

Watershed Achievements

2002 Annual Report to the
U.S. Environmental Protection Agency on
Clean Water Act Section 319 and
Clean Water Partnership Projects
in Minnesota



Minnesota Pollution Control Agency

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**Minnesota
Pollution
Control
Agency**

2002 Annual Report on Clean Water Act Section 319 and Clean Water Partnership Projects in Minnesota

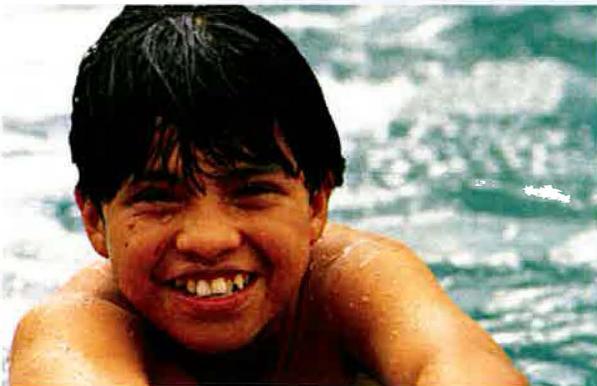
Table of Contents

■	Executive Summary	
■	Introduction	1
■	Find the Nonpoint Sources of Water Pollution in Your Community	2
■	The Partnerships Begin: Description of the Clean Water Act Section 319 and Clean Water Partnership Programs	3
■	Local Impacts of the Section 319 and CWP Programs	5
■	Statewide Impacts of the Section 319 and CWP Programs	6
■	National and International Impacts of the Section 319 and CWP Programs	12
■	The Future of the Section 319 and CWP Programs	13

Detailed Project Information

■	Projects Completed in 2001	16
■	Projects Awarded in 2002	44
■	Projects Currently Active	61
■	Projects Completed History	68

This report was compiled by the Minnesota Pollution Control Agency, with assistance from partners in the Clean Water Act Section 319 and Clean Water Partnership projects.

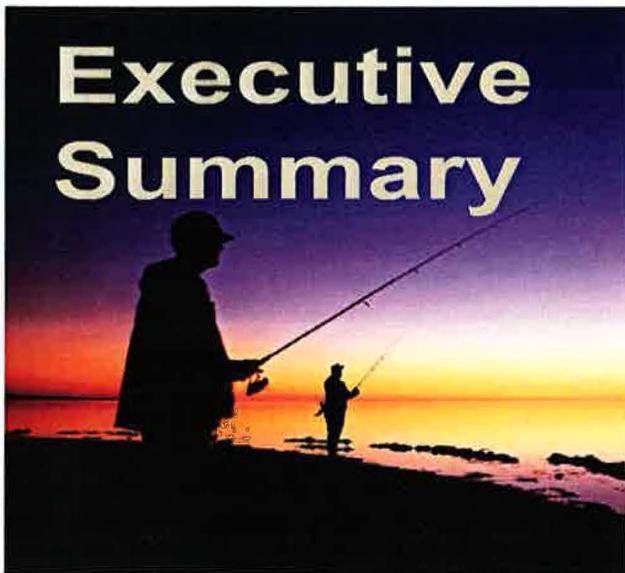


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This report describes Minnesota's efforts to protect, maintain and improve the state's waters by reducing nonpoint source water pollution through the federal Clean Water Act Section 319 (Section 319) nonpoint source water pollution program, Clean Water Partnership (CWP) and Minnesota River projects funded by specific legislative appropriations for that basin. It is submitted annually, as required by the U.S. Environmental Protection Agency (EPA).

Minnesota's water resources are fundamental to the state's health, quality of life and prosperity. These rich resources include:

- 11,842 lakes of 10 acres or more,
- more than one trillion gallons of ground water,
- 92,000 miles of rivers and streams and
- three continental watersheds, sending our water north to Hudson Bay, east through the Great Lakes and south to the Gulf of Mexico.

Recent data indicate that point ("end-of-pipe") pollution contributes 14 percent of the state's water pollution and nonpoint sources 86 percent. The Section 319 and CWP programs target nonpoint source pollutants, such as nitrate, phosphorus, bacteria and sediments, which contribute to:

- overgrowth of algae and weeds,
- depletion of oxygen required by aquatic life,
- movement of bacteria and nitrates into ground water,

- contamination of swimmable waters with bacteria,
- oxygen depletion in waters downstream from the state,
- destruction of critical habitat, and
- murkiness that deprives plants of light.

Section 319 and CWP projects deal with nonpoint source pollution through:

- 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 context of entire watersheds,
- research aimed at diagnosing and targeting the greatest problems facing specific water resources,
- public awareness, education and action,
- information and data sharing and
- leveraging resources to achieve the greatest benefit at the least cost.

Section 319 requires states to:

- identify the nonpoint source controls necessary for each project,
- 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 and
- establish a schedule for implementation.

Since 1990, the MPCA has awarded more than \$14 million in Section 319 funds, \$15 million in CWP grants and \$21 million in loans from the State Revolving Fund for nonpoint source projects. The required local match, 50 percent, often is exceeded by partners undertaking the projects.

Local, State and National Impacts of Section 319/ CWP Projects

The investment of time, energy and commitment by local sponsors of Section 319 and CWP projects is reflected not only in program achievements, but also the substantial in-kind contributions and donations that maintain and continue progress. Local goals include such observable and measurable environmental changes as improved water clarity, rebound of fish and

wildlife populations, reduced risk of flooding or reduction of bacteria levels, for example.

Long-range social impacts may be an even more important result of Section 319/CWP partnerships. These include:

- establishing short- and long-term management goals,
- using resources efficiently,
- reducing duplication of effort,
- increasing the local reservoir of knowledge and experience,
- enhancing creativity and “big picture” thinking,
- developing communication systems,
- elevating water-quality awareness and
- changing individual behavior.

Statewide impacts of Section 319/CWP projects have only begun to emerge, but appear promising for the future. Data developed by the Board of Water and Soil Resources’ Local Annual Reporting System (LARS) indicate the results of the last five years.



**LARS* Results for CWP/
319 Projects: 1997-2001**

- Soil loss reductions of 30,000 tons per year
- Sediment reduction of 7,000 tons per year
- Phosphorus reduction of 30,000 pounds per year

* Local Annual Reporting System, with data gathered by the Board of Water and Soil Resources

Quality information is important to making good decisions about the environment. Section 319 and CWP funding fueled projects that improved water quality infrastructure and efficiency gains, including:

- a network of more than 125 stream-flow monitoring stations statewide that provide consistent data on at greatly reduced costs.
- standardization of stream-flow monitoring techniques among Minnesota state agencies (Minnesota Department of Natural Resources, Minnesota Department of Agriculture), as well as county, regional (Metropolitan Council) and municipal partners.
- stream gaging installation and rating curve development facilitates water-quality monitoring. Gages have been installed at 75 of the 83 Milestone (routine monitoring) sites. Rating curve development and verification has been completed at 25 sites.
- data reduction software from the U.S. Army Corps of Engineers has helped dramatically reduce the time and costs of diagnostic studies and estimates of pollution loads.

Other state, national and international impacts of CWP/319 projects are harder to quantify, but are as important as the measurable results:

- In locations where waters are impaired, the CWP and 319 projects are establishing mechanisms and coalitions that will be crucial in returning water bodies to nonimpaired status.
- Best management practices implemented during CWP/319 projects reduce pollutants that are not always measured, such as nitrogen, pesticides, ammonia and bacteria.
- Successful strategies piloted in CWP/319 projects can be adapted or adopted for other locations.
- Wastewater treatment plants benefit from nonpoint source efforts, especially if their permits require Phosphorus Management Plans in lieu of specific phosphorus limits.
- Partners in CWP/319 projects become educated and active about nonpoint source pollution, improving understanding of these problems.
- Section 319 and CWP project that better manage runoff may help prevent or reduce the impacts of flooding events.

Summary of Section 319 and CWP Program Activities, 1997-2001

During the past five years, the partnerships funded by the Section 319 and CWP grants and technical assistance have completed many projects protecting the state's waters.

Best Management Practices Funded 1997-2001

Pollution Reduction Practices	CWP-funded Practices	319-funded Practices
Feedlot	14	25
Filter Strip Projects	185	9
Gully Stabilization	4	0
Sheet/Rill Erosion Control	44	4
Stream/Ditch Bank Stabilization	12	26
Wind Erosion	2	2
Other	102	56
Not Specified	4	2
TOTAL PRACTICES	367	124

In 2001, the following CWP and Section 319 projects reached completion. Complete descriptions of these projects are included in the report. They include:

- Whitewater River Watershed National Monitoring Program (Section 319)
- Miller Creek Restoration Project (Section 319)
- Achieving Major Change in Minor Watersheds (Section 319)
- Rice and Koronis Lakes Restoration Project (Section 319)
- Water Level Gage Installation and Rating Curve Development (Section 319)
- Upland Water Retention for Improving Drainage and Water Quality Video (Section 319)
- Information and Education Coordination (Section 319)
- Shoreland Vegetation Best Management Practices to Reduce Erosion and Runoff (Section 319)
- Mountain Lake Improvement Project (Section 319)
- Redwood River Clean Water Project (Section 319)
- Chippewa River Watershed Project (CWP)
- Greater Yellow Medicine River Watershed Project (CWP)

- Long Lake Clean Water Partnership (CWP)
- Diamond Lake Rehabilitation Project (CWP)
- Little Cottonwood River Restoration Project (CWP)
- Duck Lake Implementation Project (CWP)
- Lake Margaret Watershed Project (CWP)
- Lake Shetek Area Watershed Improvement Project (CWP)
- Minneapolis Chain of Lakes Clean Water Partnership (CWP)
- Lake Minnie Bell Restoration Project (CWP)

The Future of the Section 319 and CWP Programs

The need for financial and technical assistance for nonpoint-source pollution efforts always outpaces the resources available to meet these needs. Despite budget tightening in both the public and private sectors, Minnesotans concerned about clean water have supported the Section 319 and CWP program. Funding has increased during the last decade.

Grant requests for CWP and Section 319 funding exceeded \$14 million in 2000, \$14 million in 2001, and \$12 million in 2002. The funding available for grants each year was approximately \$6 million. These dollars leverage equal or greater matching resources from local partners.

To maintain funding spent on watershed management in the 2004-2005 biennium (in which a \$4.2 billion state budget shortfall is predicted) and beyond, Section 319 and CWP projects must demonstrate measurable results. At this time, CWP and Section 319 funding are expected to continue at current levels.

Other local, state or national trends that may positively affect the future of the Section 319 and CWP programs include:

- The watershed approach to water quality diagnosis and improvement is gaining momentum.
- Better monitoring equipment improves our understanding of water quality.
- Impaired waters may help bring point and nonpoint source water pollution issues together.
- Prevention is less expensive than repair.

- Decisions at the local level have a huge effect on water quality.
- Nonpoint source projects are important in all watersheds, large and small.
- Increased funding under the new Federal Farm Bill may help address agriculture water quality issues.

Conclusions

With so many factors influencing how water resources will be managed in the future, the Section 319 and CWP programs are facing a true watershed moment. Economic conditions in the state and nation have declined, which could spell trouble for watershed programs. At the same time, however, synergy of all current efforts at protecting and improving Minnesota's lakes, rivers and streams could bring great progress swiftly.

As citizens recognize the interconnections among personal behavior, local land-use, public policy, economic realities, explosions of technology and information, and global trends, they may join their neighbors and change their lives to guarantee clean and clear water for future generations. Though we do not know for certain what factors will influence and determine the future course of water quality protection and improvement, we do know that we have started out on the firm footing of the watershed approach based on strong partnerships of citizens and all levels of government in the Section 319 and CWP Programs.



For More Information:

Overview and Legislative

- Lisa Thorvíg, Assistant Commissioner, (651) 296-8811

Water Quality Media Lead (all water programs)

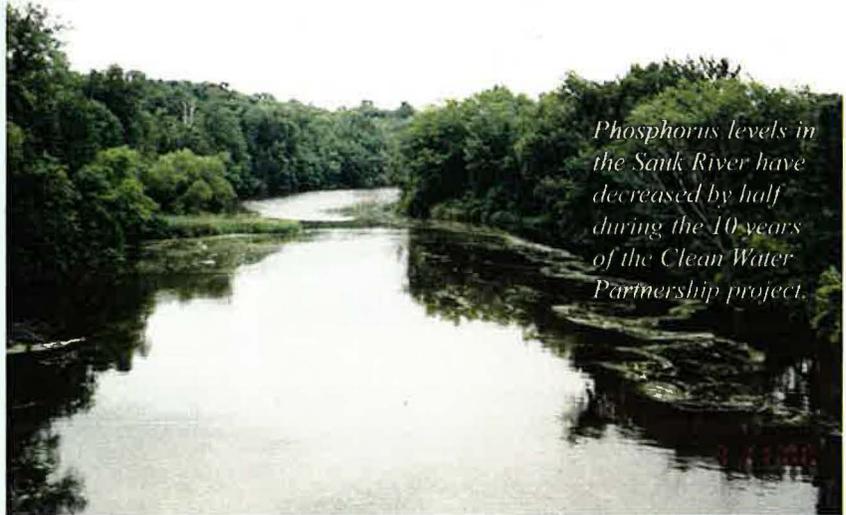
- Rodney Massey, Director, Regional Environmental Management Division (REM), (651) 296-7202

Watershed Management and Details of the Section 319 and Clean Water Partnership

- Faye Sleeper, Manager, Program Support and Training, (651) 297-3365
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Introduction

In all geographic regions and ecosystems, water is intrinsic to the state's health and well-being.



Phosphorus levels in the Sank River have decreased by half during the 10 years of the Clean Water Partnership project.

Sparkling streams, powerful rivers, peaceful lakes, abundant ground water – the need for clean water flows through the lives of all Minnesotans.

In all geographic regions and ecosystems, water is intrinsic to the state's health and well-being. Water is essential for drinking, fishing, swimming, sustaining wildlife, nourishing crops, floating barges, drawing tourists and instilling a sense of beauty and wonder in all of us.

This report describes Minnesota's efforts to protect, maintain and improve the state's waters by reducing nonpoint source water pollution through the federal Clean Water Act Section 319 (Section 319) nonpoint source water pollution program, Clean Water Partnership (CWP) Program, and Minnesota River projects funded by specific legislative appropriations for that basin.

These programs make up only part of the state's environmental protection efforts to preserve the state's lakes, rivers and streams. However, the Section 319, CWP and Minnesota River projects (illustrated in case studies at the end of this report) have integrated successfully the U.S. Environmental Protection Agency's (EPA's) and Minnesota Pollution Control Agency's (MPCA's) key strategies for reducing nonpoint source pollution – with promising evidence of long-term benefits to Minnesota's people and places.

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An abundance of riches

Minnesota's water resources are fundamental to the state's health, quality of life, and prosperity. These rich resources include:

- 11,842 lakes of 10 acres or more (14,000 lakes, including smaller lakes);
- more than one trillion gallons of ground water, used as a drinking water source by 70 percent of Minnesota;
- 92,000 miles of rivers and streams;
- three continental watersheds, sending our waters north to Canada's icy Hudson Bay, east through the Great Lakes to the Atlantic Ocean, and south through the Mississippi River to the Gulf of Mexico.

Beautiful lakes, rivers and streams make Minnesota a good place to live. In a series of 1999 citizen forums on the environment, clean water was a top priority in all areas of the state.

These water wonders also make the state a great place to visit. Tourism contributes \$10 billion annually to the state's economy and supports 117,000 jobs. People clearly come for water recreation; 98 percent of Minnesota's resorts, 80 percent of campgrounds and 24 percent of hotels are located on lakes and rivers – attracting more than 1.5 million anglers each year who spend an estimated \$846 million in Minnesota.



Find the nonpoint source pollution in your community

Walk around your neighborhood and you will see many examples of nonpoint source water pollution. Nonpoint source water pollution is the *cumulative* effect of many small sources of pollution.

From individual sources to storm sewers and then into rivers, lakes and streams, nonpoint sources contribute nutrients, bacteria, soil and organic material to the water. The result: algae growth, oxygen depletion, increased water temperature, and nitrate and bacteria contamination. During your nonpoint source water pollution tour, you may see:

- a construction site where soil is washed down storm sewers every time in rains;
- pet wastes that run off the boulevards;
- animal wastes from feedlots;
- a neighbor liberally applying fertilizer and weed-control chemicals;
- a house near the lake with a lawn mowed right down to the shoreline;
- a homeowner blowing grass clippings into the street;
- a new development where a wetland used to be;
- more paved surfaces each year, which serve as speedy runways for pollutants;
- teenagers having a car wash, rinsing the soap and oily water down storm sewers; or
- the smell of a failing septic system.

Multiply what you see by millions, and you have a grasp of the cumulative impacts of nonpoint source water pollution.

To protect and improve these abundant water resources requires exceptional commitment at the international, federal, state and local level – as well as thoughtful and informed choices by every individual.

Federal, state responses

The federal Clean Water Act of 1972 made the goal of “fishable and swimmable” waters a national priority for the first time. The Clean Water Act was enacted during a time when threats to water quality from “end-of-pipe” or point-source pollution were severe. At the time this landmark law was enacted at the federal level, Minnesota had already established the Minnesota Pollution Control Agency to control municipal and industrial discharges to the waters of the state, among other duties.

In the 1987 Clean Water Act amendments, however, the federal government began to recognize that controlling point sources of water pollution was only part of the job. The CWA amendments began to deal with water pollutants seeping from failed septic systems, running off farm fields and urban streets, eroding from construction sites, leaking from animal feedlots, falling in rain and rinsing down storm sewers near individual households.

