Watershed Achievements Report

2006 Annual Report

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

September 2006

Minnesota Pollution Control Agency

Minnesota Pollution Control Agency

2006 Annual Report

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

Table of Contents

Minnesota Pollution Control Agency
520 Lafayette Road North
St. Paul, MN 55155
(651) 296-6300 or toll-free (800) 657-3864
www.pca.state.mn.us

Introduction

Centuries ago, the Dakota gave the name Minisota, meaning "water that reflects the sky," to the river now called the Minnesota River. Years later that translation inspired our state's name and its famous slogan, "Land of Sky Blue Waters." However, even in this water-rich state, clean water has become a great concern. This is reflected in a years-long effort that culminated in the 2006 legislative session in the Clean Water Legacy Act (see Impaired Waters Section for more information). Many partners, agencies and funders are involved in working on protecting Minnesota's lakes, rivers and streams, and in restoring those waters which are impaired or otherwise do not meet water-quality standards.

The Minnesota Pollution Control Agency is one of many entities involved addressing nonpoint-source water pollution, through administration of funds made available under Section 319 of the federal Clean Water Act and the state's Clean Water Partnership (CWP) program. This report focuses on the successes and progress resulting from these two activities.

The MPCA's water programs operate under a geographically based watershed approach to support local efforts to assess, protect and restore the state's waters. This approach focuses on the state's 10 major river basins and multiple watersheds, providing data, technical assistance, and training to obtain results.

Water under stress

A 2003 MPCA study looked at stresses on Minnesota's environment, using scientific data, public perception, population projections, federal mandates, and legislative intent. The study pointed to concerns about deteriorating water quality. Among the top five stressors identified were phosphorus, transported sediments, and habitat modification. The primary sources of pollution were agricultural runoff, urban runoff, and pesticide use. The MPCA has reported that point sources contribute 14 percent of the state's water pollution and nonpoint sources 86 percent. A recent report, St.Croix Basin Phosphorus-Based Nutrient Goals, came up with a 20-percent point-source to 80-percent nonpoint-source estimate for that basin, adding to evidence that nonpoint-source pollution is the primary problem facing Minnesota's waters.

Setting goals

The goals and objectives of the MPCA's strategic plan for water quality are:

- Assess the status or condition of Minnesota's groundwater systems.
- Prevent or reduce degradation and depletion of ground water.
- Assess the chemical, physical and biological integrity of lakes, streams and wetlands to identify if designated uses are being met and provide information on the condition of waters.
- Maintain and enhance the chemical, physical and biological integrity of Minnesota lakes, streams and wetlands so that water-quality standards and designated uses are met and degradation is prevented.
- Restore the chemical, physical and biological integrity of Minnesota lakes, streams and wetlands that do not support designated uses.

The strategic plan includes environmental indicators that are reported upon regularly. This plan is setting the stage for convergence of point- and nonpoint-source programs. The watershed model is the umbrella under which all activities take place, and TMDL studies and implementation plans will be a major tool. The MPCA's statewide five-year Nonpoint Source Management Program Plan is available on the MPCA Web site at www.pca.state.mn.us/water/nonpoint/mplan.html.

Partners in water quality

Reducing nonpoint-source water pollution requires:

- Partnerships among all levels of government
- Partnerships among government, businesses and citizens
- Understanding the impact of individual actions on common water resources
- Local efforts placed in the context of entire watersheds
- Research aimed at diagnosing impairments and targeting resources toward the biggest problems facing specific water resources
- Public awareness, education and action
- Information and data sharing
- Leveraging resources to achieve the greatest benefits at the least cost.

The MPCA works with partners to achieve these aims in many ways, including the Section 319 and CWP programs and related funding. Under Section 319, the states:

- Identify the nonpoint-source controls necessary.
- Specify the programs that will apply the controls.
- Certify that the state has adequate authorities to implement these measures.
- Identify all sources of funding for these programs.
- Establish a schedule for implementation.

The goals of the CWP include:

- Diagnosing problems and threats to water resources
- Developing solutions for reducing the impacts of nonpoint-source pollution on water resources
- Implementing these solutions.

An interagency Project Coordination Team (established in statute) assists the MPCA in prioritizing Section 319 and CWP grant applications that target polluted waters and demonstrate a good chance of success. Financial and in-kind contributions from local sponsors and their communities are substantial, exceeding the 50-percent match requirement in most cases.

Statewide impacts

To date we've assessed about 10 percent of the state's streams and 16 percent of its lakes for impairments. About 40 percent of these have been found impaired (other states report finding similar rates of impairments). The state's goal is to complete assessment of all waters by 2015. With more than 11,000 lakes (10 acres or larger) and 92,000 miles of streams in the state, it's clear we can expect to find thousands more impairments in the coming years.

Data regarding the cumulative reductions in phosphorus, soil loss and sedimentation statewide have been available from the Minnesota Board of Water and Soil Resources' Local Annual Reporting System (LARS), with an upgrade to the system called "eLINK" now in place (statistics appear at the front of this report). Minnesota also works with other states and nations on protecting and improving water resources. Among cooperative interstate/international projects:

- Partnership with Great Lakes states and Canada on zero discharge of nine toxic chemicals
- Joint water-quality monitoring in the Rainy River Basin with Canada
- A joint Minnesota/Wisconsin St. Croix Basin Planning Team
- Interstate work in the upper Mississippi River basin, which impacts four of Minnesota's 10 major basins
- Participation in Red River basin planning and management, including membership on Red River Basin Commission, International Joint Commission Red River Board, and the Transboundary Water Issues Group, a multistate and binational issues interest group that communicates regularly about Red River matters.

Looking Forward

At the same time that funding for nonpoint-source activities is so critical to states, there is greater pressure for reductions in federal grant programs, including nonpoint-source grants under Section 319 of the Clean Water Act. Part of this pressure stems from inquiries and concerns about showing results from federal funding. Minnesota has actively worked to address these concerns with the U.S. Environmental Protection Agency over the past five years by sharing individual success stories that demonstrate improvements resulting from use of these funds. This report evolved out of these requests as a way to better demonstrate environmental outcomes tied to project funding.

While these efforts have helped tell the story, they aren't enough. Part of the problem is that the "fixes" for nonpoint-source pollution take time to show effects on water quality. Nonpoint-source managers from Minnesota and other EPA Region 5 states wrestled with this problem and determined that a more rigorous evaluation framework could better show the results of our programs. They've proposed using three levels of evaluation: programmatic/administrative, social, and environmental.

1. Programmatic/administrative indicators are those measures that state and federal agencies have typically reported, such as number of grants and timeliness of grant expenditures. These quick, short-term measurements satisfy basic accounting measures but don't really tell much about what happened in the environment.
2. The second level, social indicators, are those indicators that measure changes in society or individual behaviors that affect the environment. These outcomes reflect the social orientation of many nonpoint-source management activities that foster incremental progress toward improving water quality, such as activities aimed at increasing understanding and awareness, supporting watershed organizations, and building local capacity for planning and problem-solving. As intermediate measures, social indicators also provide meaningful information regarding movement toward water-quality objectives over short-term project timeframes, during which actual water-quality changes usually are not detectable.
3. The third level is to measure actual changes in the environment. These changes are represented in actual biological, chemical or physical improvements in water quality, or through modeling which demonstrates pollutant reductions in waterways.

Minnesota's nonpoint-source programs are currently using only levels 1 and 3, the programmatic/administrative and environmental indicators, though we continually look for improvements. Our partners in this work can expect to see implementation of level 2, the social indicators framework, in the funding round that begins during the summer of 2007, which will be accompanied by training in the use, collection and reporting of social indicators.

Impaired waters – MPCA's top priority

The big news on the impaired waters front for 2006 is that the Minnesota Legislature passed a policy bill and one-time funding for impaired waters work. An unprecedented coalition of business, agriculture, local government, and environmental groups developed and proposed the Clean Water Legacy Act. The Act provides approximately $24 million in funding as follows:

Activity	Amount	Lead agencies
Monitoring and Assessment	$1,140,000	MPCA & DNR
TMDL studies	$3,170,000	MPCA
Nonpoint source restoration	$11,330,000	DNR, BWSR & MDA
Point source restoration	$8,310,000	MPCA & PFA

Minnesota's Response - The Clean Water Legacy Act

This funding was provided for the 2006-2007 biennium only. However, it is a good first step in achieving long-term funding for addressing impaired waters in Minnesota, toward which we and our partners will continue to work. The Act's policy bill sets up a Clean Water Council to advise the MPCA and other agencies on policy and funding. For more information on the bill's policy aspects see the final bill on the Senate Revisor's Web site, http://ww3.house.leg.state.mn.us/hrd/bs/84/sf0762.html. The Governor's Clean Water Cabinet Web site contains a fact sheet with more information on the specifics, at www.governor.state.mn.us/priorities/initiatives/cleanwatercabinet/index.htm.

The Clean Water Legacy Act is an important step in helping Minnesota clean up our impaired waters. Like many states, Minnesota has not made sufficient progress to restore water quality to standards in waters found to be impaired. The state currently has 2,250 listed impairments on nearly 1,300 lakes, rivers and streams (the 2006 impaired waters list was approved by the U.S. Environmental Protection Agency in June 2006). Lack of progress on restoring our waters erodes Minnesota's famed quality of life, and has potentially serious consequences for business, tourism and economic development.

Addressing impaired waters is the MPCA's top priority. There are three primary reasons driving this priority:

- First, protecting and restoring our famed legacy of water resources. Clean water is too important to Minnesotans to let impaired waters go unaddressed.
- Second, impaired waters affect the growth and the health of Minnesota's communities and economy. Recent court decisions have affirmed and upheld the Clean Water Act's prohibition on new or expanded wastewater discharges to impaired waters.
- Third, the Clean Water Act requires the states to assess impaired waters and prepare Total Maximum Daily Loads for them. This mandate is currently under-funded, even with the recent passage of the Clean Water Legacy Act.

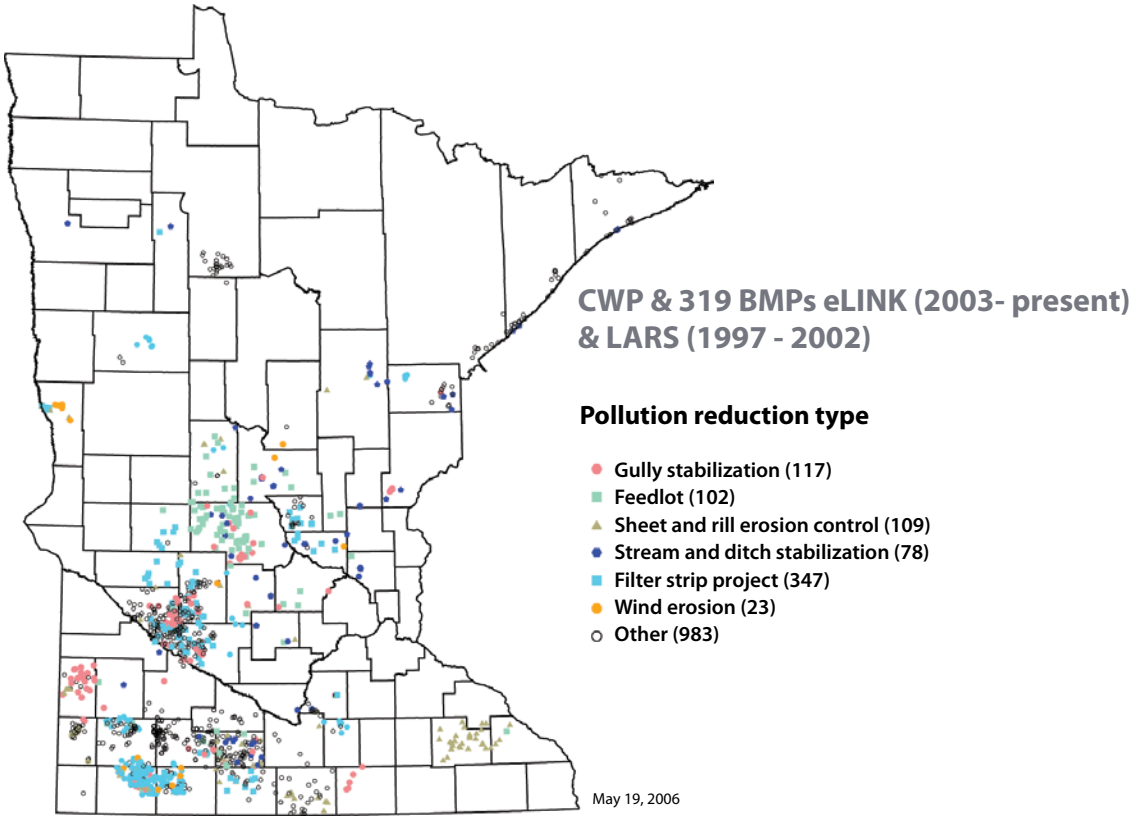
The Clean Water Legacy represents an important initial commitment toward protecting these critical resources. The funding challenges and hard work of meeting them will continue.

LARS and eLINK results
Section 319 & Minnesota CWP Projects: 1997-May, 2006

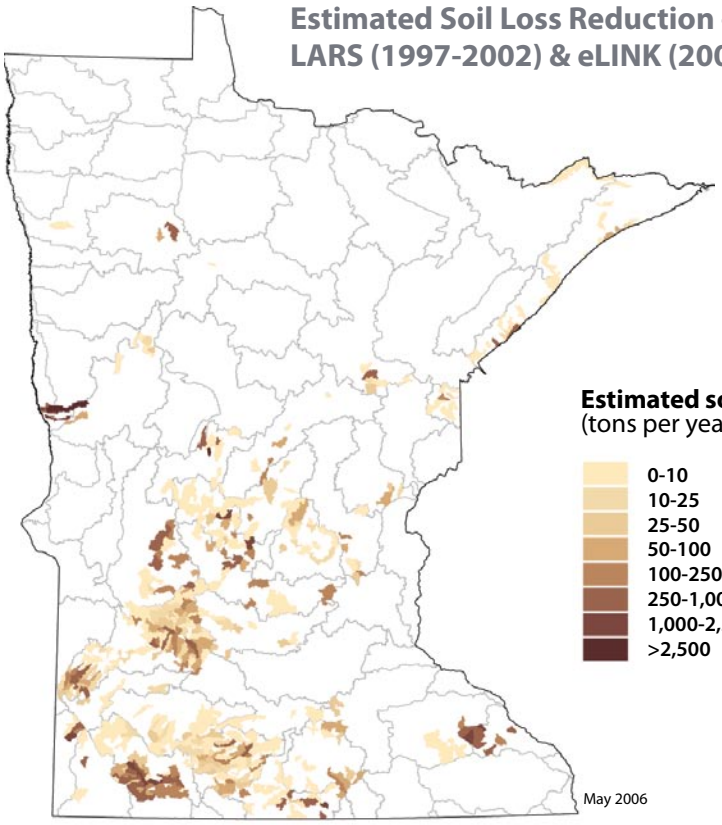
The table following shows progress through May 2006 based on previous Local Annual Reporting System (LARS) reporting and 2006 data from eLINK. Based on LARS/eLINK reporting by Clean Water Partnership (CWP) and Section 319 Project Partners, these projects are estimated to have reduced soil loss from 1997 through May 2006 by over 75,000 tons/year. Over the same period, sedimentation was estimated to have been reduced by nearly 40,000 tons/year. Phosphorus loading was estimated to have been reduced by nearly 180,000 pounds/year.

Best Management Practices (BMPs) Funded with 319/CWP Funds 1997 – May 2006

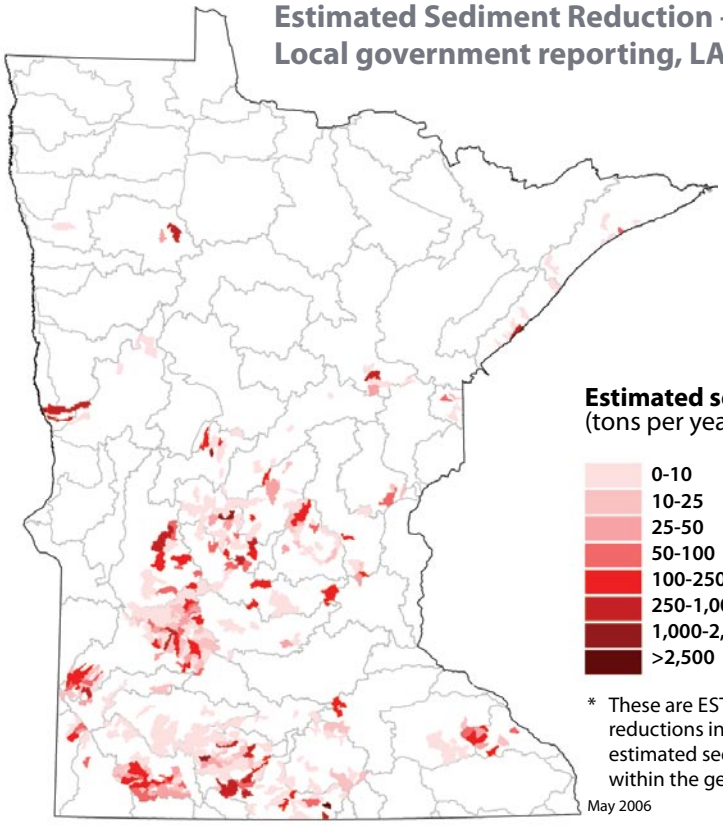
Type	# of BMPs	Soil Loss Reduction	Sediment Reduction	Phosphorus Reduction
		(tons/yr)	(tons/yr)	(pounds/yr)
Feedlots	102	--	--	4,568
Filter Strips	347	27,680	11,286	14,900
Gully Stabilization	117	9,236	5,333	5,831
Sheet and Rill Erosion Control	109	18,686	16,298	17,169
Stream Ditch Stabilization	78	4,624	4,624	4,300
Wind Erosion	23	13,441	--	555
Other	983	2,032	--	31,580
Total	**1,759**	**75,700**	**37,541**	**178,903**



Estimated Soil Loss Reduction — CWP & 319 BMPs Local Government Reporting LARS (1997-2002) & eLINK (2003-present)

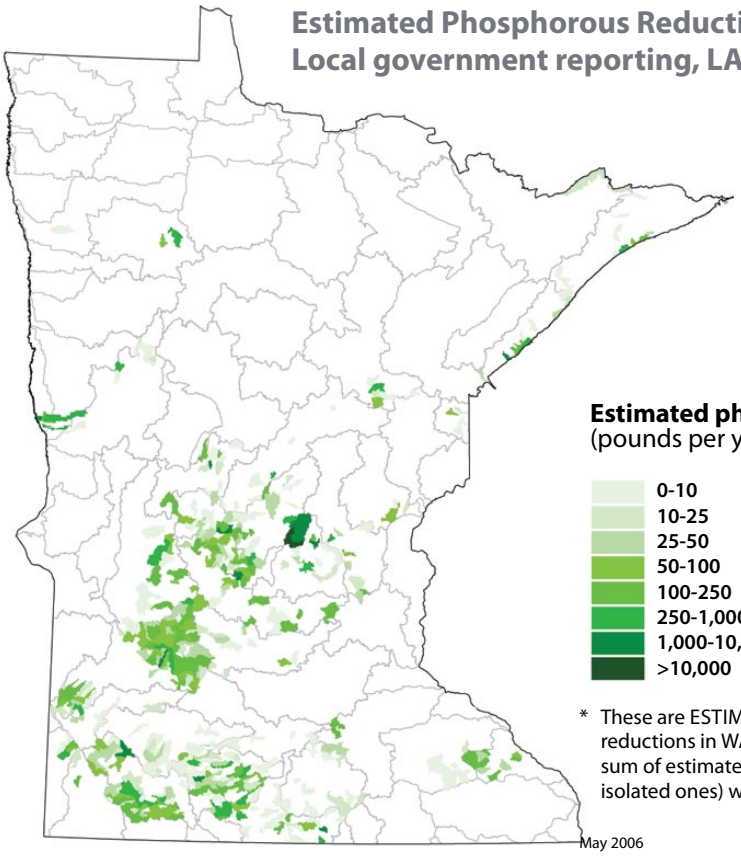


Estimated Sediment Reduction — CWP & 319 BMPs Local government reporting, LARS (1997-2002) & eLINK (2003-present)



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

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



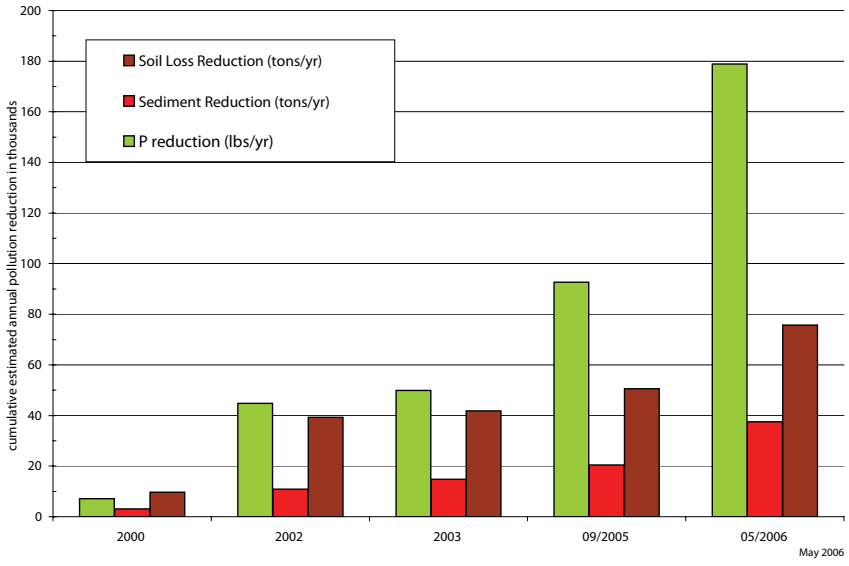
Estimated phosphorus reduction by minor watershed
(pounds per year)*

- 0-10
- 10-25
- 25-50
- 50-100
- 100-250
- 250-1,000
- 1,000-10,000
- >10,000

* 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.

May 2006

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

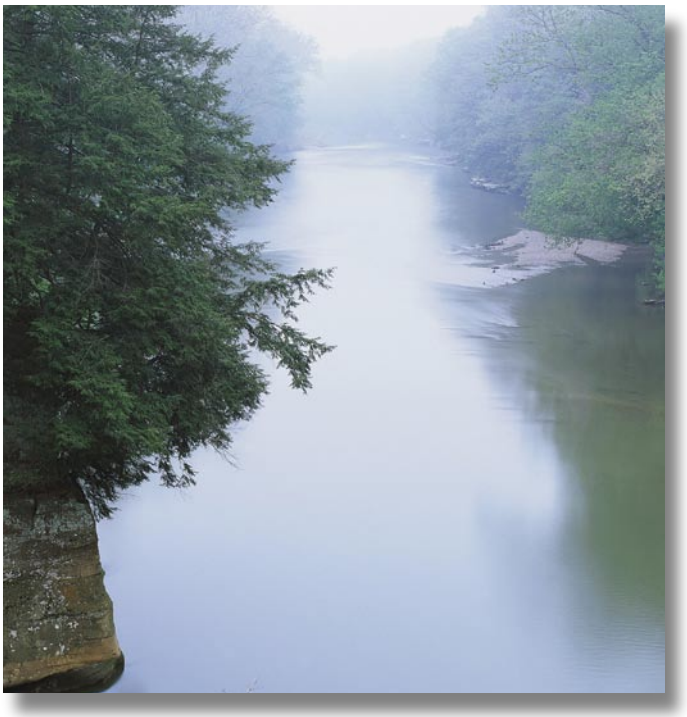


Project summaries for 2006

This section contains summary reports of projects completed through the end of the state's fiscal year 2006 (June 30, 2006). Each case demonstrates water-quality outcomes in the "Results that Count" section.

CWP projects

1. Big Lake Wastewater Alternatives Study
2. Cass Lake/Lake Winnibigoshish Watershed Study and Plan
3. Fond du Lac NPS Assessment
4. Jefferson/German Lakes Water Quality Improvement
5. Long-Term Water Quality Study of Glacial Ridge Surface and Groundwater Systems
6. Lake Minnie Belle Restoration
7. Lake Shetek Area Watershed Improvement
8. Lake Washington Phase II Continuation
9. Long Prairie River Watershed
10. Seven Mile Creek Watershed
11. Urban Stream Assessment at the Bend in the River (Mankato)
12. Watonwan River Major Watershed Implementation
13. Whitewater River Watershed
14. Yellow Medicine River Phase II



319 projects

1. BMP Implementation, Lake Carnelian
2. Conservation Tillage for South Branch Root River
3. Elk Creek Conservation Tillage
4. Geomorphic Assessment of Southern Minnesota Drainage Ditches
5. Enhancement of the Local Government Annual Reporting (LARS) System's Pollutant Reduction Benefit Calculations
6. Midway River Watershed Restoration
7. Nemadji River Basin
8. Northland NEMO Initiative
9. Red Lake River Restoration and Habitat Improvement
10. Salem Creek Bacteria Reduction
11. Sauk Lake Restoration
12. Sauk River Chain of Lakes
13. Shakopee Creek Headwaters
14. Targeted Feedlot Runoff Reduction: Lower Mississippi River Basin

TMDL projects

1. Beaver Lake
2. Clearwater River/Walker Brook
3. Hardwood Creek Biotic Impairment
4. Lake Independence TMDL
5. Lower Mississippi River Basin Regional Sediment Data Evaluation
6. Minnehaha Creek
7. Moorhead-Fargo Red River Mainstem
8. Red River Basin Turbidity
9. Shingle Creek Chloride
10. Twin Lakes/Shingle Creek Watershed District
11. Typo & Martin Lakes
12. Whitewater River -- North Branch -- Pilot Turbidity

CWP projects

Big Lake Wastewater Alternatives Study

Big Lake, just over 500 acres in size and located on the Fond du Lac Reservation in Carlton County, is a popular, heavily used recreational and fisheries lake, with substantial shoreline development (approximately 250 seasonal and year-round homes). All the partners in this project (Fond du Lac Reservation, Big Lake Improvement Association, Carlton County, Western Lake Superior Sanitary District), desire to address the growing number of noncompliant or poorly functioning septic systems and have targeted Big Lake as a priority area for considering wastewater management alternatives.

Goals for this Clean Water Partnership Phase 1 project are:

- Identify the best comprehensive wastewater treatment alternatives for this community
- Maintain Big Lake's current trophic status, protect its quality as a primary fishery, and keep it safe for swimming and boating
- Identify sources of funding for design and implementation phases.

A local, reputable engineering firm was hired to acquire, analyze and assess water-quality data; review soils maps and potential drainfield areas; prepare a feasibility study of wastewater collection and treatment alternatives; and perform cost analyses for each option.

A steering committee was formed with representatives of all the supporting partners, and charged with reviewing all the feasible alternatives identified by the engineering consultant. They arrived at a consensus decision regarding the best approach and seeking viable opportunities for future design and implementation funding. A local expert in alternative treatment systems research assisted in the public-education component of the project, which included mass mailings, public meetings and other information dissemination.

For more information contact:

Nancy Schuldt
Fond du Lac Reservation
1720 Big Lake Rd.
Cloquet, MN 55720
(218) 878-8010
nancyschuldt@fdlrez.com

Financial information

The CWP grant of $15,663 was matched by local in-kind contributions of $16,050.

Results that count

- Completed the Big Lake Area Wastewater Alternatives Study
- Conducted several public meetings, and public education and outreach continue on the alternatives study
- Began the process of creating a sanitary district for Big Lake

CWP projects

Cass Lake/Lake Winnibigoshish Watershed Study and Plan

The Cass Lake/Lake Winnibigoshish watershed Study and Implementation Plan was a four-year Clean Water Partnership project designed to assess and address nonpoint-source pollution in the Cass Lake/Lake Winnibigoshish Watershed in northwestern Minnesota, beginning at the outlet of Lake Bemidji.

This watershed is unique in that the majority of it lies within the boundaries of the Chippewa National Forest and the Leech Lake Reservation. According to the Leech Lake Band of Ojibwe Treaty Rights, the federally designated use for these waters is the protection of Tribal Traditional Lifeways, such as subsistence fishing, cultural practices, etc. With these goals, water-quality needs are higher than in recreational areas.

Surface-water monitoring was conducted at 42 sites between May 1999 and September 2002. Monitoring efforts included up to 33 parameters at each site. Phosphorus was found to be the nutrient having the greatest impact on aquatic plant growth within the watershed. Water quality for each lake has improved as total phosphorous concentrations have decreased by 30-60 %, although largely due to a recent 28% increase in precipitation (compared to average). Looking at the yearly fluctuations and concentrations of phosphorous, increases in total phosphorus measurements were negligible and did not warrant further sampling.

Shoreline development is a major concern where lakeshore is privately owned, particularly on the Turtle River Chain. Maintaining a riparian corridor to protect lakes and streams from excess nutrient and sediment loading is very important in areas where logging occurs in addition to the developed areas. Upgrading septic systems to avoid groundwater contamination is also essential.

For more information contact:

Melanie Johnson or Chris Parthun
Beltrami Soil and Water Conservation District
3217 Bemidji Ave North Suite #3,
Bemidji, MN 56601
Phone (218) 755-4339

Financial information

The $93,500 Clean Water Partnership grant was matched by local cash and in-kind funds of $211,902. Total project costs were 305,402.

Results that count

An implementation plan based on a watershed approach was developed that identifies water quality concerns, a series of BMPs to address these concerns, and information and education programs designed to achieve water quality goals. The BMPs include those for urban, agricultural, and forestry areas that have the potential to contribute nonpoint-source pollution to lakes, streams, and aquifers within the project area.

