring of agricultural fields with land-applied manure.

Data review of more than 1,250 water quality samples collected from 1995 through 2004 indicates that 100 percent of stream reaches with adequate monitoring data in the BERB qualify for listing as impaired waters. The majority of these streams require an 80-90 percent reduction in fecal coliform levels to meet surface water quality standards. Fecal coliform levels are typically highest during the summer months of June, July and August.

Livestock manure represents more than 99 percent of the fecal matter produced in the BERB. The majority (>98 percent) of livestock manure is either surface applied to, or incorporated into farm fields as a fertilizer and soil amendment. As such, the majority of fecal material that is produced in the basin is distributed on the land. Land application of this manure can be a major source of fecal coliform bacteria contamination. There are three potential pathways for fecal coliform to reach waterways from land-applied manure; 1) overland runoff, 2) open tile intakes and 3) preferential flow through soil macropores. While all three pathways generally require precipitation or snowmelt runoff, poorly timed or improper application also could lead to surface water contamination.

During low flow conditions, the primary sources of fecal coliform contamination appear to be individual straight pipe septic systems and unsewered communities. An estimated 39 percent of individual sewage treatment systems in the BERB are allowing inadequately treated wastewater into waterways. This equates to an estimated 5,500 individual sewage treatment systems. Another potential source of fecal coliform contamination, during both wet and dry conditions appears to be the stream channel itself. A portion of fecal coliform contamination from human and animal sources may

persist in the stream channel sediments for a period of time. Increases in flow during storm runoff can cause resuspension of these sediments. Even in low flow periods, fecal bacteria may be released from streambed sediments.

A significant correlation is seen between fecal coliform bacteria concentrations and stream temperature. Bacterial concentrations on average increase as stream temperature increases. A positive correlation is also seen between suspended sediment and bacterial concentrations. High total suspended solids concentrations in water usually correlate with elevated bacterial concentrations. The data indicate that strategies used to reduce erosion from agricultural fields may be effective in reducing bacterial contamination during wet periods.

Results that count

The primary result of this project is a TMDL report addressing fecal coliform impairments in the Greater Blue Earth River Basin. Specific elements of the TMDL report include:

- Conducted analysis of water quality data from the entire BERB to characterize the spatial scale, severity and seasonality of fecal coliform concentrations
- Conducted data review to identify gaps and completed additional stream monitoring in 2004
- Used/updated livestock and other inventories and ISTS statistics to assess potential bacterial sources
- Developed fecal coliform bacteria source estimates and load allocations for each impaired reach
- Initiated a stakeholder involvement process including a stakeholder committee, several open houses and development of informational materials such as a Web site and factsheets.

Financial information

This project received $179,024 in Section 319 grant funding.

Contact Information

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East Branch Chippewa River Implementation Project

The East Branch of the Chippewa River is a major tributary of the Chippewa River and covers 323,630 acres of the 1.3 million acre Chippewa River watershed. This priority subbasin of the Chippewa River Watershed is located in portions of Pope, Swift, and Kandiyohi Counties in western Minnesota. Many recreational lakes in this subbasin are being negatively affected by the East Branch Chippewa River, which flows through them. The Diagnostic Study Report and Implementation Plan identified the East Branch as the second priority management area of the Chippewa River Watershed. The study showed principal pollutant problems are high levels of nitrate/nitrites, total suspended solids, total phosphorus and fecal coliform bacteria, predominantly the result of non-point sources of pollution.

Major objectives

Objectives to reduce nutrients, sediment and bacteria were:

- Implement best management practices (BMPs) by providing cost-share incentives and technical assistance
- Establish a biomonitoring program with the students and science teachers from the high schools in the watershed
- Watershed-based education activities
- Web site development.

Objectives completed

The implementation of BMPs was accomplished with the Chippewa River Watershed Project's (CWRP) facilitation of a local work group. The local work group of cooperating partners is composed of Soil and Water Conservation Districts, Natural Resource Conservation Service, County Water Planners and Environmental Services, Resource Conservation and Development councils, the Department of Natural Resources, and citizen lake associations. The cooperating partners with the project have well established relationships with landowners throughout the watershed. This greatly increased the landowner participation in installing buffer strips, wetland enhancements, pond restorations, terraces,

livestock exclusion and feedlot management BMPs. Direct landowner contact for shoreline naturalization projects was handled by staff of the CRWP.

The biomonitoring program was created with additional help from an EPA Educational Grant that allowed CRWP to purchase the equipment for the high schools in the watershed. A two-day workshop was held to teach the high school teachers the methods of biomonitoring and techniques to incorporate them into their classes. CRWP staff conducted follow up sessions with the teachers in their classrooms and in the field to help establish regular monitoring sites and to help with identification of benthic macroinvertebrates. This component of the project is helping to build an inventory of species as water quality indicators and most importantly, it gets young people out on the river and aware of their watershed environment. This program was a huge success and the high schools are continuing to conduct biomonitoring each year.

Education activities included circulation of the project newsletter "The Citizen Connection" through the subbasin through CRWP's extensive database of landowners. The project sponsored "Coffee on the Project" at the many small town cafes throughout the watershed in the mornings when the local people gather for coffee. Information on the project, results of monitoring efforts, and solutions (such as BMP's) for improving water quality was presented to the people at the cafes.

The CRWP Web site, www.chippewariver.com, was developed and is updated monthly with information pertinent to water quality improvement, activities of the project, and links to cooperating partners' website.

Results that count

- Thirty landowners installed buffer and filter strips on 325.7 acres.
- Four landowners installed shoreline naturalization projects.
- Two wetland/pond restoration/enhancements were completed.
- Terraces were repaired for one landowner.
- One streambank stabilization project completed.
- One landowner installed fencing for a livestock exclusion and developed a feedlot management plan.
- www.chippewariver.com developed and updated monthly.
- 74 citizens were exposed to water quality and project information through "Coffee on the Project."

Financial information

Total 319 expenditures for this project were $100,518 and were matched by $367,510 in-kind from cooperating partners.

Contact

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Fingerprinting Glacial Sediment

The overall goal of this pilot project was to involve students at the University of Minnesota in the testing of methods to determine the sources of turbidity in the Minnesota River.

The program instructors had familiarity with the glacial geology of the Minnesota River Basin and the methods for geo-chemically identifying sediment. But their collaboration on a project of this nature was new. The program instructors introduced multiple methods during the course in order to allow the students to apply critical thinking skills and identify the most promising approach.

There were at least two choices for determining sources of turbidity in the Minnesota River. One option was to collect samples and geo-chemically map the entire watershed. The reference-lake approach, on the other hand, was determined to be a more economical approach.

Using the reference-lake approach, students and instructors studied the radionuclide abundance in sediment accumulating naturally in "reference lakes" to determine the best way to integrate the nature of surface erosion over time in small watersheds. Because the reference-lake approach can be economically applied in the many small, turbid watersheds in the Minnesota Basin, the project emphasis shifted during the study as mapping efforts became less important, being replaced by the interpretation of lake cores samples.

Results that count

The team is now applying the reference-lake approach identified in this pilot study to several watersheds in the Middle Minnesota and Upper Mississippi basin.

The team that was created to work on this grant continues to have a strong working relationship and two former students continue to participate in related studies.

Financial information

Total project cost was $123,642.88 in Minnesota River funding.

Contact Information

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Hawk Creek Green Corridors Watershed Project

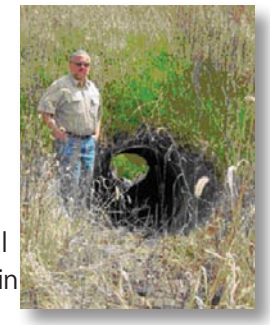
The Hawk Creek Watershed drains 623,424 acres (974 square miles). It is unique among the other major watersheds of the Minnesota River in that it is composed of a main tributary (Hawk Creek) and several other streams that flow directly into the Minnesota River. Hawk Creek originates in the lakes region of Kandiyohi County and flows approximately 65 miles to the Minnesota River. The "Green Corridors" project includes two sub-watersheds of Hawk Creek, ("Middle" Hawk Creek and Chetomba Creek) consisting of approximately 272,000 acres with a population of 7,300 residents.

Agriculture with extensive drainage is the primary land use. It is estimated that nearly 98 percent of the original wetlands in the watershed have been drained. Corn, soybeans and sugar beets are the primary crops. Livestock production includes dairy, beef, swine, and poultry. A diagnostic study found sediment and nutrients well over the 50th percentile of the Western Corn Belt Plains Eco-Region.

Twenty-two cities, towns and small villages are found in the Hawk Creek Watershed. Six major recreational lakes also lie within its borders, including significant waters such as Eagle, Long, Foot and Willmar. Additionally, several County/Regional parks and more than 15 State Wildlife Management areas dot the watershed's landscape.

Major objectives

- To involve the citizens and landowners in the identification of problem areas through a citizen monitoring network that complements ongoing watershed activities.
- To study the relationship between water quality/quantity and land use practices in the watershed.
- To integrate and coordinate the efforts of federal, state and local government agencies, schools, non-profit organizations, industry and citizens through a watershed-wide committee meeting regularly to share information and make planning recommendations.
- Buffer Strip Initiative: Provide incentive payments to encourage enrollment of 500 acres into buffer strips.
- Side Inlet/Drop Inlet Pipes: Reduce sediment and nutrient loading with goal of installing 30 projects.
- Promote use and cost share installation of alternative surface drainage systems and tile intake protection as a method of trapping sediment and phosphorus.
- Promote and cost share a variety of other special projects/BMPs that will reduce sediment or nutrient runoff in the watershed.
- Continue a strong public education program.



Objectives completed

- 31 buffer strips installed affecting 458.4 acres
- 93 side inlet/drop inlets installed on 28 projects affecting 1,892.8 acres
- 25 alternative intakes and tile intake protection projects were installed affecting 208.1 acres
- Eight special projects/BMPs were installed affecting 1,329 acres.

Results that count

Sediment and nutrient loss continue to be a major concern in the watershed. Since this project began in 2002, a total of 157 BMPs were installed affecting 3888.3 acres. BMPs provide estimated soil loss reductions of 1,370.88 tons/yr. and reduced phosphorus loading by 1896.14 lbs/yr.

Developing and maintaining cooperative working relationships is fundamental to this project. Sound, trusting relationships with agency personnel and private citizens have been used to promote BMPs and provide education opportunities throughout the watershed.

Financial information

Total CWP grant expenditures through July 25, 2006 were $106,837. Total project expenditures including in kind were $749,593.29.

Contact

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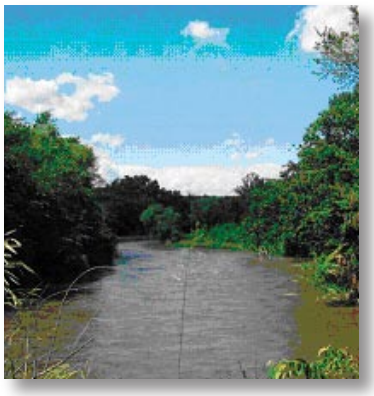
Hawk Creek Watershed Project Phase II Continuation

The Hawk Creek Watershed drains 623,424 acres (974 square miles) of land. It is unique among the other major watersheds of the Minnesota River in that it is composed of a main tributary (Hawk Creek) and several other streams that flow directly into the Minnesota River. The Hawk Creek Watershed Project includes Hawk, Chetomba, Sacred Heart, Beaver, Middle, Timms, Smith, and Palmer Creeks. Originating in the lakes region of Kandiyohi County, Hawk Creek flows approximately 65 miles to the Minnesota River.

Agriculture with extensive drainage is the primary land use. It is estimated that nearly 98 percent of the original wetlands in the watershed have been drained to increase agricultural opportunities. Corn, soybeans and sugar beets are the primary crops. Livestock production includes dairy, beef, swine, and poultry. A diagnostic study found sediment and nutrients well over the 50th percentile of the Western Corn Belt Plains Eco-Region.

Twenty-two cities, towns and small villages are found in the Hawk Creek Watershed. Six major recreational lakes also lie within its borders, including significant waters such as Eagle, Long, Foot and Willmar. Additionally, several County/Regional parks and more than 15 State Wildlife Management areas dot the watershed's landscape.



Major objectives

The ultimate goal of the Hawk Creek Watershed Project is to implement land use changes that will improve the water quality and quantity issues in the watershed while also promoting a healthy agricultural, industrial and recreation-based economy for the region.

Specific objectives:

- To involve the citizens and landowners in the identification of problem areas through a citizen monitoring network that complements ongoing watershed activities
- To study the relationship between water quality/quantity and land use practices in the watershed
- To integrate and coordinate the efforts of federal, state and local government agencies, schools, non-profit organizations, industry and citizens through a watershed-wide committee meeting regularly to share information and make planning recommendations

- Promote use and cost share installation of best management practices (BMPs) that reduce sediment and nutrient loss to the watershed
- Continue a strong public education program.

Objectives completed

- Worked with 110 cooperators cost-sharing 117 best management practices, which treated 5177.1 acres
- Maintained an active Citizen Monitoring Network of 27 participants
- Continued water sampling at the six primary sites
- Held 3rd annual public information meeting Jan. 26, 2005 entitled "Hard Water" (120 in attendance)
- Continued monthly meetings of the Local Work Group (LWG), Executive Committee, and the Watershed Public meetings
- Hawk Creek Watershed Project staff conducted and attended a variety of public informational meetings.

Results that count

Sediment and nutrient loss continue to be a major concern in the watershed. During this grant period the Hawk Creek Watershed Project has cost-shared the installation of 197 BMPs affecting 5177 acres and reducing sediment and phosphorus loss by 2302 tons/yr and 3367 lbs/yr respectively.

Developing and maintaining cooperative working relationships is fundamental to this project. Sound, trusting relationships with agency personnel and private citizens have been used to promote BMPs and provide education opportunities throughout the watershed.

Financial information

Total CWP grant expenditures through July 31, 2006 were $251,853. Total project expenditures including in kind and loan expenditures to date are $1,463,335.83.

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Indian Creek Clean Water Partnership

Indian Creek is located in Blue Earth County, partially within the Mankato city limits. The Indian Creek, Phase I, Diagnostic Clean Water Partnership (CWP) involved the City of Mankato, Blue Earth County and the MPCA. The project had three main goals:

- Determine the source of sedimentation in two specific problem areas including a flood control structure just outside the city of Mankato on Indian Lake Road and an area of Rasmussen Woods Park
- Determine the extent of pollution in the watershed
- Develop strategies to address sedimentation issues in the watershed.

The project included studies of several elements, including water quality monitoring, geomorphology assessment, urban design strategies for water quality and stormwater management. Watershed modeling was used to determine sources of sedimentation problems. Watershed modeling and engineering studies attributed the source of problem areas in the Indian Creek Watershed to erosion caused by older, ineffective storm water management systems in the watershed. There were many locations in the watershed with existing problems as well as areas just beginning to show erosion problems. The subwatershed near and including part of Minnesota State University – Mankato campus is an existing problem area.

The Indian Creek Watershed CWP involved work with the University of Minnesota Design Center for the American Urban Landscape. The Design Center worked with an undeveloped, cultivated agricultural field within an area experiencing development pressure near MSU-Mankato. The Project Team asked the Design Center to prepare innovative examples of subdivision designs to minimize development impacts on water quality. The Design Center utilized Low Impact Development (LID) techniques in the examples created for Indian Creek. The designs illustrated how combining comprehensive plans for human systems can improve water quality and quality of life for residents in new subdivisions.