Nonpoint source pollutants, such as nitrates, phosphorus, bacteria and sediments, contribute to such serious problems as:

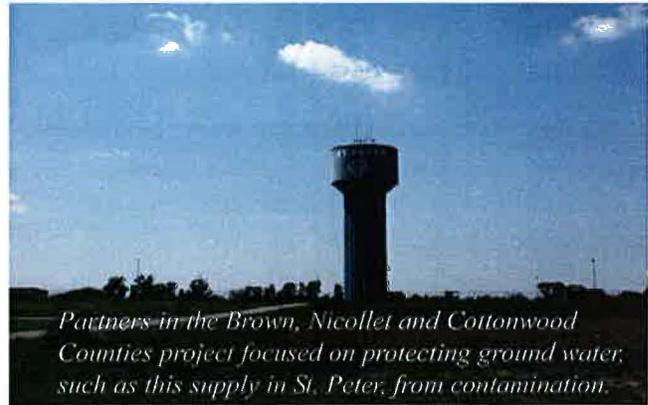
- overgrowth of algae and weeds that clog waters;
- depletion of oxygen required by aquatic life;
- movement of bacteria and nitrates into ground water used for drinking and cooking;
- contamination of formerly swimmable waters with bacteria;
- oxygen depletion in water resources downstream, such as the Lower Minnesota River and the Gulf of Mexico;
- destruction of critical habitat for native plants and aquatic organisms; and
- murkiness that deprives aquatic plants of light.

Recent data indicate that point sources contribute 14 percent of the state’s water pollution, and nonpoint sources 86 percent. Reducing nonpoint source water pollution is now the major challenge confronting Minnesota’s citizens and officials.

Concerted efforts of many partners get the job done

With as many sources of nonpoint water pollution as there are people in Minnesota (5 million), it is clear that the usual tools of regulation – permitting and enforcement – cannot do the job alone. Effective strategies for reducing nonpoint source pollution also include:

- 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 context of entire watersheds;



Partners in the Brown, Nicollet and Cottonwood Counties project focused on protecting ground water, such as this supply in St. Peter, from contamination.

- research aimed at diagnosing and targeting resources toward the biggest problems facing specific water resources;
- public awareness, education and action;
- information and data sharing; and
- leveraging resources to achieve the greatest benefits at the least cost.



The Long Prairie River, north of Browerville, an active watershed project.

The Partnerships Begin

Section 319 of the Clean Water Act requires Minnesota (along with the other states) to assess nonpoint sources of water pollution within its boundaries. State investigations must identify nonpoint sources of pollution that contribute to impaired water quality, as well as waters or stream segments unlikely to meet water-quality standards without reductions in nonpoint sources. In the last few years, the EPA has encouraged implementation activities aimed at producing measurable results in reducing pollution.

Specifically, Section 319 requires that 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, and
- establish a schedule for implementation.

The MPCA has redeveloped a statewide five-year Nonpoint Source Management Program Plan. The plan is available on the MPCA's Web site (<http://www.pca.state.mn.us/water/nonpoint/mplan.html>) and details how the state will fulfill its responsibilities. The MPCA receives funding from the EPA, both to support overall research and coordination of nonpoint source water pollution and to support local projects that achieve the overall goal of clean water.

The Clean Water Partnership Program is a primary tool in Minnesota's work to improve lakes, rivers and streams and is complementary to Section 319. Through the Clean Water Partnership Program, the MPCA supports the efforts of local units of government and citizens by providing financial and technical assistance.

The goals of the Clean Water Partnership Program include:

- diagnosing problems and threats to water resources;
- developing solutions for reducing the impacts of nonpoint source pollution on water resources; and
- implementing these solutions.

The process begins with a proposal from a local government and/or citizen group to assess problems or implement solutions.

An interagency group called the 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. Demand for funding typically exceeds the supply by two to three times, making prioritization critical. This Team includes representatives from:

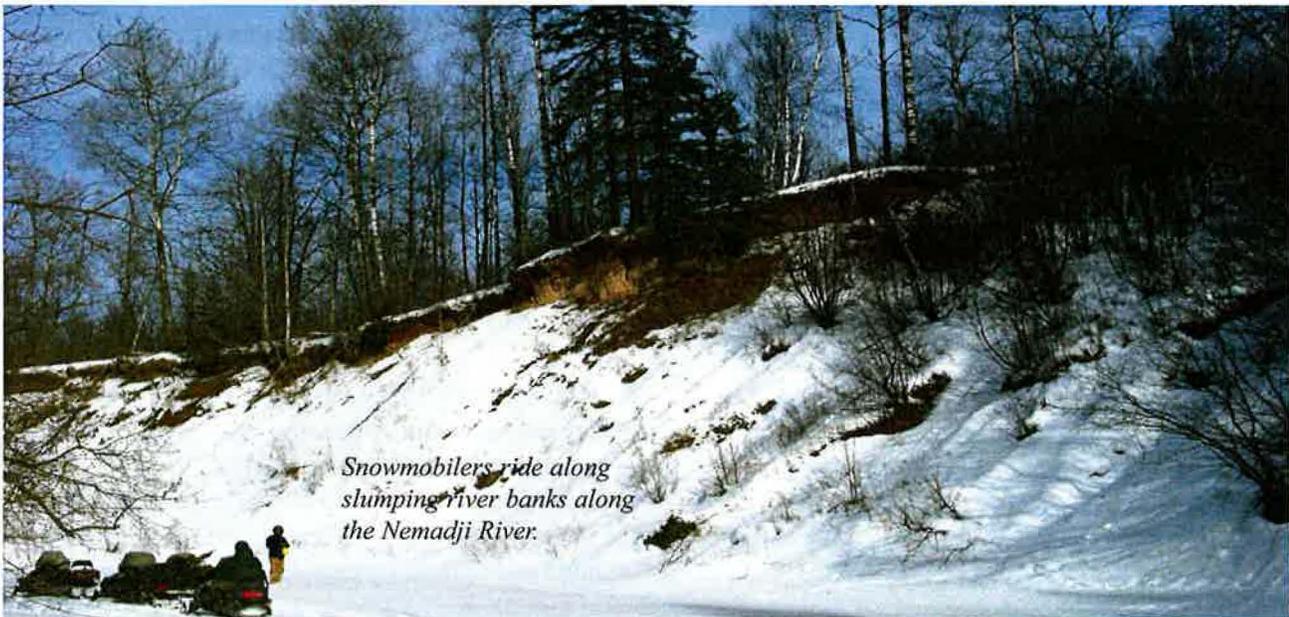
- Minnesota Pollution Control Agency
- National Resource Conservation Service (NRCS)
- Minnesota Department of Health (MDH),
- Minnesota Department of Agriculture (MDA),
- Board of Water and Soil Resources (BWSR), Metropolitan Council,
- Department of Natural Resources (DNR),
- Minnesota Indian Tribes and the Bureau of Indian Affairs (BIA),

- U.S. Geological Survey (USGS),
- Minnesota Geological Survey (MGS),
- Minnesota Department of Transportation (MnDOT),
- U.S. Fish and Wildlife Service, and
- Other invited parties.

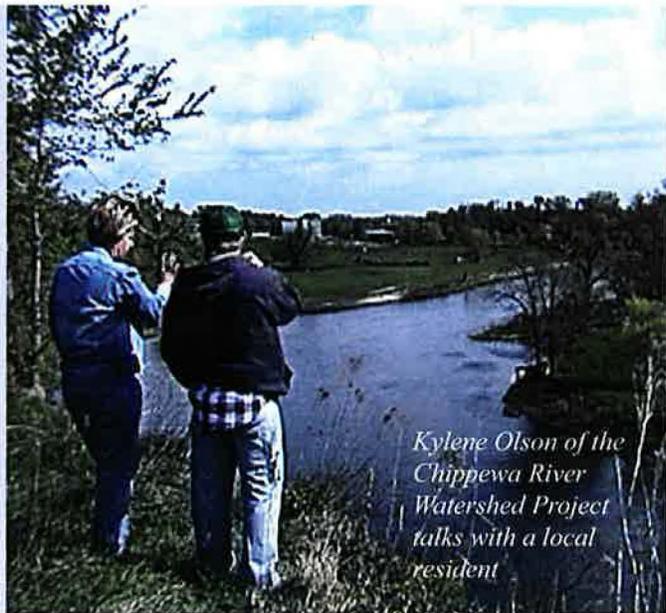
MPCA staff members with expertise in assessing and cleaning up impaired waters consult with and support local project representatives on scientific or technical issues.

Since 1990, the MPCA has awarded more than \$14 million in Section 319 funds to projects addressing nonpoint source pollution. During the first 13 award cycles of the CWP, the MPCA supported 184 projects with an estimated \$15 million in grants and \$21 million in loans from the State Revolving Fund. The financial and in-kind contributions from local communities and partners is substantial, exceeding the 50 percent match requirements in most cases.

This report highlights case studies from Section 319 and CWP projects completed in federal fiscal year 2002 (October 1, 2001 through September 30, 2002). Each case illustrates the improvements in water quality and the benefits to communities resulting from Section 319 and CWP projects.



Local Impacts of Section 319 and CWP Projects



Kylene Olson of the Chippewa River Watershed Project talks with a local resident

Case studies of Section 319 and CWP projects completed in 2001 illustrate how communities take pride in, and claim ownership of, initiatives that restore local lakes, rivers and streams. The investment of time, energy and commitment by local sponsors of these projects is reflected not only in program achievements, but also the substantial in-kind contributions and donations that maintain and continue progress. People appreciate what they have worked hard to achieve.

If the only result of Section 319 and CWP projects is to restore lakes for fishing, swimming and wildlife habitat, they are successful programs on the local level. Whether the goal is improved water clarity, rebound of desirable fish and wildlife populations, reduced risk of flooding, or reduction of elevated bacteria levels, local communities will see the results.

However, the local partnerships developed among interested individuals and groups also have long-range, positive impacts on the environment. By working in concert to achieve the goals of the project, local officials and groups often develop relationships, coalition-building skills and communication systems with broader benefits. Some of these benefits include:

- *Establishing short- and long-term management goals.* Resource management is more effective because of locally defined short- and long-term goals (both quantitative and qualitative).
- *Using resources efficiently.* By working in concert, partners can share the costs of education seminars, www.pca.state.mn.us

public awareness events and communication vehicles (newsletters, videos) that they might not otherwise be able to afford.

- *Reducing duplication of effort.* As partnerships form, areas where organizations are duplicating efforts can be coordinated for maximum impact.
- *Increasing the reservoir of knowledge and experience.* As partners work with one another and reach out to other organizations, they learn new strategies to improve water quality and become better resources for their own communities.
- *Enhancing creativity and “big picture” thinking.* Many project partnerships develop the ability to craft solutions that benefit all parties, rather than narrow interests.
- *Developing communication systems.* Through experience and experiments, many partnerships find the most effective methods to enlist citizens in protecting and improving water quality. These methods – newsletter, telephone tree, regularly scheduled meeting or event, column in a community newspaper – provide communities with ways to quickly relay pertinent local information.
- *Elevating water quality awareness.* Partners seize every opportunity to talk to people within the watershed about water-quality problems and solutions. This increases the overall awareness about best management practices.
- *Changing behavior.* Sustainability of nonpoint source efforts relies on changing behaviors of individual homeowners and landowners. These projects demonstrate the huge impact of behavior change.

Statewide Impacts of Section 319 and CWP Projects

Improvements in water resources observed and detected locally demonstrate the benefits of CWP and Section 319 projects. However, data mapped by the Board of Water and Soil Resources (BWSR) Local Annual Reporting System (LARS) shows the estimates of some results of the last five years of CWP and Section 319 activity.

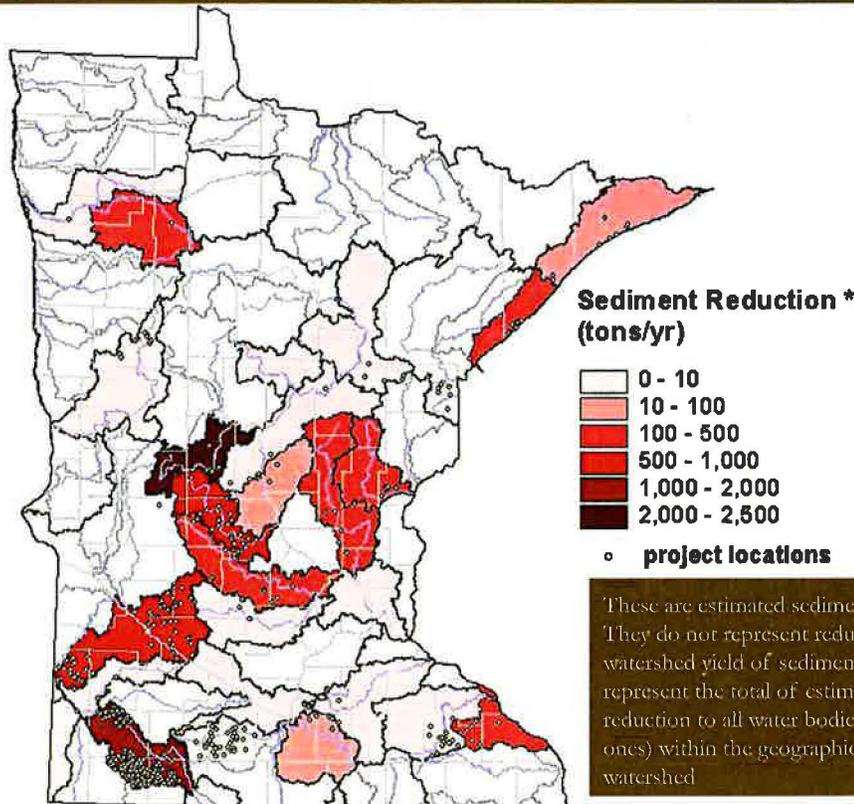
Erosion and sedimentation

“Erosion is a natural process that occurs when water, wind, ice and gravity act together to weather rock into soil particles, then move those particles

around the landscape... Erosion caused by human activity... increases the volume of the material eroded in a comparatively short period of time.”

This excerpt from “Erosion and Sediment Control Certification and E Team Training Program Manual 2001” (produced by the Minnesota Erosion Control Association and the Minnesota Department of Transportation) summarizes the process of erosion. It also describes the impacts of soil loss and sedimentation.

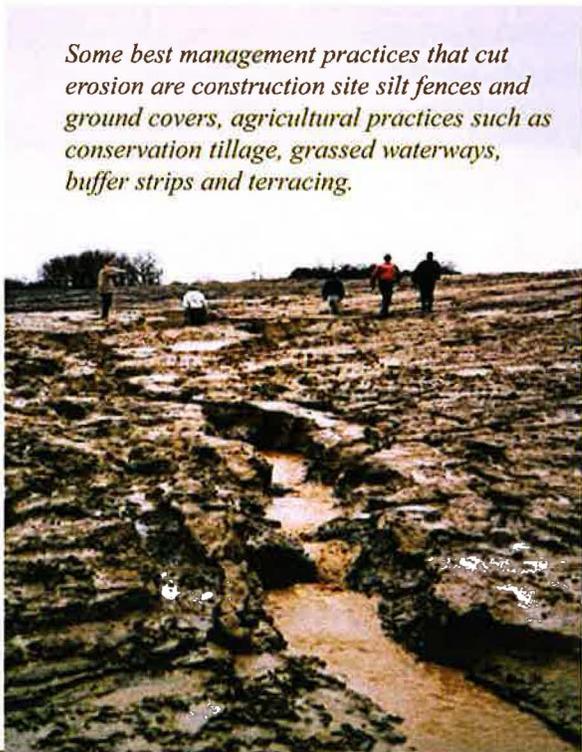
Sediment Reduction (tons/yr) -- Section 319 and CWP Best Management Practices (LARS Reporting through 2001)



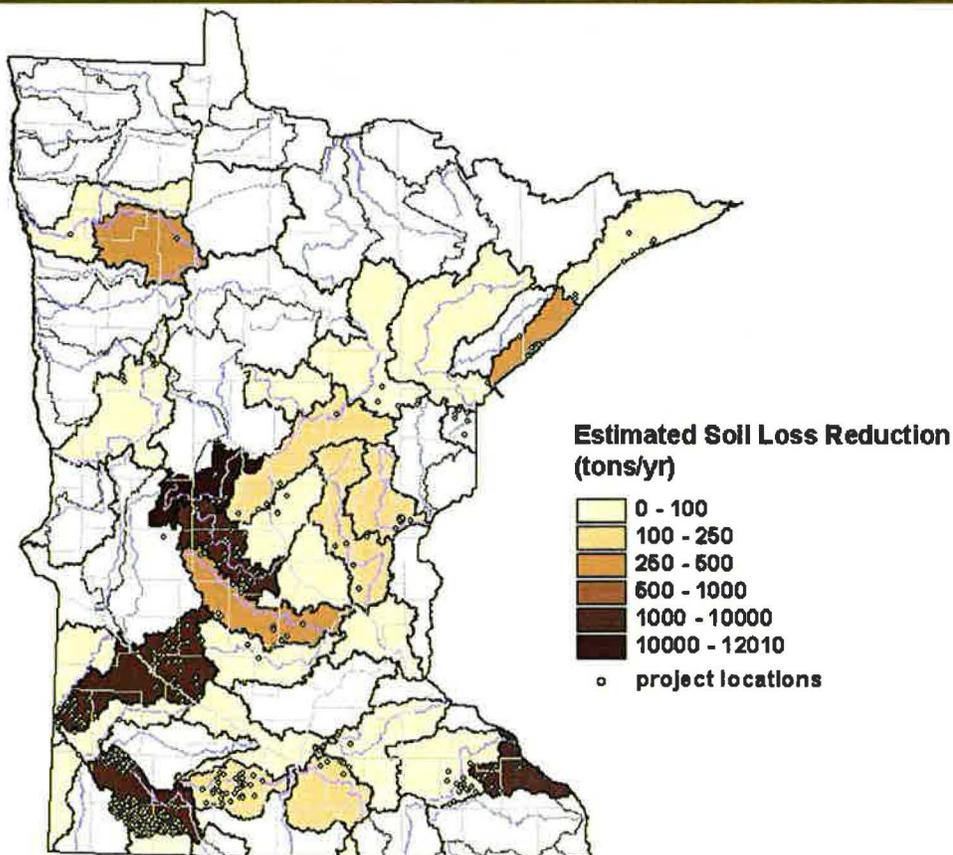
These impacts include:

- Increasing water temperature;
- Increasing turbidity (cloudiness of water);
- Losing habitat, breeding and food sources needed by fish and other aquatic species;
- Carrying nutrients that increase growth of algae and weeds;
- Introducing toxins, bacteria and chemicals into water supplies;
- Destabilizing shorelines;
- Filling in navigable waters, increasing risks to boaters and costs of dredging; and
- Reducing the productivity of cropland.