CWP projects

Fond du Lac Nonpoint Source Assessment Report and Management Program

The Fond du Lac Reservation is located in east central Minnesota near Cloquet (population 10,000), about 20 miles southwest of Duluth and Lake Superior. Extensive water resources on the reservation include 3000 acres of fisheries and wild rice lakes, 96 miles of streams and rivers, and 44,000 acres of wetlands. The reservation has numerous potential sources or activities contributing to nonpoint-source pollution, including agriculture, silviculture, urban runoff, erosion, pesticide and fertilizer use, wetland loss and degradation, non-compliant septic systems, gravel mining, and long-range transport of atmospheric pollutants.

The first year of this Clean Water Partnership Phase 1 project was dedicated to completing a Nonpoint Source Assessment Report for the lakes and streams of the reservation, using monitoring data from the Tribe's water-quality monitoring program and information from the forestry and natural resources programs. The assessment report:

- Identifies waters on the Fond du Lac Reservation which may not meet water-quality standards or support beneficial uses due to pollution from nonpoint sources
- Identifies the categories and subcategories of nonpoint-source pollution that contribute to the water quality problems for the individual waters identified above
- Describes the Tribe's process for identifying BMPs and how they will be used to reduce the level of pollution resulting from these sources
- Includes the sources of funding available for helping to control nonpoint sources of pollution on the reservation.

The purpose of the Nonpoint Source Management Program is to identify reservation-wide activities, as well as watershed-level projects, for implementing management practices for high-priority nonpoint-source problems and provide a schedule for their implementation. In addition, the management program will emphasize prevention to minimize future rehabilitation needs.

The six types of information required for the management program include:

1. A description of BMPs and measures that will be used to reduce pollutant loadings resulting from each category and subcategory of nonpoint-source pollution identified in the assessment report
2. A description of the programs that will be used to achieve implementation of the BMPs identified above
3. A schedule containing annual milestones for the implementation of the BMPs and programs identified in the above
4. A certification by an independent legal counsel that the laws of the Tribe provide adequate authority to implement such a management program, or if there is not adequate authority, a list of additional authorities that might be necessary to implement the management program. There should also be a schedule and a commitment by the Tribe to seek such additional authorities as expeditiously as practicable.
5. A list and description of any sources of federal and other assistance/funding (other than 319) that will be available for supporting the implementation of the nonpoint-source pollution control measures identified in the Tribe's nonpoint-source management program
6. Identification of any federal assistance programs and development projects to be reviewed by the Tribe for their effect on water quality or inconsistency with the Tribe's nonpoint-source management program

The prevention portion of the plan will rely heavily upon education and monitoring. This education component of the program will be relied upon for achieving voluntary compliance. Brochures, videos, and educational programming for all ages will be made available to the Tribe. In addition to education, the management program will emphasize technical assistance and financial incentives for tribe members and other land owners to voluntarily implement BMPs to prevent or mitigate impairments. The monitoring component of the program will be relied upon in order to quantify the Tribe's overall success in maintaining or enhancing the water resources on the reservation.

For further information contact:

Nancy Schuldt
Fond du Lac Reservation
1720 Big Lake Rd.
Cloquet, MN 55720
(218) 878-8010
nancyschuldt@fdlrez.com

Financial information

The Clean Water Partnership grant of $14,003 was matched by local cash and in-kind contributions of $14,417, for total project costs of $18,420.

Results that count

- Completed a Tribal Nonpoint Source Assessment Report
- Completed a management program (collectively known as the NPS document)
- The Tribe was granted status of Treatment as a State by U.S. EPA in December 2004, qualifying it for implementation funding.
- Education and outreach activities continue.

CWP projects

Jefferson/German Lakes Water Quality Improvement Project

The Jefferson-German Lake system consists of 2,800 acres of lakes within five interconnected basins. The 17,000-acre subwatershed lies in the headwaters of the Cannon River Watershed in LeSueur County. This chain of lakes represents the largest recreational lake system in south-central Minnesota.

In 1989, the Greater Jefferson-German Lake Association began a lake assessment project. This initial study assessed the basic condition of the lakes for nutrient enrichment, and concluded that the Jefferson lakes and German Lake had excessive nutrient levels.

Subsequently LeSueur County began a Phase 1 Diagnostic Study / Implementation Plan project in 1992, with phosphorus monitoring a critical component. This detailed assessment of the lakes and watershed found a highly modified system, where flow direction and lake levels fluctuated and all the lakes were negatively affected by nutrient pollution. The goals of this project included:

- Evaluate water-quality conditions and changes in the five lake basins
- Develop and foster a sense of shared responsibility by residents of the watershed and resource users
- Reduce pollutant loading through the implementation of BMPs
- Increase public awareness of water-quality issues
- Improve coordination of watershed activities
- Assess the project's effectiveness.

The project identified three feedlots in three priority subwatersheds for implementation improvements. Implementation actions at two of the sites included runoff control, manure management changes, and/or pasture management. A BWSR challenge grant helped provide cost-share incentives for these farmers. The operator of the third site chose not to participate.

Currently the project is continuing with general implementation within a third project phase. In-lake monitoring in 2006 will help determine any improving trends in lake water quality.

For more information contact:

Lauren Klement
LeSueur County Environmental Services
LeCenter, MN
(507) 357- 8540
or Gene Krautkramer
LeSueur County SWCD
(507) 357-4879

Financial information

The $38,100 CWP grant was matched by a $77,971 Clean Water partnership loan and landowner and local government in-kind contributions of $43,771, for total project costs of $159,842..

Results that count

- Follow-up lake and tributary inflow monitoring was conducted in 1995. Data showed lower nutrient loads as compared to 1993 at several inflow sites. The lower nutrient loads likely were caused by lower flow regimes rather than the newly installed BMPs. Small-scale monitoring near one of the improved feedlots showed a reduction in phosphorus concentrations due to new BMPs at the site.
- Six terrace systems were installed at three different farm sites to reduce upland erosion and sediment transport, along with several ditch or stream buffer projects.
- Several workshops provided information and practice recommendations to homeowners. A septic system workshop in 1996 and a shoreland landscaping workshop in 1997 are some examples. A newsletter also helped disseminate information.
- The Minnesota Extension Service worked with the Mike Krennik farm to develop demonstrations of nutrient and tillage management. This farm served as a field-day site on several occasions for the Jefferson German watershed as well as adjacent areas.
- A local lender offered low-interest loans to landowners in the watershed interested in participating in the recommended fixes. From 1995 to 2000, 188 septic systems were upgraded in the watershed. A few farmers received loans for minimum-tillage equipment or high-residue planting equipment.
- Volunteers with the MPCA Citizen Lake-Monitoring Program continue to take scores of Secchi-disk readings and collect associated data every year at most of the lake basins in the chain.

CWP projects

Lake Minnie Belle Restoration Project

Lake Minnie Belle is located in Meeker County four miles south of Litchfield, Minnesota. The lake forms the headwaters for Lakes Manuella, Stella and Washington. In September of 1991, a Phase 1 diagnostic-feasibility study was sponsored by Meeker County at the request of the Lake Minnie Belle Improvement Association. The study was undertaken to determine the lake's water quality, its watershed hydrology, and the nutrient loading from the lake's watershed.

The study concluded that Lake Minnie Belle was a mesotrophic lake that could quickly turn eutrophic if lake water-quality protection measures were not taken. Lake degradation could result in increased severity of algal blooms, oxygen depletion, increased emergent and submergent plant growth, degradation of fisheries and recreational uses, degraded aesthetics, and economic impacts.

Lake-user reports indicate a reduction in water transparency and fishery, and an increase in algae and aquatic vegetation. Although Lake Minnie Belle has good water quality (only 10 percent of the lakes in the North Central Hardwood Forests Ecoregion have better water quality), an increase in phosphorus could decrease the lake's ability to assimilate additional nutrient loading, causing a higher state of eutrophication.

An MPCA Clean Water Partnership grant and loan were granted in the fall of 1996 to assist in implementing BMPs. Upon completion of the first phase, Meeker County and the lake association were granted a CWP Phase II continuation to complete the projects.
Pollutant sources to the lake include agriculture, shoreland homeowner contributions, septic systems, road-drainage runoff, atmospheric deposition, internal loading, groundwater, lawn fertilizers, pesticides, herbicides, waterfowl and rough fish.

For more information contact:

Paul Virnig
Meeker County
325 North Sibley Avenue
Litchfield, Minnesota 55355
(320) 693-5201
paulvirnig@co.meeker.mn.us

Financial information

A CWP grant of $43,500 was supplemented with a Clean Water Partnership loan of $82,295 and a cash match of $7,852 for total project funding of $133,647.

Results that count

- A 16-acre parcel of land for a sedimentation basin was purchased and is now permanent set-aside land. A berm and sedimentation basin were constructed in August 2002.
- The lake's outlet to a wetland was reconstructed, replacing the easily plugged existing culvert with a 42-inch outlet structure incorporating a vertical-drop to dissipate the water's energy before it enters Sucker Creek. The new structure will help prevent the backflow of nutrient-rich wetland water into the lake. This project was completed in the spring of 2002.
- An erosion control and stream-bed stabilization project aimed at reducing erosion from agricultural fields, the stream bed, and stream banks.
- An agreement was made with landowners to lease 20 acres of land for 10 years and place it into conservation reserve.
- Four lakeshore homeowners received grant funds for shoreline restoration.
- Volunteers sampled in-lake and inflow sites during Phase I and Phase II.
- All Project and volunteer monitoring data was put into STORET.
- Workshops and meetings were held on proper septic-system maintenance, shoreland BMPs, shoreland maintenance, water-friendly lawn-care, and watershed project updates.

CWP projects

Lake Shetek Area Watershed Improvement Project

The Lake Shetek watershed encompasses 129 square miles in northwestern Murray County and southern Lyon County, where the gently rolling landscape forms a significant part of the headwaters of the Des Moines River. Lake Shetek covers approximately 3,351 acres and is about eight miles long and a mile-and-a-half wide, with 32 miles of shoreline and a maximum depth of 10 feet. Lake Sarah, the second largest lake within the larger Shetek watershed, also flows to Lake Shetek through a small creek entering from the west. Lake Sarah covers an additional 1,093 acres and has a maximum depth of nine feet.

Much of the Lake Shetek watershed consists of agricultural land. A hardwood fringe covers much of the gentle-to-moderately steep slopes that surround the lake. An extensive woodland within Lake Shetek State Park lies adjacent to the lake. The most significant known water-quality problem is excess nutrients from surface-water runoff.

Major objectives

The Lake Shetek Area Watershed Project was a short-term localized effort to provide a continuous ecological benefit to the watershed. The unifying goal of the project is to reverse the steady degradation of water quality within watershed's lakes, streams, and wetlands. Major objectives included:

- Reduce Shetek's summer mean total phosphorus concentration by 20 percent.
- Continue reducing summer mean total phosphorus further, until a 40 percent reduction is reached for incoming loads.
- Maintain Lake Sarah's summer mean total phosphorus concentration near the levels present in the 1994 diagnostic study.
- Distribute information about activities that harm the lake and alternatives to these activities.
- Hire county-level watershed specialists.

These goals have begun to be achieved through implementation of BMPs that will affect the long-term loading rates to the surface waters. The short-term goal for Lake Shetek was met during the year 2000 sampling. In the years following loading reductions there should be less nutrients being trapped in Lake Shetek, and internal loading should diminish.

A greater knowledge of the problems has been developed, and steps have been taken through the updating of the Murray County Zoning Ordinance to reduce negative impacts through proper development. Larger lots sizes have been established for the back lots on natural environment lakes as well as larger lots along the rivers and streams. New partnerships and alliances were created as a result of this project, for example among the MDNR, Lake Shetek Area Improvement Association, and Shetek Area Water and Sewer Commission.

For more information contact:

Chris Hansen
Murray County
2500 28th Street, P.O. Box 57
Slayton, Minnesota 56172
(507)-836-6148 ext. 156
chansen@co.murray.mn.us

Financial information

The project received $135,942 in Clean Water Partnership and Section 319 funds and was matched with $30,000 local cash and $170,272 in local in-kind, for total project costs of $336,214.

Results that count

- The highest priority within the Phase II Implementation Project was hiring a county-level watershed specialist staff person. The original Watershed Specialist was hired in 1997.
- A Level 3 Feedlot Inventory was conducted in 1994, which ranked the feedlots by pollution potential.
- Riparian buffer strips were installed totaling 19 acres.
- 12 agriculture BMP loans totaling $147,967 were made.
- 58 septic systems were upgraded.
- 48 property owners received technical assistance for stabilizing shoreline using proper procedures for the site specific lot. Almost 3,000 feet of shoreline was stabilized over a three-year project at one of the resorts.

CWP projects

Lake Washington Phase II Project Continuation

Lake Washington is an important recreational lake located between Mankato and St. Peter. The lake is 1639 acres in surface area, with a watershed of about 12,000 acres in both LeSueur and Blue Earth Counties. Due to its proximity to the above cities, the lakeshore is entirely built-up, and second-tier residential and suburban housing is currently underway in some areas. Recreational activities on Lake Washington include boating, swimming, water skiing, and both open-water and ice fishing. The west lake boat access, managed by MDNR, is the most heavily used lake access in south central and southwestern Minnesota.

In 1994, LeSueur County initiated an assessment and feasibility study of the lake and watershed. This study was a cooperative effort with the counties, Mankato State University's Water Resource Center, the MDNR and MPCA. Excess phosphorus from both internal and watershed sources was identified as the major water quality problem. This study identified six priority subwatersheds for improved soil and water management, as well as innovative projects for wastewater and aquatic plant management. The initial implementation phase of the project was conducted from 1996-1999.

The project has pursued five consistent goals throughout the implementation periods:

- Improve coordination of watershed activities
- Reduce watershed loading to the lake
- Develop and implement wastewater plans
- Increase public awareness of water quality issues
- Evaluate project effectiveness

In 2002, after several years of planning, the Lake Washington Improvement Association and local governments formed the Lake Washington Sanitary District. The district rings the lake, and includes the north and east shoreline of Lake George as well. The MPCA approved the establishment of the sanitary district. Construction concluded in 2005, and provided wastewater hook-ups to about 500 properties. The wastewater from Lake Washington enters the City of Mankato's wastewater treatment plant, connecting to the sewer extension that serves the Mankato Airport, located between the city of Mankato and Lake Washington.

Results that count

- The management of aquatic plants in Lake Washington has been an issue of significant concern to lakeshore property owners as well as anglers and general boaters. Curly-leafed pondweed, an exotic and aggressive annual weed, hampers lake use in the late spring, and then dies back and decays, helping to fuel algal growth in the summer and fall. To provide high-quality information, the project coordinated a presentation by Dr. John Madsen of MSU-Mankato, a national aquatic plant expert, on this topic in 2001.
- 39 septic systems were upgraded across the watershed.
- Two water retention ponds were designed and constructed to reduce sediment and nutrient loading, and an erosion problem on a channel was corrected.
- Seasonal lake-water-quality monitoring was underway in 2005 to assess the current condition of Lake Washington and to analyze any potential changes that have occurred due to shoreland, wastewater or agricultural implementation practices that have occurred in the past six years.

For more information contact:

Lauren Klement
LeSueur County
Environmental Services
LeCenter, MN
(507) 357- 8540
or Gene Krautkramer
LeSueur County SWCD
(507) 357-4879

Financial information

The $77,000 CWP grant was matched by $8,441 local cash and landowner contributions and local government in-kind contributions of $317,007, for total project costs of $402,448.

CWP projects

Long Prairie River Watershed Project

The Long Prairie River and its nearly 900-square-mile drainage basin are located in central Minnesota, covering most of Todd County and parts of Douglas, Morrison and Ottertail Counties. The river flows from the North Central Hardwood Forests ecoregion of the Alexandria Lakes area through the cities of Long Prairie and Browerville and then north into the more pristine Northern Lakes and Forest ecoregion. The river discharges into the Crow Wing River of the Upper Mississippi River Basin.

In 1994 was listed as impaired for dissolved oxygen. The impairment was investigated, determined to be caused by ammonia discharges from point sources, and allocations developed. TMDL allocations were approved by the U. S. EPA in August 2005.

In 1997, as a result of a Phase I Clean Water Partnership grant, an intensive data- collection and implementation effort was conducted by the Todd County SWCD to address nonpoint-source pollution in the Long Prairie River. While nonpoint sources were not the cause of the impairment, it was determined that water-quality management efforts needed to focus on both point and nonpoint sources.

The CWP plan for the Long Prairie has been an important component of the state's basin/ecosystem-based management of the Upper Mississippi River Basin. The Phase II effort along with the TMDL process is expected to extend over 10 to 15 years, and will be necessary to achieve both point as well as nonpoint-source improvements.

The Phase II project had four major goals:

- Reduce pollutant loading through the implementation of nonpoint BMPs.
- Increase public awareness of water-quality issues.
- Improve coordination of watershed activities.
- Evaluate project effectiveness.

Results that count

To meet project goals a wide variety of BMPs were implemented throughout the watershed in 2001 and 2002. Additionally, 12 sites were monitored between 12 and 18 times from March through November. During the monitoring season, dissolved oxygen (DO) levels were maintained above 5 mg/L at all sites except below the city of Carlos. During the 2001 sampling season, nine sites were monitored regularly, up to 17 times from April through October. Dissolved oxygen continues to be a problem at below Carlos.

The increase in nitrogen levels in 2000 appears to have leveled out but did not change significantly in 2001. The project's installation of buffers in this area is considered a contributing factor to maintaining the level of nutrients.

The project held a series of public meetings through out the watershed on the river's impaired waters status, TMDL allocations, and the nonpoint management program.

For more information contact:

Kitty Tepley
Todd County Soil and Water Conservation District
607 Ninth Street Northeast
Long Prairie, Minnesota 56347
(320) 732-2644
Kitty.Tepley@mn.usda.gov

Financial information

The $316,565 in Clean Water Partnership funding was matched by $803,683 in local and federal program dollars, with total projects costs of $1,120,248.

CWP projects

Long-Term Water-Quality Study of Glacial Ridge Surface and Groundwater Systems

This project on the Glacial Ridge National Wildlife Refuge in Northwestern Minnesota is the nation's largest wetland and prairie restoration project. Once the site of an extensive farm, this project represents a unique opportunity to understand the interaction of surface and groundwater. The project described the hydrology and land use of the area and monitored stream flow in ditches on the property using telemetry-equipped continuous monitoring equipment. The continuous water-level network established for the project includes six ditch gauges and 12 wells. Maps were developed showing both current and desired future flow pathways and flow directions.

Hydrologists from the U.S. Geological Survey (USGS) have been monitoring the hydrologic patterns of surface and groundwater flow and quality across the Glacial Ridge property since 2001. The monitoring in this project focused upon water quality, diversity of native plant communities, water budget (hydrology), species composition of plant communities, and disturbance regimes. Monitoring techniques included digital mapping with emphasis on Global Positioning System data and land-manager knowledge, essential species surveys, non-native invasive species surveys, water-quality sampling, examining geomorphic conditions following wetland restorations, groundwater monitoring, photo points, and surface-water monitoring.

For more information contact:

Corey Hanson
Red Lake Watershed District
(218) 681-5800

Financial information

The project received $525,000 in CWP funds. This amount was matched with $56,803 cash and $794,060 in-kind contributions, for total project costs of $1,375,863.

Results that count

- A new well field to provide drinking water for the City of Crookston was installed on the eastern edge of the Glacial Ridge property.
- The Minnesota County Biological Survey mapped the existing native vegetation surrounding the property to provide information for the restoration plan.
- Biologists from the USGS have conducted surveys of bird use in the area over the last several years.
- A master plan for restoration, management, and monitoring at Glacial Ridge has been established. Some of the monitoring stations established during the project will continue to be monitored after the completion of the project to further assess its impact upon hydrology and water quality. The Red Lake Watershed District provided enough funds to continue the monitoring program through the end of the 2005 monitoring season. The study will be continued through the year 2012. Other funding sources are being sought for continuing the project further into the future. These funding sources include the RLWD, Nature Conservancy, Red River Watershed Management Board, United States Fish and Wildlife Service, and the Minnesota Board of Water and Soil Resources' Challenge Grant program. A long-term monitoring plan is in the process of being developed.

CWP projects

Seven Mile Creek Watershed Project

The 23,500-acre Seven Mile Creek Watershed Project was an effort to restore water quality in Seven Mile Creek, located in south-central Minnesota between the cities of Mankato and St. Peter. The upper reaches of Seven Mile Creek are channelized for agricultural drainage. The lower reach, which flows through a popular Nicollet County park, is a designated trout stream. The Brown-Nicollet-Cottonwood Clean Water Partnership was the project sponsor.

Water-quality monitoring funded through a resource investigation grant from the MPCA and the Brown-Nicollet Environmental Health Office began in 1996. In 1997 Red Top Farms, a field-scale drainage research project, was installed in the northern portion of the watershed. Monitoring and educational outreach continued through 2002 with assistance from an MDNR Environmental Partnership grant. A detailed water-quality study was completed in the fall of 2001. In 2002, a Clean Water Partnership was formed for the project and additional technical and financial support was made available to watershed farmers, landowners, and homeowners. Special programs included low-interest loans to replace outdated septic systems, vegetated filter strips along drainage ditches, wetland restorations, nutrient management, on-farm nitrogen-rate demonstrations, open-tile intake replacements, and Conservation Security Program promotion.

Project objectives included:

- Accelerate the adoption of environmentally sensitive cropland into set-aside programs (e.g. filter strips along drainage ditches).
- Restore wetlands in strategic locations to intercept tile drainage and surface runoff.
- Demonstrate conservation drainage techniques.
- Increase watershed acres enrolled in the federal EQIP program for nutrient management and reduced tillage systems.
- Upgrade non-complying septic systems using low-interest loan funding.
- Conduct on-farm nitrogen-rate demonstrations to validate University of Minnesota recommendations and increase awareness of nutrient management concepts with individual producers.
- Demonstrate soil bio-engineering and natural stream-channel design for stabilizing eroding banks.

For more information contact:

Kevin Kuehner
Brown-Nicollet-Cottonwood Water Quality Board
322 S. Minnesota Avenue
St. Peter, Minnesota 56082
(507) 934-4140
kuehnbnc@hickorytech.net

Financial information

The project received $196,432 in Clean Water Partnership funds and was matched with $23,961 cash and $376,453 in-kind contributions, for total project costs of $596,846.

Results that count

- 156 acres of environmentally sensitive cropland taken out of production
- Twelve open tile intakes replaced with rock inlets
- 660 acres of land enrolled in a nutrient management program
- 33 failing septic systems replaced
- 36 acres of riparian buffers installed on four miles of ditches, increasing the percentage of buffered ditch miles from 16% to 31%
- Restored five wetlands covering a total area of 150 acres. One of these projects involved a first-of-its kind petition to modify public drainage tile through a restored wetland.

CWP projects

Urban Stream Assessment at the Bend in the River (Mankato)

Located in Blue Earth County, the Thompson Creek Phase I Diagnostic Clean Water Partnership was a project designed to determine the effects of stormwater ponds on water quality at the confluence of Thompson Creek and the Minnesota River. Blue Earth County was the project sponsor. The county coordinated the project in partnership with the city of Mankato, the Water Resources Center at Minnesota State University-Mankato, and the MPCA. The main objectives of the project were:

- Complete a diagnostic assessment of water quality, land use, and soil phosphorus levels in the project area
- Complete field surveys of Thompson Ravine and the confluence of Thompson Creek and the Minnesota River
- Study the influence that stormwater management ponds in the urban, commercially developed area of the watershed have on water quality in Thompson Creek and the Minnesota River
- Understand the degree to which Thompson Ravine is unstable and how such instability may affect water quality.

Overall water quality related to total suspended solids, phosphorus, and nitrogen showed that the stormwater detention basins were effectively treating or settling these pollutants before discharge to the creek. Levels of these pollutants increased substantially between the basins and lower end of the ravine, suggesting that instability in the ravine was a primary pollution source. Field survey work documented numerous areas of instability.

In response to the findings of the study, the city of Mankato has taken action in several areas, including:

- Revising requirements for development setbacks from steep slopes in order to reduce encroachment
- Increasing stormwater fees to allow for improved stormwater management
- Promoting lower-impact development practices.

The city may make changes in the Thompson Creek Ravine system by developing recreation areas and trails to connect parts of the city's expanding trail network. These changes can provide the opportunity to construct erosion-control BMPs in the area. This project has been part of a related effort to develop a Greenprint for all of Blue Earth County. The Greenprint project will provide a comprehensive plan for government and non-profits to identify existing and potential corridors to enhance quality of life and wildlife habitat, parks and trails, and stormwater management.

For more information contact:

Julie Conrad
Blue Earth County Environmental Services
410 South Fifth Street, P.O. Box 3566
Mankato, Minnesota 56002-3566
(507) 389-8386
Julie.Conrad@co.blue-earth.mn.us

Financial information

This $78,934 Minnesota River Grant was matched by $96,443 of local cash and in-kind funds, with total project costs of $175,377.

CWP projects

Watonwan River Major Watershed Implementation Project

The Watonwan River Watershed is a major watershed encompassing 561,000 acres within the Blue Earth River Basin. The watershed is located predominately in Blue Earth, Watonwan and Cottonwood Counties of South Central Minnesota, including the towns of Mountain Lake, St. James and Madelia. Agricultural production of corn and soybeans is the dominant land use in this watershed. The Watonwan River system consists of 390 miles of perennial streams. Watonwan County sponsors this ongoing implementation project, with five adjacent counties participating.

Water monitoring of streams in the Watonwan watershed has shown elevated levels of turbidity and bacteria, which has resulted in multiple impairment listings on the river and its tributaries. Hydrology and the need to improve water storage on the landscape are critical issues as well.

This implementation project has overall resource goals aligned with the goals in each county's comprehensive local water plan. Broad-based numeric goals for bacteria (achieve the state standard) and for sediment (reduce by 40% from 1996 conditions) apply across the entire Watonwan watershed. A third type of goal addresses three priority management areas as smaller subwatersheds, and sets sediment and nutrient reduction goals.

Twenty projects received cost-share funding for water storage and hydrologic improvements. The more extensive of these projects were in the middle to upper portions of the main Watonwan watershed. For example, the photo shows construction of a water-storage structure near the upper river that collects water from 167 acres and benefits both water quality quantity. This project cost $29,000 and reduced 25-year storm runoff by 80%.

From 2000-2003 the project supported split-field nitrogen-rate trials. The University of Minnesota Extension Service led the trials, which demonstrated that on average, most

producers could reduce their nitrogen rate by 30 pounds/acre without affecting crop yields.

In 2001, the project sponsored a meeting with private agronomists to share methods and information on farm nutrient planning. This showed the importance of manure crediting, as well as providing communication between the public and private sectors involved with farm nutrients and water quality.

For more information contact:

Bruce Johnson
Watonwan County Environmental Services
P.O. Box 518
St. James, Minnesota 56081
(507)375-1225
Bruce.E.Johnson@co.watonwan.mn.us

Financial information

The project received $500,000 in Clean Water Partnership funds and was matched with $6,616 cash and $856,486 in CWP Loan funds, for total project costs of $1,363,102.

Results that count

- Over 1,700 feet of tributary and main-channel reaches of the Watonwan system were rehabilitated.

- The project's student education component resulted in 22 grants from the project to local schools for a variety of water-quality projects. These projects were developed by school staff and students, and included chemical and biological water sampling and testing, the use of watershed models and curriculum, field trips, and teacher training events. Program coordinators also used funds to make a Prairie Ecology Bus available to numerous school districts, and to conduct GIS mapping and analysis of the watershed. Teachers, students and districts demonstrated excellent leadership in these programs.
- A major component of this project was development of a watershed ISTS loan program. Within the watershed, there have been 150 ISTS upgrades, using $800,000 in state loan funds, which are repaid by homeowners through property-tax assessments over a set term. Two lakeshore communities received technical and design / planning assistance for wastewater improvement.
- Four feedlot site implementation projects were cost-shared, including runoff controls, buffers and milk-house wastewater treatment.
- Stream monitoring included eight river sites in 1996, five automated sites from 2000-2003, and one site (outlet at Garden City) from 2004 to present. Citizen volunteer stream monitoring began in 2002 with 11 active volunteers through the MPCA's Citizen Stream-Monitoring Program. Most of these volunteers remain involved, and collect important data and observations at a variety of stream and ditch sites across the watershed.

CWP projects

Whitewater River Watershed Project

The Whitewater River consists of several branches and is located in southeastern Minnesota in Olmsted, Winona and Wabasha counties. The watershed is 205,000 acres in size, and is famed for its more than 100 miles of designated trout streams. Water-quality degradation, particularly sedimentation from eroding farmland, is a major problem affecting the watershed. In spite of significant progress over the years, the river still ranks high in sediment yield. Bacterial pollution and stream habitat degradation are also significant issues for the Whitewater River.

Over the past 60 to 70 years, improved land stewardship has made a marked improvement in water quality in the watershed, but there continues to be a need to build a stronger conservation ethic. Recent changes in land use toward less hay and livestock, and more row crops, have set back some of the gains in land and water quality.

The purpose of this project is to nurture an ongoing land-stewardship ethic amongst people who live, work, and recreate in the watershed. The project focuses on improving water quality, reducing sedimentation and flooding, and improving habitat for all plants and animals. A joint powers board of soil and water conservation districts and county commissioners was established in 1987 to work towards project goals. Over the last 20 years, the focus has been on education as well as technical and financial assistance within the watershed.

For more information contact:

Linda Dahl
Whitewater River Watershed Project
400 Wilson Avenue, PO Box 39
Lewiston, Minnesota 55952
(507) 523-2171
Linda.Dahl@mn.nacdnet.net

Financial information

This continuation project received $220,000 in CWP funds and was matched with $420,573 federal, state and local cash and in-kind, for total project costs of $640,573.