The project findings and recommendations were presented to the City Council and Planning Commission at several workshops where stormwater and land development policies were discussed. At the end of the project period, the

City put many of the implementation recommendations into action and more are planned in the next five years.

Results that count

- The city of Mankato revised their set back requirements for steep slopes in order to reduce encroachment by residential development
- The city of Mankato increased their stormwater fee
- Mankato's Engineering Department will prepare a Stormwater Pollution Prevention Plan. Stream channel protection will be part of future plans
- Mankato's Community Development and Engineering Departments are working on new development policies to bring equally effective but less costly and more attractive stormwater management systems to new developments in the city. LID concepts are part of the discussion.

Financial information

The $82,042 in Clean Water Partnership funding for this project was matched with $109,740 in local cash and in-kind funding for a total project cost of $191,782.

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Lac qui Parle River Low Dissolved Oxygen TMDL

A Lac qui Parle River segment on the impaired waters list for low dissolved oxygen (DO) during low flows was further studied to confirm the low DO impairment listing. The 26-mile-long segment extends from the confluence of the West Branch and the South Branch of the Lac qui Parle River to Ten Mile creek, just upstream of the Minnesota River. The purpose was to conduct additional water quality monitoring and two longitudinal surveys with low flow conditions to collect data for a computer simulation model that will explore cause and effect relationships affecting water quality and specifically, DO concentrations. An important characteristic of the watershed is the tremendous drop in elevation, 1,070 feet from the highest point in South Dakota to Lac qui Parle Lake where the river merges with the Minnesota River. From Lac qui Parle Lake to the Gulf of Mexico there is only a 931 foot drop in elevation. Education of staff and citizens were important components of this contract.

Major objectives

- Technical support for TMDL development: Supply MPCA and consultant with necessary collected available data and information, review work products, and participate in project meetings
- Conduct additional longitudinal surveys of dissolved oxygen and other field and lab parameters
- Lead stakeholder and public participation in development of TMDL and implementation plan
- Complete the CWP-TMDL progress reports twice yearly, on February 1 and August 1.

Objectives completed

- The Draft Dissolved Oxygen Total Maximum Daily Load for the Lac qui Parle River, Minnesota was prepared by Booz Allen Hamilton, McLean VA
- A computer simulation model performed a preliminary simulation of DO concentrations along the Lac qui Parle River to facilitate future water quality management decisions
- Information was presented in different formats and styles to attract multi audiences

- Low interest loans were made available for individual sewage systems
- Treatment systems brochure
- Loan application form
- "Lake That Speaks" newspaper columns
- Water quality results from 2004 and 2005
- Photographs of citizen monitors canoe trip.

Results that count

The draft TMDL study is continuing to be edited to enhance long term water quality decisions that will increase the dissolved oxygen levels in the river. As this study is being developed, evaluations, results and reductions are not available. As the TMDL progresses, the information will be tracked and monitored. During this TMDL project, all of the partnering agencies pulled together to carry the project into the future until additional funding was obtained. The Lac qui Parle-Yellow Bank Clean Water Partnership was awarded a 319 Implementation grant to continue efforts in water quality improvement through June 30, 2009. This implementation project is targeting the South Branch of the Lac qui Parle River from near Canby to Dawson before it merges with the West Branch of the Lac qui Parle River. The focus of the grant is to increase management practices to control runoff of nutrients and soil erosion. There are several organizations working on TMDL studies for impaired water and results of this study may be helpful to them.

Financial information

TMDL development - $46,000 Section 319 grant.

Contact

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Lily and Center Creeks: Blue Earth River Watershed Project

Lily and Center Creeks are located in the Blue Earth River Watershed, primarily in Martin County, south central Minnesota. The Creeks were chosen as priority areas for an implementation project within the Blue Earth River watershed based on a 1996 Phase 1 Diagnostic Study of the Blue Earth River Major Watershed (Diagnostic report, MPCA Clean Water Partnership Project #1943) and the Minnesota Impaired Waters List. A Watershed Implementation at the Local Level (WILL) Committee used data from each of the sub-watersheds investigated in the 1996 Phase I Diagnostic Study to develop a priority list for implementation activities.

The priority watersheds were determined according to sediment data from monitoring done in 1996. The Center Creek watershed was listed on the 1998 impaired waters list for ammonia and fecal coliform. It was listed for a turbidity impairment on the 2002 list. An implementation plan for Center and Lily Creeks was completed in 2001 outlining the goals and criteria of the Center and Lily Clean Water Partnership (CWP). Overall the project focuses on agricultural best management practices (BMPs), monitoring, education and technical assistance.

Specific project goals include

- Reduce pollutant loading from non-point source pollution through targeted, planned BMPs
- Increase public awareness of water quality and water quantity issues throughout the watershed
- Integrate point source pollution management with non-point source control efforts promoted by this project and the counties and communities throughout the watershed
- Assess and evaluate the project's effectiveness through stream water quality monitoring, land use management changes, and tracking implementation of management strategies
- Improve recreational activities and wildlife for watershed residents
- Promote wise management of the riparian corridor
- Increase technical staff assistance for implementation activities and monitoring.

- Increase Blue Earth River Watershed Team's awareness of Rapidan Dam maintenance/removal issue
- Coordinate efforts with Iowa
- Coordinate and improve lake management efforts.

In 2004, the project priority area was expanded with a one-year extension. In addition to Center and Lily Creeks, the priority area now includes Dutch Creek, Elm Creek, Cedar Run Creek, the southern chain of lakes near Fairmont, and portions of the Blue Earth River main stem in Faribault County. An additional continuation was recently granted to extend the project until 2009.

Results that count

- Agricultural best management practices (BMPs): six alternative easements for a total of 38.4 acres, eighteen rock tile intake conversions replaced conventional intakes, incentives paid on ten projects for a total of 160.8 acres and an 80-acre upland planting/wetland restoration in Faribault County
- Monitoring: 28 to 40 samples collected and analyzed for each monitoring site, all collected data is on file in the Martin County Soil and Water Conservation District office and MPCA STORET database
- Geographic information systems (GIS): implementation projects digitized and documented in ArcView and ArcGIS for quick analysis and future reference, Blue Earth River Major Watershed Atlas and drainage maps created with assistance from Minnesota State University – Mankato Water Resources Center, Martin County drainage maps created
- Education: $500 grants available for schools and organizations to raise water quality awareness in area youth, citizen outreach through semi-annual newsletters and community meetings, development of and participation in various educational events including: nutrient management meetings, Envirothon, Martin and Faribault county Environmental days, MPCA citizen stream monitoring workshops, Tree days, Green Wing days, Martin and Faribault county fairs, various other local school and community events and sponsorship of a Prairie Ecology bus.

Financial information

The $415,052 Clean Water Partnership funding for this project was matched with $474, 756 in local cash and in-kind funding for a total project cost of $889,808.

Contact

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Lower Maple River Watershed Project

The Maple River watershed is located in Blue Earth and Faribault counties of south central Minnesota. The Maple River is an important major tributary to the LeSueur River. The overall length of the Maple River is approximately 80 miles, with a drainage area of 340 square miles. Land use is dominated by agriculture (85 percent), with forests, grasslands/pastures, and small urban areas making up the remainder. The human population is near 4,000.

A Phase I diagnostic/assessment project, conducted in 1996 for the Greater Blue Earth River Basin, included the Maple River Watershed and provided the background information to initiate this project. This implementation project is sponsored by Blue Earth County, with project management and leadership by the Blue Earth Soil and Water Conservation District. Faribault County conservation and environmental staff are also actively engaged in this project. A project coordinator/technician works daily with cooperating agencies and groups, and serves as the point-of-contact for watershed landowners. Numerous project committees assist the coordinator to implement a project work plan for surface water quality improvement, via conservation practice adoption. This project will continue implementation, monitoring, and educational activities through 2009.

The main goals of the project are to reduce sediment, nutrient, and bacterial pollution in the Maple River. These goals are consistent with Minnesota's water quality standards and regional values associated with the impaired waters program. The 1996 Phase I diagnostic study determined that an estimated 25 percent pollutant load reduction would be an appropriate mid-term goal.

Results that count

- Nine grassed waterways were installed to reduce soil erosion from channelized flow areas
- Twelve terrace systems were installed to reduce soil erosion on sloping crop lands in the watershed
- A cooperative project in the Blue Earth County Judicial Ditch 20 (public drainage system) subwatershed area was completed. This effort involved landowners, a private engineering firm, faculty from the Department of Applied Economics (U of Minnesota), and the county, acting as the public drainage authority. This effort assessed the current drainage system, and suggested changes and alternatives such as water storage, to improve drainage system performance and water quality
- Monitoring of water flow and pollutant load was initiated at two locations on the main channel
- Two educational sites were established for use by a variety of area public school students. Visits to the educational sites helped inform students about water quality, conservation, and wildlife habitat
- Storm drain stenciling projects were conducted in the communities of Mapleton and Amboy
- Approximately 100 total citizens attended three open house events held to promote project awareness and communication
- Ten citizen stream monitoring volunteers continue to collect important stream water quality data from sites across the watershed
- A study by MSU-Mankato of benthic macroinvertebrates (young insects that live in the stream) is underway at selected sites in the Maple River watershed.

Financial information

The Maple River project is supported by in-kind contributions of approximately $650,000 from more than ten groups and additional cash support from Blue Earth County. A Clean Water Partnership implementation grant of $533,000 has also supported the project.

Contact

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Projects Currently Active in 2007 in the Minnesota River Basin:

Blue Earth River Channel Modifications and Nutrients in the Blue Earth River Basin - 2006
Sponsor: University of Minnesota
Funding: $296,060 Section 319 grant
Purpose: Advances the work begun by the Blue Earth River Basin Initiative to reduce levels of sediment, turbidity, and nutrients in the river to meet the goals of the Total Daily Maximum Load being developed for the basin.

Carver County Turbidity and Excess Nutrients TMDL Project - 2005
Sponsor: Carver County
Funding: Section 319 (Grant) $179,800
Purpose: Monitor, model and develop land use data to identify potential pollutants in order to develop total maximum daily loads for turbidity and excessive nutrients.

Chippewa County Watershed Project Continuation - 2004
Sponsor: Chippewa County
Funding: CWP (Grant) $279,211, CWP (Loan) $250,000
Purpose: Fund staff members, continue information and education on best management practices with watershed students and residents, continue maintenance of the water-quality monitoring network and continue agricultural best management practices, urban best management practices in stormwater management, upgrading individual septic systems and manure management.

Cottonwood River Watershed Phosphorus Reduction Project - 2005
Sponsor: Redwood-Cottonwood Rivers Control Area
Funding: Section 319 (Grant) $290,000
Purpose: Upgrade septic systems, restore stream banks and create grassed waterways, terraces and sediment control basins.

Cottonwood River Restoration Project BMP Implementation Continuation - 2004
Sponsor: Redwood-Cottonwood Rivers Control Area
Funding: CWP (Grant) $161,942
Purpose: Continue implementation activities, including outreach to the watershed community, education on watershed best management practices, stream bank restoration, agricultural and urban stormwater best management practices, continuing water-quality monitoring and data analysis and ongoing project administration.

Cottonwood River Restoration Project Continuation - 2004
Sponsor: Redwood-Cottonwood Rivers Control Area
Funding: CWP (Grant) $500,000; CWP (Loan) $1,400,000
Purpose: Continue implementation activities, including outreach to the watershed community, education on watershed best management practices, stream bank restoration, agricultural and urban stormwater best management practices, upgrade septic systems, continuing water-quality monitoring and data analysis and ongoing project administration.

Dry Weather/Lines/Spring Creek Sub-basin of the Chippewa River - 2006
Sponsor: Chippewa County
Funding: $264,100 Section 319 grant, $300,000 CWP loan
Purpose: Reduce nutrients, sediment and bacteria through tree plantings, nutrient and residue management, alternative tile intakes, septic system improvements, and nutrient insurance.

East Branch Chippewa River Continuation Project - 2006
Sponsor: Chippewa County
Funding: $175,000 CWP grant, $135,000 loan
Purpose: Provides continued water-quality monitoring and data analysis, upgrading of individual septic systems, and cost-share or incentive programs for buffer strips, shoreline naturalization projects, livestock exclusion, nutrient management, residue management, wetland restoration, water and sediment control basins, grassed waterways, streambank restoration/erosion control, terraces, and alternative tile inlets. Education activities to heighten awareness of local water quality, pollution, and proper BMPs will continue.

Expansion of the "Red Top" Farm Demonstration Concept - 2004
Sponsor: Minnesota Department of Agriculture
Funding: Section 319 (Grant) $87,000
Purpose: Obtain year-round quantification of nutrient and pesticide losses from the fields under different best management practices and scenarios.

Greater Blue Earth River Watershed BMPs Focus on the Big Cobb - 2006
Sponsor: Greater Blue Earth River Basin Alliance
Funding: $299,988 Section 319 grant, $100,000 loan
Purpose: Hire staff and provide cost-share for installation of conservation practices to reduce phosphorus and sediment.

Greater Yellow Medicine River Phase II Project Continuation - 2004
Sponsor: Yellow Medicine River Watershed District
Funding: CWP (Grant) $251,608; CWP (Loan) $625,000
Purpose: Continue water quality monitoring, data analysis, project administration, local education activities, and implementation of agricultural best management practices such as nutrient management, filter strip construction, conservation easements and cost-share with other conservation programs.

Hawk Creek Watershed Project TMDL -- "Land of the Lost" - 2003
Sponsor: Renville County
Funding: Section 319 (Grant) $169,680
Purpose: Ensure sound agricultural drainage practices, make extensive use of conservation tillage, buffer strips, metered tile intakes, blind tile intakes and soil-conserving cover crops.

Hawk Creek Watershed Project - 2006
Sponsor: Renville County
Funding: $300,000 Section 319 grant, $900,000 loan
Purpose: Implement practices to reduce phosphorus: Promote alternative tile intakes, improve septic systems, develop ditch buffers, urban storm water management, and education.

Hawk Creek Watershed Project -- Beaver Tales - 2004
Sponsor: Renville County
Funding: Section 319 (Grant) $174,137
Purpose: Provide financial incentives to landowners for appropriate land-use decisions and best management practices which will correct and prevent water pollution.

Hawk Creek Watershed Project -- Hawk TMDL - 2004
Sponsor: Renville County
Funding: Section 319 (Grant) $247,509
Purpose: Provide financial incentives to landowners to implement conservation practices that will reduce the impacts of non-point source water pollution on the creek.

High Island Implementation Project - 2003
Sponsor: Sibley County
Funding: Section 319 (Grant) $136,422; CWP (Grant) $163,428; (Loan) $826,000
Purpose: Implement education activities and best management practices, such as nutrient and manure management plans, spring nitrate testing, open tile intake alternatives, cover crops, feedlot waste management, noncompliant septic system upgrades, structural practices, vegetative practices and monitor for results.

Interpreting a Century of Sediment in Redwood Lake - 2006
Sponsor: Redwood-Cottonwood Rivers Control Area
Funding: $89,140 Section 319 grant
Purpose: Redwood Lake is filled with up to 27 feet of sediment that has accumulated behind the dam in Redwood Falls, and has been proposed for dredging and restoration. This project will sample the sediment to help analyze the long-term impacts of land use on water resources.