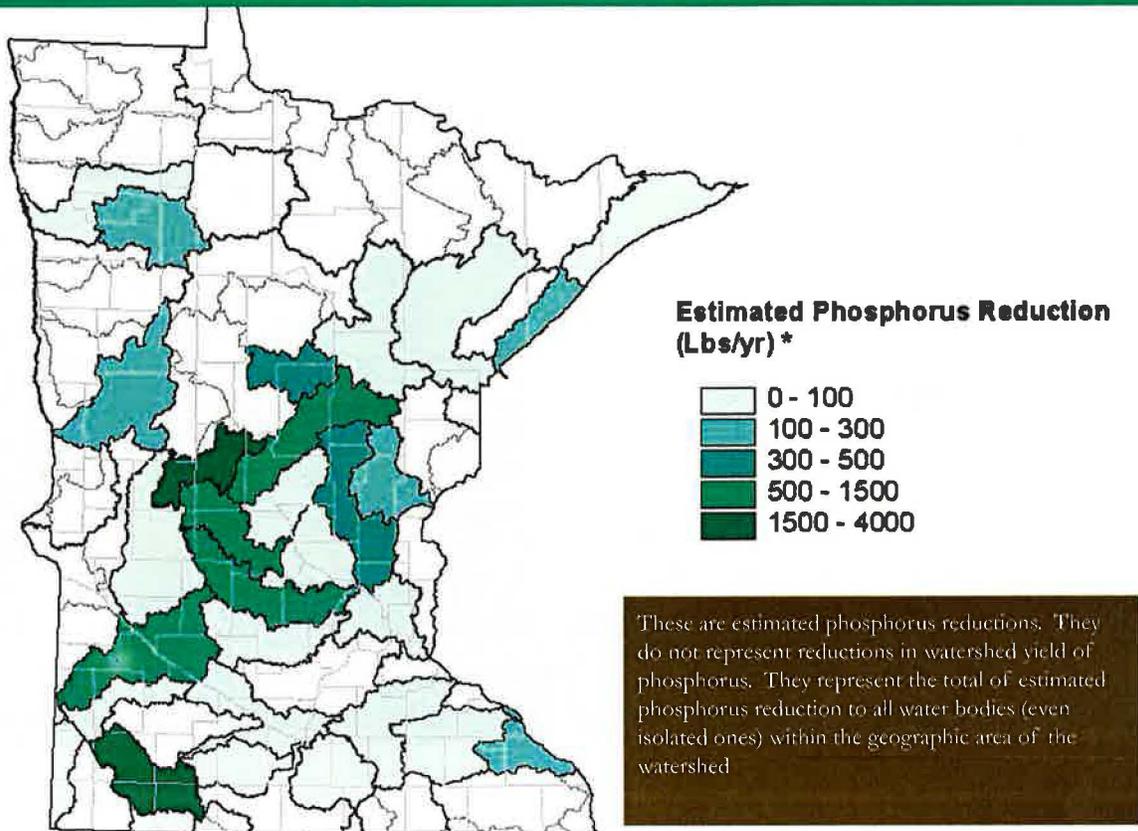
Based on LARS reporting by CWP and Section 319 project partners, these projects have reduced soil loss from 1997 – 2001 by 30,000 tons per year. Over the same period, sedimentation was reduced by an estimated 7,000 tons per year. The sediment and soil maps show results by watershed for the entire state.



Soil Loss Reduction (tons/yr) -- Section 319 and CWP Best Management Practices (LARS Reporting through 2001)



Phosphorus Reduction (lbs/yr) -- Section 319 and CWP Best Management Practices (LARS Reporting through 2001)



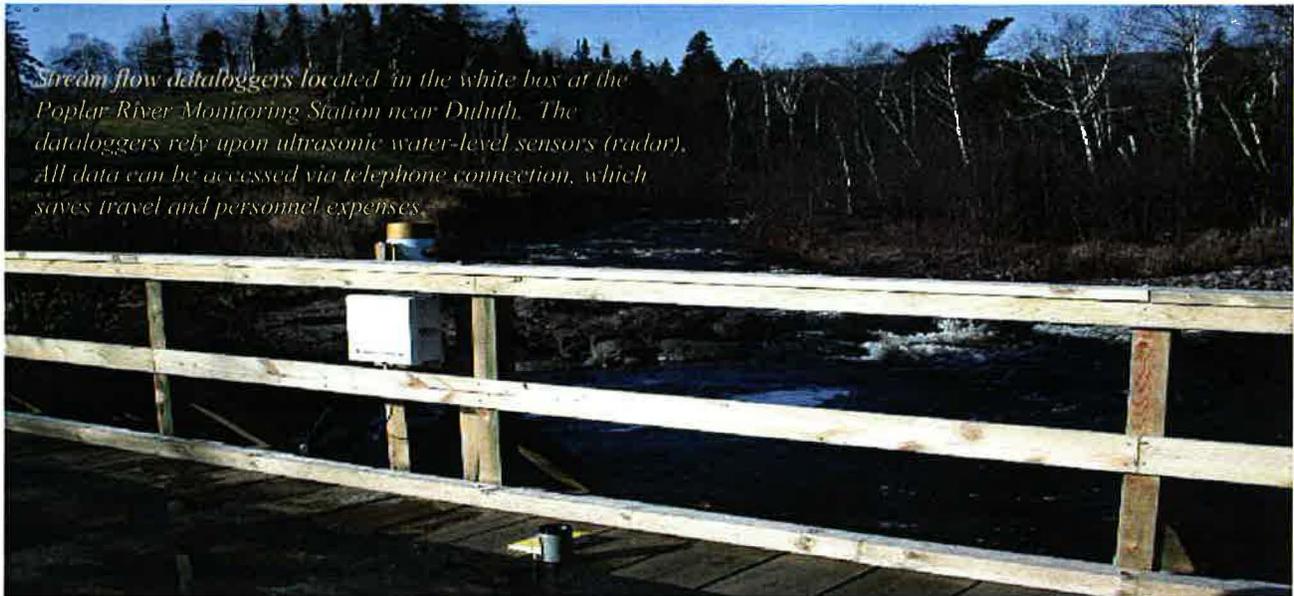
Phosphorus

All of the things Minnesotans love about lakes – the clear cool water on a hot day, the sure-fire fishing locations, glimpses of the lake bottom during a refreshing swim – are placed at risk by high levels of phosphorus entering surface waters.

In Minnesota, phosphorus is the primary pollutant associated with excessive growth of algae and depleted oxygen in surface water, a process called eutrophication. Because phosphorus has an affinity for sediment, it binds with the sediment and is available to nourish algae and weeds and encourage their excessive growth into algae blooms. Then, when these plants die and fall to the bottom, their decomposition process robs oxygen from the water. This, in turn, deprives fish and other aquatic organisms of oxygen, resulting in fish kills and species elimination.

The phosphorus comes from both point sources (wastewater from municipalities and industries) and nonpoint sources (stormwater, agricultural runoff, feedlots, failing or aging septic systems). Reducing nonpoint source phosphorus impacts on surface waters has been a high priority for the MPCA for years.

The Section 319 and Clean Water Partnership projects achieve results through fostering best management practices that keep excessive phosphorus from the state's waters, such as fixing failing septic systems, proper use of fertilizers and shoreline management. The LARS reporting by Section 319 and CWP partnerships shows that from 1997 – 2001, projects reduced phosphorus contributions to Minnesota's waters by an estimated 30,000 pounds per year. To place that into context, this amount of phosphorus would be comparable to the discharge of approximately 360 million gallons of wastewater with 1 mg/L phosphorus. This is greater than the amount discharged by the largest wastewater treatment plant in Minnesota every day, 300 million gallons.



Stream flow dataloggers located in the white box at the Poplar River Monitoring Station near Duluth. The dataloggers rely upon ultrasonic water-level sensors (radar). All data can be accessed via telephone connection, which saves travel and personnel expenses.

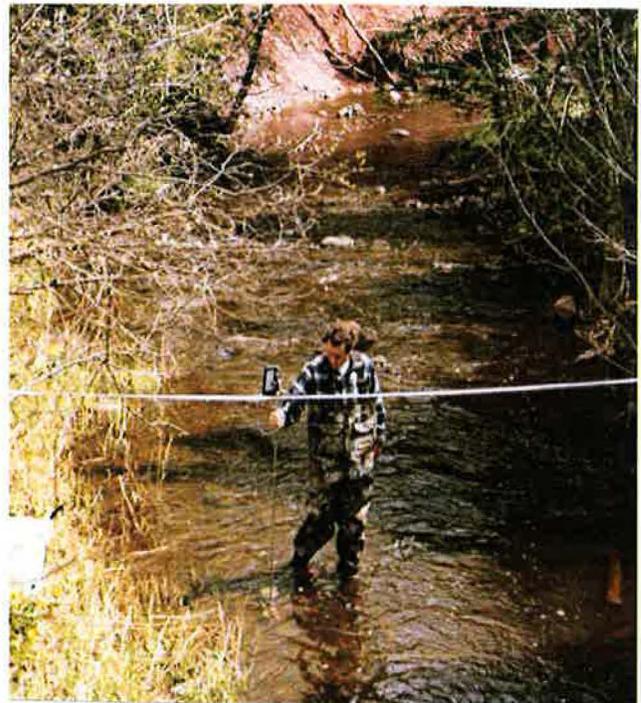
Stream flow monitoring networks

One of the “truisms” of nonpoint source management is that we need quality information to make good decisions. Usually, one of the first steps in collecting management information is to define stream/river flows through the system of concern. Stream flows are usually the greatest source of variability in our efforts to estimate the pounds of pollutants being generated from watershed sources.

This is true due to the considerable seasonal changes in flows, large storm events and year-to-year wet and dry cycles. While pollutant concentrations can change over time, they are not as large an influence on mass calculations as flows. Hence, MPCA and partner agencies pay significant attention to obtaining the best estimates of daily flows that will, in turn, allow the best estimates of pollutants in our waters.

To accurately and efficiently tabulate the pounds of pollutants being generated by a river system, the MPCA has relied upon state-of-the-art computerization for data collection, laboratory analysis, dataset preparation and, finally, the assessment and summary phase. Increased reliance upon computerization has improved the quality of the data being collected, increased efficiencies and reduced data acquisition costs. Data that formerly took weeks of effort to collect are now routinely recorded in days or hours. Overall diagnostic-study durations and expenses have been reduced and accuracy increased.

Finally, the standardization of stream flow monitoring techniques among Minnesota state agencies (Minnesota Department of Natural Resources, Minnesota Department of Agriculture) as well as county, regional (Metropolitan Council) and municipal partners has led to quality data at greatly reduced expense. Watershed monitoring has been advanced by the reliability and durability of the computerized equipment. Collectively, MPCA nonpoint source monitoring staff oversees the operation of in excess of 125 monitoring stations per year.



The results of these advances include:

- Computerization of flow measuring devices used to gauge streams increases accuracy and reduces cost.
- Computerization of flow dataloggers coupled with advanced automatic monitoring add-ons such as telephone interfaces, water level sensors, solar panels for recharging batteries, rain gauges, and probes for temperature, dissolved oxygen/pH/conductivity/salinity/NO₃/chlorides and dissolved solids.
- Standardization of stream monitoring equipment and techniques within the MPCA and with the USGS and sister agencies increases efficiencies, reduces costs and facilitates data sharing. This technology transfer has spurred significant advances in management of the Minnesota River.
- Standardization of computerization techniques, including equipment operation guides for beginners, increases the availability of equipment and skills to all partners.
- Standardization of automated sampling equipment to flow-paced sampling coupled with telemetry allows improved sampling efforts and reduced lab and travel expenses because only one sample is analyzed (rather than 10-20 time-based samples historically obtained). Again, the ability to query the monitoring station as to status and sampling events via telephone saves driving many thousands of miles of staff travel per year.
- Standardization of five-minute recordings of flows into daily and monthly values via computerized techniques, coupled with standard data reduction software from the U.S. Army Corps of Engineers, has dramatically reduced the time and costs of diagnostic studies. For most purposes, MPCA staff rely upon the software, "FLUX," to combine the flow and sampling information to estimate pollution loads.



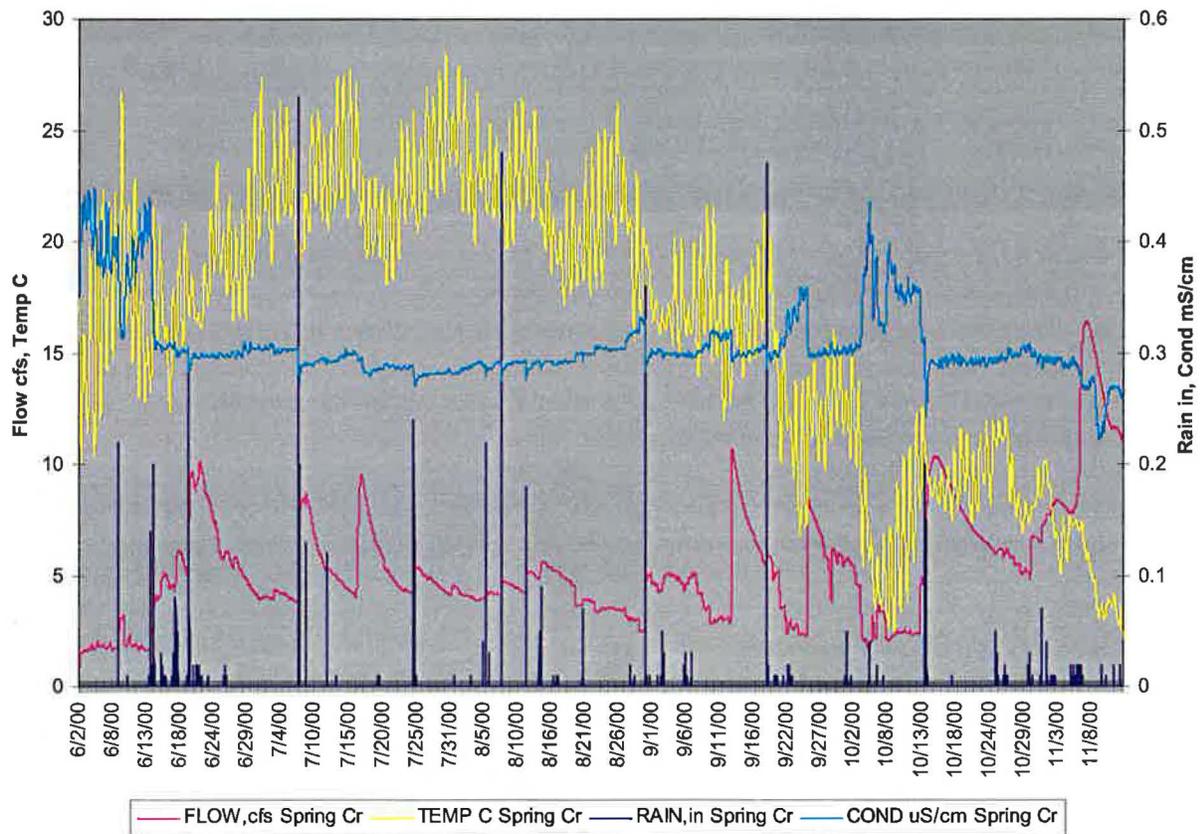
The Water Level Gage Installation and Rating Curve Development project helped fulfill the state's need for stream gaging to support water-quality monitoring by the Minnesota Pollution Control Agency (MPCA), Minnesota Department of Natural Resources (DNR) and partner organizations statewide.

The achievements of the project, which far exceeded the original goals, were:

- The emphasis placed on gaging marks rather than staff gages allowed the project staff to install gages at 75 of the 83 Milestone (routine monitoring) sites, more than double the project's goal of 30.
- The extension of the grant funding also allowed the project to exceed its goal of rating curve development and verification at 25 sites, more than twice what was expected.
- The field application of the DNR's capabilities, unique among state agencies, complemented the MPCA's work over time at the Milestone sites.
- Funding flexibility (EPA extended the grant timeline to allow the maximum possible level of work) enhanced efficiency when work required additional staff, although it does not alone support year round or multi-year staff additions.

By installing water level measurement marks at Milestone sampling sites and developing flow estimation curves for automated water level recording stations in Minnesota, the project enhances the ability to estimate nonpoint source pollutant loads in the State's stream systems.

Spring Creek



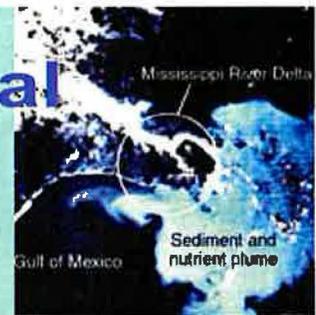
Results from Spring Creek (2001 Jessie Lake diagnostic study) show continuously monitored flows, temperature, rain and conductivity. Obtaining this type of information was unthinkable as recently as five years ago.