Results that count

The Whitewater watershed project was one of the first efforts to successfully coordinate major federal and state (CWP) resource improvement programs for land and water at the watershed scale. This collaboration is ongoing. USDA provided major technical support (1-2 full-time-equivalents) to develop farm conservation plans and practices. This overall coordination and assistance package has led to the implementation of the following agricultural practices under contract with 83 landowners:

- 25 grade stabilization structures
- 64 acres of grassed waterways
- 9 water and sediment control basins
- 7 miles of terraces
- 4 miles of temporary fences
- 1,700 acres of cropland under nutrient management
- 2 sinkholes sealed.

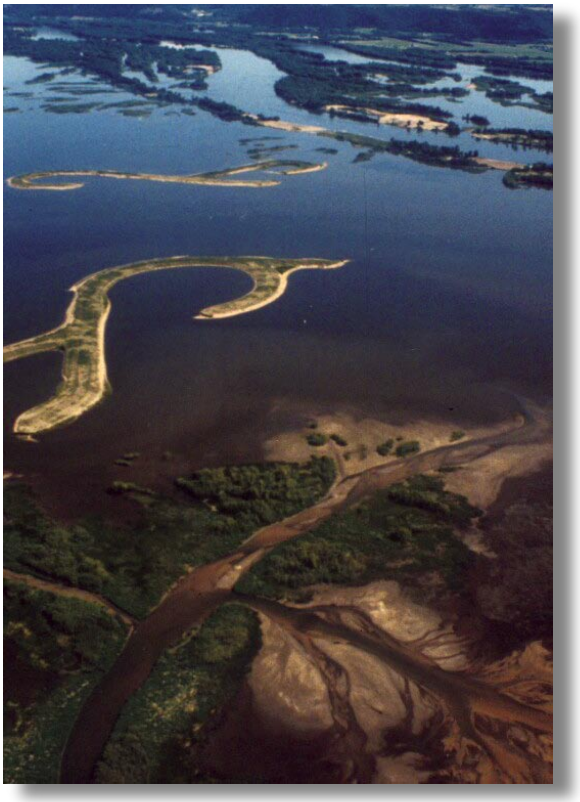
A stormwater management workshop, held in 2001 and co-sponsored with the Southeast Minnesota League of Municipalities, was attended by 75 contractors, consultants and city staff. A soil erosion workshop for contractors was held in 2003, and 59 people involved with roads, buildings and conservation projects attended. School curriculum support and teacher training/exchange has been an important project component. This has been coordinated with MDNR's naturalist program at Whitewater State Park. Educational kits were provided to the seven school districts in the watershed for upper elementary, middle and high-school levels.

The project provided a compilation of all available data sets for comprehensive GIS coverage in 2000, which all project participants received in CD format. The information is used for planning, project development, evaluation, and reporting/education.

The project determined that cover crops, such as rye, should be promoted, especially when early crops such as peas were harvested, leaving soil vulnerable. A total of 2,300 acres of cover crops were established from 2000-2005, protecting fields from erosion. A survey of participating farmers noted benefits for soil tilth, fertility, and erosion control. Private woodland management has been promoted through coordination with MDNR forestry staff and private contract foresters. Since 2001, eight field-day tours have been planned and implemented in the watershed, focusing on grazing, forestry and agricultural conservation practices.

In conjunction with Winona State University's Water Resources Center, a Citizen Stream-Monitoring Program "Plus" program was initiated. This builds upon the MPCA's regular CSMP by giving volunteers additional monitoring options. Guidance and training were provided. A part-time outreach coordinator was hired to make individual contacts with watershed residents, to disseminate information, and to develop a watershed history brochure.

The project supported a full-time project coordinator, a part-time contracting officer dedicated to federal activities, and both part-time and fulltime GIS specialists, who have all focused their attention on the watershed.



CWP projects

Yellow Medicine River Phase II Project

The Yellow Medicine River is a major tributary of the Minnesota River in western Minnesota. A CWP Phase I monitoring project beginning in 1997 determined high-priority reaches with significant levels of nutrient loading from phosphorus and nitrates.

Using a cost/benefit model, a CWP technical committee chose the following conservation measures: 1) CRP grassland cover, 2) buffer strips, 3) residue cover 4) updating septic systems, and, 5) manure management. The technical committee proposed a 25% reduction in total phosphorus, total suspended solids, and nitrate-nitrogen at the priority sites. Some of the conservation measures discussed were: terraces, grass waterways, sediment control basins, CREP/ CRP, sewer systems, tillage practices, buffer strips, filter strips, replacing open intakes with blind intakes, nutrient and pest management with EQIP program, French intakes, possible erosion controls, river bank restoration, wetland restoration, feedlot control methods, and lake-level management.

Implementation activities during the Phase II CWP included conservation measures such as CREP, CRP and RIM programs, filter strips and basins, upgrades to septic systems, local nutrient management assessments conducted by the Yellow Medicine River Watershed District, and several information and education initiatives.

A survey was conducted to determine educational needs of the watershed landowners. It was mailed to about 150 landowners in the watershed, with 79 responses. The surveys found 80% of the landowners were aware of BMPs for nitrogen and phosphorus, 90% had at one time soil-tested their land, 20% were not sure whether manure was to be applied to their land in the future, and 60% were not sure or did not know about the minimum state requirements for manure application.

Beginning in January 2002, a Nutrient Planner newsletter was sent periodically (several per year) to about 400 watershed residents involved or concerned with crop production. The newsletter addressed timely issues of nutrient planning. Working with watershed staff, presentations were given to students at area schools on the basics of soil formation and characteristics, erosion and runoff, and plant nutrients.

A manure management update was held for farmers, with the main themes of economics of manure and nutrient management as well as the value of soil testing in nutrient management programs. There was general agreement that manure had economic value and that the economic value needs to be realized or it will be wasted or possibly taken away.

A series of evening meetings was held at the watershed office to update and discuss the phosphorus index with farmers. In 2001, the school football fields of Ivanhoe, Minneota, and Cottonwood were soil-sampled and tested for phosphorus and potassium. A presentation was prepared for the students in each school that showed photos of the fields, the equipment used, and the soil-test results and fertilizer recommendations made using soil-testing methods. A series of evening meetings was held at the Lakeview school about nitrogen management. In winter 2002 a public meeting, organized by the Lincoln county environmental office, was held in Ivanhoe for Lincoln county feedlot operators and others involved in agriculture in the county. The meeting was attended by approximately 40 people. In the fall of 2003, yield results from the nitrogen-rate strip trial in site 4 were sent to farmers throughout the watershed.

Each year, participants were invited to attend seminars and meetings, and to encourage attendance their registrations fees were paid. Two feedlots were worked with by the agronomist in the Lake Shaokatan area of the watershed. One operation southwest of the lake involved a permanent easement that is being used as hay land and cannot have fertilizer or manure applications.

The project found that nitrates can be reduced slightly or at least minimized if proper BMPs are followed, but big reductions are not likely if the corn/soybean system continues. Nitrate losses in a given year are greatly dependent on the weather, an uncontrollable variable. Phosphorus reductions can be expected over time by just using the basic tools and BMPs of phosphorus

management. However, other factors such as erosion reduction are expected to have a greater impact on reduction of phosphorus loads over time.

For further information contact:

Terry Renken
Yellow Medicine River Watershed District
215 North Jefferson Street
P.O. Box 267
Minneota, Minnesota 56264
(507) 872-6720
ymrw@starpoint.net

Financial information

The project received $302,250 in Clean Water Partnership funds and was matched with $475,261 cash and $556,915 in CWP Loan funds, for total project costs of $1,334,426.

Results that count

- 31 basins and nine filter strips installed
- 105 ISTS systems installed
- 317 nitrogen tests and 103 phosphorus tests at 57 sites.

319 Projects

BMP Implementation, Lake Carnelian

Lake Carnelian lies in Washington County in the east Twin Cities metro area. The Carnelian-Marine Watershed District wanted to implement a BMP program help to maintain the quality of the district's high-priority lakes and wetlands and improve the quality of its lower-priority waters. The project's overall objectives are to protect and improve water quality and fish and wildlife habitat, and prevent flooding. More specifically, this program used a targeted approach giving priority to projects which provide a specific water-quality benefit such as reduction of sediment or phosphorous for the higher-quality waters, including Big Marine and Big Carnelian Lakes.

Program projects could include both riparian and/or upland projects that demonstrate a water-quality benefit. Water-quality sampling, lake-core sampling, and aerial photo evaluations were used to direct BMP implementation to provide the greatest benefit.

CMWD feels the program has helped bring about a paradigm shift among lakeshore owners from the idealized mowed green lawn and sandy beach to acceptance of buffers and associated water-quality benefits. Long-term success will be measured by phosphorus concentrations and Secchi depths for the targeted lakes through the district's annual water-quality monitoring program.

For more information contact:

Melissa Lewis
Program Director, Carnelian-Marine Watershed District
1380 West Frontage Road, Highway 36
Stillwater, MN 55082
651-275-1136
melissa.lewis@mnwcd.org

Financial information

With total project costs of $139,256, the Section 319 grant dollars of $50,000 were matched by local in-kind and cash of $89,256.

Results that count

- Landowners provided with project information, erosion and sediment control information, non-point pollution information, and shoreland management literature.
- Over 60 landowners in priority areas and areas with nonpoint-source pollution issues were identified through aerial photo lakeshore analysis and contacted to address priority nonpoint-source pollution concerns.
- Cooperative landowners provided with best management practice solutions along with cost-share incentives to implement BMPs. 29 projects installed
- Shoreland management demonstration projects and BMP site tours provided for the landowners and citizens, local government officials, and others.
- Provided on-going technical and resource support to cooperative landowners. Maintained contact and conduct progress inspections at regular intervals.
- Over 1,700 feet of shoreline and streamside treated with BMPs.
- Over 45,000 square feet of BMPs installed on upland.

319 projects

Conservation Tillage for the South Branch Root River

This project used funds from the Conservation Tillage Guideline 319 Grant in an effort to boost adoption of conservation tillage in the South Branch of the Root River Watershed, located in southeastern Minnesota. The South Branch had just been designated a pilot project in Governor Pawlenty's Clean Water Initiative. The project sponsor was Fillmore County. The project ran July through August 2004 and had three main goals:

- Assess the adoption of conservation tillage in the watershed
- Provide education to landowners on conservation tillage
- Coordinate area tillage grant activities.

Demonstrable environmental benefits are difficult to measure in the two months it took to meet these goals. However, gathering and disseminating information about conservation tillage appears to have contributed to a nearly 10 percent increase in adoption of the practice in the subsequent two-year period. This was demonstrated by a tillage transect survey with 260 data points conducted in the project area in 2004 and again in 2006.

For more information contact:

Donna Rasmussen
Fillmore County
912 Houston Street Northwest
Preston, Minnesota 55965
(507)765-3305
donna.rasmussen2@nacdnet.net

Financial information

This project received a $7,696 Section 319 grant and, due to time constraints, was not able to develop local match.

Results that count

This conservation tillage assessment and education project included a detailed land-use study. The Minnesota Department of Agriculture conducted 61 interviews with randomly selected farmers in the watershed to gather information about current farming practices related to tillage, nutrient management, pesticide management, and manure management. Additional funds from the University of Minnesota were devoted to this part of the project. In addition, county, NRCS and SWCD staff conducted a detailed transect survey of surface crop residue.

Farmer education was the second major focus of the project. This included displays at a Landowner Stewardship Day for area landowners, distribution of recently developed "Tillage Best Management Practices for Water Quality Protection in Southeast Minnesota" produced by University Extension under the 319 grant, and a widely publicized tillage workshop attended by 28 producers. The workshop included a panel of six farmers who have practiced conservation tillage for five to 10 years. Panel members identified barriers to adoption and how they overcame each challenge. Attendees considered the panel member testimonials very credible since the information was coming from people farming in similar landscapes under similar conditions. Staff from Extension, NRCS and the SWCD provided short presentations as well. Extension facilitated the workshop. A follow-up tillage field day provided another means for producers to share their experiences.

Finally, the goal of coordinating tillage grant activities through the watershed project was met through regular steering committee meetings. Fillmore County produced GIS maps to help target areas for subsequent education and assistance.

319 projects

Elk Creek Conservation Tillage Project

Elk Creek is a subwatershed of the Heron Lake watershed, which encompasses approximately 472 square miles in Nobles, Jackson, Murray, and Cottonwood Counties of southwestern Minnesota; Elk Creek lies within Nobles County.

Monitoring and assessment conducted in 1992 through Phase I of a CWP grant revealed that the major sources of nutrients and total solids to Okabena Creek are Elk Creek and the section of Okabena Creek that drains the City of Worthington. Streambank erosion was very evident at the Elk Creek sampling site and is probably a problem throughout the watershed. Feedlots may also be a problem.

The project's major objectives were:

- Increase public awareness of water-quality issues
- Reduce nonpoint-source pollutant loadings
- Compile and maintain a database.

In October 2000, Nobles County commissioners agreed to provide $26,400 to be used as matching funds for incentive payments within the project area. Heron Lake Watershed District applied for and received a grant outlining conservation tillage methods and incentives. HLWD gathered and distributed information to landowners in the Elk Creek subwatershed. Landowners and operators were contacted to provide information regarding the incentives that would be available for implementing conservation tillage practices in Elk Township.

Detailed tillage transect data was gathered for all of the tillable acres in Elk Township on an annual basis. The grant provided the opportunity for landowners to receive incentive payments for changing their current farming practices in an effort to achieve greater crop residues. An average of 30 percent residue cover was required in order to be eligible for an incentive. Spreadsheets containing the tillage transect data and the landowners receiving incentive payments were kept each year of the project.

During the application and work-plan processes, specific enrollment goals were set for each practice.

The most difficult undertaking in the project was gathering the tillage transect data. Often, the weather was not conducive to work scheduling. The data could not be collected during rain events, and long hours and variable conditions were standard. Landowners were hesitant to participate in this program, sometimes because they were difficult to convince that implementing conservation tillage practices on their property would be of any benefit to them. One-on-one contact was the best method of communication for this effort, although it took a substantial amount of time and commitment.

For more information contact:

Jan Voit
Heron Lake Watershed District
1008 Third Avenue, P.O. Box 345
Heron Lake, Minnesota 56137
(507) 793-2462
hlwd@roundlk.net

Financial information

The Section 319 grant totaled $28,200 and was matched with local cash and in-kind funding of $31,700. The total project costs were $59,900.

Results that count

Water quality data was gathered at three stream sites each year of the project through the CWP grant. The sampling periods ran from April through October. From 2003 through 2005, project data was entered into the eLINK program. A total of 8,274 acres were enrolled for conservation tillage, exceeding the work plan goal of 6,000 acres. A majority of the fields saw a 10 to 20 percent change in residue. Increasing the residue present in the field dramatically slows runoff to surface waters.

319 projects

Enhancement of the Local Government Annual Reporting (LARS) System's Pollutant Reduction Benefit Calculations

In the 1990s, words and phrases like "environmental outcomes," "milestones," "measurable benefits," "accountability," "indicators," "outcome measurement," and "accomplishment reporting" became increasingly common. It was no longer enough to measure accomplishments by number of permits processed or number of plans produced. Instead we wanted to know, what did these things produce? What were their benefits?

In cooperation with the MPCA and others, the Minnesota Board of Water and Soil Resources began work on developing the computerized Local Annual Reporting System. In 1995, BWSR instituted LARS as a statewide system that recorded information on implemented BMPs in Minnesota and estimated reductions of nonpoint-source pollutants for certain implemented practices. In addition to reporting activities funded through BWSR, LARS was used to document activities funded through Section 319 grant awards and Minnesota's Clean Water Partnership Program.

In 2001, a Section 319 grant was awarded to evaluate and revise the LARS algorithms and to develop a field research proposal to investigate the relation of BMP implementation to nonpoint-source reductions. The algorithms and methodologies of LARS needed to better account for regional differences (soils, precipitation, cropping patterns) and new developments in the field of agricultural BMPs. Two areas targeted were additional information on sediment delivery and the calibration of the LARS estimates with actual data from the field.

A Technical Advisory Committee was developed to guide collection of information to enhance the pollution-crediting algorithms in LARS. The advisory committee consisted of experts in the fields relating to evaluating agricultural BMPs from the following agencies:

- Minnesota Pollution Control Agency
- Minnesota Department of Agriculture
- Minnesota Department of Natural Resources
- USDA Natural Resources Conservation Service
- University of Minnesota Department of Soil, Water, and Climate
- Soil and Water Conservation Districts
- Minnesota Board of Water Resources
- U.S. Geological Survey

LARS Pollution reduction estimates

The LARS program had built-in estimates of soil erosion-based pollution reduction for soil loss reduction, sediment reduction, and phosphorus reduction for:

- Sheet and rill erosion
- Gully stabilization
- Stream bank/ditch stabilization
- Filter-strip projects
- Feedlot pollution reduction
- Wind erosion (user–specified)
- Other (user specified)

eLINK

The BWSR later developed the computerized eLINK system (partly funded with section 319 funds) which replaced the LARS program. For the first time ever, Minnesota has a widely accessible tool that enables the state to not only more efficiently manage programs, but also be able to measure positive advances in water quality and soil conservation. With eLINK, state agencies can:

- Evaluate effectiveness of programs
- Compile data on county, watershed, or individual-project basis
- Calculate pollutant reductions from conservation practices and easements
- Track cumulative grant funding over a period of years
- Map locations of projects.

Local governments can:

- Plan and track conservation projects and grants
- Prioritize and target financial assistance programs
- Evaluate the cost and benefits of conservation practices
- Track projects for long-term monitoring.

Front-line field staff technicians can:

- Use the system's on-line aerial photography to identify and map problem areas
- Plan and budget Best Management Practices using menu-driven templates
- Manage landowner contact information
- Quickly assemble a customized package of materials for individual landowners to consider in conservation planning
- Generate reporting data that funding organizations require.

For more information contact:

Eric Mohring
Minnesota Board of Water and Soil Resources
520 Lafayette Road
St. Paul, Minnesota 55155
(651) 297-7360
eric.mohring@bwsr.state.mn.us

Financial information

The Section 319 grant totaled $70,000 and was matched with state and federal in-kind funding of $85,450. The total project costs were $155,450.

319 projects

Geomorphic Assessment of Southern Minnesota Drainage Ditches

The goal of the project was to select representative ditch and natural channel sites across southern Minnesota and determine relative channel stability from field measurements of bed and bank features.

Drainage ditches are unnatural and unstable conduits of flow in the southern Minnesota landscape. Maintaining ditches cost the state an estimated $12 million every year. Altered hydrologic pathways—from the loss of perennials to increased subsurface drainage facilities—expand natural water channels, induce scour and encourage deposition in drainage ditches.

Better understanding ditch channel stability coupled with alternative ditch designs will not only save money for local government but lessen the pollutant loads to the Minnesota River and Lake Pepin.

For more information contact:

John Nieber, Professor
University of Minnesota
Department of Biosystems and Agricultural Engineering
1390 Eckles Avenue
St. Paul, Minnesota 55108
(612) 625-6724

Financial information

A Minnesota River Grant of $40,606 covered the costs for this project.

Results that count

Study results showed that:

- Both the Lake Pepin and Minnesota River turbidity TMDLs will need to address the suspended sediments and nutrients associated with ditch erosion.
- Most new ditches eroded bank material into the channel bed after construction, due to poor ditch-bank erosion protection.
- Older, unmaintained ditches accumulated sediment and developed a slight meander pattern in the bed—and were typically the most stable ditch channels.
- Partially maintained ditches were most at risk for future erosion because of steepened bank angles.
- Additionally the study led to the development of the Minnesota Agricultural Ditch Reach Assessment for Stability and a professional paper.

319 projects

Midway River Watershed Restoration Project

The Midway River system is located in the St. Louis River Watershed in the Lake Superior Basin. The St. Louis River Remedial Action Plan identified nutrient and sediment loading as problems in the St. Louis Bay Area of Concern. The Midway River watershed has been degraded by nonpoint-source pollution, and contributes to this impairment. This project was a demonstration of how St. Louis River subwatersheds could be enhanced, restored, and protected. The project has furthered the St. Louis River protection initiatives.

Goals for this Phase II project were:

- Outreach and education
- Identify sites in the watershed that are contributing sediment loading to the river system
- Identify riparian areas that are devoid of vegetation
- Plant trees along the river to stabilize eroding areas, increase riparian vegetation, and provide shading and woody debris in the future
- Water chemistry and temperature monitoring.

For further information contact:

R. C. Boheim
South St. Louis Soil & Water Conservation District
215 North First Avenue East, Room 110
Duluth, Minnesota 55802
(218) 723-4629
R.Boheim@southstlouisswcd.org

Financial information

The 319 grant contributed $32,174 and was matched by local in-kind contributions of $34,253.

Results that count

- Distributed newsletters to 2,000 landowners and 1,681 brochures were mailed to landowners in the watershed explaining forest management guidelines.
- Water chemistry monitoring for TSS, total nitrogen, and total phosphorus was performed during project.
- Tree planting at several land owner sites completed, including 451 potted white spruce, 5 potted white pine, 10 potted white cedar, 950 bare-root trees (variety of deciduous and coniferous), and 1000 seedlings donated from Potlatch Corporation.
- Developed two continuous conservation reserve program plans and four forest stewardship plans.

319 projects

Nemadji River Basin Project

The Nemadji River Watershed encompasses 433 mostly forested square miles in Minnesota's Carlton and Pine Counties and Douglas County, Wisconsin. Despite the predominance of mature red and white pine forest cover, easily erodable sand and clay soils make the watershed susceptible to streambank erosion and high volumes of runoff.

As a result, as water on the land makes its way to Lake Superior, excessive sedimentation (ten times that of the pre-settlement rate) degrades trout streams, damages roadways, and affects shipping operations in the Duluth-Superior harbor.

Examples of the costly effects:

- Sedimentation can drastically compromise the approximately 400 miles of trout-classified streams' spawning habitat for migratory trout and salmon. Lake Superior's rainbow trout population has already been dramatically reduced; this also impacts northeastern Minnesota's recreational sport fishing industry.

- Excessive sedimentation from stream bank erosion has mandated expensive (approximately $260,000 per year) dredging operations in the Duluth–Superior harbor. This is turn affects the viability of an international shipping industry.
- Human activities, such as clear-cutting forests, clearing land for agriculture, draining wetlands and building roads altered the watershed's hydrology, contributed to higher volumes of runoff and peak flows following storms and snow melt and accelerated the eroded soil's detrimental effects.

The goals of this proposed project include an inventory and assessment of the water-retention devices (dams) that were constructed in the watershed by the NRCS during the "Red Clay Project" in the 1970s and demonstrations of the construction of water-retention practices, highland wetlands construction, and riparian area reforestation. The Land SAT image land-use maps developed during the Clean Water Partnership portion of the project will be utilized in selecting sites for the wetland and riparian restoration projects. The projects will demonstrate the effectiveness and potential of installing holistic land-use practices to reduce peak flow conditions within the watershed. Educational and outreach components of the ongoing CWP project will be utilized as public outreach tools for this project.

For more information, contact:

Joan Weyandt
Carlton County Water Management Plan Coordinator
P.O. Box 220
Carlton, Minnesota 55718
(218) 384-9178
joan.weyandt@co.carlton.mn.us

Financial information

This project received a Section 319 grant of $34,654 and matched it with $63,262 local cash and in-kind. Total project costs were $97,916.

Results that count

- Inventoried and assessed the condition of water retention devices (dams) constructed during the 1970-era NRCS Nemadji Red Clay Project. Evaluated the construction of water retention practices, highland wetlands construction and riparian area reforestation.
- Planted trees on eight acres adjacent to Nemadji tributaries to establish a riparian zone in an area with established reed canary grass.
- Marketed the project to potential participants and educated the public in the feasibility of installing best management practices on their lands.
- Contracted with the University of Minnesota Duluth Geology Department to evaluate and map the Deer Creek sub-watershed area's stratigraphy to understand the 'mud volcano' phenomenon and to assess the feasibility of reducing the sediment input to Deer Creek.
- Contracted with the University of Minnesota to search the Minnesota well-log inventory, and locate and GPS all well and gravel-pit locations.
- Established long-term monitoring stations on the watershed's impaired waters, installed permanent flow meters, a dissolved oxygen meter, a portable flow meter, and a turbidity meter which will be available for the use by the Riverwatch program in area schools.
- Utilized Land SAT image land-use maps for selecting wetland and riparian restoration project sites.

319 projects

Northland NEMO Initiative

Nonpoint-source pollution from stormwater runoff has been identified as the leading cause of pollution to our waters. Growth and development generate significant erosion and pollution loads containing sediments, phosphorous, nitrogen, pathogens, heavy metals, hydrocarbons, debris and thermal changes that run off into, and threaten the quality of our surface waters.

The most effective approach to reducing nonpoint-source pollution is to address it at the local level, establishing a new focus on "community based environmental

protection." This initiative, called Nonpoint-Source Education for Municipal Officials (NEMO) aimed at educating local governments and land-use decision-makers using commonly available tools and applying them to a local situation.

The project's first goal was to expand nonpoint-source education efforts to communities throughout the state. A comprehensive educational program, directed to land-use decision makers, was developed that helped them understand the nature of nonpoint-source pollution and its impact on their lives, communities and natural resources. The objective was to enable these decision-makers to plan for growth while addressing water quality issues through educated land-use decisions.

The second goal was to incorporate the principles promoted in the presentations into policies and practices. It was hoped that the initial presentation would "open the door" to working with the communities in developing an environmental awareness toward development. As a follow-up, the communities were offered other presentations and educational materials on topics such as:

- Low-impact development
- Reducing impervious surfaces
- Conducting a Natural Resource Inventory
- Phase II EPA regulations
- Stormwater ordinance development
- Erosion control programs & practices

Far and away, the area most communities requested help with was the development of local ordinances. The Northland NEMO Team was able to put together a series of "model" ordinances addressing stormwater, erosion and sediment control, shoreland development, and subdivisions. A presentation was also developed focusing on protecting lakes faced with development. Over 90% of survey respondents identified the need for more education, more funding and more agency participation at a local level.

For more information contact:

Minnesota Erosion Control Association
PO Box 17
Lake Elmo, MN 55042
651-261-4546

Financial information

The $125,000 Section 319 grant was matched with $175,000 local cash and in-kind, for total project costs of $300,000.

Results that count

- Over 250 presentations were given, introducing thousands to the problems we face with stormwater runoff and nonpoint-source pollution.
- In Little Falls we were able to work to develop a very successful business park project and save over $200,000 on a $350,000 estimated cost.
- In Stearns County, an effective ordinance and implementation program was developed.
- A few people can still make a difference. In one community, only three people showed up for the presentation on a blustery mid-January night. Nonetheless, after much discussion the seed had been planted which grew into a new ordinance language, a lake protection project and infrastructure retrofit, and the beginnings of a stormwater plan for the community.

319 projects

Red Lake River Restoration and Habitat Improvement Project

Erosion of the east bank of the river in city of Crookston (Polk County) contributed to collapse of the sanitary sewer interceptor pipe, and was threatening to collapse the replacement pipe. The city constructed 800 feet of bank stabilization consisting of tree revetments embedded in a bank-full bench of 6-inch riprap material, three rock vanes extending outward from the eroding bank, and two rock riffles across the entire channel. These improvements, along with planting of wetland-tolerant grass-seed mixtures and willow cuttings, has halted further erosion of this reach of the Red Lake River. The rock vanes tree-root revetments along this reach trap water in "quiet zones" and force the current around these zones into the center of the channel, where it doesn't damage the riverbank.

The project also replaced a 100-year-old low-head dam with gradual rapids, dropping 9.3 feet over a distance of 300 feet. Under normal flows, the tailwater is controlled by the first of the two riffle sets, located about 1,000 feet downstream from the rapids.

For more information contact:

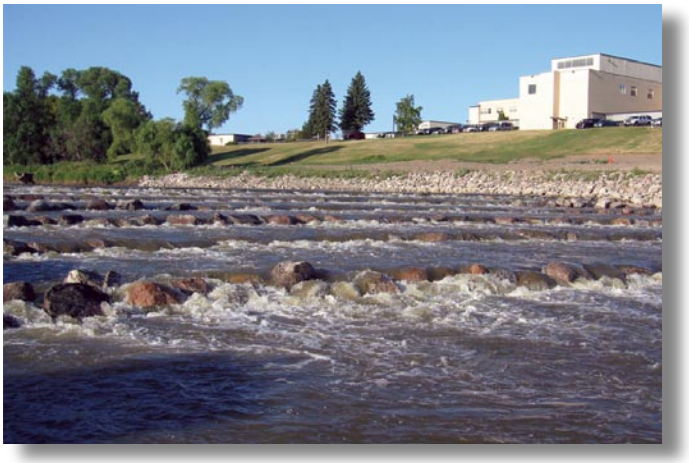
Keith Mykleseth
City of Crookston
124 North Broadway
Crookston, Minnesota 56716
(218) 281-1232

Financial information

The $420,000 Section 319 grant was matched with $1,708,170 local, state and federal cash and in-kind, for total project costs of $2,128,170.

Results that count

The DNR reports seeing certain fish species upstream from the new rock rapids that have not been seen in the area for years. The rock and boulder weirs provide an excellent location for fish to rest while making their journey upstream between the boulders from one step to the next. Removing the former dam also eliminated the tumbler effect that has trapped many people and caused several deaths since the dam was constructed in the very early 1900s. Already, people are canoeing, kayaking and boating in areas that were previously off-limits for obvious safety reasons.