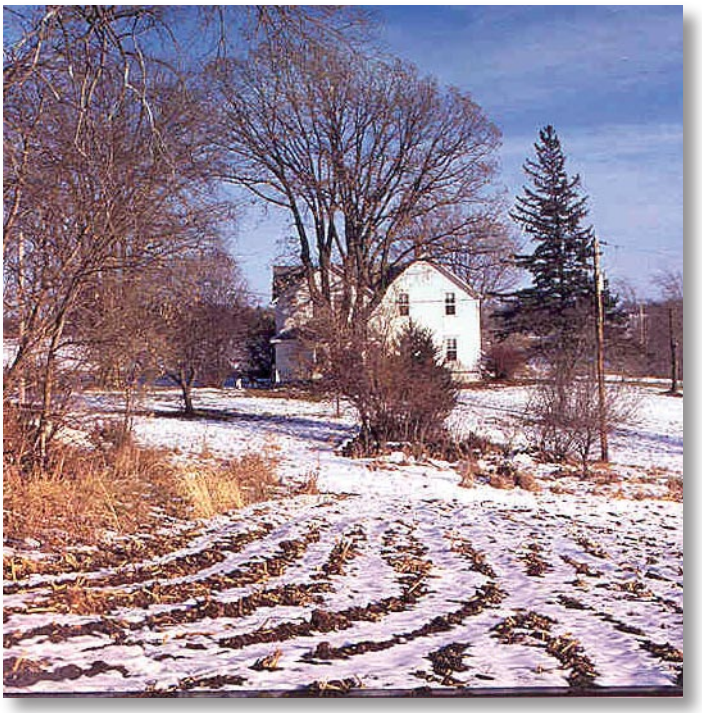
Lac qui Parle River Main Stem Water Quality Enhancement Effort - 2005
Sponsor: Lac qui Parle-Yellow Bank Watershed District
Funding: Section 319 (Grant) $298,000
Purpose: Implement best management practices, including upgrade of individual septic treatment systems

Lake Shaokatan TMDL Project - 2004
Sponsor: Yellow Medicine River Watershed District
Funding: Section 319 (Grant) $62,804
Purpose: Monitor, assess, model and develop land use data to identify potential pollutants in order to develop a total maximum daily load for excess nutrients.

Lake Shaokatan Continuing Restoration Project Continuation - 2004
Sponsor: Lincoln County
Funding: CWP (Grant) $50,000; CWP (Loan) $100,000
Purpose: Continue to assess, provide assistance and upgrade septic systems and monitor to assess the upgrade impact.

Lily And Center Creeks - Blue Earth River Clean Water Partnership - 2006
Sponsor: Martin County
Funding: $450,000 CWP grant, $300,000 loan
Purpose: This continuation project expands the activities of the original Center and Lily Creeks implementation project. Two technical positions are funded to promote all the conservation programs available to the Blue Earth Watershed and to assist with cost-share programs such as grassed waterways, filter strips, sediment control basins, tile intake buffers or conversions, alternative easements, and easements through Conservation Reserve Programs and EQIP. Septic-system upgrades are another part of this project. The grant also provides funds for water-quality monitoring and data analysis to assure effectiveness of improvements and get a better understanding of nonpoint-source water pollution in the area. Education activities such as newsletters, an annual canoe trip, community education classes, the Ecology Bus, and special projects that schools provide their students will continue.

Lincoln County/Redwood River Watershed Management Project Continuation - 2005
Sponsor: Redwood-Cottonwood Rivers Control Area
Funding: CWP (Grant) $310,000; CWP (Loan) $440,000



Purpose: Continue urban and stream bank best management practices implementation, monitoring, outreach, evaluation and project administration.

Little Cottonwood River Restoration Project Continuation - 2005
Sponsor: Brown, Nicollet and Blue Earth Counties
Funding: CWP (Grant) $157,696, CWP (Loan) $150,000
Purpose: Continue funding staff positions responsible for targeting, marketing, creating relationships and enrolling environmentally sensitive agricultural lands into state and federal programs. Nutrient management demonstrations, EQIP funding for polluting feedlots, and upgrading noncompliant septic systems are also priorities for this project. Continued watershed monitoring, data analysis, maintaining an interactive watershed Web site, newsletters, and other educational efforts will round out the work of this continuation.

Lower Main Stem Chippewa River Sub-basin - 2003
Sponsor: Chippewa County
Funding: Section 319 (Grant) $170,860
Purpose: Provide incentive programs for best management practices, including buffer strip initiative, nutrient and residue management, livestock exclusion, alternative tile intakes and special projects; document and track the best management practices installed and provide technical assistance and cooperation from an extensive group of watershed partners.

Lower Maple River Watershed Project - 2006
Sponsor: Blue Earth County
Funding: $474,100 CWP grant, $100,000 loan
Purpose: Funding for this project will be used for cost-share in installing rock inlets, grass buffers, terraces, waterways, sediment basins, harvestable buffer strips, crop residue management, nutrient management, septic-system upgrades and other technical assistance. This grant will also fund continued water-quality monitoring, data assessment and macroinvertebrate sampling, and will continue information and education activities, especially for appropriate BMPs and education for tomorrow's water-quality stakeholders.

Pomme de Terre River Fecal Coliform TMDL Project - 2003
Sponsor: Pomme de Terre Watershed District
Funding: Section 319 (Grant) $41,584
Purpose: Monitor, model and develop land use data to identify potential pollutants in order to develop a total maximum daily load for fecal coliform.

Redwood River Watershed Phosphorus TMDL Compliance Project - 2003
Sponsor: Redwood-Cottonwood Rivers Control Area
Funding: Section 319 (Grant) $290,000
Purpose: Provide information and education, encourage implementation of best management practices on agricultural land, develop one-on-one landowner contacts, provide technical assistance and cost-share for installing conservation practices.

Research Project to Develop the Greater Blue Earth River Basin Turbidity TMDL - 2003
Sponsor: University of Minnesota
Funding: Section 319 (Grant) $179,925
Purpose: Begin process of monitoring, modeling and development of land use data to identify potential pollutants in order to develop a total maximum daily load for turbidity.

Rush River Implementation Project - 2005
Sponsor: Sibley County
Funding: Section 319 (Grant) $95,440
Purpose: Complete a TMDL for fecal coliform and reduce bacteria, sediment, and nutrient levels through best management practices implementation.

Seven Mile Creek Watershed Project Continuation - 2005
Sponsor: Brown, Nicollet and Cottonwood Counties
Funding: CWP (Grant) $225,812; CWP (Loan) $395,000
Purpose: Continue information, education and outreach, water quality monitoring and assessment, best management practices promotion and implementation and project administration.

Seven Mile Creek Glacial Sediment Fingerprinting - 2006
Sponsor: Brown-Nicollet-Cottonwood Water Quality Board
Funding: $84,930 Section 319 grant
Purpose: Determine what portion of sediment and nutrient pollution in Seven Mile Creek is due to such natural processes as stream-bank erosion.

Shakopee Creek Headwaters Project - 2004
Sponsor: Kandiyohi County
Funding: Section 319 (Grant) $217,863
Purpose: Promote conservation practices that target water-quality improvement and flood reduction through education and incentives and encourage active landowner participation in developing strategies that create a sustainable environment.

Shakopee Creek Headwaters Project Continuation - 2005
Sponsor: Kandiyohi County
Funding: CWP (Grant) $254,346; CWP (Loan) $200,000
Purpose: Continue information and education, water quality monitoring and evaluation, best management practices promotion and implementation and project administration.

Upper Main Stem Chippewa River Implementation - 2004
Sponsor: Chippewa County
Funding: Section 319 (Grant) $164,210; CWP (Loan) $200,000
Purpose: Implement a buffer strip initiative, the Filters for the Future Initiative, septic inspection fee, livestock exclusion projects, manure testing, shoreline naturalization site installation, the Alternative Tile Intake Initiative, sediment basins, terraces, wetland restoration and other best management practices.

Watonwan River Major Watershed Implementation Plan Continuation - 2004
Sponsor: Watonwan County
Funding: CWP (Grant) $256,820; CWP (Loan) $500,000
Purpose: Implement agricultural best management practices for nutrient management, stream bank stabilization, channel restoration, drainage inventory, residue management, water retention, upgrade individual septic treatment systems, ongoing monitoring and data analysis and education activities.

Minnesota River Basin Projects Awarded in 2007

Section 319 Projects

Blue Earth Basin Small Community Stormwater Management Project
Sponsor: Faribault and Martin Counties
Funding: $91,000
Purpose: This project will concentrate on small, non MS4, communities within Faribault and Martin Counties where a need has been identified to assist small communities with improved stormwater management. The success of this project will be demonstrated through proactive and voluntary prevention and protection actions, and will be measured through the implementation and promotion of cost effective alternative stormwater strategies and solutions.

Carver, Bevens and Silver Creek Watershed Fecal Coliform TMDL Implementation Plan -
Sponsor: Carver County
Funding: $300,000
Purpose: Carver, Bevens, and Silver Creeks have been placed on Minnesota's list of impaired waters (303d) for fecal coliform. The goal of the TMDL is to quantify the pollutant reductions needed to meet the water quality standards for fecal coliform. An implementation plan was developed to achieve the state standard for fecal coliform. The top priorities are to update, identify, and bring into compliance up to 100 direct discharge ISTS's, install 26 miles of buffer strips, install 80 alternative tile intakes, and write 15 manure management plans.

Cottonwood River Watershed Non-Point Pollution Reduction Project
Sponsor: Redwood-Cottonwood Rivers Control Area (RCRCA)
Funding: $300,000
Purpose: The goal of this project is to continue best management practice implementation according to the Cottonwood River Phase I Implementation Plan approved in 1999 and implement phosphorus reducing conservation practices that will help achieve the Lower Minnesota River dissolved oxygen TMDL. This work plan is projected to reduce phosphorus reaching the Minnesota River by 3.47 tons annually or 2,776,064 pounds of aquatic plant growth annually (plus 2,504.41 tons of sediment).

Lower Minnesota River Low Flow Dissolved Oxygen TMDL
Sponsor: Redwood-Cottonwood Rivers Control Area
Funding: $150,000
Purpose: The implementation phase of this project will facilitate watershed land-use changes that will lead to reductions necessary to meet state goals. The locally developed implementation plans for the Redwood River and the Cottonwood River were created to direct restoration activities in the watersheds until individual TMDLs are created and approved. The goal of this project is to continue best management practice implementation according to the Phase I Implementation Plans and implement phosphorus reducing conservation practices. This work plan is projected to reduce phosphorus reaching the Minnesota River by two tons annually or 1,601,200, pounds of aquatic plant growth annually (plus 2,354.70 tons of sediment).

Red Rock Lake Watershed BMP Project
Sponsor: Douglas Soil and Water Conservation District
Funding: $25,350
Purpose: Red Rock Lake is a shallow 708 acre lake located in Douglas County, west of Alexandria. This project will attempt to reduce nutrient loading and fecal coliform levels in the Red Rock Lake watershed. Funding will be made available to livestock producers within the watershed for fencing, alternative water sources, and reseeding degraded shoreline. Priority will be given based on the proximity to the lake, current farming practices, and risk potential of contributing fecal coliform, sediment, and/or phosphorous to the water body.

South Branch of the Yellow Medicine River TMDL Fecal Coliform Reduction Project
Sponsor: Yellow Medicine River Watershed District
Funding: $238,500
Purpose: The South Branch of the Yellow Medicine River is impaired for swimming. A study revealed frequent violations of state water quality standards for fecal coliform bacteria. The fecal coliform concentrations within this reach of the Yellow Medicine River pose an unacceptable health threat to human body contact recreation. The goal is to reduce the fecal coliform concentrations to healthy levels.

Yellow Medicine Watershed Dissolved Oxygen Project
Sponsor: Lyon Soil and Water Conservation District
Funding: $31,150

Purpose: One significant water quality threat in the Minnesota River Basin is phosphorus, which encourages algae growth that results in lower dissolved oxygen levels. Here, 14% of the phosphorus comes from the runoff from agricultural cropland. During low-flow conditions, there is little rainfall and most rainwater soaks in rather than running off the land. Although large reductions of phosphorus from this source cannot be achieved, our project will work to install practices such as sediment control basins and buffer areas along water courses to improve the water quality.

Clean Water Partnership Projects

Chippewa River Lower Main Stem Sub-basin Implementation Project Continuation
Sponsor: Chippewa County
Funding: $499,998 grant, $375,000 loan
Purpose: This project provides continued water-quality monitoring and data analysis, upgrading of individual septic systems, cost-share or incentive programs for buffer strips, shoreline naturalization projects, livestock exclusion, nutrient management, residue management, wetland restoration, water and sediment control basins, grassed waterways, streambank restoration/erosion control, terraces, and alternative tile inlets. Education activities to heighten awareness of local water quality, pollution, and proper BMPs will continue.

Crystal, Loon Mills Implementation Program
Sponsor: City of Lake Crystal
Funding: $210,500
Purpose: This implementation project targets phosphorus transport reductions from the watershed to the lakes by implementing agricultural best management practices, such as wetland stabilizations, buffer strips, open tile intake alternatives, nutrient management, cover crops for canning ground, shoreland stabilization and promoting septic system upgrades for non-compliant systems. Effectiveness monitoring will assess changes in water quality. Education-based activities will include workshops, tours, demonstrations, newsletters, brochures, surveys and displays that focus on residue management, tillage practices, nutrient management and manure management.

Little Chippewa River Implementation Project
Sponsor: Chippewa County
Funding: $298,515 grant, $300,000 loan
Purpose: Funding for this project will be used to install agricultural best management practices, including shoreline naturalization/stabilization, j-hook stream barbs, sediment blocks, cattle exclusion, grass buffers/filters, nutrient/manure management, grassed waterways, terraces, ag waste management systems, wetland restoration, alternative tile inlets, stormwater practices, septic-system upgrades, and other technical assistance. This grant will also fund continued water-quality monitoring and data assessment and will continue information and education activities, especially for appropriate BMPs.

Middle Minnesota Watershed Implementation of Conservation Practices and Effectiveness Monitoring
Sponsor: Brown, Nicollet, Cottonwood Water Quality Joint Powers Board
Funding: $269,720 grant, $500,000 loan
Purpose: This project involves three objectives. The first objective will assist local landowners to implement targeted best management practices by funding a technical service representative and conservation liaison. Targeted best management practices include Conservation Reserve Enhancement Program and Conservation Reserve

Program practices, wetland restorations, septic system upgrades, conservation tillage and alternative crops. Objective two will continue effectiveness monitoring of the recent conservation practices. The final objective will develop and compare conservation targeting tools for the watershed, in order to determine the most efficient strategy for implementing conservation practices.