Other statewide benefits of Section 319 and CWP projects

In addition to these measurable reductions in erosion, sedimentation and phosphorus in Minnesota's waters, the CWP and Section 319 projects produce other tangible benefits.

- New and enhanced water quality monitoring networks can be used statewide to track trends, establish baseline water quality, identify problems, and assist decision-makers in allocating resources and identifying priorities.
- In locations where waters are impaired, the CWP and Section 319 projects are establishing mechanisms that will be crucial to return water bodies to a non-impaired status.
- The best management practices implemented as part of many CWP and Section 319 also reduce other pollutants that are currently not measured, such as nitrogen, pesticides, ammonia, and others.
- Successful strategies for reducing nonpoint source pollution discovered by partnerships can be communicated statewide for adoption in other communities (both participating in Section 319 or CWP projects, or not).
- Wastewater treatment plants can benefit from nonpoint source efforts, especially if their permits require Phosphorus Management Plans in lieu of specific phosphorus limits.
- As partners are enlisted in various Section 319 and CWP projects, more of them become educated about the watershed management approach to water pollution that Minnesota has adopted.
- Section 319 and CWP projects that allow partners to better manage large quantities of runoff may be preventing more of the severe flooding that has been endemic in Minnesota the last several years.

National and International Impacts of Section 319 and CWP Projects

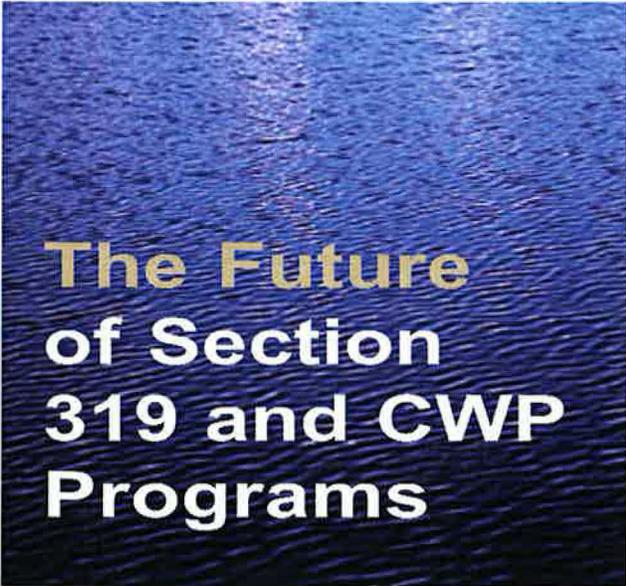


Minnesota's great rivers – the Mississippi, the Minnesota, the Red River of the North, the Rainy, the St. Croix – touch other states and nations, carrying pollutants that originate here to neighbors downstream. Local Section 319 and CWP projects that reduce nonpoint source pollution, especially those in the major river basins, affect everything from the fishing in Canada to commercial fisheries in the Gulf of Mexico. Additional benefits of pollution reduction include:

- Some Section 319 and CWP projects undertake agricultural best management practices and wetlands restoration, which reduce the amount of nitrogen flowing into lakes, rivers and streams. An estimated 7 percent of all nitrogen making its way to the Gulf of Mexico comes from Minnesota. Excessive nitrogen has contributed to a large “dead zone” in the Gulf with severely depleted oxygen threatening aquatic species and the commercial fisheries which depend upon this resource. As Section 319 and CWP projects combat erosion and phosphorus, they also may be reducing the amount of nitrogen flowing south.
- The International Joint Commission has established a goal of zero toxics for Lake Superior. Runoff carries more than just soil, sediment and phosphorus. Section 319 and CWP projects that prevent runoff limit the transportation of toxic substances.
- Some Section 319 and CWP projects involve building catch basins, holding ponds and designed wetlands. This not only helps hold potential flood water, but also prevents chemicals in runoff from being washed downstream.

These limited examples of the impact of Section 319 and CWP projects on the environment demonstrate that a program with visible effects locally can also have wide-ranging consequences for state, national and international water quality.





The Future of Section 319 and CWP Programs

In these times of budget tightening in both the private and public sector, the future of many environmental protection programs is less than secure. However, public sentiment (as determined in surveys and focus groups) indicates that most Minnesotans consider clean lakes, rivers and streams a very high priority and a significant contributor to their quality of life. This has been reflected over the last decade in increased funding for Section 319 and CWP projects.

The need for financial and technical assistance always outpaces the resources available to meet these needs. Grant requests for CWP and Section 319 funding exceeded \$14 million in 2000, \$14 million in 2001, and \$12 million in 2002. The funding available for grants each year is typically less than \$6 million.

To maintain or increase funding spent on watershed management, it will be important for all projects to demonstrate measurable results. Clearly, not all of the benefits of Section 319 and CWP projects can be quantified. Those that are measurable – erosion, phosphorus levels, recovery of fish populations, temperature, turbidity – will be key to convincing decision-makers of the benefits of this investment.

The demonstration of local commitment, in matching dollars, expertise, staff-time or in-kind services, will be another such key to the future of the program. By documenting matching resources that project partners leverage with CWP or Section 319

money, decision-makers can see that state or federal dollars can be stretched a long way by active and committed communities. While CWP and Section 319 dollars are required to be matched 1:1, most projects exceed this requirement, leveraging a higher proportion of contributing resources.

Other local, state and national trends signal the potential for significant environmental progress through CWP and 319 projects or similar approaches to water quality protection and improvement. Some of these national trends are listed below:

- **The watershed approach is gaining momentum.**

The watershed approach adopted by the MPCA and partners in CWP and Section 319 projects is gaining momentum, in Minnesota and across the nation.

- **Better monitoring equipment improves our understanding of water quality.**

The rapid advance of new and better ways to monitor water resources, as well as better ways to share data with partners, promises to give us a new understanding of the impacts of human activity – both good and bad – on Minnesota's waters. The stream flow monitoring remote stations described earlier in this report, as well as new satellite technology with remote-sensing capability, will give us more and better data to fill gaps in knowledge, establish priorities and identify trends.

- **Impaired waters may help bring point and nonpoint source issues together.**

Just as watersheds must be regarded holistically, so must regulatory systems dealing with point-source and nonpoint-source water pollution. The MPCA will use impaired waters as a way to target resources and coordinate these two systems. If watershed thinking expanded citizens' concept of water management, discovering the relative impacts of big facilities and individual households on the resource should do even more. Through the process of identifying impaired waters, studying all potential sources and arriving at a plan to reduce pollutants watershed-wide, all citizens will recognize the parts they play in water quality. Nothing sparks creative problem-solving and partnership better than a common goal and different perspectives and experiences focused on the problem.

- **Prevention is less expensive than repair.**

The CWP and Section 319 projects have confirmed the truth about water quality: it is much less

expensive to prevent damage to healthy ecosystems than to repair damage. Oftentimes, it is only when people see deterioration of their lake, river or stream that they begin to seek solutions and take ownership. CWP and Section 319 funding will be used in the future, as in the past, for repairing or restoring degraded water resources. However, these funds also may be used to fund projects focused on preserving high-quality water resources, finding creative strategies to maintain waters in the face of changes in land-use, population or development.

■ **Decisions at the local level have a huge effect on water quality.**

Local units of government have been the leaders of the CWP and Section 319 projects described in this report. The leadership of cities, counties, soil and water conservation districts, watershed management organizations and other local leaders will make the difference in the water quality of the future. Because of educational efforts by partners in these projects, the people who work in the water-quality arena now understand that their success depends on looking at preservation and problems holistically by looking at the dynamics of entire watersheds. How local governments deal with growth, development, increasing population, aging infrastructure, storm water management, regulation of septic systems, feedlots and road construction will be the difference between clear and cloudy waters.

■ **Nonpoint source projects are important in all watersheds, large and small.**

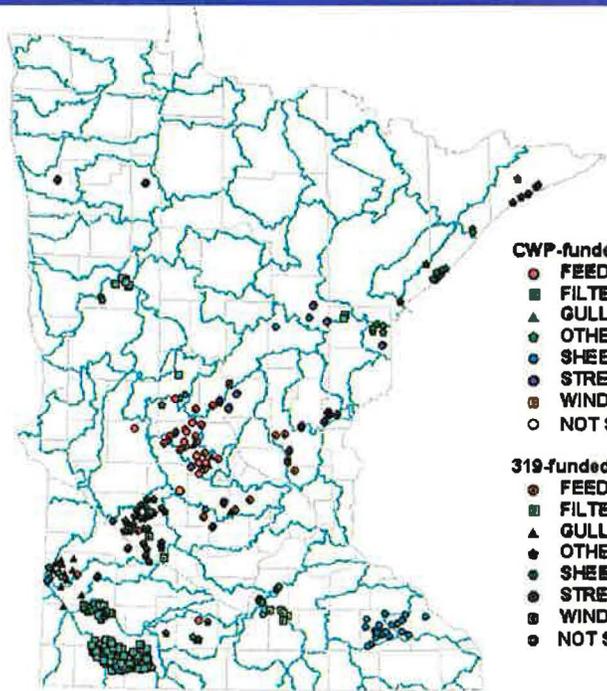
As the map of project locations indicates, most of the CWP and Section 319 projects in Minnesota are clustered in the Minnesota and Mississippi River Basins, as well as lakes with major impacts on surrounding communities. In the future, the MPCA would like to encourage project proposals in high priority waters in other basins of the state, as well as statewide projects with broader implications for improving water quality.

■ **Increased funding under the new Federal Farm Bill may help address agriculture water quality issues.**

Strong support for the federal Conservation Reserve Program (CRP) and state Conservation Reserve Enhancement Program (CREP) has focused attention on farmers' impacts on water quality. The new federal farm bill authorizes major funding increases for conservation programs like these and others, such as the Environmental Quality Incentives Program (EQIP), the Wildlife Habitat Incentives Program (WHIP) and the Wetlands Reserve Program (WRP). Increased funding for these programs will enhance our abilities to address agricultural impacts on water quality in the near future.



Section 319 and CWP Funded Best Management Practices, LARS Reporting 1997-2001



CWP-funded BMPs - Pollution Reduction Type

- FEEDLOT (14)
- FILTER STRIP PROJECTS (165)
- ▲ GULLY STABILIZATION (4)
- OTHER (102)
- SHEETRILL EROSION CONTROL (44)
- STREAM/DITCH BANK STABILIZATION (12)
- WIND EROSION (2)
- NOT SPECIFIED (4)

319-funded BMPs - Pollution Reduction Type

- FEEDLOT (25)
- FILTER STRIP PROJECTS (9)
- ▲ GULLY STABILIZATION
- OTHER (56)
- SHEETRILL EROSION CONTROL (4)
- STREAM/DITCH BANK STABILIZATION (26)
- WIND EROSION (2)
- NOT SPECIFIED (2)

With so many positive and negative factors influencing how water resources will be managed in the future, the Section 319 and CWP programs are facing a true watershed moment. Economic conditions in the state and nation have declined, which could spell trouble for watershed programs. At the same time, however, synergy of all current efforts at protecting and improving Minnesota's lakes, rivers and streams could bring great progress swiftly.

As citizens recognize the interconnections among personal behavior, local land-use, public policy, economic realities, explosions of technology and information, and global trends, they may join their neighbors and change their lives to guarantee clean and clear water for future generations. Though we do not know for certain what factors will influence and determine the future course of water quality protection and improvement, we do know that we have started out on the firm footing of the watershed approach based on strong partnerships of citizens and all levels of government in the Section 319 and CWP Programs.



Widely recognized for its success in improving an urban watershed, the Minneapolis Chain of Lakes Clean Water Partnership (see page 45) has received several awards and honors, including:

- CF Industries 2000 National Watershed Award;
- 2001 Governor's Award;
- 2001 Minnesota GREAT Award;
- 2001 Minnesota Environmental Initiative Award; and
- Minnehaha Creek 2001 Watershed Partners Award.

Projects Completed in 2001

Section 319 Projects

Whitewater River Watershed National Monitoring Program

The Whitewater River Watershed is located between the cities of Rochester and Winona, Minnesota, and is 205,000 acres in size. Three main sub-watersheds (South, Middle, and North Branches) drain gently rolling to steeply sloped karst topography. Land use in the watershed consists of mostly crop, pasture and wooded land. Significant portions of the river are classified as wild or semi-wild trout waters.

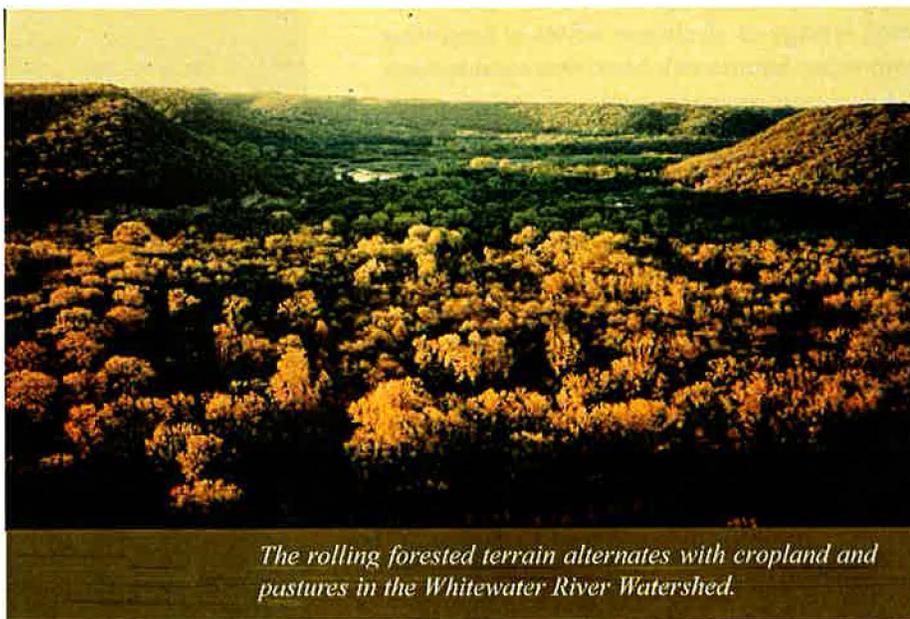
The Whitewater River Watershed is a U. S. Environmental Protection Agency (EPA) National Monitoring Program (NMP) project. The EPA established the National Monitoring Program under Section 319 of the Clean Water Act to assess the effectiveness of nonpoint-source water-pollution-control efforts. The Whitewater River Watershed NMP was selected as the 23rd NMP project in the United States in August 2001. The NMP component of this project is enhanced by an active local watershed, which is directed by a multi-county joint powers board of local officials.

The overall watershed effort evolved from a pilot project on the Middle Branch that identified intensively cultivated fields, long unprotected slopes, and inadequate feedlot, pasture and forestry management as significant problems.

These problems increase water quality degradation from sediment and other pollutants. The Whitewater River is a tributary to the Mississippi at Weaver Bottoms, a nationally significant waterfowl staging area that is threatened by the pollutants carried by the river.

Effectiveness monitoring following NMP guidance was begun in 1995 (for biological monitoring) and 1997 (for paired-watershed monitoring). The watershed was selected for this monitoring because it was and continues to be a priority watershed project for several local, state and federal agencies and organizations.

The paired-watershed component of the project focuses on water temperature, flow, total suspended



The rolling forested terrain alternates with cropland and pastures in the Whitewater River Watershed.

solids, and several chemicals and elements (including charged particles and nutrients) to evaluate changes in water quality after the implementation of best management practices. The biological monitoring focuses on fish and other aquatic species and habitat variables to evaluate changes in water quality.

The five small watersheds in the paired-watershed monitoring consist of cropland in the upper portions of the watersheds, have varying buffer areas, and have small natural springs. The springs provide an outlet for monitoring ground water in addition to surface water flows in the watersheds.

Various treatment plans will be investigated in these paired small watersheds to determine what practices achieve results. Plans include comparing Conservation Reserve Program and cropland runoff, assessing varying nutrient management levels, and implementing crop rotations. Pre-treatment data suggests that a statistical analysis of water-quality changes in these

paired watersheds following implementation of best management practices offers promise in documenting successful strategies for reducing nonpoint-source water pollution.

Biological monitoring has been completed at nearly 40 sites in and near the Whitewater River Watershed. The data collected has been used to evaluate and characterize the sites with regard to fish, macroinvertebrates, and integrity of habitat. Initial evaluations of these data in the context of land use have been completed. Further work will evaluate data in context of land use, geology, hydrology, and other features of the watersheds above the monitoring sites.

For more information about the Whitewater River Watershed National Monitoring Program project, contact:

Larry Johnson
Whitewater River Watershed Project
(507) 523-2171, ext. 110

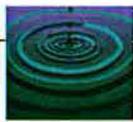
Results that Count

Physical and chemical monitoring at the five paired-watershed sites has shown differences that appear to be significant for several variables.

Initial sampling has been completed assessing fish, benthic macroinvertebrates, and habitat differences between sites during each year. Most stream sites had fair to good fish habitat ratings. Most cold water sites rated fair to good with regard to fish populations, but most warm water sites rated poor to very poor. Invertebrate populations were rated moderately impaired at most sites.

Financial Information

The Whitewater River Watershed National Monitoring Project is an ongoing and long-term project in the watershed and state park. This segment of the project was funded with two Section 319 grants to Winona State University in 1997 and 1998 to analyze biological data that had been collected over a period of years. The two grants totaled \$22,611 and were matched with a total of \$29,689 in cash and professional services. Winona State University provided the match allowing a faculty professor to spend his sabbatical year focusing on in-depth evaluation of the biological data.