319 projects

Salem Creek Bacteria Reduction Project

Salem Creek is a tributary to the South Fork of the Zumbro River, located in Dodge and Olmsted counties in southeastern Minnesota. The watershed covers 19,620 acres with most lands used for row-crop production. The stream is used by local residents for swimming and fishing, and has good potential as a higher-quality smallmouth bass fishery. During the past 15 years, water monitoring near the mouth of Salem Creek indicated that the stream was impaired for fecal coliform bacteria.

The Dodge County Environmental Quality Department sponsored this project, which sought to achieve reductions in the bacteria levels found in Salem Creek upstream of the sampling site. The project was designed to determine obvious sources of bacteria contamination and achieve source reductions through monitoring, education, citizen involvement, and funding of economical solutions to manure runoff from feedlots, pastures and crop fields. The project timeframe was from 2000-2005.

The specific project goals were to:

- Reduce fecal coliform levels below the state standard by the project's end, as measured at the main downstream sampling site.
- Provide monetary and technical support to aid agricultural producers in making feedlot corrections to reduce the transport of fecal coliform bacteria into Salem Creek.
- Increase awareness of fecal coliform contamination through meetings, site visits, letters and news releases.

For more information contact:

Mark Gamm
Dodge County Environmental Quality Director
22 Sixth Street East
Mantorville, Minnesota 55955
(507) 635-6273
mark.gamm@co.dodge.mn.us

Financial information

Total project expenditures were $212,000 (Section 319 grant of $103,000 and local/landowner match of $109,000).

Results that count

Due to the relatively short duration of the project, the inherent variability of bacteria data from streams, and the fact that most of the feedlot improvement projects were completed during the last two years of this effort, fecal coliform levels did not fall below the state standard by the project's end. Bacteria levels varied from about two to four times the state standard during the project timeframe.

From an initial list of 40 producers in the watershed, a group of 10 farmers was selected as focal points for monetary and technical support in making feedlot corrections. To date, feedlot improvements and/or grazing management changes have been accomplished on five of the farms. These were completed through grant, cost-share, and landowner contributions, coupled with technical assistance.

Annual newsletters, direct mailings, meetings, and personal contacts with county staff helped raise awareness of fecal coliform contamination in the watershed. Additional emphasis and interest was generated during the latter years of this project as feedlot and manure application rules were revised.

319 projects

Sauk Lake Restoration Project

Sauk Lake lies in the upper portion of the Sauk River Watershed District. The lake's 367 square-mile watershed lies in Todd, Stearns, Pope and Douglas Counties. The watershed encompasses numerous lakes, the largest being Osakis Lake, which forms the headwaters of the Sauk River.

The project partners and local residents recognized the changes occurring in the Sauk Lake and made a commitment to improve this important water resource. Local citizens and resource professionals were instrumental in the implementation of this restoration project and its overall accomplishments. The Sauk River Watershed District (SRWD) is the official project sponsor and coordinating agency for the EPA 319 project.

The project had a three-year implementation plan designed to address pollutant loadings in Sauk Lake and its tributaries. Priority was given to feedlots and cropland located adjacent to the Sauk River and Ashley, Silver and Hoboken Creeks.

For more information contact:

Lynn Nelson
Sauk River Watershed District
524 Fourth Street South
Sauk Centre Minnesota 56378
(320) 352-2231
lnelson@saukriver-watersheddistrict.org

Financial information

The Section 319 grant was $325,000, with local cash and in-kind project match of $392,085, for a total project cost of $717,085.

Results that count

- Ten landowners completed feedlot abatement projects.
- Vegetative buffer strips were installed on 12 acres adjacent to a drainage ditch and Ashley Creek in Pope County.
- Two adjacent landowners worked together to restore 17 acres of wetland in the upper reaches of the Ashley Creek watershed.
- Pasture management plans were developed for two livestock sites and are currently being implemented.
- Two major shoreland restoration projects, one smaller project, and five sites using a "Shoreland Kit" were implemented.
- The SRWD assisted area Boy Scouts in stenciling city storm drains to inform the general public that the city's stormwater system drains to Sauk Lake or the Sauk River.
- The SRWD also helped the city acquire a vacuum street sweeper designed to collect and recycle street sediment and remove debris from storm drains.
- A total of 232 stream samples and 139 lakes samples were collected. Latest modeling results show total phosphorus has decreased by 52% in Ashley Creek, 17% in Hoboken Creek, and 49 to 63% in Sauk Lake.

319 projects

Sauk River Chain of Lakes

The Sauk River Chain of Lakes is an important lake system in the Sauk River Watershed (see summary on Big Sauk Lake Restoration Project) and is a major economic asset to this region. This project's primary focus was to prevent the Lake chain from further degradation and to attempt to improve its current condition. The project began in 1997.

Project partners and local residents recognized the changes occurring in the Sauk River Chain of Lakes and made a commitment to improve this important water resource. The Sauk River Watershed District (SRWD) is the official project sponsor and coordinating agency for the EPA 319 project.

The project had a three-year implementation plan designed to address pollution loadings in chain of lakes and its tributaries. Priority was given to feedlots and cropland located adjacent to the Sauk River and Getchel, Unnamed, and Stoney Creeks, and along drainage ditches and other tributaries that discharge to these creeks.

For more information contact:

Lynn Nelson
Sauk River Watershed District
524 Fourth Street South
Sauk Centre, Minnesota 56378
(320) 352-2231
lnelson@saukriver-watersheddistrict.org

Financial information

The Section 319 grant was $200,000 and was matched with local cash and in-kind of $659,515, for a total project cost of $859,515.

Results that count

- 11 landowners completed feedlot abatement projects.
- One large hog operation was abandoned along Lake Zumwalde where an unpermitted earthen manure pit was found to have a seepage plume approximately 300 feet draining toward the lake.
- Stearns County SWCD and NRCS staff assisted 100 landowners in developing Manure Management Plans from 2001-2004.
- Approximately 1000 acres of filter strips and riparian forest buffers were installed. In addition, 10 grassed waterways were established, and approximately 2,332 acres have been enrolled in CRP in Stearns County.
- Sediment retention basins were installed at two farm sites. These basins were very effective in retaining agricultural runoff and trapping the fine soil materials.
- Five shoreland/riparian restoration projects were completed.
- SRWD assisted six landowners and one large resort in upgrading nonconforming septic systems.
- SRWD staff developed and participated in many education activities throughout this project, including

project newsletters, training sessions on volunteer monitoring, presentations at community events, and "Freshwater Treasure Chests" for K-12 classes.

- In 2001-2002 all 13 lakes within the lake system were monitored, with a total of 223 stream samples and 95 lakes samples were collected. Results show that total phosphorus has decreased from 44% (Krays Lake) to 80% (Horseshoe Lake) in the Chain of Lakes since 1992.

319 projects

Shakopee Creek Headwaters Project

A popular chain of lakes (West Norway, Norway, Games, Andrew, Florida) form the headwaters of Shakopee Creek located in northwestern Kandiyohi County. Shakopee Creek is the largest tributary of the Chippewa River, which itself is a major tributary to the Minnesota River. A comprehensive study of polluted runoff problems affecting this area has been underway since 1996. It has been identified as a priority management area determined to contribute a significant share of the pollutant load to the Chippewa River.

The major land use in the watershed is agriculture, and changes in agricultural practices are necessary for improvements in water quality. The watershed has remained a major recreation area for the local area, the region and the state. Hunting is also a major recreational use that has increased due to the protection and restoration of habitat within the watershed.

Fecal coliform is one of the major problems in the watershed. The preliminary goal was a reduction of 50 percent at two monitoring sites on county ditches. Fecal coliform used to spike as high as 10,000 to 100,000 organisms per 100/mL and now rarely hits 2,000. Total phosphorus in the ditches between the 2001 and 2003 monitoring seasons showed a 44% and 53% reduction, respectively.

Lake Florida has been pursuing a system to replace the need for individual septic systems. The first concept was clustered systems, which was abandoned for the connection to the Green Lake Sewer District. This system is scheduled to being construction in 2006. The removal of septic systems from around Lake Florida will bring the lake residences well above compliance and protect the lake from effluent. The Shakopee Creek project's education efforts and water-quality monitoring directly influenced the lake association to pursue this project with near-unanimous support of the residents.

Sibley State Park is installing a common sewage treatment facility for the entire park, thus protecting Lake Andrew from effluent from a non-compliant system. Work began 2005, and is scheduled to be completed 2006. The project's monitoring results were highly influential in conveying the need for this project.

For more information contact:

Lucas Youngsma, Watershed Coordinator
Kandiyohi County
1005 High Avenue Northeast
Willmar, Minnesota 56201
(320) 231-0008 Ext 132
Lucas.Youngsma@rcdnet.net

Financial information

The Section 319 grant was $225,676. A Clean Water Partnership loan of $250,000 also funded this project, as well as local cash and in-kind of $349,243. Total project costs were $824,919.

Results that count

- 3 nutrient management plans
- 1 livestock exclusion
- 5 miles of riparian area were buffered
- 5 shoreline naturalization sites were completed on the four of the five major lakes in the watershed.
- 3 wetland restorations
- 1 sediment basin
- 1 wetland control structure
- 3 rock inlets to replace open tile inlets
- CWP low-interest loan funds were utilized to upgrade 42 on-site wastewater treatment systems into compliance.

319 projects

Targeted Feedlot Runoff Reduction Project: Lower Mississippi River Basin

The Lower Mississippi River Basin in southeast Minnesota contains an estimated 9,600 livestock feedlots, of which 87% are in the "small" category (fewer than 300 animal units). In 2000, revised state feedlot rules introduced a phased-in compliance program for such feedlots, called the Open Lot Agreement (OLA). At the same time, a Regional Fecal Coliform TMDL study was being conducted which identified manure runoff from feedlots and fields as a major contributor to stream water quality impairments across the basin. The TMDL called for a 65 percent reduction in feedlot sources of fecal coliform bacteria to meet water-quality standards.

In response, the Basin Alliance for the Lower Mississippi in Minnesota (BALMM), working with the Southeast Minnesota Water Resources Board, developed a strategy to accelerate implementation of the OLA across southeast Minnesota. The project sponsor was the Southeast Minnesota Water Resources Board. Eight counties participated in developing a 319 grant to build their capacity to undertake the daunting task of certifying hundreds of producers for the OLA, and working with them to develop and fund cost-effective fixes within a limited time frame.

The goal of the grant was to enroll 90% of eligible producers in priority areas. The grant provided each county $70,000 to build its capacity to implement the OLA in priority areas over a three-year period. These funds were used to hire retired farmers and technicians to assist county staff with feedlot registration, OLA enrollment, and defining technical solutions.

It will take a considerable amount of time for all of these feedlots to be corrected. Several follow-up projects sponsored by three regional organizations are underway to provide technical and moderate financial assistance across the region. But the crucial first step of enrolling the great majority of eligible farmers in the OLA has been achieved, thanks to this project.

For more information contact:

Bea Hoffmann
Southeast Minnesota Water Resources Board
Winona State University
Winona, Minnesota 55987-5838
(507) 457-5223
bhoffmann@vax2.winona.msus.edu

Financial information

$531,658 of Section 319 funds and $711,621 of local cash and in-kind funds were spent on this project, for a total project cost of $1,243,279.

Results that count

As of October 2005, 74% (943 out of 1191) of eligible producers in the priority areas (those determined to have pollution potential) had enrolled in the OLA, compared to a target of 90%. This in itself is a remarkable accomplishment. However, most counties put forth an equally strenuous effort county-wide. As a result, the participation rate for eligible farmers in all areas of the eight participating counties was 69%, or 2,300 farmers.

Due to this project, 2,300 farmers who previously had little or no contact with local government regarding feedlot issues now have their names on a list awaiting assistance for feedlot fixes. Most participants expressed interest in achieving full compliance with feedlot runoff rules by 2010. As of the project end date, an estimated 184 farmers had developed and implemented plans for a 100% fix while 110 farmers had developed and implemented plans for a 50% fix. Approximately 265 manure management plans were approved by the end of the project.

TMDL projects

Beaver Lake TMDL

Beaver Lake and its tributary subwatershed cover parts of St. Paul, Maplewood, and Oakdale (Ramsey and Washington counties) and are part of the Ramsey Washington Metro Watershed District. The lake is listed as impaired for excessive nutrients (phosphorus). Beaver Lake is used primarily for fishing, canoeing, picnicking, wildlife habitat and sightseeing. Of concern is the 1,816-acre watershed surrounding the shallow lake.

Phosphorus released from lake sediment by water movement feeds algae. Another internal source of phosphorus is curly leaf pondweed. This large aquatic plant proliferates in the early summer and dies in mid-summer, releasing substantial amounts of phosphorus into the water column. In addition to these internal sources of phosphorous, St. Paul, Maplewood and Oakdale—all with portions inside the watershed—contribute phosphorous carried in stormwater runoff.

The start date for the TMDL was May 9, 2005 and the expiration date was Sept. 30, 2005, but the TMDL is on hold pending development of the MPCA's shallow lakes criteria.

For more information contact:

Clifton Aichinger
Ramsey Washington Metro Watershed District
2346 Helen Street
North St. Paul, Minnesota 55109
651-704-2089

Financial information

This project received a $18,861 Section 319 grant to fund this TMDL study.

Results that count

- Compiled study data into a STORET-friendly format
- Determined the TMDL allocations
- Defined the phosphorus loading capacity for Beaver Lake
- Determined the portion of phosphorus loading capacity allocated to nonpoint sources and natural background levels
- Obtained reasonable assurances that nonpoint-source phosphorous reductions will occur in Beaver Lake
- Created a plan for annual lake monitoring and public participation.

TMDL projects

Clearwater River/Walker Brook TMDL

These two stream reaches were listed as impaired in 2002. This portion of the Clearwater River runs from the Clearwater/Beltrami County line and continues north to the outlet of Clearwater Lake; the reach is classified as a Class I trout water and was listed as impaired for fecal coliform bacteria. Walker Brook, from Walker Brook Lake to the Clearwater River, was listed impaired for low dissolved oxygen.

The project was established to identify pollutant sources, define pollutant loads, predict desired loads, and identify strategies to achieve desired reductions. The Red Lake Watershed District served as project coordinator; additional technical work was provided by Bemidji State University.

Analysis determined the Clearwater River reach should be de-listed. This was done in 2005. The City of Bagley made improvements in wastewater and stormwater treatment that are credited for helping restore this stretch to water quality standards.

Analysis of Walker Brook determined that the natural conditions of the area were responsible for low dissolved oxygen levels. These conditions included both groundwater influence and redox processes in the soils of wetlands in the immediate watershed. This reach was recommended for a change in categorization due to natural conditions.

For more information contact:

Corey Hanson
Red Lake Watershed District
102 Main Avenue, P.O. Box 803
Thief River Fall, Minnesota 56701
(218) 681-5800

Financial information

This project received a $32,500 Section 319 grant to pay for this TMDL analysis and report.

Results that count

The project report recommends continued water quality monitoring in the area. This will be done by the Red Lake Watershed District.

TMDL projects

Hardwood Creek Biotic Impairment TMDL

Hardwood Creek is located in the Rice Creek watershed in the Twin Cities metropolitan area. The creek has an approximate 15,500-acre watershed that includes a significant portion of rural and agricultural areas. There are seven small registered feedlots located in the watershed.

In 2002, Hardwood Creek was listed as impaired for aquatic life due to a low fish index of biotic integrity (IBI). In 2004, the creek was again listed for biological impairment, this time due to low dissolved oxygen. Because these TMDLs are intrinsically linked, the Hardwood Creek TMDL study encompassed both impairments.

Habitat alteration was identified as the primary cause of the low index of biotic integrity in Hardwood Creek. Sediment and phosphorous were identified as having an indirect impact on the biological community, and were also identified as having an indirect effect on the low dissolved oxygen concentrations.

The study revealed that the creek has become a channel that is growing deeper. Channelization is decreasing local water-storage capacity and is changing the way water moves, passing it too quickly downstream. In the end, aquatic life is threatened by low levels of dissolved oxygen and growing levels of silt.

Excess sediment covers cobbles and gravel on the creek bed, leaving aquatic organisms vulnerable to being swept away by rushing water during a high-flow event. Sediment sources within the stream include materials eroded from banks and scoured from the streambed. Exterior sources of silt and sediment include dirt and gravel road systems in the drainage area, assisted by natural features like beaver dams and low slope gradients.

For more information contact:

Chuck Johnson
Rice Creek Watershed District
4325 Pheasant Ridge Dr, Suite 611
Blaine Minnesota 55449
(763) 398-3075

Financial information

This $205,000 TMDL project was funded with a $182,153 Section 319 grant and a $22,847 state match grant.

Results that count

The TMDL recommendations include:

- Adding streambank stabilization in severely eroded areas
- Keeping forested stream-side buffers to filter sediment and pollutants from water, absorb floodwater, decrease water temperatures, and improve water habitats
- Restoring channel meanders on portions of the creek
- Livestock exclusion fencing, livestock crossings and pathways, rotational grazing, alternate water sources, feedlot stormwater runoff control, and better manure management
- In order to protect the ecological integrity of Hardwood Creek and its receiving water, Peltier Lake, no stormwater discharge or hydrologic modifications that increase runoff rates or volumes into the creek should be allowed.

TMDL projects

Lake Independence TMDL

This 851-acre lake lies about 15 miles west of Minneapolis. As with many lakes in the Twin Cities metropolitan area, Lake Independence is used heavily for recreation and is prized for its aesthetic value. Over the past several decades, the lake's water quality has become increasingly degraded, reducing its recreational and aesthetic values. In 2002 it was added to the Impaired Waters list as a result of mean summer phosphorus values that exceeded the standard for Class 2 recreational waters.

Three Rivers Park District, which manages the lake, initiated a comprehensive monitoring plan in 1990 to identify and quantify the factors that affect the water quality of Lake Independence. The data showed that the mean summer total phosphorus concentration exceeded the 40 ug/L standard in 10 of the past 11 years. The district developed runoff models to identify the major sources of nutrients within the lake's watershed and assess the relative importance of external and internal nutrient sources.

In 2004, a diagnostic feasibility study was completed to develop a list of potential management actions for consideration. This list included estimates of associated cost, expected effectiveness, longevity, and technical feasibility for each proposed management alternative. Selection of actions for implementation required public discussion and cooperation between many concerned parties to evaluate and select the most acceptable management alternatives from this list.

For more information contact:

Lisa Whalen
Pioneer-Sarah Creek Watershed District Management Commission
3235 Fernbrook Lane
Plymouth, Minnesota 55447
(763) 553-1144

Financial information

This $6,500 TMDL project was funded with a Section 319 grant.

Results that count

The TMDL found that a reduction of 23% (882 pounds) in the lake's current nutrient loading is necessary to achieve the water-quality goals. TMDL allocations were developed and an implementation plan completed. The diagnostic feasibility study provided valuable input for developing the Lake Independence TMDL work plan.

TMDL projects

Lower Mississippi River Basin Regional Sediment Data Evaluation Project

The Lower Mississippi River Basin in Minnesota covers the southeast corner of the state and includes the Cedar River Watershed. The region has 12 major watersheds covering 7,266 square miles. Sediment pollution in streams is a significant concern. However, data on stream sediment pollution is dispersed across many governmental agencies, public universities, private colleges and local government. In 2004, MPCA staff initiated a plan to assess all available existing sources for data and information on stream sediment in the basin.

The overall goal of this project was to utilize existing stream and land-use data to better understand sediment pollution in streams of the basin. This project does not include any new stream monitoring or data collection; instead, it is an evaluation of existing data.

Major objectives included compiling, organizing, integrating, and assessing data on stream sediment. The data was then analyzed to develop a framework for stream sediment TMDL projects.

Among all watersheds in the basin, the study identified nearly 420 different sediment- monitoring stations. The project resulted GIS maps illustrating stream-monitoring sites across the basin and overall geographic distribution. This was the first time a basin-wide compilation and presentation of stream monitoring sites had been accomplished.

This study found that the USGS has significantly cut back stream and sediment monitoring in the basin. From a total of 26 USGS sites within the basin about 30 years ago, only three sites remain, and those are for flow monitoring only. There are no USGS stations today collecting stream-sediment concentration and loading data in the basin. There was also very limited data available on the quality of sediments, both in the water column and on the stream channel bed.

A seasonal analysis of stream suspended sediment concentration and stream flow data showed that winter and fall concentrations were consistently lower than early spring, late spring or summer periods. The Root, Whitewater and Zumbro rivers showed higher spring and summer sediment concentrations than basin watersheds further north.

Turbidity is a measurement of how light disperses as it travels through water. Low turbidities are associated with clear water, while higher values normally occur with high sediment or algae levels. Cold-water streams (trout streams) in the basin had significantly lower seasonal turbidity values than warm-water streams. Cold-water streams had higher turbidity values in the early spring. Warm-water streams did not have significantly different turbidity values for the spring and summer seasons.

For more information contact:

Gregory Wilson
Barr Engineering Company
4700 West 77th Street
Minneapolis, Minnesota 55435-4803
(952) 832-2600
gwilson@barr.com

Financial information

A Section 104b3 grant for $99,995 funded this TMDL project.

Results that count

This project resulted in the compilation of a significant amount of stream biological data collected by state and local government, Winona State University and other sources. The compiled data helps assess overall stream health. Ultimately, this effort will improve Minnesota's capability to predict changes in stream water quality under various land management scenarios.

TMDL projects

Minnehaha Creek TMDL

Minnehaha Creek runs from Lake Minnetonka in Hennepin County, through a number of cities including Minneapolis, over Minnehaha Falls and into the Mississippi River in Minneapolis. The creek's watershed drains about 181 square miles. Nine lakes (Brownie, Diamond, Hiawatha, Lake of the Isles, Nokomis, Parley, Powderhorn, Virginia, and Wassermann) in the Minnehaha Creek Watershed District are listed impaired for excess nutrients. TMDLs must be completed for each lake to estimate the amount of both point and nonpoint sources of pollutants that each listed water body can assimilate and still meet water-quality standards.

The watersheds of these lakes range from agricultural and rural land uses in Carver County to densely urbanized in the city of Minneapolis. Some of the lakes have a history of water-quality improvement projects in their watersheds that have resulted in observed improvements in water quality.

For more information contact:

Minnehaha Creek Watershed District
18202 Minnetonka Blvd.
Deephaven, Minnesota 55391
(952) 471-0590

Financial information

This TMDL project was funded with a $40,670 grant from Section 319 funds.

Results that count

Each of the nine lakes was separately assessed for nutrient loading and management needs to curtail impairment. A watershed phosphorus loading model was used to estimate the phosphorus load in the watershed runoff. After water-quality goals were set, in-lake models were used to determine the reduction in phosphorus load needed for each lake to reach its goal. An implementation plan was then recommended for each lake. The implementation plans were developed based on previous reports, knowledge of the watershed, and discussions with other management entities. The guidelines presented in the implementation plans are meant to serve as a guide for the necessary load reductions; a combination of other actions is possible, as long as the load-reduction goals are achieved.

TMDL projects

Moorhead-Fargo Red River Mainstem TMDL

For 12 city blocks in the twin cities of Moorhead and Fargo, the Red River is impaired for turbidity and fecal coliform bacteria. The urban "stormsheds" contributing to the reach cover approximately 2,885 acres.

This project was established to identify sources of the pollutants, define pollutant loads, predict desired loads, and identify strategies to achieve the reduction in pollutant loads. The Red River Basin Commission served as project coordinator; technical work was provided by graduate students in the Civil Engineering Department of North Dakota State University.

Analysis determined that 36 percent of the sediment load was generated in the impaired reach, while 64 percent was generated upstream of the impaired reach. While the implementation of pollutant reduction strategies such as stormwater BMPs would reduce turbidity in the impaired reach, these activities alone would not be sufficient to restore the reach to water-quality standards. U.S. EPA has concurred and further TMDL implementation activities within the urban area will be deferred until other turbidity TMDLs are completed for upstream tributaries of the Red River.

Both states – Minnesota and North Dakota – also listed the reach as impaired for fecal coliform bacteria. The study areas for this impairment were broken down into about 60 stormsheds, and 16 outfall and river locations were sampled for the project. Exceedences of the standard were documented during the summer sampling seasons. MPCA and North Dakota Health Department staff are calculating stormshed load and waste-load allocations using water-quality models. Researchers are also investigating the issue of bacterial re-growth in the impaired reach.

For more information contact:

Jack Frederick
Detroit Lakes Office
Minnesota Pollution Control Agency
714 Lake Avenue, Suite 220
Detroit Lakes, Minnesota 56501
(218) 846-0734
john.frederick@pca.state.mn.us

Financial information

This project received a $57,751 Section 319 grant to pay for this TMDL study and implementation plan.

Results that count

The project report sets goals for fecal coliform reductions of 78 percent in the watershed, outlines proposed restoration and implementation activities, and recommends a plan for effectiveness monitoring.

TMDL projects

Phalen Chain of Lakes TMDL

Keller and Kohlman Lakes are part of the Phalen Chain of Lakes, an important metro-area regional water resource lying in the cities of St. Paul, Maplewood and Little Canada.

Kohlman Lake has a surface area of 74 acres and Keller covers Keller Lake 72 acres. The lakes are heavily affected by excess nutrients and are listed as impaired for nutrients. Because these lakes are part of a connected lake chain, a joint TMDL for nutrients was conducted for both. Gervais Lake and Lake Phalen are not listed as impaired waters, but are part of the Phalen system and therefore are considered in the TMDL report.

In 2004, the Ramsey Washington Metro Watershed District completed a three-year study that resulted in a strategic lake management plan the Phalen chain and its watershed. The plan establishes priorities and guidelines for the local jurisdictions to meet water-quality goals for the chain, including Lakes Kohlman, Gervais, Keller, and Phalen.

For more information contact:

Clifton Aichinger
Ramsey Washington Metro Watershed District
2346 Helen Street
North St. Paul, Minnesota 55109
(651) 704-2089

Financial information

This project received a $22,992 Section 319 grant to fund the TMDL study.

Results that count

The study included an extensive survey of the ponds and wetlands in the tributary watershed and evaluated existing and future land uses. Extensive monitoring was done for several lake inflow points and of the lakes themselves. All of this information helped create and calibrate water-quality models for the lakes and their watersheds.

The results of the modeling were used to identify watershed BMPs and in-lake management practices that would help achieve the goals for each lake. The district estimated costs for the various management practices and made recommendations for the most cost-effective improvements and practices. All of this work, data and information were utilized to complete the TMDL Report.

Currently this TMDL is on hold MPCA pending the outcome of the MPCA shallow lakes criteria.

TMDL projects

Red River Basin Turbidity TMDL

There's too much sediment in the Red River of the North and its major tributaries. Long-term water-quality monitoring indicates that parts of 16 streams in the basin do not meet water-quality standards.

Turbidity measures light's penetration of the water's surface. High turbidity is often associated with suspended particles in the water, and as turbidity increases, light is more diffused. Light is necessary for photosynthesis healthy aquatic communities. Sediment can cover river bottoms where fish lay eggs, clog fish gills, or cause taste and odor problems at municipal drinking-water plants (e.g. Moorhead and East Grand Forks).

The Red River Basin Water Quality Team is coordinating the turbidity impairment studies. In the first year, the team gathered information about the sources of sediment and the condition of the area around each reach. The team also collected information about local efforts to reduce erosion.

All of the 16 impaired reaches lie on the floor of the Red River Valley, within 25 miles of the Red River of the North. Most of the land use in the affected reaches is in row-crop agriculture. There are several very small cities in the

reaches, but generally the population of the affected areas is quite low.

For more information contact:

Dan Wilkens
Red River Watershed Management Board
219 North Mill Street P.O. Box 584
Fertile, Minnesota 56540
(218) 945-3204
shrwd@gvtel.com

Financial information

This TMDL study was funded with a $100,000 state TMDL match grant.

Results that count

In the first year of the study, the Red River Watershed Management Board conducted water-quality monitoring at 17 locations in the basin. Reports of the condition and sources of turbidity were prepared for each reach. Sources include streambank erosion, wind erosion, overland water erosion due to precipitation, septic systems, feedlots, wastewater treatment discharges, and runoff from roads and communities. The ultimate goal is to achieve water-quality standards in the affected water bodies.

TMDL projects

Shingle Creek Chloride TMDL

Shingle Creek, in the northwestern portion of the Twin Cities metropolitan area, is used heavily for stormwater management. On its way to the Mississippi River, the 11-mile creek flows through a 44square-mile watershed crisscrossed by interstate freeways, regional highways and local roads, all draining to the creek. Most traffic authorities in the metropolitan area use road salt for snow and ice control in winter, and chloride is a major component of road salt. High levels of chloride in runoff can directly harm aquatic organisms. Shingle Creek was listed as impaired in 1998 due to exceeding the chloride standard for aquatic life. It was the first chloride TMDL in the state.

The watershed includes a major waterway (Shingle Creek), several tributaries, some intermittent streams, and a few man-made ditches. It includes portions of nine municipalities: Brooklyn Center, Brooklyn Park, Crystal, Maple Grove, Minneapolis, New Hope, Osseo, Plymouth and Robbinsdale. These cities created a joint-powers organization called the Shingle Creek Watershed Management Commission, which sponsored this TMDL study.

For more information contact:

Christina Carstens
Shingle Creek Watershed Management Commission
3235 Fernbrook Lane
Plymouth, Minnesota 55447
(763) 531-1160

Financial information

This TMDL project was funded with $93,899 of Section 319 grant funds and $44,133 state match funds, for total project costs of $138,032.

Results that count

- Defined the geographical extent, persistence and severity of chloride exceedances in the watershed
- Identified and measured the sources of chloride in Shingle Creek, including road-salt application, industrial and residential de-icing, natural sources, and groundwater discharge (such as water softeners, landfills and fertilizers)
- Allocated Shingle Creek's assimilative capacity to both point and nonpoint sources and developed safety margins to protect state water-quality standards
- Met Minnesota's non-degradation requirements
- Created an implementation framework with reduction strategies and follow-up monitoring.