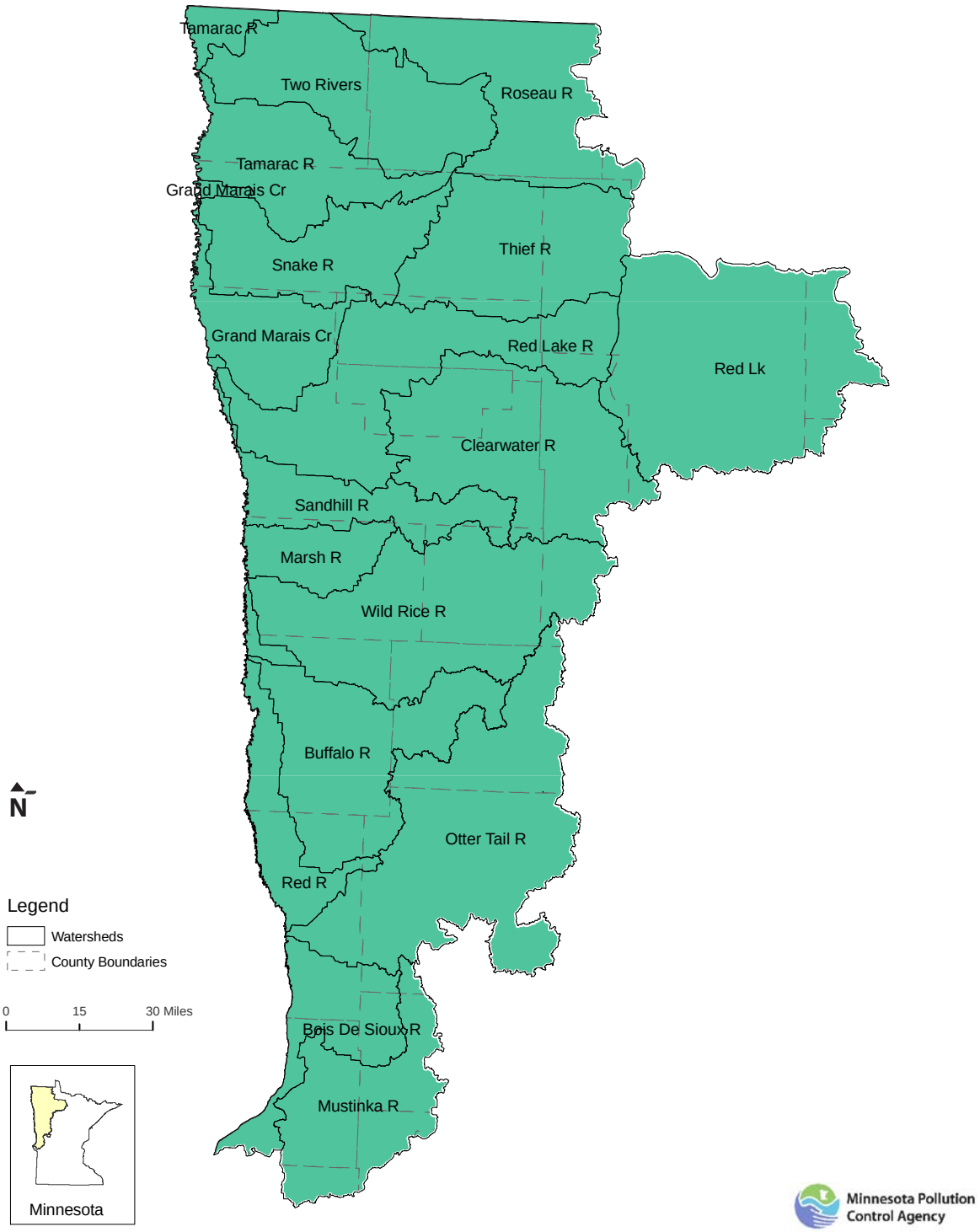
Redwood River Watershed Phosphorus TMDL Compliance Project Continuation
Sponsor: Redwood-Cottonwood Rivers Control Area
Funding: $400,000 grant, $900,000 loan
Purpose: This project continues current activities for water quality monitoring and assessment, upgrading non-compliant individual septic systems, providing cost share funds and technical assistance for agricultural best management practices and other conservation practices. It will also coordinate information and education activities.

Sand Creek Watershed TMDL and Impaired Waters Resource Investigation
Sponsor: Scott County Watershed Management Organization
Funding: $277,150
Purpose: This project will compile watershed information, such as land cover, feedlot locations, geomorphology, drained wetland inventories, erosion surveys, collect two years of water quality data, develop water quality models and complete a diagnostic study and implementation plan for Sand Creek.

Upper Cannon Assessment Project
Sponsor: Le Sueur County
Funding: $184,588 grant
Purpose: This is a diagnostic study which will include monitoring selected stream sites for flow and water quality parameters, in-lake monitoring, aggressive educational components, GIS mapping, a point source inventory and stormwater monitoring. In addition, an implementation plan will be developed to understand the water pollutant sources, identify priority areas and develop strategies and activities for improvement of the water quality in the Upper Cannon River watershed.

Red River Basin

Buffalo-Red River Watershed District Water Quality Demonstration Project
Detroit Lake Water Quality Improvement Nutrient Reductions



Buffalo-Red River Watershed District Water Quality Demonstration Project

The Red River of the North and its major tributaries flow through a very flat, wide valley that is exceptionally prone to flooding. Tributaries along the Minnesota side of the valley experience a steep grade change before they flow across the flat bed of Glacial Lake Agassiz and join the river. The grade change can lead to sedimentation problems in the channel beds, which reduces their ability to handle high-water conditions.

The goal of this project was to find a way to predict a tributary's sediment yield and identify when a channel bed is at risk for losing its capacity to withstand flood conditions.

The Buffalo-Red River Watershed district, working through Houston Engineering Inc., asked St. Anthony Falls Laboratory to create a model for predicting the risk of such sediment/flooding problems. They targeted a typical tributary, the South Branch of the Buffalo River, near Moorhead, MN.

Results that count

St. Anthony Falls Laboratory successfully developed and tested a sediment prediction model (called annAGNPS) specific to the watershed. This model will now be applied to tributaries throughout the Buffalo-Red River Watershed District.

Financial information

The MPCA awarded the Buffalo-Red River Watershed District a Section 319 grant for $45,158 in 2004. The district provided matching funds. In 2007, the district received a second grant to extend the work throughout the watershed.

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Detroit Lake Water Quality Improvement Nutrient Reductions

The 3,000-acre Detroit Lake is a haven for water sports enthusiasts, featuring an abundance of fishing in summer and winter. However, excessive phosphorus from upstream has been degrading water quality, calling for actions to reduce episodes of phosphorus loading from the Rice Lake Wetland and from agricultural and urban runoff.

The Pelican River Watershed District requested and received funding to implement the Detroit Lake Water Quality Improvement Nutrient Reductions Project Phase II. A CWP grant has provided partial financial assistance for project administration as well as support for the specialized wetland monitoring to assess the effectiveness of proposed phosphorus-control best management practices (BMPs).

The district has applied for a project continuation to construct a Rice Lake Wetland impoundment.

Goals for this project are:

- Develop and implement BMPs to reduce phosphorus loading and improve the overall water quality of Detroit Lake and its watershed area
- Maintain the lake in a healthy, trophic state
- Make these changes while also promoting the recreation-based economy of the region
- Support increased public education and outreach on this issue.

This complex project is a testimony to the value of cooperative working relationship among a variety of stakeholders, including federal, state, and local agency personnel, experts from Arkansas and Florida, Natural Resource Conservation Service (NRCS), the Board of Soil and Water Resources, and the Becker Soil and Water Conservation District.

Results that count

- Rice Lake Wetland Phosphorus Source Study was completed, including mapping of areas within the wetland, a groundwater influence study, and feedlot phosphorus study
- Livestock fencing and watering facilities constructed
- Farm field erosion control measures implemented
- Urban BMPs developed
- Environmental Assessment Worksheet and nonpoint source assessment completed
- District adopted stricter stormwater treatment rules and implemented permit system
- District entered into a memorandum of understanding to assist the city of Detroit Lakes with stormwater management
- Successful public awareness campaign included formation of Citizen's Advisory Committee, and presentations to public official and citizen stakeholders
- Alternative nutrient reduction recommendation submitted to Pelican River Watershed District Annual Summary.

Financial information

Of the $50,000 CWP grant, $12,500 was spent as of mid-2006. Only part of the grant funds was used due to delays that made it impossible to construct the necessary BMPs within the grant timeframe. However in-kind grant matches allowed the project to meet many of its goals. Total project costs (including in-kind expenditures) stand at $311,449.

Contact

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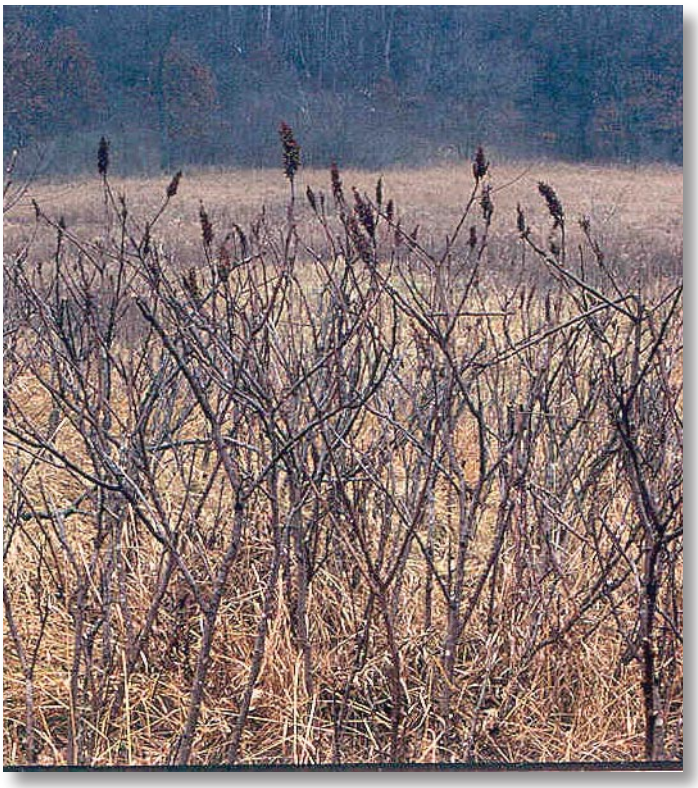
Projects Currently Active in 2007 in the Red River Basin

Red River Basin Buffer Initiative - 2003
Sponsor: Red River Basin Commission
Funding: Section 319 (Grant) $236,250
Purpose: Implement buffers and wetland restorations through a targeted approach.

Detroit Lake Water-Quality Improvement Nutrient Reductions – 2006
Sponsor: Pelican River Watershed District
Funding: CWP Award: $50,000 (grant,) $450,000 (loan)
Purpose: Enhances educational activities, monitoring, and data analysis in the watershed. Emphasis will be on nutrient and sediment reductions, identifying methods, treatment options, designs and implementation. Sites will be determined for grazing and feedlot management practices, stormwater treatment, biomass reductions, and aquatic plant management. Cost-share incentives will be provided for shoreline restorations and improved erosion and sediment control.



Red River Basin Projects Awarded in 2007

Section 319 Projects

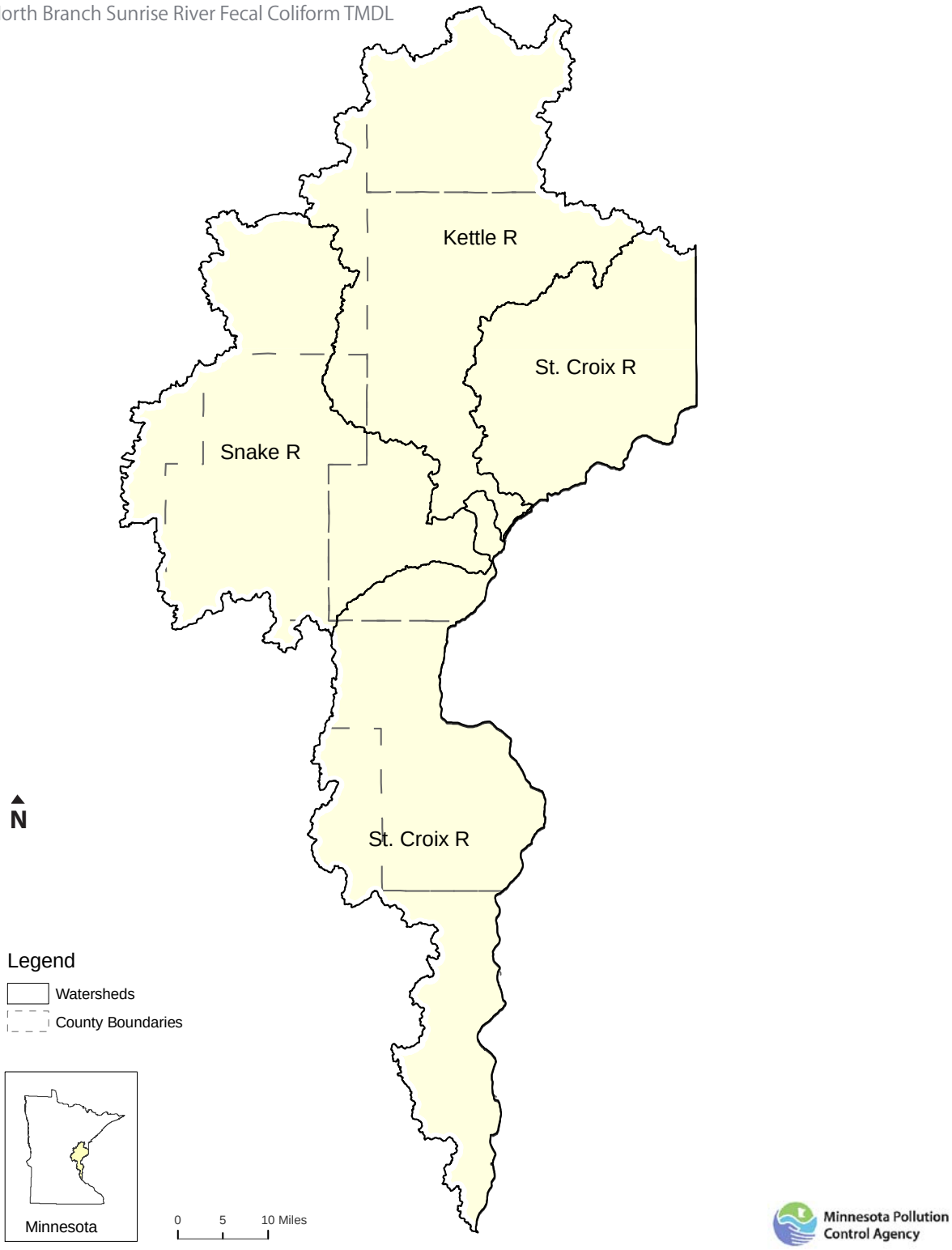
Buffalo Red River Watershed Sediment Modeling for BMP Implementation
Sponsor: Buffalo Red River Watershed District
Funding: $30,940
Purpose: Under a current Section 319 grant, a computer model, the annualized Agricultural Non-Point Source Model (annAGNPS), was developed for estimating the amount of sediment leaving the landscape, reaching the waterways, and accumulating in the South Branch of the Buffalo River. The focus of this proposed study is to expand upon the work. The annAGNPS computer model will be used to develop sediment water quality goals, and practical measures to achieve these goals, for the entire BRRWD.