Biological monitoring has been completed at nearly 40 sites in and near the Whitewater River Watershed.

Students from Winona State University monitoring biological indicators in the Whitewater River



Miller Creek Restoration Project

Miller Creek is an urban trout stream located in St. Louis County, Minnesota. It flows through the cities of Duluth and Hermantown. Water quality is extremely poor near the Miller Hill Mall, but downstream in the lesser-developed regions the water quality improves dramatically.

The creek has become the focus of the Miller Creek Joint Powers Board (JPB), local residents, the environmental community, conservation groups, and resource management agencies because of booming development in the watershed. The primary concern is the decline and potential loss of the creek's brook trout fishery. Related concerns include degraded benthic macroinvertebrate populations, increased water temperatures, sedimentation, loss of habitat, and high chloride and metals concentrations.

The goal of the Miller Creek Clean Water Partnership Project (CWP) was to maintain and improve a viable, self-sustaining urban trout fishery, as well as to educate the public regarding watershed health and urban impacts to area trout streams. The objective of the diagnostic study was to better understand thermal impacts to Miller Creek, so that restoration and efforts can be targeted to the most threatened areas.

During the past 30 years, portions of the Miller Creek Watershed have undergone significant commercial development, resulting in filling of wetlands, loss of riparian cover, and the introduction of large volumes of storm-water runoff from impervious surfaces. The creek has been rerouted four times to accommodate development. While brook trout continue to reproduce, numbers are declining in the creek segments adjacent to the most intense development.

In addition to CWP grant funds for the diagnostic study, the Miller Creek Watershed Project has received grants for implementation activities from the Legislative Commission on Minnesota Resources,



An Americorps volunteer plants trees along Miller Creek to prevent erosion damage to this viable trout brook.

Clean Water Act Section 319, and the Great Lakes Commission. Local organizations and individuals have contributed additional funds and volunteer hours.

The implementation plan consists of six program elements or goals:

- increasing public awareness of in-stream water quality issues;
- reducing in-stream pollutants;
- reducing pollutant loadings;
- improving government management;
- protecting habitat; and
- monitoring water quality and management practices.

Stream improvement activities to date have focused on habitat restoration via the use of lunger structures for on-stream shade, gravel beds for spawning, and stream-side tree planting to provide shading.

Control measures such as distributing education materials, setting aside vegetative buffers, minimizing road salt use and passing ordinances are organized and aligned with the six basic elements. When implemented, these controls should result in

significant pollution reductions and improved stream water quality and habitat.

For more information about the Miller Creek Restoration Project, contact:

R. C. Boheim
South St. Louis County Soil and
Water Conservation District
(218) 723-4867

Financial Information

The Miller Creek Restoration Project received both CWP and Section 319 money in 1996 totaling \$40,012. The local match was over \$46,000.

During the 2002 grant round, the Miller Creek project was awarded \$30,000 in CWP Phase II money to continue the work they have started.

In addition, the project recently received a grant from the National Oceanic and Atmospheric Administration – Coastal Restoration Program, which is administered by the Minnesota Department of Natural Resources Lake Superior Coastal Program, to continue the progress.



Project partners have planted 4,000 trees and completed 136 feet of luncker structures for in-stream shading.

Results that Count

This diagnostic project identified several major impacts on Miller Creek that are adversely affecting the viability of the trout stream.

Miller Creek faces three major water quality threats: increased water temperature, sedimentation, and habitat loss. All of these are the result of increased development. Road salt and runoff also significantly impact water quality.

Creek temperatures in the Miller Hill Mall area routinely exceed the Maximum Tolerable Limit (74.8° F) identified in U.S. Environmental Protection Agency guidance for trout streams. Brook trout, a coldwater fish, begin to show thermal stress at temperatures above 68° F. Additionally, data indicate that parts of the creek also exceed the acute toxicity levels for chloride.

In-kind work took the form of many hours of stream habitat restoration work by members of a local trout fishing organization; of tree planting, tree care, and yearly stream clean-up by Miller Creek Task Force members, environmental groups, school groups, Air National Guard staff, prison work crews and individual volunteers. Thus far, the project partners have planted 4,000 trees to shade the waters and counteract thermal stress. In addition, 136 feet of luncker structures are completed.

Achieving Major Change in Minor Watersheds

The impacts of agriculture on water quality are well known, and farmers are integral partners in any long-term effort to reduce pollutants to watersheds. The goal of this 319 project, a cooperative effort between the Minnesota Pollution Control Agency and the University of Minnesota Extension Service, was to achieve widespread adoption of land-use Best Management Practices (BMPs) in four minor watersheds. A secondary goal was to identify public information and education strategies for minor

watersheds that promoted the adoption of BMPs by landowners.

The four minor watersheds selected for this pilot project were:

- The Diamond Lake watershed near Atwater in Kandiyohi County, where a CWP/319 restoration project is underway;
- The German-Jefferson Lakes watershed in Le Sueur County;

- The Trout Brook watershed in Dakota County; and
- The Holland Wellfield in Pipestone County, considered a replacement for the German-Jefferson watershed.

For some of these watersheds, the project had goals for reduction of specific pollutants:

- The Diamond Lake watershed contains waters with phosphorus concentrations exceeding 200 parts per billion (ppb), and the goal is to reduce phosphorus to 40 – 50 ppb and reduce mid/late summer algae blooms.
- The Holland Wellfield is located between Lake Benton and Pipestone, and is one of three wells in the Lincoln-Pipestone Rural Water System. This system supplies drinking water to 24 communities and has elevated levels of nitrate, fecal coliform bacteria and ammonia. The goal was to reduce all three contaminants in the wellfield.

This project was the first “stand alone” watershed information and education project, modeled on three successful projects – the Ontario Environmental Farm Program, Farm*A*Syst, and Minnesota’s River Friendly Farmer program. Staff undertaking this project reported that while many landowners responded positively to early outreach about the program, participation was limited. Therefore, the program did not succeed in enlisting land owners in watershed BMPs.

The partners in the project followed through on the work plan established by:

- Selecting watersheds that would provide diverse resource situations, as well as local partners who would help with the effort.
- Introducing the plan in presentations for the Annual Water Planners Conference and Lincoln-Pipestone Rural Water Authority Board, among others.
- Completing a farm management self-assessment tool and mailing it to landowners.
- Identifying barriers to implementation.
- Developing educational activities.
- Convening land owners to explore watershed management activities and education.
- Conducting information and education activities.
- Evaluating the project.

Documenting measurable impacts of public information and education efforts proved difficult to the project team. Educational efforts also proved to be more difficult and time/labor intensive than the project team had expected. The main outcome of the project has been to outline lessons learned in the process of this educational effort.

For more information about Major Change in Minor Watersheds project, contact:

Jim Anderson
University of Minnesota Extension Service
(612) 625-0279



Lessons Learned

The project staff outlined some of the lessons learned by undertaking land owner education efforts in four minor watersheds:

- Educational efforts to improve watershed management through BMPs would be much more successful as part of an overall package of activities, rather than as a stand-alone project.
- Developing local involvement in watershed management is much more time-consuming and expensive than project partners anticipated.
- Environmental programs that demonstrate to farmers that they will not have to internalize additional risks by adopting conservation production systems and may benefit financially by their implementation of BMPs will probably be more effective.
- The project should not have assumed that in-kind matching funds would be forthcoming from participants.
- Some farmers were reluctant to participate in the project because of the MPCA’s position as a regulatory agency.
- Turnover among local partners posed problems for the project.
- One-on-one educational efforts conducted by retired extension field staff and farmers in the watershed would be recommended for future projects to encourage BMPs in minor watersheds.



The information and education strategy for this Section 319 project involved working with land owners and farmers on BMPs, with a specific concentration on agriculture.

Financial Information

This Section 319 project was sponsored by the University of Minnesota. In 1997 the U of M received \$72,173 in grant funds and contributed \$57,234 in cash and expertise.



One-on-one educational efforts conducted by retired extension field staff and farmers in the watershed would be recommended for future projects.

Rice and Koronis Lakes Restoration Project

Rice and Koronis Lakes are located in Stearns and Meeker Counties in the headwaters of the North Fork of the Crow River watershed. The North Fork of the Crow River drains about 350 square miles of primarily agricultural land upstream of these lakes. Runoff from the land is carried by the river and deposited in Rice and Koronis Lakes; consequently, the lakes are showing degradation caused by phosphorus loading and sedimentation.

The Rice and Koronis Lakes Restoration Project involves a partnership with two lake associations in the headwaters of the North Fork of the Crow River in Meeker and Stearns Counties. Recreational uses of the lake are becoming affected by erosion and sedimentation – swimming, boating, and fishing are all popular pastimes at two parks and several resorts in the community. The goal of

the project is to evaluate and reduce nonpoint pollution in the lakesheds of Rice and Koronis Lakes.

Project elements completed in 2001 include:

- Established weekly sampling in nine locations in the project area.
- A major erosion-control project on the south side of Lake Koronis, involving construction of three



sediment basins, drop pipes and a field block to prevent gully erosion.

- A landscape restoration project on the north side of Rice Lake, involving planting a buffer zone 100 feet long and 150 feet from the lake with native prairie vegetation. The site was used as a demonstration project for lakeshore owners.
- The Rice Lake and Lake Koronis Lake Associations included educational materials on water quality issues in newsletters six times per year. In addition, project staff spoke at lake association meetings on agricultural and shoreland Best Management Practices.
- The North Fork Crow River Watershed District used \$21,779 in State Revolving Fund money to pay for multiple projects, such as erosion control near the Bug Bee Resort of Lake Koronis, storm-water retention pond, and replacing tile and culverts in Paynesville Township.

For more information about the Rice and Koronis Lakes Restoration Project, contact:

Al Kuseske
North Fork Crow River Watershed District
(320) 346-2869



Water flowing through the subwatershed was reduced from 135 cubic feet per second (cfs) to two cfs, thus reducing transport of sediments and other pollutants.

Water Level Gage Installation and Rating Curve Development

The Water Level Gage Installation and Rating Curve Development project helped fulfill the state's need for stream gaging to support water-quality monitoring by the Minnesota Pollution Control Agency (MPCA), Minnesota Department of Natural Resources (DNR) and partner organizations statewide. The DNR and MPCA cooperation on this Section 319 funded project provides support for a number of local projects, as well as reinforcing an ongoing interagency cooperative relationship.

Results that Count

Gully erosion has been a consistent problem in the watershed, and the erosion-control measures taken on the south side of Lake Koronis showed an immediate benefit. Before the project began, water flowing through the subwatershed was 135 cubic feet per second (cfs), eroding sediment into the lake. Following the completion of this project, flow was reduced to two cfs.

Projects completed since 1997 include:

- Upgrading an estimated 60 septic systems;
- Installing four cluster systems for wastewater treatment;
- Completing two shoreline stabilization projects;
- Constructing two sediment control basins;
- Installing a manure management pit; and
- Restoring a wetland and installing several grassed waterways.

Financial Information

This phase of the Rice Lake and Lake Koronis project started in 1997 with a Section 319 grant of \$36,450 and a State Revolving Fund low-interest loan of \$150,000. The loan money does not have to be matched, but the grant money was matched with a local commitment of \$45,153. Rice Lake Association, Lake Koronis Association, Stearns County Soil and Water Conservation District, and the North Fork Crow River Watershed District provided in-kind contributions to this project.

The achievements of the project, which far exceeded the original goals, were to:

- Establish elevations of measuring points for tape down measurements to water level (or identify existing gaging options) for 75 of 83 Milestone Stream Sampling Sites; and
- Develop or verify stage-discharge relationships at 25 selected automatic monitoring sites on streams.



This project enhances the usefulness of the Milestone Sampling Program, which includes 83 stream monitoring sites – long-term fixed stations – most of which have no permanent recording installation. Water samples are taken from a subsurface grab at just one point in the stream cross section. For some pollutants, concentrations obtained from these samples provide adequate information. However, for other pollutants, it is necessary to estimate the total amount (or load) in the stream. By establishing gaging marks at as many locations as possible, the sampling that takes place now can be used to make at least a coarse estimate of nonpoint source pollution loads.

The second part of the project focused on selected local project stream monitoring sites where MPCA had installed water level recording capability. For each site, DNR developed or verified a rating curve showing the relationship between water level (stage) and flow (discharge) in that stream reach.

Much of the work required expertise and equipment already available at the DNR. To avoid duplication or the development of independent capacity, the MPCA teamed with the DNR, defining and developing the work and cementing productive relationships that support further cooperative efforts.

At the local project automated stream-monitoring locations, DNR personnel performed stream-flow measurements at a range of stages. These measurements were sufficient to establish a stage-discharge relationship and produced a report for each that included a site description, stream discharge measurement summary, rating table and curve plot.

At the Milestone Sites, DNR personnel visited 75 sites, establishing measuring points with elevations or

www.pca.state.mn.us

investigating existing gaging marks or installation. The report filed included written descriptions for all sites, and many photographs and maps, in both paper and electronic file formats.

For more information about the Water Level Gage Installation and Rating Curve Development project, contact:

Louise Hotka
MPCA Environmental Outcomes
(651) 296-7223 or
Judy Boudreau
DNR Surface Water Unit
(651) 297-3886



Results that Count

This collaboration between the MPCA and the DNR far exceeded the project goals:

- The emphasis placed on gaging marks rather than staff gages allowed the project staff to install gages at 75 of the 83 Milestone sites, more than double the project's goal of 30.
- The extension of the grant funding the project also allowed the project to exceed its goal of rating curve development and verification at 25 sites, more than twice what was predicted.
- The field application of the DNR's unique capabilities complemented the MPCA's work over time at the Milestone sites. Working relationships were necessary on at least two levels: the area of defining and refining the contract work and the area of exchanging practical information about site locations and characteristics.
- Funding flexibility (EPA extended the grant to allow the maximum possible level of work) enhanced efficiency when work required additional staff, but does not alone support year round or multi-year staff additions.

Financial Information

CWA Section 319 funded the project for five years with \$98,670. This project was not directly matched because it provided infrastructure for future local projects.

Upland Water Retention for Improving Drainage and Water Quality Video

“What are we leaving for future generations?” asks a Faribault county commissioner in a new video, “Upland Water Retention for Improving Drainage and Water Quality.”

His question ends a 17-minute video on the impacts of drain tiling on both water retention and water quality for farmers. The video shows the impacts of increasing tile drainage in upland areas on farms and water bodies downstream.

The video illustrates the history of drain tiling to make agricultural land usable and outlines its effects, both positive and negative. Speakers include farmers, consultants, local government officials, environmentalists and others with different perspectives but similar goals for water resources in farming areas.

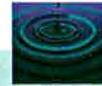
By illustrating the varied impacts of drainage choices on farmers’ crop yields, local government budgets and water quality, the video shows the benefits of alternatives, such as grassed waterways and created wetlands.

It has been distributed through partner organizations, such as the Natural Resources Conservation Service, Soil and Water Conservation Districts, and others. By taking farmers’ concerns into account and maintaining a relaxed and sensible tone, the video gets the message across to audiences concerned about localized flooding, economics and the environment. The video comes with a discussion sheet for partners making presentations.



For more information about the video, contact:

Tim Larson
MPCA Program Support and Training Section
(651) 282-5559



Financial Information

This Section 319 project is different because it is a tool for other programs, rather than a program itself. The video was commissioned and paid for with a \$10,400 grant. The grant was not matched directly, but was matched overall through the entire Section 319 program.

The video... was designed to show how to make an existing drainage system more effective by relieving the pressure in a tile main while improving water quality and reducing peak flows.

Information and Education Coordination

The Nonpoint Source Information and Education Coordinator provides leadership for educational programming to reduce nonpoint source pollutants in the State of Minnesota. A significant portion of the effort is dedicated to coordinating educational initiatives among state agencies and establishing a communication mechanism with key local entities that

will ensure long-term delivery of nonpoint source information and education.

This project took its direction from the following goals outlined in Minnesota’s Nonpoint Source Management Plan:

- Promote stewardship and active citizen involvement by focusing NPS information and education efforts on the natural resources in which local audiences have a stake;
- Improve information and education outreach network for local officials and resource managers;
- Foster coordination and cooperation among government agencies, private, nonprofit and other organizations to carry out information and education efforts; and
- Enhance and promote hydrologic unit-based management.

The major focus of the project was to facilitate and improve the coordination between partners and maximize the sharing of programs across watersheds. The educational strategy is now more integrated with several ongoing and developing programs across the state:



Results that Count

- Including educational strategies and activities as part of basin planning activities,
- Encouraging cross use of materials and programs by watersheds and counties within major hydrologic basins,
- Improving follow-up and documentation for local officials, including distribution of annual reports, matrices of existing programs and stages of water quality issues,
- Developing a series of more than 18 fact sheets relating "Success Stories,"
- Including project evaluation in Annual and final Progress Reports,
- Conducting two separate educational programming need assessments,
- Developing an e-mail network for interagency nonpoint source workers spanning across agencies, linking 500 e-mail addresses,
- Preparing a series of fact sheets targeted to the issues within specific regional watersheds (Great Lakes, Minnesota River),
- Distributing a series of Water Quality Impact Statements prepared through the UMFS Water Quality Leadership Team and distributed to

- Natural Resources and Environment Capacity Area faculty and field staff from multiple colleges and interdisciplinary centers on campus and from all Extension districts.
- MPCA's Hydrologic Basin Management, e.g. Basin Alliance Lower Mississippi of Minnesota (BALMM)
- River Friendly Farmer program
- Several Clean Water Partnership Phase II projects
- Several other Section 319 Projects, e.g., Pollution Reduction Payments in Jefferson-German Complex and Lake Washington

The Nonpoint Source Information and Education program raised awareness of all three major NPS pollutants (nutrients, sediments, and bacteria). All three appear to be at the pre-peak or peak stage of public concern in the CWP program and approaching the peak level of concern in Local County Water Plans. Educational programming is about 25 percent complete, suggesting that Minnesotans are aware of water quality issues (see table, next page).