TMDL projects

Twin Lakes-Shingle Creek Watershed District TMDL

The Twin Lakes-Shingle quantifies the pollutant reductions needed to meet water-quality standards for nutrients in the Twin Lakes chain of lakes, located in the northwestern Twin Cities suburban area.

The Twin Lakes chain is a popular recreational water resource. The suburban cities of Brooklyn Center, Crystal and Robbinsdale immediately surround the lakes, while the drainage area includes portions of those cities, plus portions of Brooklyn Park and New Hope. The watershed is fully developed.

Excess nutrients cause frequent algal blooms in Upper and Lower Twin Lakes. Middle Twin Lake has more moderately degraded water quality, with some nuisance algal blooms. These three lakes are on the Impaired Waters list for excessive nutrients, in addition to fish consumption advisories for mercury and PCBs (polychlorinated biphenyls).

For more information contact:

Christina Carstens
Shingle Creek Watershed Management Commission
3235 Fernbrook Lane
Plymouth, Minnesota 55447
(763) 531-1160

Financial information

This TMDL project was funded with $52,953 of Section 319 grant funds.

Results that count

- Watershed and lake characterization completed, including land use, recreational uses, water quality, fish populations and health, aquatic plants, and the condition of shorelines
- Determined nutrient sources, including point sources and nonpoint sources like fertilizer and urban runoff
- Drew conclusions from historic and current water-quality data for temperature and dissolved oxygen, phosphorous, chlorophyll-a, and total iron
- Modeled water-quality targets and sources
- Determined TMDL allocations for phosphorous, chlorophyll-a, and Secchi-disk measurements (turbidity)
- Developed a plan to implement strategies, including reasonable assurances of success

TMDL projects

Typo-Martin Lakes TMDL

These connected lakes occupy portions of Isanti and Anoka counties in central Minnesota. Excessive amounts of phosphorus have put them on Minnesota's Impaired Waters lists. Detailed water-quality studies were conducted for both lakes to determine current conditions, sources of phosphorus, water-quality targets, and to evaluate necessary strategies to reach them.

The primary source of phosphorus in the watersheds of these lakes is ditched wetland soils that release phosphorus under certain conditions. On-site septic systems contributed a relatively small amount of phosphorus to the lake, although this may increase in the future as existing systems get older. Phosphorus release from sediment was also strong in both lakes.

Typo Lake is shallow, no deeper than five feet, and has been affected by the substantial land-use changes and alteration of natural drainage in its watershed. Given its historically high phosphorus levels, the suggested goal of remediation efforts is a summer average phosphorus concentration of 90 ug/L. This would require reducing current phosphorus inputs by 80 percent or more.

For Martin Lake, an interim phosphorus goal of 60 ug/L and a final goal of 40 ug/L have been suggested. These goals would ultimately require a 60% watershed-wide reduction in phosphorus input to reach the interim goal and an 80% reduction to reach a lake concentration of 40 ug/L.

The TMDL report recommended a variety of nutrient reduction strategies to reach these goals. Implementation should take an iterative, stepwise approach.

For more information contact

Jamie Schurbon
Anoka Conservation District
16015 Central Avenue NW, Suite 103
Ham Lake, Minnesota 55304
(763) 434-2030

Financial information

This project was completed with a $16,178 Section 319 grant to the Anoka Conservation District, a $17,773 in-kind contribution from local partners and technical assistance from the MPCA.

Results that count

- Goals for total phosphorus will require load reductions of 60 to 80 percent from internal and watershed sources
- TMDL report outlines possible restoration and implementation activities, and recommends a plan for monitoring success
- Nutrient-reduction strategies recommended.

TMDL projects

Whitewater River TMDL Project -- North Branch -- Pilot Turbidity

Located in southeastern Minnesota, the Whitewater River project was an effort by the Whitewater River Watershed Joint Powers Board (JPB), in conjunction with MPCA staff, to compile information needed to complete turbidity TMDLs for the Whitewater River. The JPB was the project sponsor.

Project objectives included:

- Provide one-on-one landowner contacts to develop active citizen involvement for the TMDL projects in the Whitewater River watershed
- Provide GIS support to the TMDL projects
- Completion of a study on multiple benefits of agriculture
- Staffing changes and other project demands resulted in limited landowner contacts being made; however, another project provided some of this information. The funds for GIS support were not used following the departure of the JPB GIS staff.
- The citizen outreach efforts and landowner management surveys were important components of this project. Telephone surveys were used to collect information on attitudes/beliefs of area landowners. Farmer management surveys also provided valuable data on field/farm scale management.

Findings of this data collection project included:

- Modeling on multiple land-area scales is essential. A model at the subwatershed scale is necessary to address questions of stream conditions at downstream locations, but may not be useful in dealing with individual landowners. Instead, farm- and field-scale modeling is most useful for landowners.
- Involving local landowners in TMDL activities should be a main priority. Without specific planning, local outreach becomes unfocused.

For more information contact:

Linda Dahl, Project Coordinator
Whitewater River Watershed Joint Powers Board
400 Wilson Street, P.O. Box 39
Lewiston, Minnesota 55952
(507) 523-2171
Linda.Dahl@MN.nacdnet.net

Financial information

The costs for this TMDL project totaled $37,000, of which $9,988 came from Section 319 grant funds and $27,012 came from a Section 104b3 grant.

Results that count

The results of the project (survey and modeling) will be used to complete turbidity TMDLs in the Lower Mississippi River Basin in addition to the listed reaches in the Whitewater River watershed.

Projects awarded in 2006

Clean Water Partnership Continuation Grants

Big Sandy Area Lakes Watershed Management Project

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 schools, lake associations, and county boards, new landowner contacts, small neighborhood meetings, and participation in information fairs.
Sponsor: Aitkin County
Award: $260,000 grant

Blue Earth River Clean Water Partnership

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 will 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.
Sponsor: Martin County
Award: $450,000 grant, $300,000 loan

Detroit Lake Water-Quality Improvement Nutrient Reductions

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.
Sponsor: Pelican River Watershed District
Award: $50,000 grant, $450,000 loan

East Branch Chippewa River Continuation Project

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.
Sponsor: Chippewa County
Award: $175,000 grant, $135,000 loan

Elk Creek Conservation Tillage Incentive Program

This project will 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.
Sponsor: Heron Lake Watershed District
Award: $28,200

Lower Maple River Watershed Project

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.
Sponsor: Blue Earth County
Award: $474,100 grant, $100,000 loan

Miller Creek Watershed Implementation

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.
Sponsors: City of Duluth and South St. Louis Soil and Water Conservation District
Award: $31,000 grant

Upper Mississippi River Source-Water Protection Plan Implementation Project

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.
Sponsor: City of St. Cloud Public Utilities
Award: $425,000 grant

319 Projects

Assessing Potential of Watershed and Stream Channel Modifications on Suspended Sediment, Turbidity and Nutrients in the Blue Earth River Basin

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.
Sponsor: University of Minnesota
Award: $296,060

Dry Weather/Lines/Spring Creek Sub-basin of the Chippewa River

Reduce nutrients, sediment and bacteria through tree plantings, nutrient and residue management, alternative tile intakes, septic system improvements, and nutrient insurance.
Sponsor: Chippewa County
Award: $264,100 grant, $300,000 loan

Elk River Watershed Priority Lakes II

Re-establish shoreland vegetation around area lakes, reduce phosphorus and nitrogen applications on farmland, improve and create wetlands.
Sponsor: Elk River Watershed Association
Award: $185,187 grant

Hawk Creek Watershed Project

Implement practices to reduce phosphorus: Promote alternative tile intakes, improve septic systems, develop ditch buffers, urban storm water management, and education.
Sponsor: Renville County
Award: $300,000 grant, $900,000 loan

Heron Lake Alternative Tile Intake Cost-Share Program

Reduce sediment in runoff from farm fields by replacing open tile intakes with subsurface rock intakes.
Sponsor: Heron Lake Watershed District, Jackson County
Award: $36,000 grant

Interpreting a Century of Sediment in Redwood Lake

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.
Sponsor: Redwood-Cottonwood Rivers Control Area
Award: $89,140 grant

Into the Home Stretch: Achieving Feedlot Runoff Control to Reduce Bacteria Total Maximum Daily Load to Impaired Waters of the Lower Mississippi in Minnesota

Hire technicians to assist eligible open livestock feedlots and provide some funds for low-cost improvements to reduce runoff.
Sponsor: Southeast Minnesota Water Resources Board
Award: $300,000 grant

Manure Basin Storage Abandonment Alternatives and Water Quality Improvement in the Upper Mississippi River Basin

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.
Sponsor: Stearns County
Award: $57,150 grant

Multi-Metric IBI-Based Citizen Monitoring of Hydrologically Altered Systems Within the Rice Creek Watershed

Collection of data on the health of aquatic ecosystems in eight streams that are heavily used for stormwater management in the Rice Creek Watershed.
Sponsor: Friends of the Mississippi River, Inc.
Award: $21,500 grant

Swan River Watershed Management Plan Implementation

Identify and work with smaller feedlots to reduce over-application of manure to cropland with nutrient management plans, buffer strips and other conservations practices.
Sponsor: Morrison County SWCD
Award: $70,000 grant

Targeted Implementation/Compliance Activity Within Impaired and Ecologically Sensitive Areas in the Upper Mississippi River Basin in Stearns County (Continuation)

Hire inspector and technician to investigate unpermitted earthen manure storage basins, conduct feedlot evaluations, develop manure management plans.
Sponsor: Stearns County SWCD
Award: $300,000 grant

Testing Assumptions of Sediment and Nutrient Supply by Fingerprinting Glacial Sediment Sources

Determine what portion of sediment and nutrient pollution in Seven Mile Creek is due to such natural processes as stream-bank erosion.
Sponsor: Brown-Nicollet-Cottonwood Water Quality Board
Award: $87,930 grant

The Greater Blue Earth River Watershed BMPs Focus on the Big Cobb

Hire staff and provide cost-share for installation of conservation practices to reduce phosphorus and sediment.
Sponsor: Greater Blue Earth River Basin Alliance
Award: $299,988 grant, $100,000 loan

The Sediment in the System: Modeling the Response of the Minnesota River to Major Forcing Events at 10,000, 1,000, 100, 50 and 10 Years Ago

The Minnesota River is still evolving in response to events that happened thousands of years ago. The project will use computer modeling to help resource managers in the river's basin better understand how the river responds to natural and human changes.
Sponsor: National Center for Earth-Surface Dynamics
Award: $79,445 grant

Vermillion River and Chub Creek ISTS Inspection and Upgrade Program

Inspect individual sewage treatment systems near streams, provide incentives for improvements.
Sponsor: Dakota County
Award: $160,500 grant

Winter parking lot/sidewalk maintenance training and certification to reduce environmental impacts to Shingle Creek, the Mississippi River, Sauk River, Lake Superior, North Shore streams and other waters of Minnesota

Provide training for staff working in winter road maintenance to reduce the amount of road salt in runoff to surface and groundwater.
Sponsor: Fortin Consulting, Minneapolis
Award: $80,000 grant

Projects Currently Active in 2006 (listed by year of award)

2001 Awards

Project: West Des Moines River CWP Phase I Project
Sponsor: Cottonwood County
Funding: CWP (Grant) $169,975
Purpose: Monitor, develop land use data, complete data analysis and develop an implementation plan to reduce pollutants in the West Des Moines River Watershed.

2002 Awards

Project: BERBI Non-point Source Accelerated Implementation
Sponsor: Greater Blue Earth River Basin Initiative
Funding: Section 319 (Grant) $671,250
Purpose: Accelerate the implementation of conservation practices that address non-point source pollution within the greater Blue Earth River system in order to meet TMDL and hypoxia-reduction goals.

Project: Blue Earth River Basin Fecal Coliform TMDL Project
Sponsor: Mankato State University
Funding: Section 319 (Grant) $139,897
Purpose: Monitor, model and develop land use data to identify potential pollutants in order to develop a total maximum daily load for fecal coliform.

Project: Blue Earth River Watershed Project (Lily and Center Creeks)
Sponsor: Martin County
Funding: CWP (Grant) $450,000; CWP (Loan) $300,000
Purpose: Reduce sediment and total suspended solids in the Lily and Center Creek sub-watersheds.

Project: Cation-Anion Analysis
Sponsor: University of Minnesota Department of Geology & Geophysics
Funding: Section 319 (Grant) $25,000
Purpose: Continue analysis of cations, anions and isotopes in samples provided by the MPCA to assist in TMDL monitoring.

Project: Chippewa River TMDL Project – Public Meetings
Sponsor: Chippewa County
Funding: Section 319 (Grant) $10,387
Purpose: Plan and present public information meetings concerning the TMDL reports on ammonia and fecal coliform.

Project: Dairy Milk House Wastewater Treatment Demonstration
Sponsor: University of Minnesota
Funding: Section 319 (Grant) $192,852
Purpose: Evaluate and demonstrate effective techniques or systems to reduce environmental pollution contained in dairy milk house wastewater and disseminate the results to dairy producers in Minnesota.

Project: Des Moines River (West Fork) Fecal Coliform, Ammonia, Dissolved Oxygen and Turbidity TMDL Project
Sponsor: Cottonwood County
Funding: Section 319 (Grant) $40,873
Purpose: Monitor, model and develop land use data to identify potential pollutants in order to develop total maximum daily loads for fecal coliform, ammonia, dissolved oxygen and turbidity.

Project: East Branch Chippewa River Implementation
Sponsor: Chippewa County
Funding: Section 319 (Grant) $120,840
Purpose: Implement a plan to reduce high nutrient loads and sediment during the growing season from rainfall-driven runoff that occurs throughout the watershed of this tributary to the Chippewa and, eventually, Minnesota River.

Project: Grazing Management for Trout Stream Improvement
Sponsor: Minnesota Board of Water and Soil Resources
Funding: Section 319 (Grant) $139,300
Purpose: Train service providers to develop managed grazing plans and facilitate fencing, livestock watering systems and protection of sensitive areas.

Project: Hawk Creek Watershed Project "Green Corridors" Project
Sponsor: Renville County
Funding: CWP (Grant) $106,837
Purpose: Reduce erosion and nutrient loading to Middle Hawk Creek and Chetomba Creek by enrolling riparian areas into Reinvest in Minnesota, improving agricultural drain-tiling systems, and ditch bank stabilization.

Project: Implementation Projects for Big Sandy Watershed's Future
Sponsor: Aitkin County Soil and Water Conservation District
Funding: Section 319 (Grant) $32,500
Purpose: Improve and protect water quality, wildlife, fisheries and aesthetic concerns in sensitive areas of the watershed.

Project: Indian Creek Improvement Project
Sponsor: Blue Earth County
Funding: CWP (Grant) $82,042
Purpose: Reduce sediment deposition and bacteria levels in this tributary to the Minnesota River that flows through the City of Mankato by developing a plan to address land use, storm water and other strategies.

Project: Knife River Watershed TMDL Project, Phase 1
Sponsor: South St. Louis Soil and Water Conservation District
Funding: Section 319 (Grant) $97,000
Purpose: Monitor, assess, model and develop land use data to identify potential pollutants in order to develop a total maximum daily load for turbidity.

Project: Lac qui Parle River TMDL Project
Sponsor: Lac qui Parle-Yellow Bank Watershed District
Funding: Section 319 (Grant) $21,378
Purpose: Monitor, model and develop land use data to identify potential pollutants in order to develop a total maximum daily load for dissolved oxygen.

Project: Lake Nutrient TMDL Protocol
Sponsor: Limno Tech, Inc.
Funding: Section 319 (Grant) $14,989
Purpose: Develop, assess, model and correct process for developing a total maximum daily load for excessive nutrients in lakes.

Project: Lake Volney Improvement Project Continuation
Sponsor: Le Sueur County
Funding: CWP (Grant) $125,000; CWP (Loan) $100,000
Purpose: Continue activities to improve watershed coordination, reduce lake loading, educate landowners and evaluate impacts.

Project: Long and Spring Lakes Restoration Project Continuation
Sponsor: Meeker County
Funding: CWP (Grant) $67,020
Purpose: Continue activities to reduce shoreline erosion and non-point source nutrient loading to the lakes.

Project: Lower Cannon River Turbidity TMDL Project
Sponsor: Cannon River Watershed Partnership
Funding: Section 319 (Grant) $44,950
Purpose: Monitor, model and develop land use data to identify potential pollutants in order to develop a total maximum daily load for turbidity.

Project: Lower Maple River Watershed Project
Sponsor: Blue Earth County
Funding: CWP (Grant) $533,713; CWP (Loan) $200,000
Purpose: Reduce sediment, phosphorus, nitrate, nitrogen and fecal coliform bacteria in the Maple River by 25 percent.

Project: Manure Management within Ecologically Sensitive Areas in Stearns County
Sponsor: Stearns County Soil and Water Conservation District
Funding: Section 319 (Grant) $490,000
Purpose: Enhance, sustain, conserve and protect county surface and ground-water resources.

Project: Middle Sauk River Rehabilitation Project
Sponsor: Sauk River Watershed District
Funding: CWP (Grant) $250,000; CWP (Loan) $500,000
Purpose: Address agricultural impacts, including priority feedlots, erosion along ditches, best management practices and rural septic systems.

Project: Miller Creek Watershed Preservation and Restoration Project
Sponsor: City of Duluth
Funding: CWP (Grant) $30,000
Purpose: Monitor Miller Creek to determine current status and continue implementation of best management practices.

Project: Nutrient Reductions to Improve Lake Detroit Water Quality
Sponsor: Pelican River Watershed District
Funding: CWP (Grant) $50,000; CWP (Loan) $450,000
Purpose: Reduce episodes of internal nutrient loading from Rice Lake and adjacent wetlands, promote agricultural best management practices and reduce biomass nutrient contributions.

Project: Osakis Lake Watershed Management Program – Phase 3
Sponsor: Sauk River Watershed District
Funding: CWP (Grant) $365,000; CWP (Loan) $355,000
Purpose: Prevent the lake from further degrading and improve or maintain its current condition by addressing water quality concerns within each sub-watershed.

Project: Pond Sediment Characterization
Sponsor: Metropolitan Council Environmental Services
Funding: Section 319 (Grant) $90,000
Purpose: Characterize pond sediments (quantity and quality) in the Twin Cities metro area and provide that information to agencies with responsibilities for public health and water quality.

Project: Sauk Lake Storm and Surface Water Resource Investigation Project
Sponsor: Sauk River Watershed District
Funding: CWP (Grant) $80,000
Purpose: Focus on storm-water runoff and its effects on Sauk Lake with identification of primary sources and best management practices.

Project: Shingle Creek Lakes TMDL Project, Phase 2
Sponsor: Shingle Creek Watershed Management Commission
Funding: Section 319 (Grant) $63,200
Purpose: Continue to monitor, model and develop land use data to identify potential pollutants in order to develop a total maximum daily load for excessive nutrients.

Project: Small Group Preparation of Nutrient Management Plans
Sponsor: University of Minnesota
Funding: Section 319 (Grant) $263,040
Purpose: Improve nutrient and manure management practices by increasing the number of management plans and provide clear access to information through a centralized Web site.

Project: Springbrook Sub-watershed Implementation Project
Sponsor: City of Fridley
Funding: CWP (Grant) $200,669
Purpose: Restore the Springbrook wetland ecosystem by reestablishing a 66:33 emergent plant/open water balance.

Project: Targeted Residential Wastewater Treatment Project
Sponsor: Southeast Minnesota Water Resources Board
Funding: Section 319 (Grant) $530,000
Purpose: Double the average rate at which individual sewage treatment systems are corrected through local efforts across the basin.

Project: Upper Mississippi River Source-Water Protection Project
Sponsor: City of St. Cloud
Funding: Section 319 (Grant) $243,250
Purpose: Implement source-water protection at a watershed level among several water suppliers who share a common source water resource.

Project: Whitewater River Watershed National Monitoring Program
Sponsor: Minnesota Pollution Control Agency
Funding: Section 319 (Grant) $50,000
Purpose: Provide information required under the National Monitoring Program and provide long-term monitoring for evaluation of pollutant problems and potential solutions.

2003 Awards

Project: Blue Earth River Basin Fecal Coliform TMDL Project
Sponsor: Mankato State University
Funding: Section 319 (Grant) $31,781
Purpose: Complete monitoring, modeling and development of land use data to identify potential pollutants in order to develop a total maximum daily load for fecal coliform.

Project: Byllesby Reservoir Phosphorus TMDL Project
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.

Project: Citizen Sediment Monitoring Coordinator to Support TMDLs
Sponsor: Southeast Minnesota Water Resources Center
Funding: Section 319 (Grant) $72,260
Purpose: Fund a coordinator to assist local landowners in monitoring for pollutants, particularly excessive sediment, in southeastern Minnesota waters.

Project: Conservation Tillage Demonstration Project
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.

Project: Crow River TMDL Data Collection
Sponsor: Crow River Watershed District
Funding: Section 319 (Grant) $50,000
Purpose: Begin monitoring, modeling and development of land use data to identify potential pollutants in order to develop total maximum daily loads in the Crow River Watershed.

Project: Des Moines River (West Fork) Fecal Coliform, Ammonia, Dissolved Oxygen and Turbidity TMDL Project
Sponsor: Cottonwood County
Funding: Section 319 (Grant) $40,779
Purpose: Complete monitoring, modeling and development of land use data to identify potential pollutants in order to develop a total maximum daily load for fecal coliform, ammonia, dissolved oxygen and turbidity.

Project: Elk River Watershed Priority Lakes Phosphorus Reduction Project
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.

Project: Evaluating Feedlot Runoff Pollution and Ways to Reduce Impacts
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.

Project: Hawk Creek Watershed Project TMDL -- "Land of the Lost"
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.

Project: Heron Lake Development of TMDLs
Sponsor: Heron Lake Watershed District
Funding: Section 319 (Grant) $3,750
Purpose: Begin process of monitoring, modeling and development of land use data to identify potential pollutants in order to develop total maximum daily loads for the Heron Lake Watershed.

Project: Heron Lake Watershed District – CWP Project

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.

Project: High Island Implementation Project

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.

Project: Improved Livestock Management in Riparian Areas

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.

Project: Lake Pepin TMDL Science Advisory Panel Initiation

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.

Project: Lake Pepin TMDL Public Meetings Project, Phase 2

Sponsor: MRCC
Funding: Section 319 (Grant) $5,000
Purpose: Organize and conduct public education meetings on the Lake Pepin TMDL project.

Project: Local Nitrate Testing and Educational Outreach for Private Well Owners

Sponsor: Minnesota Department of Agriculture
Funding: Section 319 (Grant) $110,000
Purpose: Assist local entities to provide nitrate water testing services and water-quality outreach on a county level.

Project: Lower Main Stem Chippewa River Sub-basin

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.

Project: Lower Vermillion River Watershed Turbidity TMDL Project – Phase 3

Sponsor: Tetra Tech, Inc.
Funding: Section 319 (Grant) $125,000
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.

Project: Manure Management within Ecologically Sensitive Areas in Stearns County – Phase 2

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.

Project: Meeting TMDL Goals with the Minnesota Phosphorus Index

Sponsor: Minnesota Department of Agriculture
Funding: Section 319 (Grant) 290,000
Purpose: Field test, validate and implement the Minnesota Phosphorus Index in a real-world setting, including evaluation of its effectiveness as a tool for prioritizing high-risk fields and farms.

Project: Miller Creek Watershed TMDL Project
Sponsor: South St. Louis Soil and Water Conservation District
Funding: Section 319 (Grant) $92,000
Purpose: Monitor, model and develop land use data to identify potential pollutants in order to develop a total maximum daily load for impaired biota and temperature.

Project: North Branch Sunrise River Watershed TMDL Project
Sponsor: Chisago County
Funding: Section 319 (Grant) $12,500
Purpose: Continue monitoring, modeling and development of land use data to identify potential pollutants in order to develop a total maximum daily load for fecal coliform.

Project: Pomme de Terre River Fecal Coliform TMDL Project
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.

Project: Research Project to Develop the Greater Blue Earth River Basin Turbidity TMDL
Sponsor: University of Minnesota
Funding: Section 319 (Grant) $80,181
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.

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

Project: Reduction of Fecal Coliform Bacteria from Human Sources (TMDL Implementation Project)
Sponsor: Olmsted County
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.

Project: Redwood River Watershed Phosphorus TMDL Compliance Project
Sponsor: Redwood-Cottonwood Rivers Control Area
Funding: Section 319 (Grant) $470,000
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.

Project: Snake River Watershed Enhancement Project
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 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 at the same time promoting cost-share programs and project activities.

Project: South Branch Buffalo River Water Quality Monitoring Demonstration Project
Sponsor: Buffalo Red Watershed District
Funding: Section 319 (Grant) $45,158
Purpose: Implement a comprehensive program of education, citizen involvement, conservation of critical pieces of land, acceleration of current best management practices programs, pilot new best management practices and continue monitoring.

Project: South Branch Root River Modeling TMDL Project
Sponsor: Fillmore County
Funding: Section 319 (Grant) $40,000
Purpose: Assess, recommend and implement various models which will identify potential pollutants in order to develop total maximum daily loads.

Project: Straight River Fecal Coliform Reduction Project

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.

Project: Straight River Three Reaches TMDL Project

Sponsor: Cannon River Watershed Partnership
Funding: Section 319 (Grant) $20,000
Purpose: Assess, recommend and implement various models which will identify potential pollutants in order to develop total maximum daily loads.

Project: TMDL Educational Seminar

Sponsor: Heron Lake Watershed District
Funding: Section 319 (Grant) $4,193
Purpose: Develop and implement a two-day educational seminar for local governmental units to explain the TMDL program. Specific topics would include identifying and listing impaired waters, developing effective TMDL plans, implementing TMDLs and the effect TMDLs would have on local producers and their agricultural operations.

Project: Verdi Wellfield Implementation Project

Sponsor: Lincoln County
Funding: CWP (Grant) $4,000; CWP (Loan) $220,000
Purpose: Assess, provide assistance, administer and upgrade septic systems that impact the Verdi Wellfield in Lincoln County.

Project: Whitewater River Watershed National Monitoring Program

Sponsor: Whitewater River Watershed Project
Funding: Section 319 (Grant) $100,000
Purpose: Continue monitoring, begun in 1995, for a National priority watershed project with several local, state and federal agencies and organizations.

2004 Awards

Project: Chippewa River Watershed Project Continuation

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 and best management practices, urban best management practices in stormwater management, upgrading individual septic systems and manure management.

Project: Clearwater River and Lake Louisa TMDL Project – Phase 2 and 3

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.

Project: Cost-Share Incentives for Small Feedlot Fixes

Sponsor: Hiawatha Valley Resource Conservation and Development Council
Funding: Section 319 (Grant) $242,000
Purpose: Provide a 50-percent cost share for feedlot fixes for 220 feedlots.

Project: Cottonwood River BMP Implementation Project Continuation

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.

Project: Cottonwood River Restoration Project Continuation

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.

Project: Dakota County Non-point Source Reduction Project

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.

Project: Des Moines River TMDL Project, Phases 2 and 3

Sponsor: Cottonwood County
Funding: Section 319 (Grant) $99,794
Purpose: Complete monitoring, assessment, modeling and development of land use data to identify potential pollutants in order to develop total maximum daily loads for fecal coliform, ammonia, dissolved oxygen and turbidity.

Project: Designing Feedlot Improvements in Targeted Areas under the Open Lot Agreement

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.

Project: Educating Local Officials on Water-Quality Impacts of Non-point Source Pollution

Sponsor: Minnesota Lakes Association
Funding: Section 319 (Grant) $30,000
Purpose: Educate elected and appointed officials on the connection between water quality and land-use, through one-day workshops, presentations at local government conferences, working with trade groups and the production of videos and brochures.

Project: Expansion of the "Red Top" Farm Demonstration Concept

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.

Project: Greater Yellow Medicine River Phase II Project Continuation

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.

Project: Groundhouse River TMDL Project, Phase 1

Sponsor: ERA Laboratory
Funding: Section 319 (Grant) $9,261
Purpose: Complete laboratory assessment of water samples to identify potential pollutants in order to develop a total maximum daily load for fecal coliform.

Project: Groundhouse River TMDL Project, Phase 1

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.

Project: Groundhouse River TMDL Project, Phase 1
Sponsor: Tetra Tech, Inc.
Funding: Section 319 (Grant) $99,952
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.

Project: Hawk Creek Watershed Project Continuation
Sponsor: Hawk Creek Watershed District
Funding: CWP (Grant) $251,853, CWP (Loan) $872,000
Purpose: Continue funding staff positions; additional water-quality monitoring, and data analysis to measure prior best management practices performance; outreach activities such as displays, tours, demonstrations and fairs; and land-use best management practices including nutrient management, stream-bank erosion control, and an individual septic-system loan program.

Project: Hawk Creek Watershed Project -- Beaver Tales
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.

Project: Hawk Creek Watershed Project -- Hawk TMDL
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.

Project: Jefferson-German Lakes Water Quality Improvement Project Continuation
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.

Project: Knife River Watershed TMDL Project, Phase 2
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 total maximum daily loads for turbidity.

Project: Lake Shaokatan Continuing Restoration Project Continuation
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.

Project: Lake Shaokatan TMDL Project
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.

Project: Long Prairie River Implementation Project Continuation
Sponsor: Todd County
Funding: CWP (Grant) $300,000
Purpose: Continue design and installation of agriculture waste systems, buffers and erosion control best management practices, as well as cost share for these activities.

Project: Miller Creek Watershed TMDL Project
Sponsor: South St. Louis Soil and Water Conservation District
Funding: Section 319 (Grant) $97,000
Purpose: Monitor, model and develop land use data to identify potential pollutants in order to develop total maximum daily loads for impaired biota and temperature.