Clean Water Partnership Projects

Thief River Watershed Sediment Investigation (Red River)
Sponsor: Red Lake Watershed District
Funding: $96,500
Purpose:This study will perform investigative water quality, sediment and flow monitoring, as well as data analysis, at up to 11 sites to diagnose the impact of hydrologic modification, other anthropogenic and natural factors influencing water quality in the Thief River watershed. This study will also develop a diagnostic study and implementation plan to address impairments discovered in the watershed.

St. Croix River Basin

North Branch Sunrise River Fecal Coliform TMDL



North Branch Sunrise River Fecal Coliform TMDL

The beautiful North Branch of the Sunrise River has its headwaters near Weber in Isanti County and joins the main stem of the Sunrise River near Hay Creek in Chisago County. The North Branch is listed as impaired for primary-contact recreation and swimming. More than two decades of data have frequently shown excessive levels of fecal coliform bacteria in these waters, especially during times of increased flow due to rainfall.

The Minnesota Pollution Control Agency partnered with the Chisago County to complete a TMDL study of the river, with support from a U.S. Environmental Protection Agency (EPA) Section 319 program grant. Since completion of the study, the partners have developed and implemented plans to correct the problem. In addition to Chisago County, local partners include the Chisago Soil & Water Conservation District, Isanti County and the city of North Branch.

The study looked at all significant sources of fecal coliform and allocated loading capacity among point sources (such as treatment plants) and nonpoint sources. They determined that a 52 percent, watershed-wide reduction in fecal coliform would be necessary to comply with the state's water quality standards.

The strategy to reduce fecal coliform was outlined in the TMDL study and developed in an implementation plan that identified specific measures to correct the problem. The plan establishes a timeframe of five to ten years to put the solutions in place. An EPA grant, matched by cash and in-kind contributions from local partners, will provide continued support to implement control practices among local landowners. In the meantime, the river will be monitored to determine compliance with water quality standards.

Results that count

- TMDL study was completed
- Treated wastewater from the city of North Branch was not a major source of fecal coliform. Nonpoint sources, like unregulated livestock facilities, pastures near the river and poorly functioning individual sewage treatment systems, were the main sources of this pollutant

Financial information

The North Branch study was funded by a $64,721 Section 319 grant from the EPA; of that grant amount, staff spent $62,891.

Contact

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Projects Currently Active in 2007 in the St. Croix River Basin

Groundhouse River TMDL Project, Phase 1 - 2004
Sponsor: Kanabec County
Funding: Section 319 (Grant) $19,118
Purpose: Monitor, assess, model and develop land use data to identify potential pollutants in order to develop a total maximum daily load for fecal coliform.

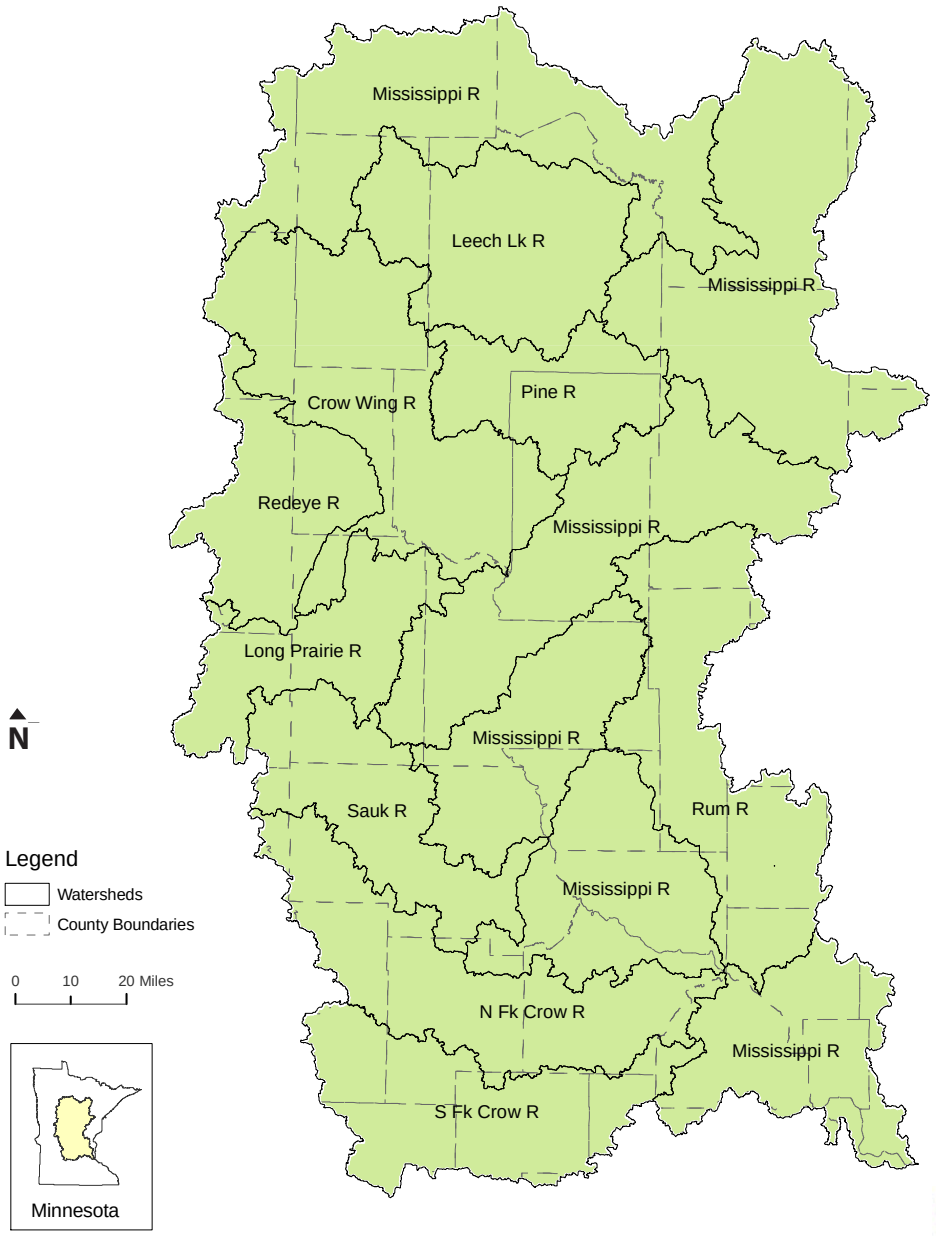
Groundhouse River TMDL Project, Phase 1, year 2 - 2004
Sponsor: Tetra Tech, Inc.
Funding: Section 319 (Grant) $93,700
Purpose: Complete monitoring, assessment, modeling and development of land use data to identify potential pollutants in order to develop a total maximum daily load for fecal coliform.

Snake River Watershed Enhancement Project - 2003
Sponsor: Snake River Watershed Management Board
Funding: Section 319 (Grant) $23,957; CWP (Grant) $226,043; CWP (Loan) $100,000
Purpose: Bring into compliance agricultural feedlots and septic systems, protect shoreline against erosion, restore lakeshore with native vegetation, exclude livestock from streams, protect stabilized stream banks, reduce nutrient and sediment loading, write forest stewardship plans for private forest land, produce a semi-annual newsletter and provide education about ways to protect and improve the water quality while at the same time promoting cost-share programs and project activities.

Valley Creek Repair and Rehabilitation Program - 2005
Sponsor: Valley Branch Watershed District
Funding: Section 319 (Grant) $150,000
Purpose: Develop education and outreach activities, and address severe gully erosion sites, stream bank erosion sites, and roadway sites.

Upper Mississippi River Basin

Beauty Lake Monitoring
Big Sandy Area Lakes Watershed Management Project
Crow River Water Quality Data Enrichment Project
Dairy Milk House Wastewater Treatment Demonstration
Lambert Creek Water Quality Improvement Project
Long Prairie River Implementation Project Phase II
Long and Spring Lakes Restoration Project (Phase II Continuation)
Lower Sauk River Fecal Coliform TMDL Study
Manure Management Within Ecologically Sensitive Areas
Middle Sauk River Rehabilitation Project
Osakis Lake Watershed Management Project Phase III
Sauk Lake Storm and Surface Water Resource Investigation
Shingle Creek Phase II
Springbrook Sub-watershed Implementation Project
Upper Mississippi River Source Water Protection Project
Whitewater Watershed "Paired-Watershed" Monitoring Project



Big Sandy Area Lakes Watershed Management Project

MPCA priority project goals were addressed through the cooperative efforts of numerous project partners. Efforts to reduce nutrient levels in Big Sandy Lake by reducing nutrient inputs from tributary and shoreline sources were undertaken. Wastewater treatment, shoreline management, agricultural practices, and education of watershed landowners were all addressed through efforts funded by this grant.

One of the greatest strengths of the Big Sandy Area Lakes Watershed Management Project is the partnerships that have been built. Working together, partners have been able to accomplish many goals that would have been unattainable as individuals or individual organizations. Direction to the project is given by volunteer members of the Big Sandy Area Lakes Watershed Management Project Executive Council. Having the local citizens and units of government working together to improve water quality has proven to be a very successful means of reaching common goals.

Specific project goals

- Cluster septic system feasibility studies
- Parcel inventory, Big Sandy Lake
- Educational presentations
- Water quality monitoring
- Fencing - livestock exclusion

Results that count

The Cluster Septic System Studies generated some interest among lakeshore owners. The cost estimates (higher than anticipated) earned people's attention, and drew their interest to this topic. The landowners on Prairie Lake proceeded furthest toward installation of a cluster system, although in the end, costs became prohibitive. It is the hope of the Big Sandy Area Lakes Watershed Management Project committee that this was a good first step in addressing this topic.

Cluster Septic System Feasibility Studies included:

- Sensitive septic system area maps
- Parcel inventory - Big Sandy Lake
- STORET summary of water quality data collected
- Public outreach and education – several presentations were given throughout the area promoting the project.

Financial information

The Section 319 Grant totaled $32,500 and was matched with local cash and in-kind funding of $66,601 for a total project cost of $99,101.

Contact

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Beauty Lake Monitoring Program

Until 1999, the shores of Beauty Lake in Hubbard County were completely undeveloped. Then the lake was platted for a 30-lot residential development; within a year, all the lots were sold and construction began. The situation afforded a unique opportunity to track the impact development has on lake water quality.

The Hubbard County Environmental Services Office and the Hubbard Soil and Water Conservation District asked the Minnesota Pollution Control Agency (MPCA) for help monitoring the lake to track any changes in its water quality, shoreline characteristics or overall ecology. The project became a cooperative effort between the MPCA, Bemidji State University, and Hubbard County. Project management is provided by Bemidji State University Faculty and the MPCA.

Goals for this project are:

- Collect historical data to serve as a baseline for future monitoring and trend analysis
- Survey aquatic vegetation
- Evaluate water quality parameters
- Evaluate sedimentation rate.

The results of the research show that:

- Species diversity and richness is relatively high, with no evidence of water quality disturbance
- Beauty Lake ranged from oligotrophic to low mesotrophic in 2006, depending on the season and the parameters analyzed. This is consistent with the survey of aquatic vegetation
- Water quality measures, including water temperature profiles, dissolved oxygen concentration, pH, specific conductance, and Secchi disk transparency, were similar in 2000 and 2006.

- Water quality and zooplankton abundance varied among sampling dates, indicating the need for repeated sampling during the ice-free period to gain a comprehensive view of lake conditions
- Beauty Lake has very steep slopes, making a case that the typical types of development should not have been allowed in this watershed. Extreme erosion is a major concern. Calculations show that based on the assumption of the 30 lots being divided into 55 pieces, the lake will fill with sediment much more quickly. Instead of taking 37,000 years for the lake to fill naturally, it may take only 370 years (moderate case) or 93 years (worst case).

Project staff recommends that changes in the lake be carefully followed during coming years. Considering that abrupt changes in trophic status can occur, they recommend that water quality and zooplankton monitoring be conducted annually throughout the major construction period. Also, after development is complete, an occasional monitoring schedule of approximately every five years should be maintained. This ongoing research would detect the potential effects of fertilizer runoff or shoreline alteration.

Results that count

- Lake data from 2000 and 2004 collected and evaluated, resulting in a baseline data set that will be replicated in the future to track trends
- Aquatic vegetation survey conducted in August 2006
- Water quality parameters measured
- Sedimentation rate studied and projected.

Financial information

The total budget for this project is $20,000 from the state environmental fund.

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Crow River Water Quality Data Enrichment Project

The Crow River Data Enrichment Project exceeded its goals and met its deliverables. The project has helped demonstrate that overall knowledge and appreciation of the Crow River has increased throughout the watershed. The lower portion of the Crow River Watershed, including the main stem was placed on the state 303d Impaired Waters list in 2002 for Fish IBI and turbidity and in 2004 for fecal coliform. The project served as a precursor to TMDL work that was scheduled to begin in 2006. The project had two program elements; water quality monitoring, and information and education.

Specific project goals

- Water Quality Monitoring: Data gathering and water quality monitoring conducted under the Crow River Organization of Water (CROW) diagnostic study ceased in 2003. The project allowed monitoring on selected sites and further refined data that was collected during the diagnostic study. Data collection during the project will help avoid a gap in data prior to necessary TMDL work
- Information and Education: The CROW will work closely with local agencies and organizations to ensure that information gathered during this study is incorporated into public awareness and education. Getting area landowners to understand the direct cause and effect relationship that exists between land use and runoff water quality and quantity is the key to the success of this project.

Results that count

- CROW conducted water quality monitoring on five sites near the Main Stem of the Crow River. Grab samples were taken and analyzed for baseline parameters: TP, TSS, NO3, BOD and E.Coli. Minisonde measurements were taken for DO, temperature, pH, conductivity and turbidity. Bridge down measurements were taken to estimate flow patterns
- CROW submitted data to MPCA in December 2006 in a STORET compatible format

- CROW collaborated with the Upper Mississippi River Source Water Protection Project (UMRSWPP). The UMRSWPP conducted a time of travel study on the Crow River. The study evaluated times of potential contamination spills in tributaries and in the Mississippi River
- CROW established a regular meeting schedule with the "Technical Committee" consisting of Local SWCDs NRCSs, Water Planners and Environmental Offices
- CROW produced a series of paper and electronic digital maps of the Crow River Watershed
- CROW maintained its website and scheduled regular Joint Powers Board meetings to effectively convey technical information and current projects
- CROW was selected to take part in a three day training program developed by Minnesota Waters. The purpose of the training was to develop, expand or improve citizen monitoring programs
- CROW sponsored their 3rd Annual Crow River Clean Up Day. More than 280 volunteers participated in ten communities throughout the watershed. More than six tons of trash was removed from the river and its tributaries
- CROW continued to work with a grass roots community group in Hutchinson called the South Fork Crow River Association
- CROW collaborated with three other watershed organizations to organize and host the second annual "Earth Day Celebration"; 400 people attended the event
- Winsted Lake Association signed up to conduct a stormdrain marking campaign around Winsted Lake
- CROW participated in the Crow River Sustainable Agriculture Group's first annual "Garlic Festival"
- CROW created a newsletter and electronic newsletter called E-Currents
- CROW recruited five new volunteers into the Citizen Stream Monitoring Program
- CROW and Middle Fork Crow River Watershed District received a grant to expand and enhance lake and stream volunteer monitoring in the Crow River Watershed
- CROW presented information on water quality and the River Watch Program at the Wright SWCD 5th Grade Educational Field Days
- CROW loaned out the equipment used in the River Water Program to Wright County Parks Department and 7th grade class in Hutchinson, MN.