- County extension offices and Clean Water Partnership project managers,
- Researching responsibility for Metro Area NPS Pollution Education Campaign coordinated by Watershed Partners and BWSR,
- Providing information and training to local citizen groups and township officers on how to set up action-oriented local water quality programs (such as the River Friendly Farmer program).
- Presenting and publishing "319 BMP Demonstration Projects" to PCT in 1998,
- Activating and coordinating the Feedlot and Manure Management Information and Training Subcommittee NSMPP (1994) with UMES Extension Service and MPCA staff,
- Presenting at several County Water Planners Conferences,
- Compiling and distributing "An Annotated Inventory of Nonpoint Source Educational Materials," which included approximately 645 educational reference materials
- Preparing Minnesota Section 319 Success Stories (1997), and
- Publishing "issue maps" used in the Findings from the Nonpoint Source Strategic Planning Effort of the NPSMP, 2001.

Nonpoint Source Issue Stages and Percent of Educational Activities Completed, by Basin

Basin or Statewide	Nutrients		Sediments		Bacteria	
	Stage	Complete (%)	Stage	Complete (%)	Stage	Complete (%)
State	Pre-Peak	24	Peak	28	Pre-Peak	27
Cedar Des Moines	Peak	27	Peak	28	Peak	29
Lake Superior	Peak	9	Pre-Peak	11	Peak	20
Lower Mississippi	Pre-Peak	25	Peak	26	Peak	30
Minnesota River	Pre-Peak	24	Pre-Peak	27	Pre-Peak	24
Missouri River	Peak	18	Pre-Peak	25	Pre-Peak	27
Rainy River	Pre-Peak	15	Pre-Peak	19	Pre-Peak	27
Red River	Pre-Peak	25	Pre-Peak	29	Pre-Peak	26
St. Croix River	Peak	30	Peak	34	Pre-Peak	27
Upper Mississippi	Peak	26	Peak	30	Peak	31

Most of the programs and specific projects funded with Section 319 and state moneys are designed to get people to change behavior and land-management practices so that pollution can be prevented or controlled. Since they rely on voluntary measures, these projects often include educational components.

For more information about information and education activities, contact:

Glenn Skuta
MPCA Regional Environmental Management
(651) 296-7359

Financial Information

This Section 319 project began in 1998 and is sponsored by the University of Minnesota. The University received a grant of \$65,697 and contributed \$66,005 in cash and in-kind services.



The number of River Friendly Farmers increased by 73 percent since 1996.

Shoreline Vegetation Best Management Practices to Reduce Erosion and Runoff



The vegetation of shoreland areas is usually removed during residential lake development. The lack of littoral wetland fringes and protected shoreland buffers increases sediment and nutrient loads to these developing lakes.

Big Sandy Lake in Aitkin County typifies this condition. Long-term lake residents have observed

degradation of shoreland coincidental with increased algal productivity and decreased water transparency. The shoreline is 56.5 miles in length with a circular shape which likely increases shoreline exposure to waves.

The Big Sandy Lake Association sought technical assistance from the University of Minnesota and

Minnesota Board of Water and Soil Resources (BWSR) for revegetating shoreland. The lack of available information on how to reestablish plants in shoreland areas and measure effectiveness at reducing shoreland erosion with revegetation resulted in this demonstration and research project.

Work on the project began in 1995, and the project partners have established four shoreland revegetation sites. The primary purposes for the demonstration areas are:

- Increase understanding about how to accomplish revegetation in wave-impacted areas,
- Learn how to appropriately manage adjacent uplands, and
- Provide educational opportunities for area residents and the public.

One additional site was used to demonstrate approaches for site development that minimize vegetation removal.

Between 1996 and 1999, 4,685 plants (47 species) were installed at the four test sites, along with wave breaks constructed from PVC pipe, mesh and plywood. The structures were tested and the designs refined over the growing seasons.

The University of Minnesota Extension Service developed a series of fact sheets on natural shoreland landscaping, choosing plants, wave break structures, and planting shoreland vegetation. Extensive public education efforts followed, using the sites to illustrate and explain shoreland vegetation.

For more information about the project, contact :

Susan Galatowitsch,
U. of M. Department of Horticultural Sciences
(651) 624-5300



www.pca.state.mn.us

Results that Count

At each of the four sites, project partners made discoveries about what plants succeeded in shoreline stabilization.

- **Guntzburger Site.** Twenty-four total species of plants (aquatic, meadow and shoreland) were installed. Of these, 20 species survived and nine are spreading (twice the number of individuals than that originally planted). Wave break structures were no longer needed to protect the shoreline from erosion.
- **Greifzu Site.** Twenty-three total species of plants were installed. Of these, 18 species survived and eight are spreading, but forest species had trouble taking hold until flooding weakened soils in that area. Wavebreak structures are still needed to protect the shoreline.
- **Keen Site.** Twenty-seven total species of plants were installed. Of these, 19 survived (although two were in poor condition) and three are spreading. Aquatic species had a hard time establishing, so wave break structures are still needed. When mowing along the shoreline ceased, the shoreline returned to wet meadow and additional native species established.
- **Simonson Site.** Thirteen species of plants were installed. Of these, 10 survived and five are spreading. Wave break structures may no longer be needed to protect the shoreline. Existing land grades suggest that the site may have been excavated upland, leaving the surface with low fertility in the forest zone.

Plans for sites included many additional native species, but plants were not available from local nursery owners or the U of M. The partners produced a plan focused on increasing native plant availability in the area.

Financial Information

This was part of a continuing educational project sponsored by the University of Minnesota. In 1997, the U of M was awarded a Section 319 grant of \$29,512 and matched it with \$33,300 in professional services and cash.

Mountain Lake Improvement Project

Mountain Lake, located in Cottonwood County, has a watershed of 6,268 acres and a depth of 6.6 to 8.9 feet. Current land use within the watershed is a mix of agriculture, residential, open space and open water. Agriculture takes up 73 percent of the land in the watershed.

Mountain Lake has been adversely affected by excessive nutrients, with phosphorus being the biggest problem. The excessive phosphorus has produced unwanted algae blooms and reduction of water transparency. Concerns exist about the increase in rough fish and degradation of habitat for game fish.

The Mountain Lake Improvement Project started with a grassroots effort to protect water quality for recreation use while maintaining existing natural habitat areas in and around the lake. The overall project objectives are to:

- Reduce in-lake phosphorus concentrations to 80 parts per billion (ppb), and
- Produce lake quality conditions suitable for full-body contact recreation.

Project partners used a variety of strategies to work toward these goals over the duration of the Section 319 funding:

- Developing an agricultural nutrient management program,
- Installing sedimentation ponds and controlling gully erosion,
- Acquiring buffer strips,
- Implementing shoreline erosion control,
- Consulting on urban stormwater issues,
- Controlling agricultural and urban wastes from nonconforming onsite wastewater treatment systems,
- Producing fact sheets, newsletter and a lake magazine,
- Developing ecosystem-based science experiments for school children in grades 4 - 9,
- Establishing a stream and lake biocriteria monitoring system,



- Monitoring water chemistry, and
- Performing a lake soil survey.

Providing regular newsletter-style reports to citizens in the watershed, the partners highlighted Mountain Lake's problems and achievements. While the goal of 80 ppb has not yet been achieved, gradual decreases have occurred since a high of 199 ppb in 1995. But at the beginning of Summer 1999, Secchi disk readings of seven feet (from an all-time low of 0.8 feet in 1995) were taken, providing encouragement to partners for future gains..

Rotenone treatment of the lake helped eliminate rough fish and the Minnesota Department of Natural Resources restocked the lake with walleye, bass, bluegills, northern pike, yellow perch and black crappies. Aquatic plants have begun to reestablish.

For more information about the Mountain Lake Improvement Project, contact:

Jim Peterson
Mountain Lake Commission/City of Mountain Lake
(507) 427-2707

Financial Information

In 2001, the Mountain Lake Improvement Project finished its latest phase of an ongoing project first awarded Clean Water Partnership money in 1989. They were awarded \$50,000 of Section 319 grant funds in 1997 and matched it with \$199,750 in cash and in-kind services, an almost four-to-one match.

Results that Count

Among the achievements of the Mountain Lake Improvement project are:

- Increased water clarity from 0.8 feet to 7.0 feet in five years.
- Reestablished game fish population and eradicated rough fish.
- Completed nutrient management contracts and phosphorus soil maps.
- Restored two sedimentation ponds, constructed one new pond, and stabilized two gully-heads.
- Seeded acres under buffer strip contract with landowners.
- Staking willows along 200 feet of eroded shoreline.
- Customized an urban best management practices package for Mountain Lake and installed a sedimentation basin in the City of Mountain Lake.
- Established assistance for upgrading failing septic systems and upgraded several systems.
- Produced a newsletter in all four years of the grant.
- Conducted sampling all seasons from 1997 - 1999.



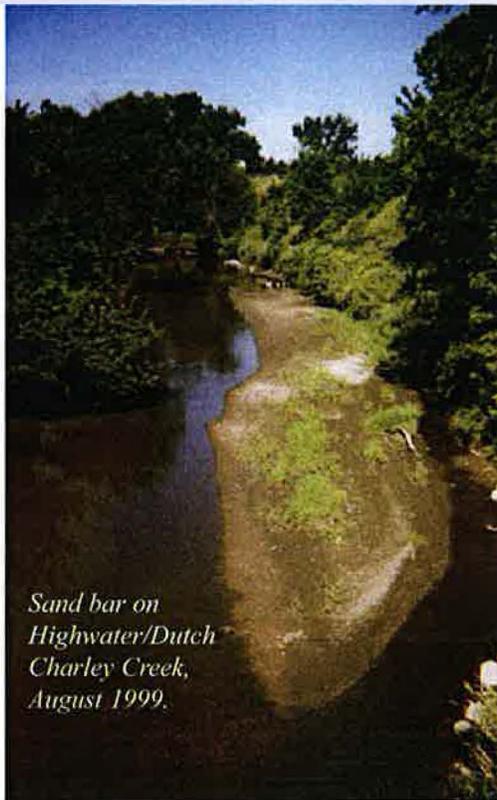
One of the goals of the Mountain Lake project is to increase the aquatic plant community to cover about 40 percent of the lake bottom.

Redwood River Clean Water Project

The Redwood River flows through many counties: Brown, Cottonwood, Lincoln, Lyon, Murray, Pipestone, Redwood and Yellow Medicine. Lake Redwood, a 67-acre reservoir in the City of Redwood Falls, was established by construction of a dam across the river in 1902.

By the 1970s, Lake Redwood was of only marginal usefulness. Fish populations steadily decreased, despite stocking programs. Boating was hazardous due to shallow water, and swimming was almost out of the question. The Redwood-Cottonwood Rivers Control Area (RCRCA) held meetings to gather local perceptions of the lake. Consensus developed that lake conditions were getting worse.

The Redwood River Clean Water Project was conceived as a plan to reduce sediment and nutrient delivery to the Redwood River and Lake Redwood. The RCRCA consisted of all counties and Soil and Water Conservation Districts in the watershed.



Sand bar on Highwater/Dutch Charley Creek, August 1999.

The mission of the Redwood River Clean Water Project is to create awareness of and appreciation for the value of a clean Redwood River, promote watershed identity, and cooperatively achieve land-use changes necessary to restore the river's health. Its goals:

- Reduce sediments and nutrients by 15 - 30 percent,
- Expand game fishery habitat and fishing opportunities, and
- Reduce peak flow and improve flow stability.

During the past six years, more than 160 conservation-minded landowners and operators have participated within the project to establish more than 350 best management practices throughout the watershed. These 160 landowners adopted practices that have the potential to reduce soil loss by 24,169 tons per year, sediment by 16,332 tons, and 24,470 pounds of phosphorus.

Results that Count

The Redwood River Clean Water Project has exceeded its goal of reducing sediment and nutrients by 30 percent.

- The total sediment reduction has been 61,170 tons per year.
- The total phosphorus reduction has been 69,528 pounds.
- The phosphorus reduction is enough to have reduced 28 million pounds of algae in the Minnesota River Basin each year.
- Of the total cultivated acres in the watershed (48,523), an estimated 13 percent have been treated with conservation practices.
- The average annual sediment load to the Redwood River between 1990-92 was 142,026 tons. The average between 1997-2000 was 29,137 tons, nearly an 80 percent reduction.
- Estimates show that 61,170 tons of sediment reduction can be attributed to best management practices established by the project and partners.
- Surveys of watershed residents showed the increased public awareness resulting from educational efforts.
- Monitoring confirms a substantial downward trend in nitrate reaching Lake Redwood.

For more information about the project, contact:

James Doering
RCRCA Executive Director
(507) 637-2142, Extension 4



*ISCO sampler,
Highwater/Dutch
Charley Creek, near
Lamberton, MN.*

Financial Information

The Redwood-Cottonwood Rivers Control Area (RCRCA) was awarded \$50,000 in 2000 as part of a re-budgeting of Section 319 funds turned back to the MPCA. RCRCA agreed to take the award on short notice and spent very little time spending the grant and matching it with \$50,000 in local funds. Over the years, the RCRCA has been highly successful at getting grant and loan money from the MPCA programs, as well as many other sources.

One Last Word...

A group poem about the Redwood River created by a 6th grade class at Lynd Public School.

The Redwood River is...

A moody person
A freed slave
A snake trying to find its destination
A speedy race car
Always the same, yet always different
A flag blowing in the wind
A turtle moving slowly
A flowing silk scarf
A ribbon in a girl's hair
The best listener

A free ride
A butterfly flitting
A drain unplugged
A mustang in the wild
A love that will never end
A dog chasing a cat
A leaf changing in the fall
A runner in a race
A flower blooming
We hope a river will always be with us.

Clean Water Partnership Projects

Chippewa River Watershed Project

The Chippewa River is one of 13 major tributaries to the Minnesota River, which ranks as one of the most threatened rivers in the nation. The Chippewa River contributes significant amounts of sediment, nutrients, and harmful bacteria to the Minnesota River. The lower reach of the Chippewa River exceeds the fecal coliform standard and is subject to a total maximum daily load (TMDL) study.

Chippewa County sponsored the Chippewa River Watershed Project to improve the water quality and reduce flooding in the watershed, while also promoting a healthy agricultural, industrial and recreation-based economy. To cope with the size and scope of the project, the watershed was broken down into six priority management areas. The project will target funding and efforts on specific priority management areas over a 10-year period, beginning in 2001 with a Section 319 grant for Shakopee Creek and Shakopee Headwaters.

The goals of the project are:

- To achieve the highest level of water quality attainable for ecoregion streams;
- To increase the number of watershed residents taking an active role in enhancing and protecting the Chippewa River;
- To continue to have the watershed community of agencies, organizations, and citizens across the participating counties work toward the common goal of improved water quality; and
- To develop the Chippewa River as a major recreational resource within the Minnesota River Basin.

Initial efforts have focused on building relationships with project participants and the community, providing education and consultation to interested groups, developing monitoring systems to establish baseline data about the watershed, and seeking long-term funding. Activities have touched on all major contributors to watershed water quality:



The Chippewa River is the subject of a TMDL study for fecal coliform on its lower reach.

- Surveyed Shakopee Creek Watershed residents and held an Open House to discuss the findings.
- Continued working on a Memorandum of Agreement on nonpoint pollution issues with the Southern Minnesota Sugar Beet Cooperative, one of the largest industries in the watershed.
- Published "The Citizen Connection," a newsletter with a circulation of 8,000 residents in the watershed, to increase awareness about nonpoint-source water pollution issues.
- Consulted with the City of Glenwood on a storm-water management plan.
- Developed Conservation Reserve Enhancement Program initiatives with Soil and Water Conservation Districts in the watershed.
- Performed water quality monitoring across the watershed and began a bio-monitoring program.
- Recruited and maintained a Citizen Monitoring Network to provide data on water quality watershed-wide.
- Developed public education and partnership opportunities, from a Nutrient Management and Farm Bill Update Seminar (held jointly with Hawk Creek and Crow River watershed organizations) to a Minnesota River School class trip down the entire Chippewa River to the River Leaders Summit.

Because the project is only in its second year of implementation, measurements of improved water quality are not yet available. However, the Chippewa River Watershed now has baseline data to measure progress and to add to general watershed knowledge statewide.

In addition, public awareness and stakeholder involvement in nonpoint-source water pollution has likely been elevated in the region as a whole because of aggressive efforts at partnership.

For more information about the Chippewa River Watershed Project, contact:

Kylene Olson
Chippewa River Watershed Project
(320) 269-2139 ext. 116

Results that Count

- Educational materials circulated to 8,000 watershed residents.
- Established a citizen monitoring network.
- Established partnerships with city of Glenwood, Soil and Water Conservation Districts, Hawk Creek and Crow River Watershed organizations, and other key groups to project implementation.

Financial Information

The Chippewa River project was awarded \$308,660 of CWP Phase I grant money in 1998. The project sponsor and partners matched that amount with \$418,700 in cash and in-kind services, for a total project cost of \$727,360.