Project: Nemadji River Basin Project Continuation
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.

Project: On-Farm Manure Management Demonstration

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

Project: Restoring Water Resources of the Sauk River Chain of Lakes

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.

Project: Sauk River/Greater St. Cloud Area Fecal Coliform TMDL Project

Sponsor: Sauk River Watershed District
Funding: Section 319 (Grant) $26,437
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.

Project: Shakopee Creek Headwaters Project

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.

Project: South Branch Root River Watershed Fecal Coliform Bacteria Reduction Project

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.

Project: Southeast Minnesota Milk House Wastewater Treatment Demonstration

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.

Project: Steele County Septic System Loan Program

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.

Project: Targeted Feedlot Open Lot Implementation Engineering Assistance

Sponsor: Southeast Soil and Water Conservation Districts 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.

Project: Targeting Implementation/Compliance Activity within TMDL and Ecologically Sensitive Areas

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.

Project: Upper Main Stem Chippewa River Implementation

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.

Project: Vermillion River Watershed Turbidity TMDL Project – Phases 2 & 3

Sponsor: Tetra Tech, Inc.
Funding: Section 319 (Grant) $88,304
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 turbidity.

Project: Watonwan River Major Watershed Implementation Plan Continuation

Sponsor: Watonwan County
Funding: CWP (Grant) $100,000; 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.

2005 Awards

Project: Beaver Creek Watershed Improvement Project Continuation

Sponsor: Murray County
Funding: CWP (Grant) $62,122; CWP (Loan) $178,800
Purpose: Develop manure management plans, design and implement grass 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.

Project: Big Birch Lake Watershed Management Project Continuation

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.

Project: Building Local Capacity for Community Solutions to Wastewater Problems

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.

Project: Carver County Turbidity and Excess Nutrients TMDL Project

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.

Project: Cottonwood River Watershed Phosphorus Reduction Project

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

Project: Feedlot Runoff Pollution Removal by Organic Bio-filter Demonstration

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.

Project: Jessie Lake Watershed TMDL Project

Sponsor: Itasca County Soil and Water Conservation District
Funding: Section 319 (Grant) $23,200
Purpose: Monitor, model and develop land use data to identify potential pollutants in order to develop a total maximum daily load for excessive nutrients.

Project: Lac qui Parle River Main Stem Water Quality Enhancement Effort

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.

Project: Lake Pepin, Spring Lake, 5 Mississippi River Reaches and 1 Minnesota River Reach TMDL Project

Sponsor: Limno-Tech, Inc.
Funding: Section 319 (Grant) $129,327; state (Grant) $120,673
Purpose: Monitor, model and develop land use data to identify potential pollutants in order to develop total maximum daily loads for turbidity and eutrophication.

Project: Lambert Creek Phase 3 Water Quality Project Continuation

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.

Project: Lincoln County/Redwood River Watershed Management Project Continuation

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.

Project: Little Cottonwood River Restoration Project Continuation

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.

Project: Little Rock Creek TMDL Project

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.

Project: Long Prairie River 2204 TMDL Application Work Plan

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.

Project: Middle Sauk River Rehabilitation Project Continuation

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.

Project: Osakis Lake Watershed Management Program – Phase 3 Continuation

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.

Project: Rush River Implementation Project

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.

Project: Sauk Lake Basin Restoration Project Continuation

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.

Project: Sauk River Chain of Lakes TMDL Project

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.

Project: Sauk River Chain of Lakes Watershed Management Project Continuation

Sponsor: Sauk River Watershed District
Funding: CWP (Grant) $224,700; CWP (Loan) $500,000
Purpose: 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.

Project: Seven Mile Creek Watershed Project Continuation

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.

Project: Shakopee Creek Headwaters Project Continuation

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.

Project: South Branch Whitewater River Watershed Bacteria Reduction Project

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.

Project: Targeted Implementation/Compliance Activity Within TMDL and Ecologically Sensitive Areas, Phase II

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.

Project: Valley Creek Repair and Rehabilitation Program

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.

Project: Volunteer Nitrate Monitoring Network in Target Areas Demonstration

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.

Project: Water Quality Improvement Project Continuation

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.

Project: Watonwan River Major Watershed Implementation Plan Continuation

Sponsor: Watonwan County
Funding: CWP (Grant) $156,820; CWP (Loan) $48,800
Purpose: Implement agricultural best management practices for nutrient management, stream bank stabilization, channel restoration, drainage inventory, residue management, water retention, upgrading individual septic treatment systems, ongoing monitoring and data analysis and education activities.

Project: Working Together to Improve Water Quality

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.

Projects Completed History (listed by year of award)

2002 Awards

Project: Des Moines River (West Fork) TMDL Project–Phase 1
Sponsor: Tetra-Tech, Inc.
Funding: Section 319 (Grant) $33,087
Purpose: Monitor, model and develop land use data to identify potential pollutants in order to develop a total maximum daily load for fecal coliform, ammonia, dissolved oxygen and turbidity.

Project: Lambert Creek Water Quality Improvement Project
Sponsor: Vadnais Lake Area Water Management Organization
Funding: Section 319 (Grant) $176,287 & CWP (Grant) $213,713
Purpose: 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.

Project: Lower Vermillion River Watershed Turbidity TMDL Project, Phase 1
Sponsor: Houston Engineering, Inc.
Funding: Section 319 (Grant) $16,220
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.

Project: Minnesota River Basin Modeling Project
Sponsor: Tetra Tech, Inc.
Funding: Section 319 (Grant) $21,018
Purpose: Complete development and calibration of the Hydrologic Simulation Program–Fortran (HSPF) to simulate watershed conditions, such as hydrology, sedimentation, nutrient loading and other Lower Minnesota River watershed factors.

Project: Rush River Assessment Project
Sponsor: Sibley County
Funding: CWP (Grant) $312,518
Purpose: Develop diagnostic study and implementation plan for the Rush River watershed.

2001 Awards

Project: Agnes, Henry, Winona Stormwater Detention Project
Sponsor: City of Alexandria
Funding: Section 319 (Grant) $261,700
Purpose: Construct two stormwater detention ponds and monitor effectiveness.

Project: Big Birch Lake Watershed Management Project
Sponsor: Sauk River Watershed District
Funding: Section 319 (Grant) $50,000; CWP (Loan) $86,888
Purpose: Install buffer strips, restore lakeshore, improve feedlots, install agriculture waste storage facilities, upgrade septic systems and expand education and outreach efforts.

Project: Chippewa River Watershed Project, Phase 2
Sponsor: Chippewa County
Funding: CWP (Grant) $422,435
Purpose: Continue local partnerships, develop and complete agricultural best management practices.

Project: Contaminant Source Management in Karst Areas
Sponsor: University of Minnesota
Funding: Section 319 (Grant) $113,250
Purpose: Review well records, map geology and topography and coordinate information with MDNR karst features inventory and hydrologic study.

Project: Crow River Diagnostic Study
Sponsor: Crow River Organization of Water
Funding: CWP (Grant) $398,415
Purpose: Monitor, develop land use data, complete data analysis and develop an implementation plan to reduce pollutants in the Crow River Watershed.

Project: Dalen Coulee Natural Waterway Project
Sponsor: Wild Rice Watershed District
Funding: Section 319 (Grant) $50,000
Purpose: Construct weirs and natural channels, place adjacent land in set-aside programs and complete sediment and debris reduction structures.

Project: Diamond Lake Rehabilitation Project Continuation
Sponsor: Kandiyohi County
Funding: CWP (Grant) $25,000
Purpose: Operate carp barriers, Install buffer strips and other agricultural best management practices, educate landowners on well safety and test wells for nitrates.

Project: Education to Improve Feedlot, Manure and Nutrient Management, Year 2
Sponsor: University of Minnesota
Funding: Section 319 (Grant) $89,000
Purpose: Continue developing education materials and conducting regional workshops designed to reduce the environmental impact of manure.

Project: Feedlot Pollution Abatement and Erosion Control Assistance, Phase 2
Sponsor: Stearns County Soil and Water Conservation District
Funding: Section 319 (Grant) $250,000
Purpose: Continue to investigate and upgrade animal waste control facilities, develop erosion control projects, present feedlot update meetings and monitor surface waters in the Sauk River Watershed.

Project: Groundwater Vulnerability Zoning Project
Sponsor: Brown-Nicollet-Cottonwood Water Quality Board
Funding: Section 319 (Grant) $60,000
Purpose: Develop county-wide nitrate probability maps for Brown, Nicollet and Cottonwood counties for land-use management and groundwater protection

Project: Hawk Creek Watershed Project
Sponsor: Renville County
Funding: Section 319 (Grant) $337,188; CWP (Loan) $530,000
Purpose: Reduce soil erosion, implement nutrient management plans, install livestock waste storage facilities, restore wetlands and complete erosion control measures and buffer strips.

Project: Internet Technology to Enhance Communication of Non-point Source Information
Sponsor: Minnesota Lakes Association
Funding: Section 319 (Grant) $10,000
Purpose: Update and enhance computerized bibliography and web for non-point source best management practices information and resources.

Project: Karst Features Inventory and Hydrologic Investigation
Sponsor: Minnesota Department of Natural Resources
Funding: Section 319 (Grant) $27,350
Purpose: Complete karst feature inventory, karst hydrology investigations, educational outreach, and hydrogeologic evaluations at several limestone quarries.

Project: Lac qui Parle Watershed Diagnostic Study
Sponsor: Lac qui Parle-Yellow Bank Watershed District
Funding: CWP (Grant) $262,510
Purpose: Monitor, develop land use data, complete data analysis and develop an implementation plan to reduce pollutants in the Lac qui Parle Watershed.

Project: Lake Calhoun Alum Treatment Project
Sponsor: City of Minneapolis
Funding: Section 319 (Grant) $105,000
Purpose: Treat Lake Calhoun with an alum treatment to bind phosphorus, monitor for effectiveness, increase street sweeping and continue citizen education.

Project: Lake Superior Shoreline Protection Project Continuation
Sponsor: Cook County
Funding: CWP (Grant) $6,000; CWP (Loan) $300,000
Purpose: Assess, provide assistance, administer and upgrade septic systems that impact the north shore of Lake Superior.

Project: Lake Superior Shoreline Protection Project Continuation
Sponsor: Lake County
Funding: CWP (Grant) $6,000; CWP (Loan) $$300,000
Purpose: Assess, provide assistance, administer and upgrade septic systems that impact the north shore of Lake Superior.

Project: Little Cottonwood River Restoration Project
Sponsor: Brown, Nicollet, Cottonwood Joint Powers Board
Funding: CWP (Grant) $305,900; CWP (Loan) $146,415
Purpose: Develop and implement agricultural best management practices and upgrade septic systems.

Project: Local Nitrate Testing and Educational Outreach for Private Well Owners
Sponsor: Minnesota Department of Agriculture
Funding: Section 319 (Grant) $110,000
Purpose: Provide support and technical assistance to local units of government for local nitrate testing and educational outreach.

Project: Long Prairie River TMDL Project – Phase 2
Sponsor: Wenck Associates, Inc.
Funding: Section 319 (Grant) $25,000
Purpose: Complete monitoring, modeling and development of land use data to identify potential pollutants in order to develop a total maximum daily load for dissolved oxygen.

Project: Minnesota River Basin Modeling Project
Sponsor: Tetra Tech, Inc.
Funding: Section 319 (Grant) $127,305
Purpose: Continue development and calibration of the Hydrologic Simulation Program–Fortran (HSPF) to simulate watershed conditions, such as hydrology, sedimentation, nutrient loading and other Lower Minnesota River watershed factors.

Project: North Branch Sunrise River Watershed TMDL Project
Sponsor: Chisago County
Funding: Section 319 (Grant) $10,000
Purpose: Continue monitoring, modeling and development of land use data to identify potential pollutants in order to develop a total maximum daily load for fecal coliform.

Project: Paynesville Wellhead Protection Project
Sponsor: City of Paynesville
Funding: CWP (Grant) $56,783
Purpose: Purchase land and implement a wellhead protection plan for the City of Paynesville.

Project: Whitewater River Watershed National Monitoring Program - Paired Watershed Monitoring
Sponsor: Robert Finley
Funding: Section 319 (Grant) $31,961
Purpose: Evaluate surface and ground-water interactions and detect improvements through use of feedlot management, erosion control, land use best management practices, education and monitoring.

2000 Awards

Project: Agricultural and Rural Water Management: On-farm Demonstration Project
Sponsor: Minnesota Department of Agriculture
Funding: Section 319 (Grant) $180,000
Purpose: Develop and evaluate the rock inlet and inline woodchip studies for pollutant reduction effectiveness.

Project: Ashley and Hoboken Creeks Water Quality Improvement Project
Sponsor: Sauk River Watershed Project
Funding: Section 319 (Grant) $231,500
Purpose: Complete feedlot abatement projects, upgrade manure storage facilities, develop a pasture management plan, install buffer strips and wetlands and upgrade septic systems.

Project: Big Sandy Area Lakes Watershed Management Project Continuation
Sponsor: Aitkin County
Funding: CWP (Grant) $175,000; CWP (Loan) $32,450
Purpose: Conduct a study of cluster septic systems, implement a shoreline and watershed education program, plant native vegetation, complete erosion control measures and other best management practices.

Project: Carver and Bevens Creek Watershed Restoration TMDL Project
Sponsor: Carver County
Funding: Section 319 (Grant) $25,000
Purpose: Continue monitoring, modeling and development of land use data to identify potential pollutants in order to develop total maximum daily loads for turbidity, fecal coliform and excess nutrients.

Project: Clearwater River Stream Bank Stabilization and Revitalization Project
Sponsor: Red Lake Watershed Project
Funding: Section 319 (Grant) $134,500
Purpose: Stabilize the stream bank for the Greenwood 27 reach of the Clearwater River and evaluate its effectiveness.

Project: Construction Site Erosion Control Ordinance Implementation
Sponsor: Minnesota Erosion Control Association
Funding: Section 319 (Grant) $60,000
Purpose: Provide education and training to key groups, promoting expertise in erosion-control measures and improve implementation of state programs and local ordinances.

Project: Cottage Grove Nitrate Study
Sponsor: Washington County
Funding: CWP (Grant) $75,000
Purpose: Identify the sources and causes of nitrate contamination in the Cottage Grove area and develop a basis for improvements.

Project: Cottonwood River Restoration Project
Sponsor: Redwood-Cottonwood Rivers Control Area
Funding: CWP (Grant) $400,700; CWP (Loan) $369,853
Purpose: Best management practices cost share, septic system replacements and Conservation Reserve Enhancement Program easements.

Project: Crop Nutrient Management for the St. Peter Wellhead Protection Area
Sponsor: Brown-Nicollet-Cottonwood Water Quality Board
Funding: Section 319 (Grant) $60,000
Purpose: Assist farmers in adopting appropriate nitrogen rates while fertilizing crops and evaluate effectiveness in pollutant reduction.

Project: Crow River Watershed Water Quality Enhancement Project
Sponsor: Prairie Country Resource Conservation and Development Council
Funding: Section 319 (Grant) $453,790
Purpose: Stabilize seven stream bank or lakeshore sites, install 14 agricultural waste systems and install other best management practices to reduce sedimentation.

Project: Des Moines River Valley Drinking Water Study
Sponsor: Cottonwood County
Funding: CWP (Grant) $65,000
Purpose: Delineate the wellhead protection areas for Windom, Jeffers and Red Rock Rural Water Supply and develop a regional ground-water flow model.

Project: Digital Soil Data for Management of Wetlands and Rivers
Sponsor: Minnesota Board of Water and Soil Resources
Funding: Section 319 (Grant) $60,000
Purpose: Develop digitalizing lab, establish procedures, secure agreements and obtain NRCS survey certification.

Project: Education to Improve Feedlot, Manure and Nutrient Management
Sponsor: University of Minnesota
Funding: Section 319 (Grant) $97,000
Purpose: Develop education materials and conduct regional workshops designed to reduce the environmental impact of manure.

Project: Feedlot Pollution Abatement and Erosion Control Assistance
Sponsor: Stearns County Soil and Water Conservation District
Funding: Section 319 (Grant) $250,000
Purpose: Investigate and upgrade animal waste control facilities, develop erosion control projects, present feedlot update meetings and monitor surface waters in the Sauk River Watershed.

Project: Green Lake and Middle Fork Crow River Watershed Project
Sponsor: Kandiyohi County
Funding: CWP (Grant) $105,000
Purpose: Conduct a resource investigation of the Green Lake and Middle Fork Crow River watershed area.

Project: Hawk Creek Watershed Project
Sponsor: Renville County
Funding: Federal 319 (Grant) $19,032
Purpose: Continue best management activities to reduce pollutants in the watershed.

Project: High Island Creek Watershed Assessment Project
Sponsor: Sibley County
Funding: CWP (Grant) $191,785
Purpose: Resource investigation of hydrologic, water quality and ecological status of the High Island Creek watershed.

Project: Holland-Edgerton Wellhead Management
Sponsor: Pipestone County
Funding: Section 319 (Grant) $92,960
Purpose: Assist with nutrient management plans, inspect and upgrade septic systems, adopt conservation tillage practices and monitor on Pipestone Creek.

Project: Horseshoe Chain of Lakes Improvement Project Continuation
Sponsor: Sauk River Watershed District
Funding: CWP (Grant) $135,000; CWP (Loan) $750,000
Purpose: Install agricultural waste storage systems, assist with manure management plans, restore shore land riparian sites, enroll land in Conservation Reserve Enhancement Program and continue education efforts.

Project: Implementing Comprehensive Nutrient Management Plan to Meet TMDL Goals
Sponsor: Blue Earth River Basin Initiative (BERBI)
Funding: Section 319 (Grant) $18,275
Purpose: Develop comprehensive manure management plans, enroll land in Conservation Security Program and map Greater Blue Earth River Basin for watershed risk assessment.

Project: In-Situ Measurement of Denitrification in Selected Aquifers of Minnesota and North Dakota
Sponsor: University of North Dakota
Funding: Section 319 (Grant) $117,273
Purpose: Determine the capacity of aquifers to reduce or eliminate nitrates.

Project: Independence Lake TMDL Project
Sponsor: Pioneer-Sarah Creek Watershed Management Commission
Funding: Section 319 (Grant) $6,500
Purpose: Monitor, model and develop land use data to identify potential pollutants in order to develop a total maximum daily load for excess nutrients.

Project: Jessie Lake Watershed Project
Sponsor: Itasca County
Funding: CWP (Grant) $72,000
Purpose: Monitor and assess water quality and ecological status of the Jessie Lake watershed and begin best management practices to improve water quality.

Project: Lake Pepin TMDL Public Meetings Project
Sponsor: MRCC
Funding: Section 319 (Grant) $3,000
Purpose: Organize and conduct public education meetings on the Lake Pepin TMDL project

Project: Lake Sallie Restoration Project Continuation
Sponsor: Pelican River Watershed District
Funding: CWP (Grant) $40,400; CWP (Loan) $70,990
Purpose: Apply alum treatment to Lake St. Clair, create rain detention ponds, monitor and upgrade septic systems, permit oversight on detention and runoff controls and complete wetland and ditching best management practices.

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

Project: Lake Superior Shoreline Protection Project
Sponsor: Cook County
Funding: CWP (Grant) $8,400; CWP (Loan) $602,711
Purpose: Assess, provide assistance, administer and upgrade septic systems that impact the north shore of Lake Superior.

Project: Local Governmental Unit Annual Reporting System (LARS) Continuation
Sponsor: Minnesota Board of Water and Soil Resources
Funding: Section 319 (Grant) $119,930
Purpose: Develop software for the eLINK system which will facilitate statewide reporting and tracking of best management practices for state grant programs.

Project: Long Prairie River TMDL Project–Phase 2
Sponsor: Wenck Associates, Inc.
Funding: Section 319 (Grant) $150,889
Purpose: Continue to monitor, model and develop land use data to identify potential pollutants in order to develop a total maximum daily load for dissolved oxygen.

Project: Lower Vermillion River Watershed Turbidity TMDL Project
Sponsor: Houston Engineering
Funding: Section 319 (Grant) $103,612
Purpose: Monitor, model and develop land use data to identify potential pollutants in order to develop a total maximum daily load for turbidity.

Project: Minnesota Green Resort Program
Sponsor: Minnesota Pollution Control Agency
Funding: Section 319 (Grant) $3,572
Purpose: Develop materials and contacts to assist in developing environmentally-friendly resorts.

Project: Minnesota Non-point Source Information and Education Program
Sponsor: University of Minnesota
Funding: Section 319 (Grant) $62,799
Purpose: Continue position and coordination of educational programming to reduce non-point source pollution.

Project: Mississippi River Headwaters Non-point Source Remediation Effort
Sponsor: Mississippi Headwaters Board
Funding: Section 319 (Grant) $184,825
Purpose: Develop and implement Whiskey Creek retention pond, stabilize Itasca county shoreline and conduct best management practices workshops.

Project: Pollution Reduction Project
Sponsor: Cannon River Watershed Partnership
Funding: Section 319 (Grant) $130,000
Purpose: Implement best management practices in the Cannon River Watershed.

Project: Redwood River Clean Water Project
Sponsor: Redwood-Cottonwood Rivers Control Area
Funding: Section 319 (Grant) $166,970
Purpose: Continue activities to reduce sediments and nutrients, expand game fishery habitat and reduce peak flow.

Project: Rice and Koronis Lakes Restoration Project Continuation
Sponsor: North Fork Crow River Watershed District
Funding: CWP (Grant) $80,000; CWP (Loan) $542,915
Purpose: Upgrade manure/feedlots, install sediment basins, complete erosion control structures, upgrade septic systems and develop a stormwater retention pond.

Project: River-Friendly Farmer Curriculum Development
Sponsor: University of Minnesota
Funding: Section 319 (Grant) $30,000
Purpose: Develop materials and education program to promote the River-Friendly Farmer Program.

Project: Shore Land Reclamation for Improved Water Quality
Sponsor: Carnelian-Marine Watershed District
Funding: Section 319 (Grant) $23,250
Purpose: Enlist landowners in reclaiming shoreline areas through best management practices.

Project: South Branch Root River Watershed Implementation Project
Sponsor: Fillmore County
Funding: Section 319 (Grant) $7,696
Purpose: Develop outreach and communications plan and map Fillmore County tillage practices in preparation for best management practices implementation.

Project: South Branch Yellow Medicine River TMDL Project
Sponsor: Yellow Medicine River Watershed District
Funding: Section 319 (Grant) $45,055
Purpose: Monitor, model and develop land use data to identify potential pollutants in order to develop a total maximum daily load for fecal coliform.

Project: St. Louis River TMDL Mercury Project
Sponsor: Western Lake Superior Sanitary District
Funding: Section 319 (Grant) $29,626
Purpose: Identify existing mercury reduction programs, develop and implement strategies and complete monitoring and follow-up.

Project: Swan River TMDL Project
Sponsor: Todd County
Funding: Section 319 (Grant) $4,400
Purpose: Complete GIS land use mapping for the Swan River watershed.

Project: Training, Technical Assistance and Incentives for Nutrient Management
Sponsor: Minnesota Board of Water and Soil Resources
Funding: Section 319 (Grant) $154,761
Purpose: Select priority watershed, develop and deliver nutrient management workshops to local staff and develop local nutrient management plans.

Project: Trapper's Run Best Management Practices
Cost Share Project
Sponsor: Pope County
Funding: CWP (Grant) $90,000
Purpose: Identify noncompliant feedlots and encourage placement of land in CREP, CRP and RIM programs.

Project: Typo and Martin Lakes TMDL Project
Sponsor: Anoka Conservation District
Funding: Section 319 (Grant) $11,073
Purpose: Monitor, model and develop land use data to identify potential pollutants in order to develop a total maximum daily load for excess nutrients.

Project: Upper Mississippi River Headwaters to Schoolcraft River Dissolved Oxygen TMDL Project
Sponsor: Bemidji State University
Funding: Section 319 (Grant) $3,750 & state (Grant) $11,250
Purpose: Monitor, model and develop land use data to identify potential pollutants in order to develop a total maximum daily load for dissolved oxygen.

1999 Awards

Project: Accelerated Water-Quality Improvement Program, Phase II
Sponsor: Stearns County Soil and Water Conservation District
Funding: Section 319 (Grant) $200,000
Purpose: Lower the total phosphorus concentration to the ecoregion average for tributaries of the Sauk River.

Project: Achieving Major Change in Minor Watersheds Continuation
Sponsor: University of Minnesota
Funding: Section 319 (Grant) $37,665
Purpose: Achieve widespread adoption of land-use best management practices for four minor watersheds.

Project: Benefits and Impacts of Chemical Treatment of Lake Inflows, Years 2 and 3
Sponsor: University of Minnesota
Funding: Section 319 (Grant) $79,152
Purpose: Evaluate factors that can affect the success of alum treatment, including treatment design elements, chemical composition of lake inflows and lake characteristics.

Project: Best Management Practices Implementation in Lake Superior Drainage-Continuation
Sponsor: Minnesota Board of Water and Soil Resources
Funding: Section 319 (Grant) $30,801
Purpose: Staff assistance to design and implement best management practices to protect Lake Superior.

Project: Big Fish and Long Lakes Resource Investigation Project
Sponsor: Sauk River Watershed District
Funding: CWP (Grant) $33,000
Purpose: Assess the waters of Big Fish and Long Lakes and develop actions to reduce pollution sources.

Project: Big Ten Mississippi Watershed EQIP Project
Sponsor: Morrison County Soil and Water Conservation District
Funding: Section 319 (Grant) $279,000
Purpose: Develop water quality improvement projects for the Big Ten Mississippi Watershed.

Project: Carver and Bevens Creek Watershed Restoration TMDL Project
Sponsor: Carver County
Funding: Section 319 (Grant) $30,000
Purpose: Monitor, model and develop land use data to identify potential pollutants in order to develop a total maximum daily load for turbidity, fecal coliform and excess nutrients.

Project: Chain of Lakes Alum Treatment and Macrophyte Interaction Assessment Project
Sponsor: City of Minneapolis
Funding: Section 319 (Grant) $100,000
Purpose: Treat Lake Harriet with an alum treatment and measure for effects on lake phosphorus levels by monitoring and monitoring.

Project: Comparing Effectiveness of Shore Land Vegetative Establishment Techniques
Sponsor: Beltrami County Soil and Water Conservation District
Funding: 319 (Grant) $37,250
Purpose: Determine and plant vegetation to reduce shoreline erosion and evaluate plant effectiveness.

Project: Conservation Tillage Guidelines for the Mississippi River Basin
Sponsor: University of Minnesota
Funding: 319 (Grant) $10,104
Purpose: Develop, publish and distribute conservation tillage guidelines for the Lower Mississippi Basin.

Project: Conservation Tillage in Fillmore County
Sponsor: Fillmore County
Funding: 319 (Grant) $6,262
Purpose: Present conservation tillage guidelines for the Lower Mississippi Basin to farmers in Fillmore County and evaluate understanding and use.

Project: Dunns and Richardson Lakes Diagnostic-Feasibility Study
Sponsor: Meeker County
Funding: CWP (Grant) $19,258
Purpose: Monitor and assess Dunns and Richardson Lakes and develop actions for public education, septic system upgrades, rough fish control and watershed and shoreline erosion control.

Project: Grazing Land Improvement Project
Sponsor: Board of Water and Soil Resources
Funding: Section 319 (Grant) $61,200
Purpose: Assist landowners and operators to develop and maintain managed grazing systems and provide technical support in pasture management.

Project: Hastings Area Nitrate Study
Sponsor: Dakota County
Funding: CWP (Grant) $75,000
Purpose: Develop a wellhead and groundwater protection strategy for reducing nitrates in drinking water.

Project: Hawk Creek Watershed Project
Sponsor: Renville County
Funding: CWP (Grant) $148,000
Purpose: Monitor and assess the waters of Hawk Creek Watershed and develop an implementation plan to reduce pollutants in the watershed.

Project: Hawk Creek Watershed EQIP Project
Sponsor: Prairie Country Resource Conservation and Development Council
Funding: Section 319 (Grant) $320,000
Purpose: Install best management practices, monitor and analyze the results on the watershed, develop a citizen network, conduct outreach and education.

Project: Heron Lake Continuation Project
Sponsor: Heron Lake Watershed District
Funding: CWP (Grant) $250,000; CWP (Loan) $167,404
Purpose: Reduce pollutant loading, improve wildlife habitat, improve lake management, upgrade septic systems and implement other best management practices.

Project: Implementation of Locally Administered Nitrate Testing and Educational Outreach for Rural Well-owners
Sponsor: Minnesota Department of Agriculture
Funding: 319 (Grant) $100,000
Purpose: Develop equipment distribution network and cooperative training program and provide oversight to local nitrate testing clinics.

Project: Knife River Watershed EQIP Project
Sponsor: South St. Louis County Soil and Water Conservation District
Funding: Section 319 (Grant) $75,268
Purpose: Develop forest stewardship plans, stabilize and reduce active bank erosion and stabilize stream temperature.

Project: Lake Francis Diagnostic-Feasibility Study
Sponsor: Lake Francis Improvement Association
Funding: CWP (Grant) $17,987
Purpose: Develop a comprehensive strategy for reducing algal blooms and increasing clarity and fishery potential.

Project: Long and Spring Lakes Restoration Project
Sponsor: Meeker County
Funding: CWP (Grant) $26,689
Purpose: Continue activities to reduce shoreline erosion and non-point-source nutrient loading to the lakes.

Project: Long Prairie River TMDL Project–Phase 2
Sponsor: Wenck Associates, Inc.
Funding: Section 319 (Grant) $41,857
Purpose: Monitor, model and develop land use data to identify potential pollutants in order to develop a total maximum daily load for dissolved oxygen.