Financial information

The Section 319 TMDL grant totaled $50,000 and local match of $53,338.47 was provided for a total project cost of $103,338.47.

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Dairy Milk House Wastewater Treatment Demonstration

The purpose of this EPA Section 319 project was to demonstrate and evaluate three types of milk house wastewater treatment systems on eight farms in Carver and Wright counties. The systems needed to be effective in a cold climate and comply with state and federal regulations. A collaborative team guided and funded the research. Performance, cost, and management results of the study were distributed to milk producers, product engineers, University of Minnesota Extension educators, and technical staff.

Installation costs for the alternative systems varied from $6,000 to $15,400. Five of the eight alternative systems had aerobic treatment units. Two systems used bark beds and the remaining system was an irrigation system. For the study, more than two years of milk house water flow data was collected at each site. Data collected included milk house water use, milk house wastewater characteristics, and treatment system effectiveness.

The collaborative team found the aerobic systems worked well overall, but one system was later replaced with a bark-bed system. The two bark-bed systems worked well, too, but the single gravity-fed bark system was operating poorly and was replaced with a pressurized version. Irrigation systems worked well over the course of the study, when the size of the irrigation area was calibrated to the nutrient loading and the soil's ability to uptake those nutrients.

Results that count

Summaries and educational materials on the alternative systems were completed and made available to Soil and Water Conservation Districts and National Resource Conservation Service offices as well as every county feedlot officer in Minnesota.

Three technical papers based on the work done for this project were prepared and presented at international meetings. Project team members fielded numerous technical questions from across Minnesota, the US and even internationally, regarding the milk house wastewater treatment systems evaluated in the study.

The project team members assisted in the draft and review of a NRCS design standard (719) for milk house wastewater treatment systems.

Financial information

The EPA Section 319 program project grant funding of $192,852 was matched by cash contributions of $206,792. Cash contributions to the project were received from all of the cooperating producers and Bongaards' Creameries, Bevens Creek Watershed, Crow River Watershed, Carver County BWSR, Carver County, and the Wright County SWCD. All funds were expended by the end of June 2006.

Contact

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Lambert Creek Water Quality Improvement Project

Between June 2002 to June 2007, the Vadnais Lake Area Water Management Organization completed projects that will cut down the level of phosphorous that Lambert Creek delivers to Vadnais Lake in Vadnais Heights. Vadnais Lake is the reservoir for the St. Paul Water Utility, which serves 400,000 drinking-water customers in eight communities.

Lambert Creek's contribution to Vadnais Lake water quality degradation is significant, and a 50 percent reduction of phosphorus from this source is necessary to meet the Vadnais Lake phosphorus-reduction goals.

In 2005, researchers monitored river flow and chemical composition, but overall, the Lambert Creek watershed has been intensively monitored and the phosphorus loading patterns and the subsequent lake response are relatively well understood. These patterns remained consistent for the grant period.

In order to reduce phosphorous, Vadnais Lake Area Water Management Organization partially restored the Rice Lake, Grass Lake and Lambert Lake wetlands.

Results that count

To restore the wetlands, the water management organization constructed a 530-foot low-head weir (a small, overflow dam) with adjustable notches to distribute flows to the greater wetland without raising the current 100-year frequency flood elevation. The weir contains a 1.7-acre pond with a depth of four feet to act as a stilling pool and to disperse the flow into the greater wetland. More than 2,200 feet of county ditch was filled and an overflow channel was constructed. A small berm was constructed along the length of this filled portion of the ditch and a permanent 600-foot, Class 5 utility road provides access to the site.

Other work required for the construction of these features included clearing and grubbing, post-construction wetland restoration, installation of a flotation silt curtain during construction, installation of rip rap at critical outfalls, soil borings, and the purchase of easements.

All the projects outlined in the grant were completed in spring 2006.

Financial information

The CWP grant amount of $390,000 was supplemented with $550,423 in matching funds for a total of 940,423.

Contact

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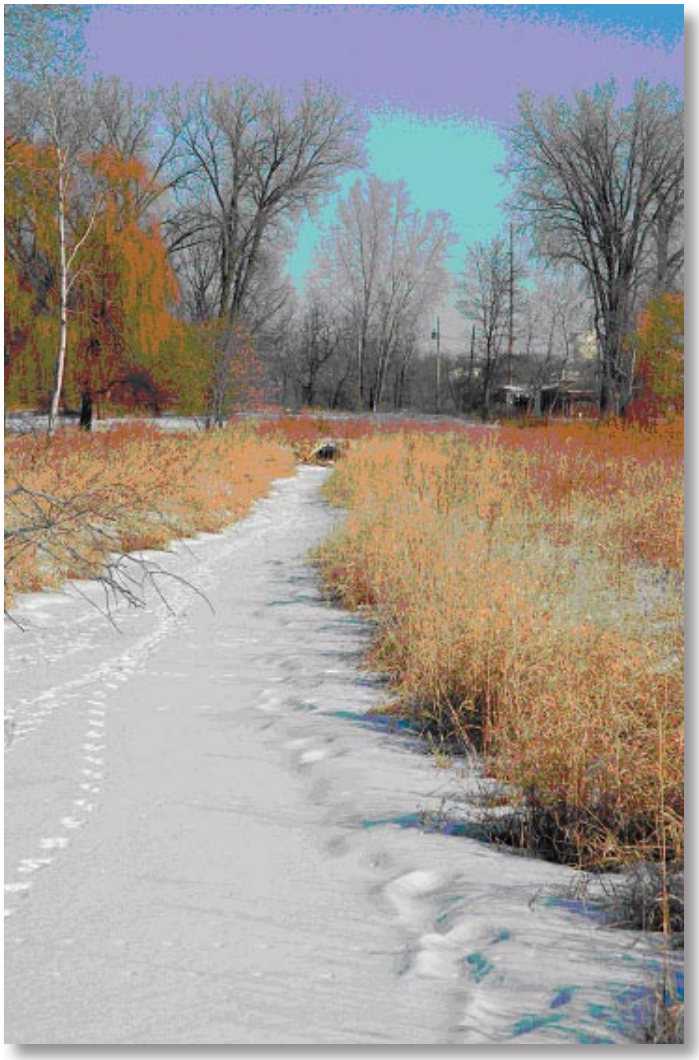

Long Prairie River Implementation Project Phase II

The Long Prairie River and its nearly 900 square mile drainage basin are located in central Minnesota, covering most of Todd County with contributing areas from Douglas, Morrison and Ottertail counties. The river begins as an oligotrophic stream with excellent transparency, low nutrient content and little sediment being generated from its source at Lake Carlos. However, the river immediately receives impacts from a wetland area located generally below Carlos, as measurable increases in nutrients and a repeating pattern of dissolved oxygen depletions have been noted.

Specific project goals

Land use changes and attitudes about the future of the Long Prairie River have changed significantly. Point sources were determined to be the major problem, and through the cooperation of MPCA and the permitting process, most have made changes to improve the quality of their discharges. Reductions of non-point source pollutants are also making improvements. Buffers and cover crops are becoming standard practices, erosion control projects and improved tillage methods are being used, nutrient management practices are in place, and landowners are much more aware of the river and their impact on it. Native grasses are being planted with many different types of tree plantings to restore the canopy along the river banks and on the steep slopes adjacent to the river valley. The LCMR project has started working with landowners to develop Nitrogen reduction practices in the sand plain areas. Perhaps the biggest change is that now the Long Prairie River has become a valuable resource to be preserved and protected. There is a long way to go to restore it to an un-impaired state, but progress is being made on all fronts.

Results that count

- One of the first feedlot filter strip projects located in Todd County
- Two pasture management and rotational grazing projects, one where cattle have been fenced out of Moran Creek have been completed. A Pasture Field Day was held at this location on August 8, 2006
- 11 Nutrient management and waste utilization plans completed
- One complete ag waste storage facility built
- Four abandoned ag waste ponds have been properly closed
- Two water and sediment basin projects
- One stream bank erosion control project that used three stream barbs to control erosion
- 14 landowners have used no-till equipment
- 26.1 acres of forest riparian buffers
- 15.5 acres of field windbreaks
- 173.8 acres of wildlife habitat improvement
- 436.1 acres of trees, shrubs and native grasses planted in declining habitat areas
- 183 acres of trees and shrubs planted for reforestation and windbreaks
- Three abandoned, unused wells have been sealed.

Financial information

A Clean Water Partnership grant of $300,000 was supplemented with a local match of $662,762 for total project funding of $962,762.

Contact

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Long and Spring Lakes Restoration Project (Phase II Continuation)

Meeker County, located about one hour west of Minneapolis, received Clean Water Partnership funds to finish studying and fixing water quality problems in Spring and Long Lakes.

In previous studies, Meeker County, the Dassel Area Environmental Association and the City of Dassel determined that non-point sources were contributing to poor water quality.

The City of Dassel had implemented several best management practices to improve the quality of stormwater entering the lakes. The city increased street-sweeping frequency from eight to 17 times each year, adopted city-wide yard waste management rules and enforcement of those rules. The Meeker County Soil and Water Conservation District addressed the problems of gully erosion, highly erodible land and cattle access restriction in the northeast corner of Long Lake. Also, Dassel installed three stormwater treatment units in the city's storm sewer system.

This grant was a CWP "Phase II Continuation" grant to continue implementation of BMPs. The City of Dassel and Meeker County provided in-kind labor and cash to complete the projects during the Phase II Continuation.

Results that count

All of the previously implemented best management practices were continued during this CWP Phase II continuation grant period. Especially noteworthy is that the majority of the CWP Phase II and the CWP Phase II continuation grant funds were used to purchase stormwater treatment units that remove oil and sediment from storm water in the city storm sewer system prior to entering Spring Lake.

Because the watershed was already urban and there was not open space for above ground sedimentation basins, Vortechnics brand stormwater treatment devices were installed.

These units were cleaned twice a year and yielded 28 to 42 cubic yards of debris in 2006. In 2006, ramped-up street sweeping gathered 510 to 680 cubic yards debris.

The level of awareness, with respect to surface water drainage patterns and their pollutant contributions to Long and Spring Lakes, was raised. Better yard waste management was also promoted and mandated as needed during all the projects.

Financial information

CWP Grant amount: $67,020; Actual matching cash: $64,079; Actual in-kind contribution: $29,371. Total project cost: $160,470.

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Lower Sauk River Fecal Coliform TMDL Study

The Sauk River Watershed is about 1,040 square miles within the Upper Mississippi River Basin in central Minnesota. It stretches from east of Alexandria to Sauk Rapids where it enters the Mississippi upstream from St. Cloud. The lower Sauk River region is the last 20-mile river stretch from Cold Spring to the mouth near Sauk Rapids.

Agriculture is a key industry in the watershed and it has given Stearns County national recognition as one of the top dairy-producing counties. Fecal coliform levels are a concern since Stearns County has 1,500 registered feedlots within the Sauk River Watershed, of which about 160 feedlots are located in the Lower Sauk River area. This area is also one of the most rapidly growing regions of the state, so development along sensitive water resources and the effects of urban stormwater runoff is also a worry.

These concerns led to the Lower Sauk River Diagnostic Study which began in 2005. The study area encompassed the watershed that drains into the 20-mile portion of the Sauk River from the Cold Spring dam on the west end to the Mississippi. It was a partnership between the Sauk River Watershed District, Barr Engineering, and a Minnesota Department of Health-certified lab.

Goals for this project are:

- Complete the diagnostic study with thorough testing for fecal coliform levels, sediment loading and phosphorus levels
- Develop a plan for continued monitoring
- Suggest best management practices for improving water quality.

Results that count

- Monitoring results for Mill Creek show that one of the major sources of fecal coliform contamination may have been corrected at the end of 2005 as part of the implemented best management practice; however, there may be additional sources. Septic sources may represent a secondary cause of impairment
- The project consultant recommended continuing the monitoring program that was used during 2005 with additional emphasis farther upstream, particularly within the two major tributaries of Mill Creek. Volatile suspended solids should also be added to the suite of water quality parameters to assist with further defining the sources of suspended solids
- Flow measurements should be taken at the Grand Lake outlet and Mill Creek main stem subwatershed to further define the magnitude of contributions to any fecal coliform impairment
- Preventing additional sediment and phosphorus concentrations delivered to the Sauk River will protect and/or maintain its current water quality, as well as enhance fish and aquatic habitats. Techniques to improve water quality and protect habitat include: upgrading substandard septic systems; stabilizing eroding riparian areas; restoring riparian areas to a more natural state; and maintaining or improving the current land use within the watershed.

Financial information

This project was funded with Section 319 and state match funds in the amount of $51,879.

Contact

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Manure Management within Ecologically Sensitive Areas

The area of concern is livestock producers and landowners located in and near Ecologically Sensitive Areas in Stearns County. These areas include wellhead protection areas and drinking water supply management areas, designated lakesheds and shoreland areas, lands identified on Minnesota County Biological Survey Maps, Watershed Management Districts, "Special Protection Areas", and coarse textured soils. Stearns County has approximately 2,900 livestock operations with 2,000 of these having 300 animal units or less. Proper manure management and storage was targeted to enhance or sustain surface and groundwater quality throughout the county. Additional BMP promotion and education and awareness campaigns of the feedlot rules accelerated adoption and implementation of BMPs.

Incentives were made available to encourage livestock producers to work with a Certified Crop Adviser (CCA) in developing a manure management plan (MMP).

Other cost share funds were made available to correct feedlot pollution problems (producers with less than 999 animal units) and soil erosion for landowners. Additional educational and technical information about feedlot rules and corrective actions were made available to livestock producers with 999 animal units or less in order to meet the requirements set forth by County and State Rules.

Specific project goals

- 100 manure management plans (MMP) were to be developed. A one-time incentive of a $500 payment was made available to livestock producers applying manure within or near Ecologically Sensitive Areas. The producers developed a MMP in cooperation with a Certified Crop Advisor (CCA). Producers received $500 after the CCA developed plan was approved by the ESD and SWCD. Priority was given to operations with 300 animal units or less. Operations between 300 and 999 animal units were given second priority
- Enroll approximately 1,000 livestock producers into the Open Lot Certification Program (OLCP). Nearly

550 producers have signed up for OLCP. A recent MPCA/BWSR Open Lot Technical Assistance grant will accelerate technical assistance to producers in Stearns County and other counties in the Central Minnesota Technical Service Area (Stearns, Todd, Morrison, Benton, Sherburne, Wright, McLeod, and Meeker counties)

- Leverage Section 319 grant funds to provide additional assistance to livestock producers and landowners resulting in five feedlot pollution abatement systems and five erosion control conservation practices.

Results that count

- Twenty feedlot animal waste control facilities were constructed
- Additional improvement from each producer developing a comprehensive nutrient management plan and educational workshops will result in further reduction in pollutants
- The Stearns County Environmental Services has identified and prioritized additional livestock producers with pollution potential. The 36 unpermitted manure storage basin investigations resulted in 23 failing to meet the MPCA specifications. These producers will be targeted in the future with technical and financial assistance
- The seven erosion control projects resulted in a 272 ton/yr reduction in soil loss.

Financial information

The Section 319 Grant totaled $490,000 and was matched with local cash and in-kind funding of $964,493 for a total project cost of $1,454,493.