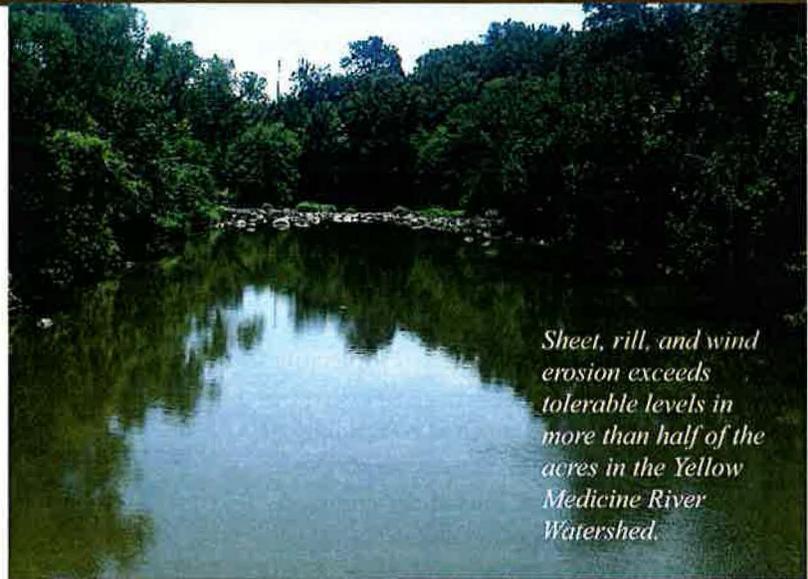
Greater Yellow Medicine River Watershed Project

The Yellow Medicine River watershed includes 422,600 acres located within a three-county area (Lyon, Lincoln, and Yellow Medicine Counties). Flooding, drainage, erosion, sedimentation, and poor water quality are among the foremost problems in this watershed.

Currently, sheet, rill, and wind erosion is exceeding tolerable levels on nearly 221,300 acres in the watershed and of those, 39,100 acres are twice the tolerable levels. Not included in these totals are erosions from ephemeral gullies. Water quality in the watershed's streams and lakes suffers from the sediment, nutrients, fertilizer, and chemicals in the runoff.

The goal of this Project is to:

- Increase implementation of best management practices for runoff;
- Reduce soil erosion;
- Improve water quality; and
- Reduce flooding.



Sheet, rill, and wind erosion exceeds tolerable levels in more than half of the acres in the Yellow Medicine River Watershed.

The Greater Yellow Medicine River Watershed Project was awarded CWP Phase I grant funds in 1997. CWP Phase 2 funds were awarded to the project in 2001. Building on momentum gained from the successful Phase I project, the three Soil and Water Conservation Districts and National Resources Conservation Services (NRCS) offices applied for and were awarded a 319 grant in 2000 to accelerate best management practices (BMP) adoption in the watershed while the Phase I project neared completion.

Among the projects completed or designed and waiting for current crop removal for construction, through the 319 project are:

- More than 50 water and sediment control basins on 12 properties with erosion impacts on the watershed.
- Water and sediment control basins planned for 11 properties with erosion impacts on the watershed.
- Fencing and grazing management projects to prevent livestock impacts on the watershed.

In addition, the Greater Yellow Medicine CWP Project staff and partners:

- Completed the CWP Phase I assessment and wrote a comprehensive Implementation plan to address priority areas throughout the watershed based on the study findings.
- Worked with 30 landowners thus far on nutrient management plans, demonstrating existing nitrogen and phosphorus levels.
- Surveyed 150 landowners in priority areas of the watershed about their nutrient knowledge and educational needs, with 79 responses.
- Made presentations to students in secondary and vocational schools about watersheds and river stewardship.

For more information about the Greater Yellow Medicine River Watershed Project, contact:

Terry Renken, YMRWD
(507) 872-6720

Pauline Moen, Lincoln SWCD
(507) 694-1630



More than 50 water and sediment control basins have been completed



Results that Count

- A 685 mi² watershed was assessed through a network of 15 monitoring sites, allowing for smart decisions to be made on prioritizing limited BMP Implementation funding.
- Set goal of 25 percent decrease in nutrient and sediment loading within six years.
- More than 50 water and sediment control basins have been completed, and more planned.
- Fencing and grazing management projects completed.
- Nutrient management plans under discussion with 30 landowners.
- Surveyed 150 landowners in priority areas about educational needs.

Financial Information

The Greater Yellow Medicine River Project was a CWP Phase I resource investigation project which was awarded grant funds in 1997. The project sponsors were awarded \$200,092, which they matched with \$324,655 of their own in-kind services and money.

Long Lake Clean Water Partnership

Land use in the Long Lake Watershed in Isanti County consists of a mixture of agricultural, urban, wetland and forest. Housing subdivisions and cabins are located along the entire shoreline, with the exception of the extreme south shore. The lake outlet is located on the southeast shore and drains into the Rum River.

Results of a diagnostic study conducted in 1997-98 showed that high phosphorus, nitrogen and ammonia were affecting the lake's water quality and the partners designed an implementation plan to work on reductions.

The water quality goals established for Long Lake included:

- Reduction of total phosphorus from 80 ppb measured during the diagnostic study to 50 ppb,
- Reduction of chlorophyll-a from 60 ppb to less than 20 ppb,
- Mean nitrogen/phosphorus ratio from 21.6 to less than 16.

The implementation plan consisted of several strategies to reduce nutrients to Long Lake:

- Installation of stream buffer strips,
- Development of manure management plans with facilities located near the lake,
- Aquatic plant management,
- Encouraging conservation tillage,
- Shoreland revegetation,
- Lake reclamation activities,
- Dam maintenance,
- Low-interest loans for septic tank upgrades and replacements, and
- Lake sediment chemical treatment with alum.

The Long Lake Clean Water Partnership requested funding for implementation actions in Fall 2000, but were unsuccessful due to the limited availability of state and federal grant funds.

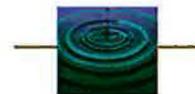


Financial Information

The Long Lake Project in Isanti County was a very locally driven CWP Phase I resource investigation which began in 1997. The project sponsors were given a relatively small grant of \$39,264. They put in \$46,303 worth of cash and volunteer and professional services.

For more information about the project, contact:

Jerry Tvedt
Isanti County Coordinator
(763) 689-3859



The Long Lake Clean Water Partnership requested funding for implementation in Fall 2000, but were unsuccessful.

Diamond Lake Rehabilitation Project

Diamond Lake is located near the City of Spicer in Kandiyohi County. It is a popular fishing lake, with walleye and northerns as the game fish of choice. In the last 20 years, nuisance algae blooms and low water transparency have been documented.

Diamond Lake participated in a Clean Lakes Program Phase I Diagnostic Study from August 1992 through March 1995. The Project applied for Phase II Clean Water Partnership (CWP) funding.

Lake Association Board members were instrumental in Phase II best management practices selection and seeking landowner participation. Unfortunately, they had trouble getting landowners to accept grant money for BMPs during the original Phase II. The Project requested a Phase II continuation and was awarded a \$25,000.00 continuation grant which started in April 2001 through April 2004.

During the original CWP Phase II, the following projects were completed:

- In-lake monitoring conducted during Phase II included Secchi Disk and total phosphorus, as well as some monitoring of the Hubbard, Schultz and Wheeler chain of shallow lakes to obtain more information on water quality flowing into Diamond Lake;
- Purchased shallow lake/wetland “reverse aeration” equipment. The equipment consists of an air compressor that will produce low-level aeration and a special outboard motor what will mix organic mater and sediment at the bottom of shallow lakes and wetlands. The mixing will cause a decrease in dissolved oxygen which will kill rough fish. Partners want to eliminate rough fish in the Hubbard, Schultz and Wheeler shallow lakes. Then these shallow lakes should reestablish emergent and submergent vegetation and tie up nutrients so the nutrients will not flow downstream into Diamond Lake.
- The local SWCD did several wetland improvements and the CWP grant paid for a wetland improvement on which the lake association worked.
- An aquatic plant management (experimental) project included the cutting of curly leafed pondweed



A fish trap installed in Diamond Lake prevents rough fish from stirring sediments.

before they went to seed, to reduce in-lake nuisance conditions. The DNR and City of Spicer permitted and closely monitored this effort.

- The Lake Association was instrumental in the establishment of a no-wake zone in Dogfish Bay to reduce resuspension of sediment and to protect fish and wildlife habitat;
- Two shoreline stabilization projects were completed.;
- DNR and the City of Spicer oversaw rehabilitation of a northern pike rearing pond, aquatic plant management and roughfish control (operation of a fish trap by the Lake Association);
- Education efforts during the project included lawn soil testing for phosphorus, yard care fact sheets, and the production of two newsletters/year with educational articles;
- Farmer contacts were made by a local retired SWCD staff person to try to get farmers to accept grant dollars to install BMPs.

Results of the implementation project were mixed. To obtain and sustain long-term water quality improvements, watershed best management practices should be implemented and maintained, along with a healthy native aquatic plant and fish population within Diamond Lake.

Results that Count

- In the exotic plant area, nuisance conditions produced by curly leaf pondweed were reduced dramatically.
- In 2000, Diamond Lake water clarity met its six-foot goal. However, the six-foot summer average has been reached four times since 1990.
- No significant improvements were seen in total phosphorus levels so far; phosphorus concentrations have been above those predicted for a lake in the ecoregion since 1993.
- A shallow wetland, deepened and reshaped, noticeably improved wetland wildlife, fish spawning and wetland water quality.
- Carp are suspected of contributing to high nutrient levels in the lake, and installation of a fish trap helped in 1998. More recent years have seen less carp removed.

Financial Information

The Diamond Lake Rehabilitation Project entered the implementation phase as a CWP project in 1997. The project sponsors and other groups involved were awarded \$49,000 in grant money and matched that more than one-to-one with \$85,353 in cash and in-kind services.

For more information about the Diamond Lake Rehabilitation Project, contact:

Jeff Bredberg
Kandiyohi County
(320) 231-6288



Nuisance conditions produced by curly leaf pondweed were reduced dramatically.

Little Cottonwood River Restoration Project

The Little Cottonwood River watershed is located in south-central Minnesota, covering parts of Cottonwood, Brown and Blue Earth counties. It flows into the Minnesota River. The diagnostic study of the river concluded that nonpoint source pollutants, specifically sediments, nutrients (nitrogen and phosphorus) and fecal coliform bacteria, have impaired water quality in the river.

Using water quality data, watershed assessment information and research results, the Brown Nicollet Cottonwood Water Quality Joint Powers Board established goals of reducing pollutants to the river by 25 to 50 percent within the three-year project span.



An estimated 2,000 acres of land was enrolled in the CREP program through the watershed project.

Page 40

Implementation consisted of tasks organized under six goals:

- Administration, to include promoting upgrading and replacement of inadequate septic systems.
- Inventory of the watershed and mapping of priority areas.
- Planning, regulation and ordinances.
- Monitoring and data collection.
- Land and water treatment.
- Information and Education.

The Conservation Reserve Easement Program (CREP) has been a very important conservation tool for this project. Nearly half of the CREP easements in Brown County have taken place in areas of the Little Cottonwood River watershed that are marginal for farming. Future efforts will concentrate on other best management practices.

Minnesota Pollution Control Agency

Other initiatives undertaken as part of the project:

- Providing alternatives to tile intakes. Approximately 25 open-tile intakes have been replaced with rock inlets or close pattern tile draining in the headwaters of the watershed.
- Nutrient management. Project staff are working with livestock producers to develop field record-keeping systems and procedures for properly crediting nutrients found in manure and soil, demonstrating ways to increase profits and protect water quality.
- Two producers will participate in the Center for Agricultural Partnerships on farm N-rate demonstration. With the use of yield monitors and GPS units, the corn producers will conduct a small-scale, statistically valid field trial to help them determine which nitrogen rate is the most profitable for their farms.
- Low-interest loans for septic system upgrades were made available to watershed residents.
- Feedlot relocation and buffer strip project is assisting a dairy farm implement best management practices.



Results that Count

- An estimated 2000 acres of land have been enrolled in the Conservation Reserve Easement Program (CREP) through the watershed project. Almost half of the CREP easements established in Brown County are on marginal areas of the Little Cottonwood River watershed.
- 25 open tile intakes have been replaced with rock inlets or close pattern tile drainage at the headwaters of the watershed.
- Two corn producers will undertake a small-scale, statistically valid field trial to determine (and demonstrate to others) what the most productive nitrogen rate is for crops.
- Eight septic systems (and several more planned) were installed or upgraded.

Financial Information

The Little Cottonwood River Project started as a CWP resource investigation in 1997 with \$102,000 in grant funds. The partners completed their project in 2001 and contributed \$52,000 in cash and in-kind resources.

For more information about the Little Cottonwood River Restoration Project, contact:

Kevin Kuehner
Brown Nicollet Cottonwood Water Quality Board
(507) 934-4140

Duck Lake Implementation Project

The Duck Lake subwatershed is located in the Middle Minnesota River Major Watershed within Blue Earth County.

The Duck Lake Water Quality Improvement Project began with a diagnostic study funded in 1990 and completed in 1994. The implementation project is sponsored by Blue Earth County with the following contributing sponsors:

- Duck Lake Preservation Association,
- Duck Lake Implementation Steering Committee,
- Blue Earth County Soil and Water Conservation District,
- Minnesota Extension Service,
- Department of Natural Resources, and
- The Water Resources Center at Mankato State University.

The project goals included:

- Reduction of pollution loading from nonpoint sources through the use and implementation of best management practices;
- Inspections and assistance to feedlot operators within the watershed;
- Evaluation and improvement of wastewater treatment in the watershed, as well as education of residents about wastewater treatment issues;
- Reduction of internal nutrient loading of Duck Lake through aquatic macrophyte management;
- Promotion of public awareness about water quality issues; and
- Monitoring the plan's effectiveness.

Implementation of best management practices proved difficult over the duration of the project. One livestock facility with significant impacts on the watershed was budgeted for improvements, but the facility ceased operation. Funding was shifted to a study of the feasibility of a more centralized wastewater treatment for lakeshore residents, but to date, no significant improvements have been made.



Educational aspects of the project were quite positive. Both agricultural and lakeshore landowners received high-quality information about nutrient management, conservation programs, wastewater treatment and aquatic plants.

Native plant populations increased during the project period. It is difficult to say whether nutrient loading reductions, transplanting, or other factors promoted this change, but it is a very positive outcome.

Financial Information

The project sponsor was awarded \$40,167 in grant funds. The grant from the CWP program was more than matched by the local project participants with \$71,745 of in-kind and financial contributions. Substantial in-kind contributions were provided by the Duck Lake Association and Blue Earth County.

Native aquatic plant populations appeared to increase during the project period.

Lake Margaret Watershed Project

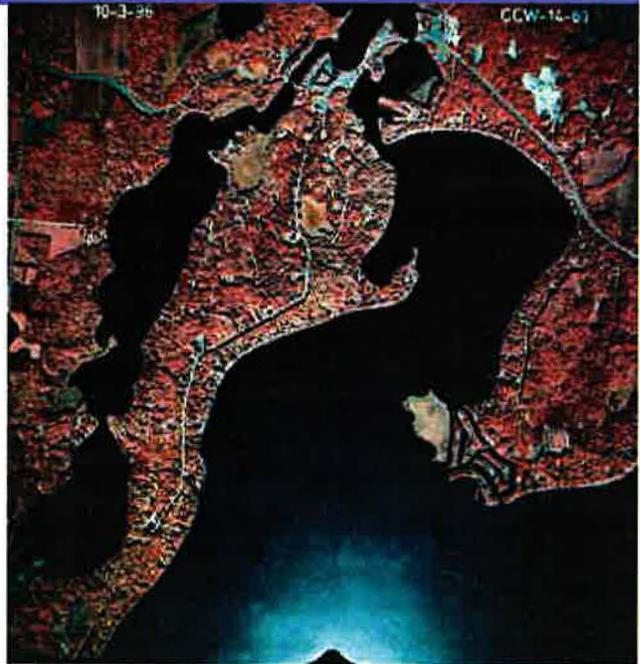
Lake Margaret is located in north-central Minnesota in the City of Lake Shore in Cass County. The lake is 217 acres in size, with a maximum depth of 26 feet. The watershed area is 18,340 acres, with forested land as the primary land use.

Lake Margaret is the first lake draining into the larger Gull Lake and Home Brook watershed. It is first to experience nutrient loads from the Home Brook watershed. Shoreland residents noticed a decline in the quality of lake water, as evidence by decreased clarity, increased weed growth and sedimentation. The City of Lake Shore and the MPCA concluded that a diagnostic study of the lake was warranted.

Since the award of the Clean Water Partnership grant in 1997, problems have plagued the project. Because of these circumstances, the partners have not completed a diagnostic assessment of Lake Margaret, although some actions taken to date are described here. The City of Lake Shore has canceled the contract with the MPCA, with no renewal expected.

Among the activities undertaken during the grant period are:

- Monitoring lake chemistry at two primary sites on three occasions for total phosphorus, total nitrogen, total suspended solids, alkalinity, chloride, color, pH and chlorophyll a.
- Sediment sampling.
- Monitoring with a Hydrolab for Secchi transparency, temperature, dissolved oxygen, pH, conductivity, redox potential and depth.
- Monitoring five stream sites in the Home Brook watershed for inflow to Lake Margaret.
- Inventory and maps of current land use.
- Home Brook watershed invertebrate analysis.
- Aerial flyover of the lake and watershed.
- Construction of a livestock wintering/watering demonstration.
- Establishing a water quality library.
- Survey of past and current fishery characteristics of the Lake Margaret/Home Brook watershed fishery.
- Survey of Lake Margaret's aquatic vegetation or macrophytes.



Information and data collected during sampling and analysis has been provided to the MPCA, for possible future diagnostic use.

Financial Information

In 1997, CWP implementation funds were awarded to the Lake Margaret Watershed Project in the amount of \$37,106. The local project sponsor and partners matched those grant funds with \$46,303 in cash and in-kind contributions.

For more information about the Lake Margaret Watershed Project, contact:

Teri Hasting
City of Lake Shore
(218) 963-2148



Project sponsors monitored with a Hydrolab for Secchi transparency, temperature, dissolved oxygen, pH, conductivity, redox potential and depth.