Project: Long/Spring Lakes Shoreline Stabilization Project
Sponsor: Dassel Area Environmental Association
Funding: Section 319 (Grant) $15,000
Purpose: Reduce shoreline erosion and non-point-source nutrient loading to the lakes.

Project: Mille Lacs Lake Watershed Diagnostic-Feasibility Study
Sponsor: Mille Lacs County
Funding: CWP and 319 (Grant) $170,000
Purpose: Monitor and assess the watershed and develop a comprehensive strategy for reducing pollutants to Mille Lacs Lake.

Project: Minnesota River Basin Modeling Project
Sponsor: Tetra Tech, Inc.
Funding: Section 319 and state match (Grant) $213,550
Purpose: Develop and calibrate the Hydrologic Simulation Program–Fortran (HSPF) to simulate watershed conditions, such as hydrology, sedimentation, nutrient loading and other Lower Minnesota River watershed factors.

Project: Nemadji River Basin Protection Project
Sponsor: Carlton County
Funding: CWP and 319 (Grant) $141,060
Purpose: Plant trees, develop artificial reefs, install two culverts and remove manure.

Project: North Branch Sunrise River Watershed TMDL Project
Sponsor: Chisago County
Funding: Section 319 (Grant) $19,270
Purpose: Monitor, model and develop land use data to identify potential pollutants in order to develop a total maximum daily load for fecal coliform.

Project: Olmsted County Intensive Manure Management Program
Sponsor: Olmsted County
Funding: 319 (Grant) $73,000
Purpose: Develop manure management plans for livestock producers and work with NRCS to develop EQIP plans.

Project: Osakis Lake Improvement Project
Sponsor: Sauk River Watershed District
Funding: CWP (Grant) $56,830; CWP (Loan) $600,000
Purpose: Define water-quality goals, reduce pollutants, increase public awareness and improve coordination of non-point-source water pollution-prevention activities.

Project: Redwood River Clean Water Partnership Continuation
Sponsor: Redwood-Cottonwood Rivers Control Area
Funding: Section 319 (Grant) $121,840; CWP (Loan) $440,000
Purpose: Reduce sediments and nutrients, expand game fishery habitat, upgrade septic systems and reduce peak flow.

Project: River-Friendly Farmer Program Expansion
Sponsor: Minnesota Board of Water and Soil Resources
Funding: Section 319 (Grant) $70,000
Purpose: Provide recognition of farmers whose best management practices help maintain and improve water quality in Minnesota's rivers.

Project: Rum River Watershed EQIP Project
Sponsor: Anoka Conservation District
Funding: Section 319 (Grant) $310,000
Purpose: Review and inventory monitoring efforts in the watershed and develop procedures to select farms for assessment.

Project: Rush Lake Watershed Enhancement Project
Sponsor: Rush Lake Improvement Association
Funding: CWP (Grant) $70,000
Purpose: Determine the causes of the lakes' deteriorating water quality and design a program to improve the watershed.

Project: Sediment Diatom Reconstruction for Southern Minnesota Lakes Project
Sponsor: Science Museum of Minnesota
Funding: Section 319 (Grant) $49,355
Purpose: Determine pre-settlement lake phosphorus concentrations by current lake monitoring and comparing diatoms found in sediment cores and those found in current lake conditions.

Project: Small Community Wastewater Solutions
Sponsor: University of Minnesota
Funding: Section 319 (Grant) $11,750
Purpose: Prepare a common-sense guidebook for communities seeking practical solutions to wastewater problems.

Project: South Branch Yellow Medicine River TMDL Project
Sponsor: Yellow Medicine River Watershed District
Funding: Section 319 (Grant) $11,929
Purpose: Monitor, model and develop land use data to identify potential pollutants in order to develop a total maximum daily load for fecal coliform.

Project: Tile Intake Initiative
Sponsor: Blue Earth Rive Basin Initiative (BERBI)
Funding: Section 319 (Grant) $93,374
Purpose: Bring awareness about the environmental impacts of open tile intakes and alter at least 234 open tile intakes.

Project: Tillage Best Management Practices for Water Quality Protection in Southeastern Minnesota
Sponsor: Minnesota Board of Water and Soil Resources
Funding: Section 319 (Grant) $44,000
Purpose: Develop a publication to assist landowners with erosion control and other best management practices.

Project: Upper Elk Creek Erosion Control and Water Quality Improvement Project
Sponsor: Sauk River Watershed District
Funding: CWP (Grant) $33,000
Purpose: Plant grass waterways, critical area plantings, complete wetland restorations, rock inlets and filter strips.

Project: Vermillion River Watershed TMDL Project
Sponsor: Dakota County Soil and Water Conservation District
Funding: Section 319 (Grant) $56,842
Purpose: Monitor, model and develop land use data to identify potential pollutants in order to develop a total maximum daily load for fecal coliform.

Project: Water Quality Improvement Project for County Ditches 7 and 32
Sponsor: North Fork Crow River Watershed District
Funding: Section 319 (Grant) $50,000
Purpose: Feedlot management, erosion control, land use best management practices, education and monitoring for inputs into the Crow River.

Project: Whitewater River TMDL Project
Sponsor: Mississippi River Revival
Funding: Section 319 (Grant) $2,110
Purpose: Monitor, model and develop land use data to identify potential pollutants in order to develop a total maximum daily load for turbidity.

Project: Whitewater River TMDL Project
Sponsor: Winona State University
Funding: Section 319 (Grant) $58,399
Purpose: Monitor, model and develop land use data to identify potential pollutants in order to develop a total maximum daily load for turbidity.

Project: Whitewater River Watershed National Monitoring Program
Sponsor: Minnesota Pollution Control Agency
Funding: Section 319 (Grant) $49,589
Purpose: Develop information required under the National Monitoring Program and provide long-term monitoring for evaluation of pollutant problems and potential solutions.

Project: Yellow Medicine River Watershed EQIP Project
Sponsor: Lincoln County Soil and Water Conservation District
Funding: Section 319 (Grant) $190,000
Purpose: Increase implementation of conservation practices that reduce soil erosion and flooding, as well as sedimentation and nutrient loading.

1998 Awards

Project: 1999 State Water Planning Conference
Sponsor: Southeast Minnesota Water Resources Board
Funding: Section 319 (Grant) $3,000
Purpose: Provide funds for the 1999 Minnesota State Water Planning Conference June 22-23, 1999.

Project: Alternative Wastewater Demonstration Project
Sponsor: Beltrami County Soil and Water Conservation District
Funding: Section 319 (Grant) $65,000
Purpose: Replace 19 septic systems with a community activated sludge treatment system.

Project: Benefits and Impacts of Chemical Treatment of Lake Inflows
Sponsor: University of Minnesota
Funding: Section 319 (Grant) $39,626
Purpose: Evaluate effectiveness of alum treatment for phosphorus removal at three sites.

Project: Bioavailable Phosphorus Credits in Pay for Pounds Program
Sponsor: University of Minnesota
Funding: Section 319 (Grant) $17,426
Purpose: Determine relationships between soils, phosphorus and chemistry in the Minnesota River Basin.

Project: Best Management Practices Implementation in Lake Superior Drainage
Sponsor: Minnesota Board of Water and Soil Resources
Funding: Section 319 (Grant) $21,200
Purpose: Continue funding of half-time engineer in the BWSR Duluth Office.

Project: Buffering Drainage Ditches in Iosco Creek Watershed
Sponsor: Blue Earth River Basin Initiative
Funding: Section 319 (Grant) $44,020
Purpose: Establish vegetative buffers in Iosco Creek watershed drainage ditches.

Project: Cation, Anion and Isotope Analysis, Phase 2
Sponsor: University of Minnesota Department of Geology & Geophysics
Funding: Section 319 (Grant) $5,000
Purpose: Continue analysis of cations, anions and isotopes in samples provided by the MPCA.

Project: Chippewa River Watershed Project
Sponsor: Chippewa County
Funding: CWP (Grant) $308,660
Purpose: Monitor and assess Chippewa River sub-watersheds, develop diagnostic study and implementation plan and establish local partnerships.

Project: Cold Spring Wellhead Protection Project
Sponsor: City of Cold Spring
Funding: CWP (Grant) $100,620
Purpose: Develop a joint wellhead protection plan taking in six public water suppliers.

Project: Crow River Watershed Water Quality Enhancement Project
Sponsor: Prairie Country Resource Conservation and Development Council
Funding: Section 319 (Grant) $30,658
Purpose: Reduce stream bank and lakeshore erosion, install agricultural waste systems, install filter and buffer strips and restore wetlands.

Project: Environmental Protection through Shoreline Stewardship
Sponsor: Beltrami County Soil and Water Conservation District
Funding: Section 319 (Grant) $27,000
Purpose: Provide information and education on the effects of traditional landscaping on water quality.

Project: Ground Water Disinfection Rule Requirements Implementation
Sponsor: Minnesota Department of Health
Funding: Section 319 (Grant) $85,000
Purpose: Conduct detailed age dating of public well water under water disinfection rule.

Project: Improved Implementation of Manure-Testing Practices on Minnesota Farms
Sponsor: Minnesota Department of Agriculture
Funding: Section 319 (Grant) $17,100
Purpose: Provide direct assistance and information to more than 106 Minnesota livestock producers for implementing manure-testing practices.

Project: Information and Education Coordinator
Sponsor: University of Minnesota
Funding: Section 319 (Grant) $65,697
Purpose: Continue funding for non-point-source information and education coordinator.

Project: Lake Superior Shoreline Protection Program
Sponsor: Lake Superior Association of Soil and Water Conservation Districts
Funding: Section 319 (Grant) $58,801
Purpose: Work with landowners to solve erosion and sedimentation problems on the north shore of Lake Superior.

Project: Lake Volney Improvement Project, Phase II
Sponsor: Le Sueur County
Funding: CWP (Grant) $174,651; CWP (Loan) $50,612
Purpose: Improve watershed coordination, reduce lake loading, education for landowners and evaluate impacts.

Project: Lakeshed Erosion Control Cost-Share Program
Sponsor: Minnesota Board of Water and Soil Resources
Funding: Section 319 (Grant) $50,000
Purpose: Provide funds to demonstrate and apply lower cost land treatment practices to sediment.

Project: Local Governmental Unit Annual Reporting System (LARS)
Sponsor: Minnesota Board of Water and Soil Resources
Funding: Section 319 (Grant) $90,900
Purpose: Provide funds for LARS enhancements and information to local governments.

Project: Minneapolis Chain of Lakes Continuation
Sponsor: City of Minneapolis
Funding: CWP (Grant) $250,000; CWP (Loan) $1,000,000
Purpose: Continue implementation activities begun in Minneapolis Chain of Lakes Phase II.

Project: Pollution Reduction Payments Projects
Sponsor: Le Sueur County Soil and Water Conservation District
Funding: Section 319 (Grant) $30,940
Purpose: Provide pollution reduction payments to qualified landowners.

Project: Promoting the Adoption of Best Management Practices in the Minnesota River Watershed
Sponsor: University of Minnesota
Funding: Section 319 (Grant) $46,353
Purpose: Develop relationships with local governments to promote agricultural best management practices.

Project: Redwood River Clean Water Project, Year 5
Sponsor: Redwood-Cottonwood Rivers Control Area
Funding: Section 319 (Grant) $122,000
Purpose: Continue best management practices activities in the Redwood River watershed.

Project: South Branch Root River Watershed Phase I Diagnostic Study
Sponsor: Fillmore County
Funding: CWP (Grant) $61,500
Purpose: Complete monitoring, data analysis, diagnostic study and implementation plan for the South Branch of the Root River.

Project: South Zumbro River Watershed Partnership
Sponsor: Olmsted County
Funding: CWP (Grant) $228,510; CWP (Loan) $260,282
Purpose: Begin implementation activities, including upgrades to failing septic systems in the south branch of the Zumbro River.

Project: Square Lake Phase I Resource Investigation
Sponsor: Washington Conservation District
Funding: CWP (Grant) $56,000
Purpose: Find out how vulnerable Square Lake might be to pollution and develop protection strategies to maintain its conditions.

Project: Upper Mississippi River Protection Project
Sponsor: City of St. Cloud
Funding: CWP (Grant) $125,000
Purpose: Develop partners, begin assessment of the Upper Mississippi Watershed and develop a source water protection plan.

Project: Wastewater Facilitator
Sponsor: Blue Earth River Basin Initiative
Funding: Section 319 (Grant) $92,130
Purpose: Provide facilitator to work in Blue Earth watershed on wastewater problems.

Project: Whitewater Paired Watershed Monitoring 2000-2001
Sponsor: University of Minnesota
Funding: Section 319 (Grant) $42,500
Purpose: Continue long-term monitoring for the Whitewater River Watershed.

Project: Whitewater River Watershed Project, Phase II
Sponsor: Whitewater River Joint Powers Board
Funding: CWP (Grant) $218,800
Purpose: Provide financial assistance, technical assistance, education, monitoring and incentives for landowners to reduce erosion, increase forest cover and improve water quality.

1997 Awards

Project: 1998 Minnesota Comprehensive Local Water Planners Conference
Sponsor: West Polk County Soil and Water Conservation District
Funding: Section 319 (Grant) $3,000
Purpose: Provide partial funding for the 1998 Minnesota Local Water Planners Conference.

Project: Accelerated Water Quality Improvement Program
Sponsor: Stearns County Soil and Water Conservation District
Funding: Section 319 (Grant) $100,000
Purpose: Provide technical and financial assistance for water quality improvement in the Sauk River watershed.

Project: Achieving Major Changes in Minor Watersheds
Sponsor: University of Minnesota
Funding: Section 319 (Grant) $72,173
Purpose: Involve landowners and local units of government in developing tailor-made best management practices implementation plans.

Project: Anoka Sand Plain V-Ground-Water Dating
Sponsor: U.S. Geological Survey
Funding: Section 319 (Grant) $35,000
Purpose: Determine the recharge age of the Anoka Sand Plain aquifer

Project: Biological Monitoring in the Whitewater Watershed Project
Sponsor: Winona State University
Funding: Section 319 (Grant) $20,311
Purpose: Site sampling and assessments of biological indicators in the Whitewater River watershed.

**Project: Boy River II State Revolving Fund Loan-Environmental Subordinate Service Districts **
Sponsor: Cass County \
Funding: CWP (Loan) $52,349 \
Purpose: Provide loan funding to local subordinate service districts for sewage treatment.

Project: Comfort Lake Phase I Diagnostic Study
Sponsor: Wyoming Township
Funding: CWP (Grant) $34,000
Purpose: Monitor Big and Little Comfort Lakes to analyze nutrients and develop a best management practices implementation plan.

Project: Diamond Lake Rehabilitation Project
Sponsor: Kandiyohi County
Funding: CWP (Grant) $49,000
Purpose: Purchase aeration equipment, complete wetland improvements, implement aquatic plant management, establish shore land stabilization and begin local water quality education.

Project: Greater Yellow Medicine River Watershed Project
Sponsor: Yellow Medicine River Watershed District
Funding: CWP (Grant) $200,092
Purpose: Develop diagnostic study and implementation plan to reduce runoff, soil erosion and flooding.

Project: Horseshoe Chain of Lakes Improvement Project
Sponsor: Sauk River Watershed District
Funding: CWP (Grant) $80,221; CWP (Loan) $320,000
Purpose: Extend agricultural efforts, address on-site septic systems and shore land erosion.

Project: Introduction to ArcView Course for MPCA Employees
Sponsor: Rowekamp Associates Inc.
Funding: Section 319 (Grant) $13,200
Purpose: Provide introduction to ArcView computer training for MPCA employees.

Project: Lake Margaret Watershed Project
Sponsor: City of Lake Shore
Funding: CWP (Grant) $22,264
Purpose: Begin monitoring and lake assessment, assess current land use and establish a water quality library.

Project: Lake Minnie Belle Restoration Project
Sponsor: Meeker County
Funding: CWP (Grant) $76,225; CWP (Loan) $64,705
Purpose: Construct wetland outlet, assist farmers with erosion control plans, place land in Conservation Reserve Program, conduct lakeshore cleanups, shore land restoration and various water quality workshops.

Project: Lake Sallie Restoration
Sponsor: Pelican River Watershed District
Funding: CWP (Grant) $54,000; CWP (Loan) $284,911
Purpose: Develop ecosystem management approach with alum treatment and biomanipulation.

Project: Lake Shetek Phase II Water Quality Improvement Project
Sponsor: Murray County
Funding: CWP (Grant) $99,557; CWP (Loan) $165,304
Purpose: Develop shoreline stabilization projects, upgrade and repair failing septic systems and develop and assess demonstration pilots on manure management.

Project: Little Cottonwood River Restoration Project
Sponsor: Brown, Nicollet, Cottonwood Joint Powers Board
Funding: CWP (Grant) $102,000
Purpose: Develop a pollution reduction strategy and implementation plan through monitoring and data analysis.

Project: Long Lake Water Quality Project
Sponsor: Isanti County
Funding: CWP (Grant) $39,264
Purpose: Develop a diagnostic study and implementation plan to reduce high phosphorus, nitrogen and ammonia and improve water quality.

Project: Long Prairie River Monitoring Project
Sponsor: Todd County Soil and Water Conservation District
Funding: CWP (Grant) $35,000
Purpose: Group efforts to depict water quality conditions and to maintain and improve water quality.

Project: Mountain Lake Watershed Project IV
Sponsor: City of Mountain Lake
Funding: Section 319 (Grant) $50,000
Purpose: Continue best management practices implementation activities.

Project: Old Sod Farm Wetland Enhancement and Storm-Water Management
Sponsor: Ramsey-Washington Metro Watershed District
Funding: Section 319 (Grant) $40,403
Purpose: Design/develop wetland learning center, improve storm-water quality and increase diversion of stormwater.

Project: On-Farm Manure Management II
Sponsor: University of Minnesota
Funding: Section 319 (Grant) $37,000
Purpose: Continue educational program with livestock producers for precise manure management strategies.

Project: Pokegama/Cross Lake Erosion Project
Sponsor: Pine County Soil and Water Conservation District
Funding: Section 319 (Grant) $72,185
Purpose: Implement sediment control structures for ravines to Pokegama and Cross Lakes.

Project: Redwood River Watershed Project Year 4
Sponsor: Redwood-Cottonwood Rivers Control Area
Funding: Section 319 (Grant) $121,840
Purpose: Continue implementation activities in the Redwood River watershed.

Project: Rice Lake and Koronis Lake Restoration Project
Sponsor: Rice Lake and Koronis Lake Improvement Association
Funding: Section 319 (Grant) $36,450
Purpose: Develop and implement best management practices for the watershed and educate landowners.

Project: Shore Land Vegetation III-Best Management Practices to Reduce Erosion and Runoff
Sponsor: University of Minnesota
Funding: Section 319 (Grant) $29,512
Purpose: Continue reestablishment of native vegetation to reduce erosion and runoff, and evaluate impacts.

Project: Springbrook Sub-watershed Resource Investigation Project
Sponsor: City of Fridley
Funding: CWP (Grant) $29,745
Purpose: Investigate and monitor water quality and land use, identify pollutants and develop best management practices.

Project: Tillage Transect Program
Sponsor: Minnesota Board of Water and Soil Resources
Funding: Section 319 (Grant) $93,500
Purpose: Establish baseline data on crop residue management and reduce soil erosion and sedimentation.

Project: Whitewater Watershed Biological Monitoring
Sponsor: Winona State University
Funding: Section 319 (Grant) $22,508
Purpose: Analyze the biological monitoring data collected for the Whitewater Watershed Project.

Project: Workshops for Designing Storm-Water Management Practices
Sponsor: University of Minnesota
Funding: Section 319 (Grant) $27,342
Purpose: Develop and present workshops on construction site erosion and storm-water detention.

1996 Awards

Project: Best Management Practices Implementation
Sponsor: Natural Resources Conservation Service
Funding: Section 319 (Grant) $33,934
Purpose: Continue the technical assistance to local governmental units of NRCS conservationist.

Project: Best Management Practices Implementation in the Lake Superior Drainage Basin
Sponsor: Minnesota Board of Water and Soil Resources
Funding: Section 319 (Grant) $22,000
Purpose: Fund a position to educate, design best management practices and oversee erosion control in Lake Superior.

Project: Big Sandy Lake Phase II Restoration Plan
Sponsor: Aitkin County
Funding: CWP (Grant) $200,000; CWP (Loan) $211,864
Purpose: Reduce phosphorus loadings and increase participation in conservation practices.

Project: Bioavailable Phosphorus Credits
Sponsor: University of Minnesota
Funding: Section 319 (Grant) $3,000
Purpose: Determine relationships of soils, phosphorus absorption and chemistry in the Minnesota River Basin.

Project: Blue Earth River-Watonwan Basin Implementation Framework
Sponsor: Blue Earth County
Funding: CWP (Grant) $214,451
Purpose: Identify pollutant contributions to the Watonwan River and determine goals for improvement.

Project: Brown-Nicollet-Cottonwood Phase IIB Project
Sponsor: Brown-Nicollet-Cottonwood Water Quality Board
Funding: CWP (Grant) $150,000; CWP (Loan) $1,725,000
Purpose: Continue implementation activities and further loan funding for best management practices implementation.

Project: Cation/Anion and Isotope Analysis
Sponsor: University of Minnesota Department of Geology & Geophysics
Funding: Section 319 (Grant) $7,781
Purpose: Analyze cation, anion and isotopes in samples provided by the MPCA.

Project: Clearwater River Water Quality Improvement Project
Sponsor: Red Lake Watershed District
Funding: CWP (Loan) $309,009
Purpose: Provide SRF loan funding for stream bank stabilization, public education and best management practices.

Project: Cottonwood River Restoration Project
Sponsor: Redwood-Cotton Rivers Control Area
Funding: CWP (Grant) $215,280
Purpose: Document factors affecting sediment/nutrient transport and develop an implementation plan.

Project: Creating Wetlands over Acid Generating Tailings
Sponsor: Minnesota Department of Natural Resources
Funding: Section 319 (Grant) $25,000
Purpose: Convert tailings basins into wetlands to protect water quality and create habitat.

Project: Cross Lake Watershed Project
Sponsor: Pine County Soil and Water Conservation District
Funding: CWP (Grant) $34,956
Purpose: Collect data, determine nutrient/hydrogeologic budgets and promote water quality awareness.

Project: Economic Evaluation for Pollutant Reduction
Sponsor: University of Minnesota
Funding: Section 319 (Grant) $20,000
Purpose: Develop economic model of decisions to estimate the financial impacts of pollutant reduction on farms and local units of government.

Project: French Lake Phase II Continuation Project
Sponsor: Rice County
Funding: CWP (Grant) $61,800; CWP (Loan) $291,028
Purpose: Continue best management practices implementation activities begun in French Lake Phase II.

Project: Grove Lake Restoration Phase II Project
Sponsor: North Fork Crow River Watershed District
Funding: CWP (Grant) $40,000; CWP (Loan) $140,637
Purpose: Reduce or eliminate nutrient loading through implementation of best management practices.

Project: Growth Management Project: Sustainable Land-Use Pilots
Sponsor: Minnesota Office of Strategic and Long Range Planning
Funding: Section 319 (Grant) $90,000
Purpose: Test planning, principles and goals through sustainable local land-use pilots.

Project: Heron Lake Watershed Restoration Project
Sponsor: Heron Lake Watershed District
Funding: CWP (Grant) $200,000; CWP (Loan) $441,985
Purpose: Reduce pollutant loading, improve wildlife habitat and improve lake management.

Project: Jefferson-German II State Revolving Fund Loan #2
Sponsor: Le Sueur County
Funding: CWP (Loan) $432,005
Purpose: Additional loan for continuation of implementation activities.

Project: Lake Harriet Watershed Best Management Practices Phase III Project
Sponsor: Minnesota Department of Agriculture
Funding: Section 319 (Grant) $50,000
Purpose: Continue best management practices activities in the Lake Harriet watershed.

Project: Lake Washington Phase II Water Quality Improvement Project
Sponsor: Le Sueur County
Funding: CWP (Grant) $102,500; CWP (Loan) $524,910
Purpose: Improve watershed coordination, reduce watershed loading, develop plans and educational opportunities.

Project: Manual for Protecting Water Quality in Urban Areas
Sponsor: Minnesota Pollution Control Agency
Funding: Section 319 (Grant) $8,480
Purpose: Develop an urban stormwater best management practices manual.

Project: Miller Creek Restoration Project
Sponsor: South St Louis Soil and Water Conservation District
Funding: Section 319 (Grant) $21,750
Purpose: Initiate riparian tree planting, pond side plantings and reestablish fish habitat.

Project: Miller Creek Watershed Preservation and Restoration Project
Sponsor: City of Duluth
Funding: CWP (Grant) $18,262
Purpose: Monitor Miller Creek to determine current status and begin implementation of best management practices.

Project: Mountain Lake Phase IIB Watershed Project
Sponsor: City of Mountain Lake
Funding: Section 319 (Grant) $100,000
Purpose: Continue best management practices activities for the Mountain Lake Project.

Project: NALMS 1996 Conference
Sponsor: North American Lake Management Society
Funding: Section 319 (Grant) $2,500
Purpose: Provide funding to assist with presentation of 1996 NALMS conference.

Project: Oakdale Wellhead Protection Program
Sponsor: City of Oakdale
Funding: CWP (Grant) $8,041
Purpose: Delineate wellhead protection plan, assess water supply vulnerability, develop strategies and implement.

Project: On-Farm Manure Management
Sponsor: Kandiyohi County
Funding: Section 319 (Grant) $33,480
Purpose: Assist farmers and compile information on implementing a county-wide manure management strategy.

Project: Osakis Lake Improvement Project
Sponsor: Sauk River Watershed District
Funding: CWP (Grant) $48,000; CWP (Loan) $783,174
Purpose: Define water-quality goals, reduce pollutants, increase public awareness and improve coordination of non-point-source water pollution-prevention activities.

Project: Paynesville Wellhead Protection
Sponsor: City of Paynesville
Funding: CWP (Grant) $12,000
Purpose: Evaluate impacts on Paynesville water supply and develop a plan to protect ground-water resources.

Project: Phosphate Management II in the Blue Earth River Basin
Sponsor: University of Minnesota
Funding: Section 319 (Grant) $60,760
Purpose: Increase adoption of best management practices to lower phosphorus inputs to the Blue Earth River.

Project: Pollution Reduction Payments Project
Sponsor: Le Sueur County Soil and Water Conservation District
Funding: Section 319 (Grant) $26,060
Purpose: Develop grant agreements with land managers for best management practices implementation in Le Sueur County.

Project: Prior-Spring Lakes Improvement Project
Sponsor: Prior Lake - Spring Lake Watershed District
Funding: Section 319 (Grant) $67,240
Purpose: Continue implementation activities begun in earlier Prior and Spring Lakes projects.

Project: Redwood River Clean Water Project
Sponsor: Redwood-Cottonwood Rivers Control Area
Funding: Section 319 (Grant) $108,790
Purpose: Continue implementation activities for the Redwood Watershed project.

Project: Rice Lake and Koronis Lake Restoration Project
Sponsor: North Fork Crow River Watershed District
Funding: CWP (Grant) $57,500; CWP (Loan) $494,750
Purpose: Reduce phosphorus loadings through best management practices.

Project: Shore Land Vegetation Best Management Practices to Reduce Erosion and Runoff
Sponsor: Aitkin County
Funding: Section 319 (Grant) $17,502
Purpose: Continue establishing filter strip demonstration plots to protect water quality in Aitkin County.

Project: Shore Land Vegetation II Best Management Practices
Sponsor: University of Minnesota
Funding: Section 319 (Grant) $14,880
Purpose: Continuation of shore land vegetation activities on Big Sandy Lake.

Project: Snake River Project
Sponsor: Snake River Watershed Management Board
Funding: Section 319 (Grant) $60,000
Purpose: Implement stream bank protection, pollution abatement, erosion control and manure management.

Project: Tanner's Lake State Revolving Fund Loan
Sponsor: Ramsey-Washington Metro Watershed District
Funding: CWP (Loan) $944,720
Purpose: Provide loan assistance for best management practices in the Tanner's Lake watershed.

Project: Water Level Gage Installation Project
Sponsor: Minnesota Department of Natural Resources
Funding: Section 319 (Grant) $49,555
Purpose: Install and monitor water level gages on bridge piers or freestanding structures.

Project: Upland Water Retention for Improving Drainage and Water Quality Video
Sponsor: Epic Media
Funding: Section 319 (Grant) $5,332
Purpose: Prepare a 17-minute video on the impacts of drain tiling on both water retention and water quality.

Project: Wetland Treatment of Mine Drainage
Sponsor: Minnesota Department of Natural Resources
Funding: Section 319 (Grant) $20,000
Purpose: Study two created wetland systems to determine lifetime for treating mine wastes.

Project: Whitewater Paired Watershed Monitoring
Sponsor: Robert Finley
Funding: Section 319 (Grant) $1,800
Purpose: Place water quality monitoring stations in two small watersheds to evaluate best management practices effectiveness.

1995 Awards

Project: 24,000 Scale Hydrology Mapping
Sponsor: St. Cloud State University
Funding: Section 319 (Grant) $33,000
Purpose: Develop complete stream network using Arcview and other information.

Project: Agricultural Best Management Practices Implementation Program
Sponsor: Minnesota Board of Water and Soil Resources
Funding: Section 319 (Grant) $261,350
Purpose: Provide technical staffing assistance and support to implement agricultural State Revolving Fund loans.

Project: Anoka Sand Plain Project IV
Sponsor: U.S. Geological Survey
Funding: Section 319 (Grant) $40,000
Purpose: Continue monitoring activities in the Anoka Sand Plains area.