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Middle Sauk River Rehabilitation Project

The Middle Sauk River Rehabilitation Project was established to address the water quality concerns of the middle section of the Sauk River from the outlet of Sauk Lake on the northern end to the inlet of the Sauk River Chain of Lakes on the southern end. The minor watersheds that make up this area include Getchell Creek, Unnamed Creek, Stoney Creek and Adley Creek.

Getchell and Stoney Creeks were identified as nutrient contributors to the Sauk River during the MPCA 1985 Limnological Study. The Middle Sauk River Rehabilitation Project had defined specific objectives which focused primarily on reducing sediment from eroding riparian areas and cropland, runoff from farm sites and leachate from septic systems. The implemented BMPs are considered cost effective improvements especially if benefits are assessed over a twenty-year time period.

Specific project goals

The objective of the project was to work with area landowners to address the water quality concerns of the Sauk River and tributaries and assist them in implementing best management and conservation practices to reduce the nutrient concentration levels within these waters of concern. This rehabilitation project had a three year implementation plan designed to address pollution contribution in the Sauk River and its four primary tributaries. Priority was given to feedlots, vegetative buffer strips, riparian erosion issues, and septic concerns.

Results that count

- Animal Waste Control Facilities: Fourteen landowners completed their feedlot abatement projects within the Middle Sauk River watershed
- Abandoned Wells: One landowner properly abandoned three of their irrigation wells using the Minnesota Department of Health guidelines. By properly closing these wells, groundwater contamination is prevented
- Manure Application Equipment: One landowner utilized the SRF loan program to purchase a knife-injecting manure spreader. The immediate incorporation of the manure helps prevent nutrient runoff from his fields

- Abandoned Manure pits: One landowner properly abandoned an ag-waste storage structure using the MPCA guidelines. Properly closing this structure prevents groundwater contamination from leaching nutrients
- Shoreland Restoration: Two major shoreland restoration projects were completed on the Sauk River. More than 40,000 square feet of shoreline was restored to native vegetation
- Stormwater: The local boy scouts, with assistance from the Sauk River Watershed District (SRWD) and the City of Melrose, made local residents aware of stormwater runoff concerns by installing 400 brightly colored storm drain markers along the street curbs
- Septic Systems: The SRWD worked with thirteen landowners to update their septic systems
- Stoney Creek Study: The SRWD contracted with Inter-Fluv Inc. to conduct a ground-truthing study on land use changes in the Stoney Creek watershed and the effects these changes have made on water quality and quantity
- Education Classes and Seminars: The SRWD staff used education funds to increase their knowledge on water monitoring and data analysis
- Monitoring: The purpose of the monitoring program conducted during this project was to determine the water quality and quantity of tributaries entering the Sauk River and track the runoff rates in different areas.

Financial information

The Clean Water Partnership grant totaled $294,064 and was matched with local cash and in-kind funding of $500,000 for a total project cost of $794,064.

Contact

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Osakis Lake Watershed Management Project Phase III

Osakis Lake is a large, popular, recreational water body located in central Minnesota, bordered by the City of Osakis, and is the headwaters of the Sauk River. The water quality of Osakis Lake sets the stage for the overall water quality of the Sauk River which directly impacts the water bodies downstream.

Osakis Lake is a major economic asset to this region of the Sauk River watershed. Water quality degradation can be expected to detract from the economic values that this lake provides unless strong efforts are made to reverse the declining water quality. The primary focus for the Osakis Lake Watershed Management Project is to prevent Osakis Lake from further degradation and to improve its current condition.

Specific project goals

The objective of this ongoing watershed management project is to work with area landowners and city council members to address the water quality concerns on Osakis Lake and assist them in implementing best management and conservation practices to reduce the nutrient concentration levels in Judicial Ditch 2, Clifford and Faille Lake, Osakis Lake and the intermittent tributaries. This phase of the Osakis Lake Watershed Management Project had a three year implementation plan designed to address pollution contribution in Osakis Lake and its tributaries. Priority was given to feedlots, erosion issues, shoreland and stormwater concerns.

Results that count

- Animal Waste Control Facilities: Three landowners completed their feedlot abatement projects within the Osakis Lake watershed
- Abandoned Manure pits: Six landowners properly abandoned their ag-waste storage structures using the MPCA guidelines. By properly closing these structures, groundwater contamination from leaching nutrients was reduced
- Shoreland Restoration: Seven shoreland restoration projects were completed of which three were part of the Osakis Lake Demonstration project. More than 30,000 square feet of lakeshore was restored to native vegetation. In addition, two rain gardens were installed at the Miller point site
- Storm Water: The Sauk River Watershed Districe (SRWD) joined efforts with the City to address the undersized stormwater pond located on King's Street. The expanded storm water retention basin was designed to remove sediment and debris washed down from streets and parking lots on the west side of the city before it enters Osakis Lake
- Sediment Reduction Project: The SRWD and project partners installed a two cell retention basin designed to remove more than 50 percent of the sediment transported through the ditch system prior to discharging to Osakis Lake
- Alum Treatment Project: The SRWD hired Barr Engineering and Sweetwater Technology to apply Alum and Lime to these lakes to sequester the suspended solids and phosphorus within the water column and trap it in the lake bottom
- Septic System Upgrades: The SRWD worked with twelve landowners to update their septic systems. Each landowner received a septic system maintenance guidebook to assist in proper management of their systems
- Education Classes and Seminars: The SRWD staff used education funds to increase their knowledge on water monitoring and data analysis
- Research Projects: To get a better understanding of Lake Osakis and its watershed, the SRWD worked with three consulting firms to research different aspects of Osakis Lake. Wenck and Associates, Inc. were hired to do dissolved oxygen profiling to determine potential internal phosphorus loading
- Monitoring: The purpose of the monitoring program conducted during this Phase III implementation project was to track the effectiveness of the watershed management efforts and to provide a better understanding of the non-point source pollution entering Osakis Lake.

Financial information

The Clean Water Partnership grant totaled $365,000 and was matched with local and in-kind funding of $418,934 for a total project cost of $783,934.

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Sauk Lake Storm and Surface Water Resource Investigation

Sauk Lake is located in both Todd and Stearns County and is bordered by the City of Sauk Centre. A dam on the Sauk River, which flows through the lake, controls water levels. The lake has a heavily developed shoreline and a predominately agricultural watershed, which along with internal loading from runoff and excessive curly leaf pondweed decomposition has a degrading effect on the lake's water quality. During the summer, excessive algae blooms are common which greatly impair the recreational value of the lake. Mechanical weed harvesters are employed throughout the summer to manage the overabundance of aquatic vegetation and to open a channel within the lake to allow for adequate navigation.

Specific project goals
The water quality characterization goal is to determine the extent of degradation that the City's storm and surface water runoff contributes to Sauk Lake through a diagnostic study. The specific objective of the diagnostic study is to determine where the most critical impacts of urban runoff exist so that concentrated efforts can be made that are the most significant to the improvement of the Lake.

The overall resource goals of the project are to protect Sauk Lake from further degradation and to provide for a usable lake by decreasing the frequency and severity of algal blooms.

Results that count
- Aerial mapping of study area
- Determine study area hydrology
- Stormwater monitoring plan
- Analysis and evaluation of data
- Information and education program
- Pilot project (in-lake project)
- Completion of implementation plan and diagnostic study.

Financial information
The Clean Water Partnership Project totaled $48,000.

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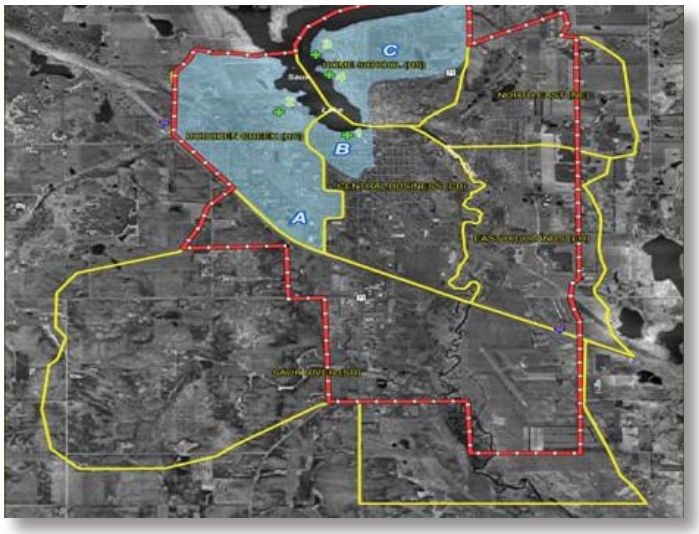

Shingle Creek Phase II

This EPA Section 319 project grant funded the preparation of TMDL studies for nine lakes in the Shingle Creek watershed that were placed on Minnesota's 2002 or 2004 list of impaired waters. TMDL studies for four other lakes in the watershed were completed under a previous grant. All these lakes are located in the northwestern Twin Cities suburban area. The studies included TMDLs for two chains of lakes – Pomerleau/Schmidt/Bass (all in the City of Plymouth) and Cedar Island/Pike/Eagle (in the cities of Plymouth and Maple Grove) – and three other lakes – Crystal (in Robbinsdale), Meadow (in New Hope), and Magda (in Brooklyn Park). All except Pomerleau are located in fully developed areas. The Pomerleau Lake area is rapidly developing with new housing.

Eagle Lake is a large, popular regional recreational resource known for its fishing. Eagle Lake Regional Park, managed by the Three River Park District, is located on its southern shore. The park's master plan includes eventual development of a beach on Eagle Lake. Bass Lake and Crystal Lake also have high recreational values. The other lakes are smaller, limited access lakes used primarily by the lakeshore residents. Each of these lakes was identified as impaired for aquatic life and recreation (swimming) because of nutrient levels that exceed state standards.

Results that count

- Watershed and lake characterizations completed, including land use, recreational uses, water quality, fish populations and health, and aquatic plant assessments for some of the lakes
- Determined nutrient sources, including urban runoff and internal nutrient loading
- Modeled water-quality targets and sources
- Determined TMDL allocations for phosphorus, chlorophyll-a, and Secchi depth (clarity)
- Identified general nutrient reduction strategies that will be refined in the development of detailed implementation/lake management plans
- Developed a plan to implement strategies, including reasonable assurances of success.

Financial information

This TMDL project was funded with $63,200 of Section 319 grant funds.

Contact

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Springbrook Sub-watershed Implementation Project

With significant help from a Clean Water Partnership (CWP) implementation grant, the City of Fridley worked to restore the wetland at Springbrook Nature Center between May 2002 and May 2006. The Springbrook sub-watershed is considered an urban, mature watershed.

The project had four main components:

- The drawdown of the Nature Center wetland's ordinary water levels to reestablish emerging plants and to allow existing seeds in the mudflats to germinate, mature and produce new seed
- Significant expansion of a small, existing storm water pond
- Restoration of an inlet stream to the Springbrook Nature Center main wetland complex with a 48-inch bypass pipe to handle heavy storms
- An education campaign that included brochures, workshops, displays and video projects.

Results that count

Expansion of the existing storm water pond allowed the grantee to cut in half the expected discharge from a year's biggest expected rainfall and the biggest storm that could be expected in 100 years. Achieving this goal also significantly reduced chemical pollutants to the wetlands—another project goal.

The success of the wetland drawdown and the fact that the University Avenue pond expansion came in about $100,000 under budget meant that project organizers were able to restore a wetland inlet stream bank—a project they anticipated would require additional grant funds to complete. Restoration of this inlet stream involved re-meandering the stream bed and installation of a bypass pipe to handle heavier storm flows.

While the largest amount of cash dedicated to this grant project was spent on physical improvements in the watershed, the greatest amount of staff time and in-kind contributions were made in the area of public information and education. Education efforts included direct-mail brochures, video productions, educational fairs and displays, educational workshops for city staff, commissioners and council members, trail signs and newsletter articles. All of the public education efforts were designed to demonstrate that all property owners in the watershed were in essence riverfront property owners and thus played an important part in protecting the Springbrook Nature Center wetlands.

Two garden shows were organized and included rain garden demonstrations, rain barrels, and speakers on water quality in the Springbrook Nature Center watershed. Stormwater and water-quality brochures were developed which were unique to the Springbrook Nature Center Watershed and mailed to every property owner in the watershed, including Fridley, Coon Rapids, Spring Lake Park, Northtown and Blaine.

Financial information

CWP grant amount: $200,669; Matching funds: $351,730; In-kind: $98,524. Total project costs: $650,923.

Contact

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Upper Mississippi River Source Water Protection Project

This project, sponsored by the St. Cloud Public Utilities, is the first attempt in Minnesota, and perhaps in the country, to develop and implement Source Water Protection (SWP) plans at a watershed level among several water suppliers who share a common source water resource.

The project took place between January 2002 and June 2006.

The goal of this Section 319 grant project was the establishment of collaborative relationships among these three water suppliers, local governments, watershed groups, and ground water-based communities within the 7,700 square mile project area, which consists of the combined source water protection areas for St. Cloud, St. Paul, and Minneapolis.

Results that count

The primary product of this project is the Source Water Protection Plan for St. Cloud, St. Paul and Minneapolis.

The St. Cloud, St. Paul, and Minneapolis water suppliers each delineated Source Water Protection Areas, consisting of a Priority Area A, Priority Area B, and the associated Drinking Water Supply Management Area for each. These delineations were then formally approved by the St. Cloud City Council, the St. Paul Board of Water Commissioners, and the Minneapolis City Council respectively.

Formal recognition of these source water protection areas at the state level is pending. The EPA has noted that its formal recognition of these areas will follow the state's recognition. The delineation of the SWP Areas by the water suppliers, and the formal approval by the respective governing bodies, are the first steps in the larger process of formal recognition of such areas by units of government at all levels in their management and regulatory programs. The Minnesota Pollution Control Agency has offered a Clean Water Partnership Continuation Grant to support the implementation phase of Source Water Protection Plans by St. Cloud, St. Paul, and Minneapolis.

Several other goals of the project were achieved. Project contributors accurately calculated times of travel for water in Mississippi River tributaries within the source water protection areas for St. Cloud, St. Paul, and Minneapolis. Time-of-travel estimates provided information that was previously unavailable and was a central element in the delineation of source water protection areas. The travel-time data provided the empirical basis for establishing the boundaries of the source water protection area. A contaminant release within this area could require the closure of the surface water intake in order to protect the public health, so the accurate delineation of this boundary is very important.

During the grant period, the Minnesota Department of Health mapped many of the shallow aquifers within the project area that are susceptible to nitrate contamination. In addition, the U.S. Geological Survey and private contractors developed ground water flow models for aquifers near the Mississippi River. This work clarifies the degree to which specific aquifers serving as public water supplies may be hydraulically connected to the Mississippi River or tributaries. The aquifer sensitivity and ground water flow data will help determine which aquifers in the project area could be sensitive to other potential contaminants, such as spills into the Mississippi River.

During the project, and Department of Health staff participated in several conferences, workshops, and other forums to raise awareness of source water protection and to integrate source water protection into local, state, and federal regulatory, management, and policy initiatives.

Project staff prepared project summary for distribution to the many audiences who play a role in source water protection in the project area. These audiences include individual citizens, students, landowners, watershed managers, ground water-based communities in the project area and government decision-makers at all levels. Several hundred copies of this summary have

been distributed at various meetings and conferences to date and many more copies have been distributed electronically.

A significant, although unquantifiable, accomplishment of the Upper Mississippi River Source Water Protection Project (UMRSWPP) has been the creation of cooperative relationships between water suppliers and local units of governments upstream of intakes, especially watershed groups. Members of the project staff have started to attend meetings of watershed districts that are within the collective Source Water Protection Area.

Financial information

The Section 319 grant was for $243,250. The total cash and in-kind match contributed to the project from all project sponsors is $429,225.49. Grant and in-kind contributions and cash brought the total to $672,475.49.

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Projects Currently Active in 2007 in the Upper Mississippi River Basin:

Big Birch Lake Watershed Management Project Continuation - 2005
Sponsor: Sauk River Watershed District
Funding: CWP (Grant) $40,000
Purpose: Continue monitoring and data analysis, continue citizen education, install buffer strips, plant native vegetation for shore land restoration and upgrade feedlots.

Big Sandy Area Lakes Watershed Management Project - 2006
Sponsor: Aitkin County
Funding: CWP (Grant) $260,000
Purpose: The project continues funding for water-quality monitoring, staffing for project administration and local ordinance coordination, and lake and agricultural BMPs such as shoreland revegetation, lakeshore protection, riparian livestock operations, streambank stabilization, riparian buffer strips, conservation easements, and implementation of operation and maintenance plans. Information and education activities will include watershed-wide newsletters, education of students, lake associations, and county boards, new landowner contacts, small neighborhood meetings, and participation in information fairs.

Clearwater River and Lake Louisa TMDL Project – Phase 2 and 3 - 2004
Sponsor: Clearwater River Watershed District
Funding: Section 319 (Grant) $149,628
Purpose: Monitor, assess, model and develop land use data to identify potential pollutants in order to develop total maximum daily loads for fecal coliform, dissolved oxygen and excessive nutrients.

Elk River Watershed Priority Lakes Phosphorus Reduction Project - 2003
Sponsor: Sherburne County
Funding: Section 319 (Grant) $122,780
Purpose: Establish manure management best management practices test plots throughout the watershed to measure nitrogen and phosphorus reductions and install low-cost conservation practices to address feedlot runoff as well as establish lakeshore buffer demonstration projects along developed shoreline.

Elk River Watershed Priority Lakes II - 2006
Sponsor: Elk River Watershed Association
Funding: Section 319 (Grant) $185,187
Purpose: Re-establish shoreland vegetation around area lakes, reduce phosphorus and nitrogen applications on farmland, improve and create wetlands.

Feedlot Runoff Pollution Removal by Organic Bio-filter Demonstration - 2005
Sponsor: Stearns County Soil and Water Conservation District
Funding: Section 319 (Grant) $150,000
Purpose: Develop a demonstration project to utilize a carbon-rich bio-filter to treat feedlot runoff and produce technical information so that Natural Resources Conservation Service can approve this as a best management practice.

Lambert Creek Phase 3 Water Quality Project Continuation - 2005
Sponsor: Vadnais Lake Area Water Management Organization
Funding: CWP (Grant) $250,000
Purpose: Continue activities to restore sheet flow and natural catchments of waters in Lambert Lake, a previously ditched wetland draining to Vadnais Lake, the final impoundment reservoir for the St. Paul Regional Water Services.

Little Rock Creek TMDL Project - 2005
Sponsor: Benton County Soil and Water Conservation District
Funding: Section 319 (Grant) $82,000
Purpose: Monitor, model and develop land use data to identify potential pollutants in order to develop a total maximum daily load for biota.

Long Prairie River TMDL Project - 2005
Sponsor: Todd County Soil and Water Conservation District
Funding: Section 319 (Grant) $300,000
Purpose: Provide cost share, install and maintain best management practices with a focus on riparian buffers, manure and nutrient management, and grassed waterways.

Manure Management within Ecologically Sensitive Areas in Stearns County – Phase 2 - 2003
Sponsor: Stearns County Soil and Water Conservation District
Funding: Section 319 (Grant) $300,000

Purpose: Provide funding for comprehensive manure management plans, correct feedlot pollution and soil erosion problems and provide educational and technical information about feedlot rules and corrective actions.

Middle Sauk River Rehabilitation Project Continuation - 2005
Sponsor: Sauk River Watershed District
Funding: CWP (Grant) $237,000; CWP (Loan) $500,000
Purpose: Continue information and education, water quality monitoring and evaluation, agricultural and urban best management practices, shore land and riparian restoration, project administration, upgrading septic systems, and reducing erosion and sediment.

Osakis Lake Watershed Management Program – Phase 3 Continuation - 2005
Sponsor: Sauk River Watershed District
Funding: CWP (Grant) $235,000, CWP (Loan) $310,000
Purpose: Continue information and education, water quality monitoring and evaluation, stormwater, agricultural, rural land use and urban best management practices, shore land and riparian restoration, project administration, upgrade septic systems, and reduce erosion and sediment.

Restoring Water Resources of the Sauk River Chain of Lakes - 2004
Sponsor: Sauk River Watershed District
Funding: Section 319 (Grant) $250,000; CWP (Loan) $500,000
Purpose: Continue to carry out the goal of phosphorus reduction and loading by following the recommendations made in the CWP Phase IIA Final Report.

Rice Creek Watershed Index of Biological Integrity - 2006
Sponsor: Friends of the Mississippi River, Inc.
Funding: Section 319 (Grant) $21,500
Purpose: Collection of data on the health of aquatic ecosystems in eight streams that are heavily used for stormwater management in the Rice Creek Watershed.

Sauk Lake Basin Restoration Project Continuation - 2005
Sponsor: Sauk River Watershed District
Funding: CWP (Grant) $267,200; CWP (Loan) $500,000
Purpose: Continue information and education, water quality monitoring and evaluation, agricultural, rural land use, stormwater and urban best management practices, shore land and stream bank restoration, project administration and upgrading septic systems.

Sauk River Chain of Lakes TMDL Project - 2005
Sponsor: Sauk River Watershed District
Funding: Section 319 (Grant) $125,000
Purpose: Monitor, model and develop land use data to identify potential pollutants in order to develop a total maximum daily load for excessive nutrients.

Sauk River Chain of Lakes Watershed Basin Restoration Project Continuation - 2005
Sponsor: Sauk River Watershed District
Funding: CWP (Grant) $224,700; CWP (Loan) $500,000
Purpose: Continue information and education, water quality monitoring and evaluation, agricultural, rural land use, stormwater and urban best management practices, shore land and stream bank restoration, project administration and upgrading septic systems.

Stearns County Manure Basin Abandonment Project - 2006
Sponsor: Stearns County
Funding: Section 319 (Grant) $57,150
Purpose: Evaluate ground water beneath six abandoned manure basins, with the aim of learning more about the effect of such facilities on regional ground-water resources.

Swan River Watershed Management Plan Implementation - 2006
Sponsor: Morrison County SWCD
Funding: Section 319 (Grant) $70,000
Purpose: Identify and work with smaller feedlots to reduce over-application of manure to cropland with nutrient management plans, buffer strips and other conservations practices.

Targeting Implementation/Compliance Activity within TMDL and Ecologically Sensitive Areas - 2004
Sponsor: Stearns County Soil and Water Conservation District
Funding: Section 319 (Grant) $300,000
Purpose: Investigate unpermitted earthen manure storage basins; target and accelerate compliance; implement educational initiatives, manure management, feedlot pollution abatement systems, erosion control; promote related best management practices and continue water-quality monitoring.

Targeted Implementation/Compliance Activity Within TMDL and Ecologically Sensitive Areas, Phase II - 2005
Sponsor: Stearns County Soil and Water Conservation District
Funding: Section 319 (Grant) $300,000
Purpose: Accelerate best management practices adoption by providing technical and financial assistance to producers, investigate unpermitted earthen manure storage basins; identify feedlots in need of pollution abatement, reconstruction or abandonment; develop manure management plans and implement soil erosion best management practices.

Targeted Implementation/Compliance Activity Within Impaired and Ecologically Sensitive Areas in the Upper Mississippi River Basin in Stearns County (Continuation) - 2006
Sponsor: Stearns County SWCD
Funding: Section 319 (Grant) $300,000
Purpose: Hire inspector and technician to investigate unpermitted earthen manure storage basins, conduct feedlot evaluations, develop manure management plans.

Water Quality Improvement Project Continuation - 2005
Sponsor: North Fork Crow River Watershed District
Funding: CWP (Grant) $85,000; CWP (Loan) $450,000
Purpose: Continue feedlot and manure upgrades, agriculture and rural best management practices, septic system upgrades and water quality monitoring and evaluation.

Working Together to Improve Water Quality - 2005
Sponsor: Crow River Organization of Water
Funding: Section 319 (Grant) $300,000
Purpose: Upgrade septic systems, install alternative tile intakes, enroll filter or buffer strips, stabilize shore land erosion, work with cities on stormwater/water quality issues, provide financial incentives to landowners to reduce sediment and nutrient loads and increase education efforts.

Upper Mississippi River Source-Water Protection Plan Implementation Project - 2006
Sponsor: City of St. Cloud Public Utilities
Funding: CWP (Grant) $425,000
Purpose: Funding allows the project to conduct a dye-trace study on the South Fork of the Crow in order to refine the earlier travel-time estimates, obtain locational data from local units of government on potential point and nonpoint contaminant sources, identify areas susceptible to nitrate contamination, hire a project data specialist to update state and federal data files and incorporate the data into the project data base, quantify tributary inflows and in-stream flows (allowing for estimates of groundwater contributions to and losses from the Mississippi River), identify areas of potential contaminant transport between ground and surface waters, support the delineation of wellhead protection areas for ground water-based suppliers, identify areas of high sediment loading potential, implement local source water protection plans, and continue administration and education activities.

Upper Mississippi River Basin Projects Awarded in 2007

Section 319 Projects

Long Prairie River Dissolved Oxygen TMDL Implementation Project
Sponsor: Todd Soil and Water Conservation District
Funding: $150,000
Purpose: The MPCA has observed dissolved oxygen (DO) concentrations below the 5-mg/L standard near Motley and Browerville, and during the summer months near Carlos. The primary goal for the project is to use certain BMPs to keep nutrient levels at or below the standard. The BMPs to be constructed include, but are not limited to, riparian buffers, contour cropping, grassed waterways and others, along with the use of alternative water sources, seed varieties, rotations, cover crops and fertilizers.

Shingle Creek Chloride Reduction Project
Sponsor: City of New Hope
Funding: $15,000
Purpose: Shingle Creek, an 11-mile stream located in northwestern Hennepin County, was designated an Impaired Water by the MPCA and USEPA for chloride concentrations that exceed state established standards. A TMDL analysis determined that the majority of chloride in the watershed is derived from non-point sources including road salt deicing. The TMDL concluded that an overall 71 percent reduction in chloride load must be achieved to meet State chloride concentration standards. The use of a new deicing product, ClearLane, is identified by the City of New Hope as a BMP to reduce chloride levels in Shingle Creek in the Implementation Plan for the Shingle Creek Chloride TMDL. The City intends to implement this proposed BMP by replacing standard road salt applications with ClearLane for the 2007/2008 deicing season.

Targeted Implementation Activity Within Impaired and Ecologically Sensitive Areas in Stearns County
Sponsor: Stearns County Soil and Water Conservation District
Funding: $300,000
Purpose: This project targets livestock producers and landowners located in and near wellhead protection areas and drinking water supply management areas, designated lakesheds and shoreland areas. Funds would be made available to encourage livestock producers to work with a Certified Crop Adviser in developing a comprehensive Manure Management Plan, and to correct feedlot pollution problems and soil erosion for producers within the ecologically sensitive areas.

Clean Water Partnership Projects

Middle Fork Crow River Watershed Restoration and Enhancement Project
Sponsor: Middle Fork Crow River Watershed District
Funding: $242,000 grant, $200,000 loan
Purpose: This project focuses on protecting high quality lakes and restoring lakes with poorer water quality by restoring wetlands, providing educational opportunities that link people to the resources, implementing best management practices to reduce non-point source pollution and targeting specific lake management projects that will harness internal loading in lakes. Activities will focus on citizen information (a new district website, workshops, newsletters, and volunteer training), continued water quality monitoring and evaluation, agricultural and rural land use BMPs, wetland, streambank and shoreland restoration, stormwater and urban BMPs and septic system upgrades.

Middle Sauk River Water Quality Restoration Project
Sponsor: Sauk River Watershed District
Funding: $216,892 grant, $500,000 loan
Purpose: The objective of this project is to assist agricultural producers in applying conservation practices, such as riparian restoration, feedlot management and buffer strip installation. This project will also work with local municipalities to address stormwater runoff concerns and local septic system upgrades. In addition, this project will expand the current monitoring program to investigate new sources of pollution and to assess the effectiveness of current and future BMPs. Information and education will focus on changing behaviors to reduce nutrient loading in the watershed. Activities will include school visits, elementary student water festivals and hands-on workshops in areas such as shoreline restoration and maintenance, citizen monitoring training and stormwater runoff alternatives.

Glossary of acronyms

annAGNPS - annualized Agricultural Non Point Source model
BERBI - Blue Earth River Basin Initiative
BMP - best management practices
BOD - biochemical oxygen demand
BWSR - Board of Water and Soil Resources
CCA - certified crop advisor
COD - chemical oxygen demand
CROW - Crow River Organization of Water joint powers board
CRWP - Chippewa River Watershed Project
CSM - citizen stream monitoring
CSMP - citizen stream monitoring program
CWA - Clean Water Act (1987)
CWP - Clean Water Partnership
DO - dissolved oxygen
EPA or **USEPA** - Environmental Protection Agency or United States Environmental Protection Agency
ESD - Environmental Services Department
FLEval - Feedlot evaluation model
GBERBA - Greater Blue Earth River Basin Alliance
GPS - global positioning system
IBI - index of biological integrity
IPHT - imminent public health threat
ISTS - individual sewage treatment system
LCMR - Legislative Commission on Minnesota Resources
LID- low impact development
MDA - Minnesota Department of Agriculture
MMP - manure management plan
MPCA - Minnesota Pollution Control Agency
NMP - national monitoring program
NO^3 - nitrate
NPSP - non point source pollution
NRCS - Natural Resource Conservation Service
OLCP - open lot certification program
RCRCA - Redwood-Cottonwood Rivers Control Area
Section 319 - section of Clean Water Act
SRF - state revolving fund
SRWD - Sauk River Watershed District
STORET - storage and retrieval system - EPA database
SWCD - Soil and Water Conservation District
TMDL - total maximum daily load
TP - total phosphorus
TSS - total suspended solids
TT - transparency tube
USEPA - United States Environmental Protection Agency
WD - watershed district

Minnesota Pollution Control Agency

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A list of completed projects and history can be found at:
www.pca.state.mn.us/water/cwp-319.html#reports

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1230 South Victory Drive
Mankato, MN 56001
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MPCA Rochester Office
18 Wood Lake Drive SE
Rochester, MN 55904
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toll-free (800) 657-3864

MPCA Willmar Office
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MPCA Marshall Office
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Marshall, MN 56258
(507) 537-7146

Minnesota Pollution Control Agency

520 Lafayette Road North
St. Paul, MN 55155
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www.pca.state.mn.us