Project: Big Birch Lake Improvement Project
Sponsor: Sauk River Watershed District
Funding: CWP (Grant) $79,500; CWP (Loan) $345,956
Purpose: Begin best management practices implementation on Big Birch Lake.

Project: Blue Earth River Basin Implementation Framework
Sponsor: Blue Earth County
Funding: CWP (Grant) $219,799
Purpose: Identify contributions of pollutants from the Blue Earth River basin and determine strategies for reduction.

Project: Brown-Nicollet-Cottonwood Phase II Implementation Project
Sponsor: Brown-Nicollet-Cottonwood Counties Joint Powers Board
Funding: CWP (Grant) $129,000; CWP (Loan) $1,086,000
Purpose: Continue implementation activities begun in earlier phases of the project.

Project: Cation, Anion and Isotope Analysis
Sponsor: University of Minnesota Department of Geology & Geophysics
Funding: Section 319 (Grant) $5,219
Purpose: Analyze cations, anions and isotopes in samples provided by the MPCA.

Project: Cost-Benefit Analysis to Help Make Environmental Decisions
Sponsor: Express Interactive Solutions
Funding: Section 319 (Grant) $15,000
Purpose: Present seminar on cost/benefit analysis for water-quality regulation.

Project: Cost-Benefit Analysis for Water Quality Regulation and Decision-making
Sponsor: University of Minnesota
Funding: Section 319 (Grant) $4,963
Purpose: Assist with seminar presentation on cost/benefit analysis for water-quality regulation.

Project: Digital Hydrographic Data Project
Sponsor: U.S. Geological Survey
Funding: Section 319 (Grant) $68,400
Purpose: Develop and analyze digital hydrographic data in portions of Minnesota.

Project: Fecal Coliform Analysis for the Minnesota River Basin
Sponsor: Mankato State University
Funding: Section 319 (Grant) $3,020
Purpose: Collect and analyze Minnesota River Basin water samples for fecal coliform and enter into database.

Project: Fish and Invertebrate Communities in the Whitewater River
Sponsor: University of Minnesota
Funding: Section 319 (Grant) $3,015
Purpose: Using GIS technology, examine fish and invertebrate communities in Whitewater River watershed.

Project: Fish Lake Phase II Project
Sponsor: City of Eagan
Funding: CWP (Grant) $48,975; CWP (Loan) $51,250
Purpose: Implement best management practices to reduce phosphorus and nutrient loading to Fish Lake.

Project: Growth Management Project II, Implementation
Sponsor: Minnesota Office of Strategic and Long Range Planning
Funding: Section 319 (Grant) $41,000
Purpose: Implement a land management framework.

Project: Jefferson-German Lakes Water Quality Improvement Project
Sponsor: Le Sueur County
Funding: CWP (Grant) $95,971; CWP (Loan) $113,582
Purpose: Reduce phosphorus loadings to the Jefferson- German Lakes system through best management practices.

Project: Lake Bemidji IIA Watershed Management Project
Sponsor: Beltrami County
Funding: CWP (Grant) $120,000; CWP (Loan) $555,041
Purpose: Continue implementation activities begun under the Lake Bemidji Phase II project.

Project: Lake Volney Water Quality Improvement Project
Sponsor: Le Sueur County
Funding: CWP (Grant) $49,708
Purpose: Determine cause and effect relationships between land use and water quality, develop an improvement plan and implement.

Project: Maplewood Innovative Storm-Water Management Project
Sponsor: City of Maplewood
Funding: Section 319 (Grant) $63,000
Purpose: Implement storm-water methods and infiltrate storm water using innovative strategies and techniques.

Project: Mountain Lake Project Phase II
Sponsor: City of Mountain Lake
Funding: Section 319 (Grant) $100,000
Purpose: Continue implementation activities begun in the Mountain Lake Phase II CWP project.

Project: Phosphate Management in the Blue Earth River Basin
Sponsor: University of Minnesota
Funding: Section 319 (Grant) $60,760
Purpose: Increase adoption of practices to reduce losses of pollutants to the Blue Earth River watershed.

Project: Pokegama Lake Watershed Project
Sponsor: Pine County Soil and Water Conservation District
Funding: CWP (Grant) $62,125
Purpose: Develop a comprehensive lake and watershed management plan for Pokegama Lake.

Project: Prior/Spring Lakes Phase II CWP Project
Sponsor: Prior Lake-Spring Lake Watershed District
Funding: Section 319 (Grant) $76,776
Purpose: Continue implementation activities begun previously for Prior and Spring Lakes.

Project: Redwood River Phase II Clean Water Project
Sponsor: Redwood-Cottonwood Rivers Control Area
Funding: Section 319 (Grant) $108,790
Purpose: Continue implementation and best management practices begun in Redwood River Phase II.

Project: Shore Land Vegetation Best Management Practices to Reduce Erosion and Runoff
Sponsor: University of Minnesota
Funding: Section 319 (Grant) $32,860
Purpose: Demonstrate pollution prevention by the effectiveness of vegetative plantings.

Project: South Zumbro River Watershed Project
Sponsor: Olmsted County
Funding: CWP (Grant) $135,416
Purpose: Implement best management practices to reduce ground-water and surface-water pollution in the Zumbro River watershed.

Project: Whitewater Watershed Project II
Sponsor: University of Minnesota
Funding: Section 319 (Grant) $26,803
Purpose: Continue macroinvertebrate fishery and habitat assessments for Whitewater River.

Project: Whitewater Watershed Project: Automated Monitoring
Sponsor: University of Minnesota
Funding: Section 319 (Grant) $8,433
Purpose: Operate and maintain automated monitoring sites near the Whitewater River watershed.

Project: Whitewater Watershed Project: Biosystems and Ag Engineer
Sponsor: University of Minnesota
Funding: Section 319 (Grant) $4,956
Purpose: Assist operation of five automated monitoring sites and monitor weather station.

1994 Awards

Project: 1996 Non-point Source Conference Management
Sponsor: Southeast Minnesota Water Resources Board
Funding: Section 319 (Grant) $10,000
Purpose: Provide funding for the 1996 agricultural non-point source conference.

Project: Anoka Sand Plain Project III
Sponsor: U.S. Geological Survey
Funding: Section 319 (Grant) $35,000
Purpose: Continue monitoring activities of the Anoka Sand Plain Project.

Project: Big Sandy Area Lakes Watershed Project
Sponsor: Aitkin County
Funding: CWP (Grant) $69,195
Purpose: Assess in order to maintain the beneficial uses of the Big Sandy Lakes watershed.

Project: Boy River CWP Project, Phase II
Sponsor: Cass County
Funding: CWP (Grant) $38,150
Purpose: Implement the improvement plans for the Boy River.

Project: Crystal, Loon, Mills Lakes Water Quality Improvement Project
Sponsor: Blue Earth County
Funding: CWP (Grant) $93,199
Purpose: Investigate the sources of degradation to Crystal, Loon and Mills Lake.

Project: Fairfax Urban Demonstration Project
Sponsor: City of Fairfax
Funding: Section 319 (Grant) $110,000
Purpose: Implement structural and nonstructural best management practices in an urban watershed.

Project: Feedlot Technical Assistance Project
Sponsor: Minnesota Board of Water and Soil Resources
Funding: Section 319 (Grant) $62,640
Purpose: Prove statewide feedlot technical support to implement revolving loan fund program.

Project: Great Lakes Erosion Control II
Sponsor: South St. Louis County Soil and Water Conservation District
Funding: Section 319 (Grant) $40,000
Purpose: Develop projects to correct erosion, sedimentation and pollution problems in Lake Superior.

Project: Information and Education Coordinator
Sponsor: University of Minnesota Extension Service
Funding: Section 319 (Grant) $59,900
Purpose: Continue coordination of educational programming to reduce non-point-source pollution.

Project: Knife Lake Demonstration Project
Sponsor: Kanabec County
Funding: CWP (Grant) $31,500
Purpose: Implement the final phase of rehabilitation for Knife Lake.

Project: Lake Harriet Best Management Practices
Sponsor: Minnesota Department of Agriculture
Funding: Section 319 (Grant) $50,000
Purpose: Test the implementation and evaluation of urban best management practices in the Lake Harriet Watershed.

Project: Manure Management Program
Sponsor: University of Minnesota
Funding: Section 319 (Grant) $54,000
Purpose: Continue one-on-one contact with livestock producers for manure management plans.

Project: Minneapolis Chain of Lakes Implementation Project
Sponsor: City of Minneapolis
Funding: CWP (Grant) $811,682
Purpose: Implement best management practices for the Minneapolis Chain of Lakes watershed.

Project: Minnesota Lakes Association 1994 Annual Conference
Sponsor: Minnesota Lakes Association
Funding: Section 319 (Grant) $2,000
Purpose: Co-sponsor the 1994 Minnesota Lakes Association annual conference.

Project: Mountain Lake CWP Phase II Project
Sponsor: City of Mountain Lake
Funding: Section 319 (Grant) $100,000
Purpose: Implement the improvement plan for Mountain Lake.

Project: Nutrient Management Technical Assistance
Sponsor: Minnesota Department of Agriculture
Funding: Section 319 (Grant) $95,000
Purpose: Continue nutrient management activities with farmers and expand to agricultural retailers.

Project: Prior Lake Wetlands Project
Sponsor: Prior Lake-Spring Lake Watershed District
Funding: Section 319 (Grant) $74,250
Purpose: Demonstrate wetland restoration on non-point-source pollution in Prior Lake.

Project: Prior Lake - Spring Lake CWP Phase II Project
Sponsor: Prior Lake-Spring Lake Watershed District
Funding: Section 319 (Grant) $100,000
Purpose: Implement activities for Prior and Spring Lakes improvement.

Project: Redwood River Clean Water Project
Sponsor: Redwood-Cottonwood Rivers Control Area
Funding: Section 319 (Grant) $108,790
Purpose: Implement activities for the Redwood River improvement strategies.

Project: Schwanz Lake Clean Water Partnership Phase II Project
Sponsor: City of Eagan
Funding: Section 319 (Grant) $89,064
Purpose: Implement the improvement plan for Schwanz Lake.

Project: Whitewater Watershed Project
Sponsor: Winona State University
Funding: Section 319 (Grant) $8,550
Purpose: Water sampling and assessments in the Whitewater River watershed.

Project: Whitewater Watershed Project
Sponsor: University of Minnesota
Funding: Section 319 (Grant) $12,677
Purpose: Complete a macroinvertebrate, fishery and habitat assessment in the Whitewater River watershed.

Project: Whitewater Watershed Project Continuation
Sponsor: Winona State University
Funding: Section 319 (Grant) $18,000
Purpose: Continue water sampling at new sites in the Whitewater River watershed.

1993 Awards

Project: Anoka Sand Plain Project II
Sponsor: U.S. Geological Survey
Funding: Section 319 (Grant) $35,000
Purpose: Determine the residence time of water and chemicals in the Anoka Sand Plain area.

Project: Biological Community Monitoring in the Minnesota River Basin
Sponsor: Winona State University
Funding: Section 319 (Grant) $10,000
Purpose: Conduct a non-point-source assessment of biological elements of the Minnesota River.

Project: Brown-Nicollet-Cottonwood Phase II -- Ground-Water Implementation
Sponsor: Brown-Nicollet-Cottonwood Water Quality Board
Funding: CWP (Grant) $263,600
Purpose: Implement ground-water monitoring and improvements.

Project: Conservationist Best Management Practices Implementation
Sponsor: Natural Resources Conservation Service
Funding: Section 319 (Grant) $35,000
Purpose: Continue conservation position to work on non-point-source issues.

Project: French Lake Water Quality Improvement Project, Phase II
Sponsor: Rice County Highway Department
Funding: CWP (Grant) $138,600
Purpose: Implement the French Lake water quality improvement project.

Project: Garvin Brook RCW Project V
Sponsor: Winona County Soil and Water Conservation District
Funding: Section 319 (Grant) $1,073
Purpose: Continue the Garvin Brook Clean Water Project to assess ground-water quality.

Project: Growth Management Project II
Sponsor: Minnesota Office of Strategic and Long Range Planning
Funding: Section 319 (Grant) $33,750
Purpose: Continue project to prevent non-point-source pollution via growth management strategies.

Project: Information and Education Coordinator
Sponsor: University of Minnesota
Funding: Section 319 (Grant) $92,139
Purpose: Fund coordinator to provide educational programming to reduce non-point-source pollution.

Project: Isotopic and Chemical Analyses of Waters from the Whitewater/Minnesota River Basin
Sponsor: University of Minnesota
Funding: Section 319 (Grant) $10,000
Purpose: Evaluate implemented best management practices and pollutant flow paths, assess best management practices timeframe impacts.

Project: Lake Harriet Watershed Assistance Project
Sponsor: Minnesota Department of Agriculture
Funding: Section 319 (Grant) $50,000
Purpose: Implementation and evaluation of best management practices in the Lake Harriet watershed.

Project: Lake Shaokatan Restoration Phase II Project
Sponsor: Yellow Medicine River Watershed District
Funding: CWP (Grant) $239,645
Purpose: Reduce algal/toxic algal blooms and improve recreational uses on Lake Shaokatan.

Project: Lake Shetek Watershed Improvement Project
Sponsor: Murray County
Funding: CWP (Grant) $131,040
Purpose: Resource investigation of Lake Shetek to assess and develop improvement plan.

Project: Lake Traverse Improvement Project
Sponsor: Bois de Sioux Watershed District
Funding: CWP (Grant) $62,967
Purpose: Resource investigation of Lake Traverse to assess and develop improvement plan.

Project: Lake Washington Water Quality Improvement Project
Sponsor: Le Sueur County
Funding: CWP (Grant) $94,379
Purpose: Resource investigation of Lake Washington to assess and develop improvement plan.

Project: Lambert Creek Improvement Project
Sponsor: Vadnais Lake Area Water Management Organization
Funding: CWP (Grant) $245,000
Purpose: Implement best management practices to reduce phosphorus in Vadnais Lake.

Project: Manure Management Program
Sponsor: University of Minnesota
Funding: Section 319 (Grant) $57,613
Purpose: Develop a manure management program to advance the state's non-point-source abatement efforts.

Project: Manure Storage Basin Monitoring Project
Sponsor: Morrison County
Funding: Section 319 (Grant) $2,000
Purpose: Develop a plan to monitor manure storage basins in Morrison County.

Project: Whitewater Project Land-Use Data
Sponsor: Land Management Information Committee
Funding: Section 319 (Grant) $6,335
Purpose: Develop land-use data for the Whitewater River watershed.

Project: Whitewater River Monitoring
Sponsor: Whitewater River Watershed Joint Powers Board
Funding: Section 319 (Grant) $3,600
Purpose: Develop and implement a monitoring plan for the Whitewater River watershed.

Project: Whitewater River Runoff Monitoring Project
Sponsor: Whitewater River Watershed Joint Powers Board
Funding: Section 319 (Grant) $8,204
Purpose: Monitor runoff from the Whitewater River watershed.

Project: Whitewater River Sampling and Analysis Project
Sponsor: Winona State University
Funding: Section 319 (Grant) $8,550
Purpose: Complete water sampling and pollutant analysis in the Whitewater River watershed.

Project: Whitewater Watershed Monitoring
Sponsor: Joseph Finley
Funding: Section 319 (Grant) $300
Purpose: Evaluate effectiveness of best management practices through the use of paired-watershed monitoring.

1992 Awards

Project: Anoka Sand Plain Project
Sponsor: U. S. Geological Survey
Funding: Section 319 (Grant) $40,000
Purpose: Study the residence time of recharge water and flux of agricultural chemicals in the unsaturated zone.

Project: Best Management Practices Field Audits on Forest Land II
Sponsor: Minnesota Department of Natural Resources
Funding: Section 319 (Grant) $38,500
Purpose: Continue forestry best management practices field audits.

Project: Conservationist Best Management Practices Implementation
Sponsor: Natural Resources Conservation Service
Funding: Section 319 (Grant) $58,800
Purpose: Assign a NRCS conservationist to MPCA to assist with best management practices implementation.

Project: Farm*A*Syst and Manure Management Materials
Sponsor: University of Minnesota
Funding: Section 319 (Grant) $50,000
Purpose: Continue Farm*A*Syst Program.

Project: Feedlots in Marshall Project
Sponsor: Minnesota Board of Water and Soil Resources
Funding: Section 319 (Grant) $52,510
Purpose: Develop feedlot management training and technical assistance to soil and water conservation districts in the Marshall area.

Project: Garvin Brook RCW Project III
Sponsor: Winona County Extension Service
Funding: Section 319 (Grant) $8,940
Purpose: Continue well sampling and cataloging in Garvin Brook project area.

Project: Garvin Brook RCW Project IV – Well Sampling
Sponsor: Winona County Extension Service
Funding: Section 319 (Grant) $3,632
Purpose: Continue well sampling in the Garvin Brook area.

Project: Growth Management Project
Sponsor: Minnesota Department of Administration
Funding: Section 319 (Grant) $40,334
Purpose: Assess growth management to mitigate non-point-source pollution.

Project: Jefferson–German Lakes Water Quality Improvement Project
Sponsor: Le Sueur County
Funding: CWP (Grant) $117,515
Purpose: Resource investigation of Jefferson-German Lakes watershed.

Project: Lake Bemidji Watershed Project
Sponsor: Beltrami County
Funding: CWP (Grant) $274,350
Purpose: Implement activities to reduce non-point source pollution to Bemidji and Irving Lakes and the sand plain aquifer.

Project: Minnesota River Water Quality Conference
Sponsor: Sportsmen's Coalition for a Clean Minnesota River
Funding: Section 319 (Grant) $5,000
Purpose: Sponsorship of citizens interested in improving the water quality in the Minnesota River.

Project: Nutrient Management Technical Assistance
Sponsor: Minnesota Department of Agriculture
Funding: Section 319 (Grant) $95,000
Purpose: Provide nutrient management technical assistance to Minnesota farmers.

Project: Pineland Clean Water Project
Sponsor: Pineland Clean Water Project Joint Powers Board
Funding: CWP (Grant) $144,675
Purpose: Resource investigation of surface and groundwater non-point-source pollution in Hubbard and Becker Counties.

Project: St. Louis River Phosphorus Reduction Project
Sponsor: South St. Louis County Soil and Water Conservation District
Funding: Section 319 (Grant) $48,000
Purpose: Reduce phosphorus non-point-source pollution in the St. Louis River.

Project: Wellhead Protection Outreach and Public Information
Sponsor: Minnesota Department of Health
Funding: Section 319 (Grant) $40,000
Purpose: Continue public information and outreach activities promoting wellhead protection.

1991 Awards

Project: Best Management Practices Field Audits on Forest Land
Sponsor: Minnesota Department of Natural Resources
Funding: Section 319 (Grant) $20,000
Purpose: Pilot a best management practices field audit for future use.

Project: Best Management Practices on Nonferrous Mine Wastes
Sponsor: Minnesota Department of Natural Resources
Funding: Section 319 (Grant) $25,000
Purpose: Develop guidance on wetland treatment best management practices to reduce trace metal runoff.

Project: Clear Lake Wellhead Project
Sponsor: City of Clear Lake
Funding: CWP (Grant) $70,538
Purpose: Investigate high nitrate-N in municipal well and develop reduction methods.

Project: Clearwater Non-point-Source Study
Sponsor: Red Lake Watershed District
Funding: CWP (Grant) $142,142
Purpose: Develop a best management practices plan to improve river water quality, feedlot management and agricultural practices.

Project: DNR Coordination Effort
Sponsor: Minnesota Department of Natural Resources
Funding: Section 319 (Grant) $45,850
Purpose: Coordinate and implement DNR water non-point-source efforts.

Project: Farm*A*Syst and Manure Management Program
Sponsor: University of Minnesota
Funding: Section 319 (Grant) $39,800
Purpose: Develop Farm*A*Syst displays and brochures, manure management manual and training.

Project: Feedlots in the Marshall Region II
Sponsor: Minnesota Board of Water and Soil Resources
Funding: Section 319 (Grant) $47,790
Purpose: Provide a feedlot technical assistance specialist in the Marshall Office.

Project: Garvin Brook RCW Project II
Sponsor: Winona County Extension Service
Funding: Section 319 (Grant) $5,267
Purpose: Continue well sampling and surveying for nitrogen/nitrates and provide information to the public.

Project: Great Lakes Erosion Control
Sponsor: South St. Louis County Soil and Water Conservation District
Funding: Section 319 (Grant) $100,000
Purpose: Investigate methods of limiting erosion in the Lake Superior Basin.

Project: Lake Shaokatan Restoration Project
Sponsor: Yellow Medicine River Watershed District
Funding: CWP (Grant) $47,791
Purpose: Reduce algal and toxic algal blooms, improve fishery and other uses.

Project: Metropolitan Ground-Water Study of Highway Runoff
Sponsor: Metropolitan Council
Funding: Section 319 (Grant) $39,500
Purpose: Determining ground-water impacts of PAHs from infiltrating highway runoff.

Project: Middle Des Moines Watershed Restoration
Sponsor: Jackson County
Funding: CWP (Grant) $172,009
Purpose: Stop and reduce degradation in the Middle Des Moines watershed.

Project: Minnesota River Play
Sponsor: Theater for Corporate and Community
Funding: Section 319 (Grant) $5,000
Purpose: Develop a script for a play on the value and water-quality condition of the Minnesota River.

Project: St. Louis River Phosphorus Abatement
Sponsor: South St. Louis County Soil and Water Conservation District
Funding: Section 319 (Grant) $48,000
Purpose: Investigate best management practices to reduce phosphorus in the St. Louis River.

Project: Statewide Non-point-Source Educational Strategy
Sponsor: Office of Strategic and Long Range Planning
Funding: Section 319 (Grant) $42,000
Purpose: Develop a statewide non-point-source pollution educational strategy

Project: Upper Coon Creek Watershed Water Quality Project
Sponsor: Coon Creek Watershed District
Funding: CWP (Grant) $47,502
Purpose: Develop an interactive ground water and surface water project and implement watershed best management practices for water quality.

Project: Wellhead Protection Outreach and Public Information
Sponsor: Minnesota Department of Health
Funding: Section 319 (Grant) $61,747
Purpose: Develop public information and outreach activities to promote wellhead protection.

Project: Wetlands Restoration in the Upper Minnesota River
Sponsor: Upper Minnesota River Watershed District
Funding: Section 319 (Grant) $30,080
Purpose: Restore wetlands throughout the Upper Minnesota River watershed for improved water quality.

1990 Awards

Project: Agnes, Henry and Winona Clean Lakes Monitoring Project
Sponsor: Douglas County
Funding: CWP (Grant) $90,594
Purpose: Monitoring three hypereutrophic lakes and develop a management plan to improve recreational uses.

Project: Buffalo River Aquifer – Buffalo River Monitoring Project
Sponsor: Clay County Health Department
Funding: CWP (Grant) $81,485
Purpose: Determine water quality and identify potential contamination for the Buffalo River aquifer.

Project: Centerville Peltier Lake Project
Sponsor: Rice Creek Watershed District
Funding: CWP (Grant) $46,233
Purpose: Control severe algal blooms through wetland restoration and watershed management.

Project: Duck Lake Water Quality Improvement Project
Sponsor: Blue Earth County
Funding: CWP (Grant) $57,016
Purpose: Reduce algal blooms using agricultural and urban best management practices and improve recreational uses.

Project: Feedlots in the Marshall Region
Sponsor: Minnesota Board of Water and Soil Resources
Funding: Section 319 (Grant) $40,000
Purpose: Provide technical assistance to soil and water conservation district staff on addressing high-priority feedlots.

Project: Ground-Water Analysis of East Brown and West Nicollet Counties
Sponsor: Brown-Nicollet-Cottonwood Water Quality Board
Funding: CWP (Grant) $67,148
Purpose: Monitor nitrate contamination of wells and focus on nitrogen best management practices implementation.

Project: Lake Sarah Project
Sponsor: Pioneer-Sarah Creek Watershed Management Commission
Funding: CWP (Grant) $50,060
Purpose: Reduce algal blooms and reduce weeds to improve recreation with best management practices and wetland restoration.

Project: Loon Lake Project
Sponsor: City of Waseca
Funding: CWP (Grant) $380,000
Purpose: Construct treatment pond to reduce phosphorus and sediment from storm water.

Project: Minneapolis Chain of Lakes Project
Sponsor: Minneapolis Parks and Recreation Board
Funding: CWP (Grant) $182,298
Purpose: Improve and maintain recreational uses of Minneapolis Chain (Lakes Cedar through Harriet) using urban best management practices.

Project: Minnesota Non-point-Source Implementation Program
Sponsor: University of Minnesota
Funding: Section 319 (Grant) $73,547
Purpose: Develop best management practices, manure management, farmstead and on-site workshops.

Project: Mountain Lake Project
Sponsor: City of Mountain Lake
Funding: CWP (Grant) $49,960
Purpose: Reduce weed growth for recreational uses through control of agricultural and urban runoff and sediment.

Project: Non-point-Source Analysis of the Nemadji River
Sponsor: Carlton County Soil and Water Conservation District
Funding: Section 319 (Grant) $25,000
Purpose: Analyze non-point-source problems and sources in the Nemadji River Basin.

Project: Non-point-Source Analysis of the St. Louis River
Sponsor: South St. Louis County Soil and Water Conservation District
Funding: Section 319 (Grant) $35,000
Purpose: Analyze non-point-source problems in the tributaries of the St. Louis River

Project: North Shore Management Board Project on Nonconforming Septic Systems
Sponsor: North Shore Management Board
Funding: Section 319 (Grant) $15,000
Purpose: Assess nonconforming septic systems from the Lester to the Encampment Rivers.

Project: Pesticide Management
Sponsor: Minnesota Department of Agriculture
Funding: Section 319 (Grant) $40,000
Purpose: Develop management and storage site plans for pesticide collection and disposal.

Project: Schwanz Lake Water Quality Diagnostic Study
Sponsor: City of Eagan
Funding: CWP (Grant) $29,504
Purpose: Develop solutions for a hypereutrophic lake in a suburban park, using a storm-water best management practices education program.

Project: U. S. Fish and Wildlife Service Technical Assistance
Sponsor: U.S. Fish and Wildlife Service
Funding: Section 319 (Grant) $41,729
Purpose: Provide technical assistance on wetland restoration and development.

Project: Water Coordinator
Sponsor: Minnesota Department of Natural Resources
Funding: Section 319 (Grant) $50,000
Purpose: Initiate DNR Waters and Forestry 319 work plans and coordination efforts.

Project: Whitewater Watershed Project
Sponsor: Winona State University
Funding: CWP (Grant) $71,000
Purpose: Improve water and land resources, streams and wetland in a cooperative project with the USDA.

1989 Awards

Project: Beardsley Groundwater Study
Sponsor: Upper Mississippi River Watershed
Funding: CWP (Grant) $9,735
Purpose: Map groundwater movement to protect wells in the Beardsley area.

Project: Boy River Recreational Area Diagnostic Feasibility Study
Sponsor: Cass County
Funding: CWP (Grant) $78,286
Purpose: Prevent degradation of resources through identification of non-point-source controls and education.

Project: East Side Lake Improvement Project
Sponsor: Mower County
Funding: CWP (Grant) $64,480
Purpose: Monitor water quality and sediments, improve water quality for recreational and aesthetic purposes.

Project: French Lake Water Quality Improvement Project
Sponsor: Rice County
Funding: CWP (Grant) $68,542
Purpose: Determine sources and locations of pollutants entering French Lake.

Project: Grove Lake Restoration Project
Sponsor: North Fork Crow River Watershed District
Funding: CWP (Grant) $24,621
Purpose: Reduce algal blooms and weed growth through wetland restoration and feedlot management.

Project: Lake Bemidji Watershed Study
Sponsor: Beltrami County
Funding: CWP (Grant) $99,870
Purpose: Protect and improve water quality using urban and forestry best management practices, as well as feedlot and erosion control.

Project: Lake Florence Restoration Project
Sponsor: City of Stewartville
Funding: CWP (Grant) $65,902
Purpose: Study water-quality problems and determine restorative measures for Lake Florence.

Project: Lake Redwood Monitoring Project
Sponsor: Redwood-Cottonwood Rivers Control Area
Funding: CWP (Grant) $52,877
Purpose: Prioritize and implement best management practices in sub-watersheds of Lake Redwood.

Project: Lambert Creek/Vadnais Lake Water Quality Improvement Project
Sponsor: Vadnais Lake Area Water Management Organization
Funding: CWP (Grant) $120,800
Purpose: Reduce phosphorus concentrations in watershed and St. Paul reservoir lakes.

Project: Long Lake Diagnostic/Feasibility Study
Sponsor: Minnehaha Creek Watershed District
Funding: CWP (Grant) $26,530
Purpose: Reduce algal blooms through control of in-lake sediments and watershed best management practices.

Project: Maple Grove Drift Aquifer Protection
Sponsor: City of Maple Grove
Funding: CWP (Grant) $65,736
Purpose: Municipal wellhead protection, monitoring and development of protection strategy.

Project: Okabena-Ocheda-Bella Diagnostic/ Feasibility Study
Sponsor: City of Worthington
Funding: CWP (Grant) $85,960
Purpose: Reduce algal blooms, preserve and restore wetlands and protect the water supply aquifer.

Project: Olmsted County Ground-Water and Wellhead Protection Project
Sponsor: Olmsted County
Funding: CWP (Grant) $198,000
Purpose: Install monitoring network for wellhead protection and develop land use strategies that protect the water supply.

Project: Trout Lake Diagnostic Feasibility Project
Sponsor: City of Coleraine
Funding: CWP (Grant) $36,277
Purpose: Restore swimming by reducing algal blooms, reintroduce trout and develop a management plan.

Minnesota Pollution Control Agency

520 Lafayette Road North
St. Paul, MN 55155
(651) 296-6300 or toll-free (800) 657-3864
www.pca.state.mn.us