Lake Shetek Area Watershed Improvement Project

Sediment and nutrient loading are the two of the main sources adversely affecting water quality in Lake Shetek, an important natural resource in Murray County. The Lake Shetek Area Watershed consists of agricultural and residential areas, both of which contribute to water degradation.

Agricultural runoff carrying sediments and nutrients to the lake, as well as lakeshore residences with failing individual sewage treatment systems (ISTS), excess lawn fertilization and poor shoreline stabilization, are the focus of the improvement project.

The goals of the Lake Shetek Clean Water Partnership are:

- To reach out to agricultural producers to encourage conservative land-use practices that enable agricultural productivity while maintaining healthy surface and ground water and
- To reach out to lakeshore residents to promote proper shoreland management, as well as to remedy the failing and substandard ISTS.

Among the strategies of the Lake Shetek Clean Water Partnership are:

- Nutrient management demonstration plots to illustrate that crop yields do not improve with application of commercial fertilizer, leading to nutrient management plans for landowners.
- Loans for septic system upgrades.
- Shoreline stabilization projects for properties with erosion or runoff into Lake Shetek or contributing streams.

In 2001, water quality samples were collected on six separate occasions from Lake Sarah, Lake Shetek, and three Lake Shetek inflow streams. The analysis shows a surprising reverse in a trend of decreased phosphorus levels in Lake Shetek from 1994 to 2000. Only one inflow stream showed a decrease in total phosphorus, and none of the water bodies monitored showed a decrease in soluble reactive phosphorus.



Lake Sarah is one of the water bodies included in the Lake Shetek Watershed improvement project.

However, the monitoring data will now be coordinated with information regarding changes in land use, watershed characteristics, and other factors to assess the data.

The two agricultural demonstration project results supported the assertion that commercial fertilizers do not necessarily increase crop yields. The results on the Lingen site shows yield in bushels/acre for increasing levels of commercial fertilizer use.

Treatment (lbs. of NH ₃)	Yield (Bu/acre) 2000	Yield (Bu/acre) 2001
0	170	172
50		165
100		173
150		177

The Schwartz site illustrated the effectiveness of fall manure application versus spring manure application – a yield of 170 bushels (Bu)/acre for the former, 158 Bu/acres for the latter.

Other activities included:

- Violations of the Wetland Conservation Act noted in the watershed were turned over to local enforcement.
- The project resource committee discussed abandonment of the Beaver Creek water diversion structure and dam, which increased overflow of Beaver Creek with the Department of Natural Resources.

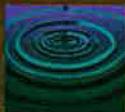
- A major portion of shoreline along Currant Lake was stabilized and rip-rapped this fall.
- Signs, newsletter articles, and special events helped the project gain visibility and enhance public involvement.

For more information about the Lake Shetek Watershed Area Improvement Project, contact:

Chris Hansen
Murray County Environmental Services
(507) 836-6148, ext. 166

Financial Information

The Lake Shetek Area Phase II project was a large and ambitious CWP implementation project begun in 1997. The project sponsor and local partners received just under \$100,000 in grant funds and matched it with funds and in-kind contributions totaling \$1,037,699, a **more than 10 to one match**.



Results that Count

Results from pilot plots demonstrated that local soils fertilized with applied manure did not need commercial fertilizer applications to achieve optimal yields. In addition, the efficacy of fall versus spring manure application was affirmed. Both of these projects will speed the development of nutrient management plans for other agricultural settings.

The project completed 19 shoreline stabilization projects and 13 ISTS repairs or upgrades. Awards made in 2001 included \$71,000 in loans to upgrade or replace failing septic systems and inspections of all ISTS in the watershed district.

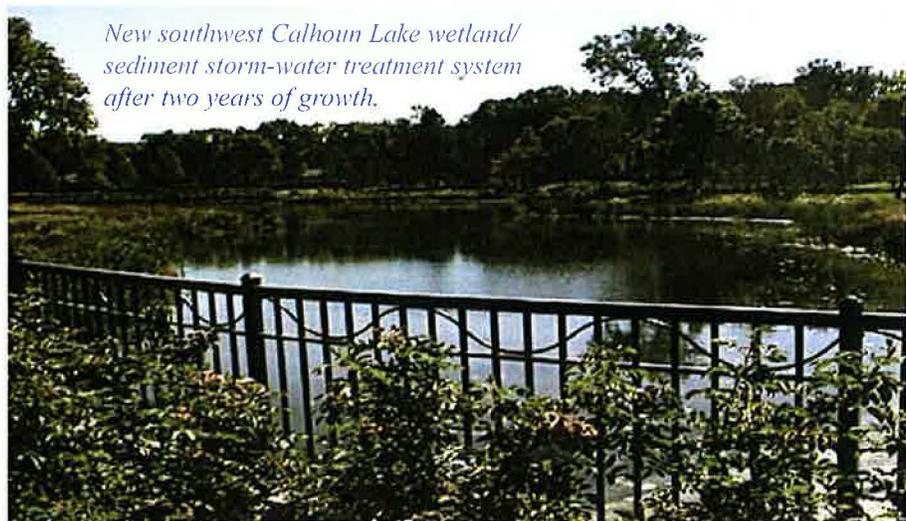
Monitoring results have not yet been collated with land-use and watershed characteristic information. However, the 2001 monitoring report show increases in total phosphorus and soluble reactive phosphorus. This reverses a trend showing decreases from 1994 to 2000. Further data analysis may reveal the reasons for this anomaly.

Minneapolis Chain of Lakes Clean Water Partnership

Called simply “the Lakes” by Twin Cities Metro area residents, the Minneapolis Chain of Lakes draws more than 5.5 million visitors annually. However, decades of intense use and urban development have slowly degraded the lakes’ water quality.

The Chain of Lakes Clean Water Partnership has been a ten-year initiative, one of the largest urban lake restoration projects in the nation. The Chain of Lakes watershed project covers approximately 7,000 acres. It was funded by the city of Minneapolis, Minnehaha Creek Watershed District, Minneapolis Parks and Recreation Board, city of St. Louis Park, Hennepin County, and the Minnesota Pollution Control Agency.

Water quality has improved both visibly and statistically in Cedar Lake, Lake of the Isles and Lake Calhoun. The efforts undertaken during the partnership will reap continuing improvements to the entire chain of lakes.



New southwest Calhoun Lake wetland/ sediment storm-water treatment system after two years of growth.

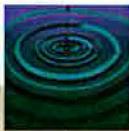
Strategies for improving the Chain of Lakes water quality have included:

- Improved street sweeping efficiency and practices;
- Better management of storm-water runoff through trapping pollution-laden sediment and creating two wetland and storm-water pond systems;
- Reductions in algae growth through alum treatment and storm-water management;
- Increased public awareness;
- Pollutant monitoring and tracking;
- Stepped-up enforcement efforts and new regulatory controls;
- Managing wildlife wastes; and
- Restoring shorelines.

For more information about the Minneapolis Chain of Lakes Clean Water Partnership Project, contact:

Sara Aplikowski

City of Minneapolis Parks and Recreation
(612) 370-4900



Financial Information

The Minneapolis Chain of Lakes Project was one of the largest and most ambitious projects undertaken in the Metropolitan area. The last implementation phase of this project was begun in 1997 with a \$250,000 grant from the CWP program. In total, the contributions of the many partners in this project came to \$3,378,200 in cash and in-kind services.

Results that Count

Water quality has improved both visibly and statistically in Cedar Lake, Lake of the Isles, and Lake Calhoun. The project followed three water quality measures: lake transparency (clearer is better); total phosphorus (lower numbers are better); and concentration of chlorophyll-a (more chlorophyll-a means more algae).

These results have clearly demonstrated that the \$12 million implementation project (using \$1.25 million in state and \$0.25 million in EPA 319 funding) has improved water quality and is creating a healthy, sustainable environment for recreation on and around these important lakes.

Widely recognized for its success in improving an urban watershed, the Chain of Lakes Clean Water Partnership has received several awards and honors, including:

- CF Industries 2000 National Watershed Award;
- 2001 Governor's Award;
- 2001 Minnesota GREAT Award;
- 2001 Minnesota Environmental Initiative Award; and
- Minnehaha Creek 2001 Watershed Partners Award.

Lake Minnie Belle Restoration Project

Lake Minnie Belle is located approximately 6.5 km south of Litchfield, Minnesota. The lake's area is 226 acres and is 14 meters deep, with a shoreline of 6.6 km.

The Lake Minnie Belle watershed is divided into six subwatersheds, five of which discharge to other waters. Land use around the lake include agricultural and residential impacts.

The lake's average summer phosphorus concentration places it in the 90th percentile range, when compared to other lakes in the region. Lake-user

perception indicates a reduction in water transparency and fishery, as well as an increase in algae and aquatic vegetation.

The diagnostic study of the lake recommended five remedial alternatives to improve the lake's water quality, including:

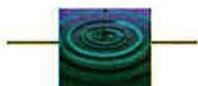
- Wetland restoration,
- Watershed best management practices, including erosion and sediment reduction, conservation tillage systems, buffer strips, grassed waterways and outlets,

nutrient management and conservation land retirement

- Shoreland best management practices and education, including proper care of lawns and gardens, soil erosion, fertilizers and pesticides, yard waste disposal, minimizing runoff, limiting impacts of recreation, preventing introduction of exotic species, maintenance of shoreland and septic systems and environmental education for local schools,
- Septic system improvements, including mitigation of septic leachate and septic system loan program, and
- Water quality monitoring, including in-lake and stream flow chemical and physical parameters, precipitation and water level gaging.

During the grant period, the partners took a number of actions to achieve lake improvement, including:

- Finding an alternative to wetland restoration that eliminated flow from a farm milk house;
- Constructed a new lake wetland outlet with 42-inch culvert under a road with 72-inch diameter inlet drop;
- Negotiated with farmers about erosion control plans;
- Leased 10 acres of land for 10 years to be placed in the Conservation Reserve Program;
- Purchased 17 acres of highly erodable agricultural land and deeded it to Meeker County;
- Conducted lakeshore cleanups in 1997, 1999;
- Held a lawn care and aqua-scaping workshop, and septic system workshop;
- Entered into agreements with five lakeshore homeowners to have their shorelines restored;
- Replaced or upgraded 10 individual septic systems; and
- Monitored stream and in-lake water quality, including Trophic State Index, dissolved oxygen, temperature and stream flow.



The project purchased 17 acres of highly erodable agricultural land on Lake Minnie Belle.

Results that Count

Overall, in-lake data from three years has indicated little to no change in Lake Minnie Belle's mesotrophic state. There were two notable points of interest:

The measured in-lake total phosphorus concentrations may be on the rise.

High concentrations of sediment and total phosphorus in the stormwater runoff samples.

Taken in concert, an increase in total phosphorus may be inevitable, at least in the short term.

Financial Information

In 1997, the Lake Minnie Belle Restoration Project received CWP implementation loan funds in the amount of \$64,705 and \$76,225 in grant funds, for a total of \$140,930 in financial assistance. The project sponsor, Meeker County and other members of the partnership contributed \$151,610 in cash and in-kind contributions.

For more information about the Lake Minnie Belle Restoration Projects, contact:

Paul Virnig
Meeker County Environmental Services
(320) 693-5201



Projects Awarded in 2002

Big Lake Partnership Wastewater Alternatives Study

The Big Lake Partnership Wastewater Alternative Study has received a grant from the state's Clean Water Partnership Program for the current funding cycle. Project partners will develop a work plan; prepare a request for proposal, develop a contract, and select an engineering consultant for the project; provide water quality data to the hired consultant; coordinate with other staff in providing data and managerial oversight for the project; communicate with the other contributing sponsors; prepare mailings and articles on the progress of the project; coordinate a public meeting to discuss the project; and work with the consultant on the final report.

Fond du Lac Nonpoint Source Assessment and Mgmt. Plan

Fond du Lac Nonpoint Source Assessment and Management Plan has received a grant from the state's Clean Water Partnership Program for the current funding cycle. The end product, a tribal Nonpoint Source Management Plan, will complement and enhance the state's and other agencies' nonpoint source management objectives in the region.

Long-term Water Quality Study of Glacial Ridge Surface and Ground Water Systems

The Glacial Ridge resource investigation will guide over 20,000 acres of watershed restoration and establish a monitoring network to document the effects of the restoration on the local flow system and water quality. The project area is located just east of Crookston, on the relict beach ridges of Glacial Lake Agassiz, covering an area of more than 100 square miles. The waters of concern in the Glacial Ridge Project are the Gentilly River, Burnham Creek, the Polk-Red Lake County Beach Ridge Aquifer, and the Red Lake River.

The number of conservation partners involved in the Glacial Ridge Project attests to its significance. Its implementation has the potential to:

- Improve the quality of both surface and ground water;
- Reduce downstream flooding associated with frequent, small storm events; and
- Create outstanding wildlife habitat.

The Resource Investigation phase of the Clean Water Partnership grant would be used to address both site-specific and regional issues. At the site level, a more detailed understanding of the flow system is required in order to carry out this restoration project successfully and address the following concerns:

- The potential for the local water table to rise and inundate neighboring properties still in agricultural production;
- The preservation of unique natural features, such as calcareous fens, that currently occur within the project area;
- Rewetting of drained wetlands may change concentrations of mercury and pesticide metabolites; and
- The requirement that the municipal wells of the City of Crookston be protected in terms of both water supply and quality.

From a broader perspective, the magnitude of this restoration effort and its location in the headwaters of two watersheds provides an unprecedented opportunity to document the water quality and hydrologic effects of restoring the prairie/wetland mosaic to beach ridge areas in the Red River Valley. Such documentation relies upon establishing baseline conditions prior to the bulk of the restoration, tracking 'background' changes unrelated to the restoration itself, and developing a monitoring network that will carry on for several decades.



Indian Creek Improvement Project

Indian Creek is a small stream flowing through agricultural land and the City of Mankato before it reaches the Minnesota River just downstream from the mouth of the Blue Earth River. The Indian Creek Watershed is characterized by agricultural land, parks and trails, rural subdivisions, schools, churches, developing areas of the City of Mankato and about half of the City of Skyline.

Problems include:

- Sediment deposition. This is a serious problem in the watershed as storm water washes large amounts of sediment into the Indian Creek system.
- Bacteria and health. Another issue of concern is possible bacteria in the system that may be a health concern, as people often wade in the creek. The levels of bacteria contamination are unknown. Suspected sources of possible contamination are from urban land uses that may lack effective wastewater treatment.

Strategies developed include:

- Monitor water quality to determine sources and amount of sediment and bacteria in the system.
- Program evaluation. The City's Storm Water Utility Program is just being implemented at this time.
- Education and involvement of project partners. Citizens in the watershed will be aware of the project.
- Dissemination of information. The Middle Minnesota River Watershed Team, the City of Mankato and Blue Earth County are all interested in engaging not only citizens but also cities in the Minnesota River Basin.
- Implementation plan. A plan will be developed to address land use, storm water and reduction of sediment and bacteria, if necessary.

Rush River Assessment Project

The water of concern is the Rush River and its watershed. The Rush River watershed is located in South Central Minnesota in the Lower Minnesota Watershed of the Minnesota River Basin. The counties of Sibley, Nicollet and McLeod have land within the Rush River watershed boundary. The area of the Rush River watershed consists of approximately 262,798 acres.

The Lower Minnesota Watershed is a high-priority major watershed of the Minnesota Basin. It is listed on the 303(d) list of impaired waters.

It is the intent of the project proposers to develop numerical, measurable and achievable short- and long-term goals for the Rush River. The problems of the watershed are excessive levels of fecal coliform, nutrient levels and sedimentation. The diagnostic study of the High Island Creek Assessment Project shows excessive nutrient loading. The trend of excessive nutrients is expected to be similar in the Rush River watershed. Monitoring efforts will show high-priority areas for implementation of best management practices within the Rush River watershed. The lakes located in the watershed are eutrophic prairie lakes. Improving water quality throughout the watershed will improve the quality of water in the lakes.

Sauk Lake Storm and Surface Water Resource Investigation Project

Storm water from urban runoff is believed to be one of the leading contributors to pollution in Sauk Lake. Sauk Centre is almost completely developed and the areas surrounding the lake contain many impermeable surfaces like roofs, parking lots and streets. Consequently, rainwater travels over paved areas, settles in gutters and flows through storm drains directly into the lake. In the process, this storm water quickly become polluted by chemicals, fertilizers and litter picked up while it travels overland.



Sauk Lake has experienced decreasing water clarity, and increased problems with aquatic vegetation and algae growth since the early 1980s. Studies conducted through the Sauk River Watershed District have documented that both basins of Sauk Lake have experienced declining transparency over the past 20 years (average summer secchi reading is 4.7 ft.), with the South basin being more severely affected. It is this South basin that receives surface water inflows from Ashley Creek, an impaired waters on the latest TMDL list and Hoboken Creek, as well as the storm water runoff from the City. Although there is a strong demand for recreational activities, the MPCA has classified Sauk Lake as hypereutrophic and nonsupportive of swimming.

The focus of this project is on storm water runoff and its effect on Sauk Lake. The tasks the city would undertake are as follows:

- Aerial topographical mapping of the city to identify drainage patterns.
- Development and mapping of all storm drainage districts within the city using a Geographic Information System.
- Monitoring and GIS modeling to assess what and how much surface water discharge and pollutants are going into Sauk Lake from each storm drainage.
- Identification of those districts that have the greatest impact and are in immediate need of attention.
- Creation of a local water plan, consistent with the Watershed District Plan for the city to protect Sauk Lake.
- Identification of which best management practices to employ to improve storm water quality and promote education.
- Development of ordinances and regulations.

On a broader scale, Sauk Lake has a significant influence on the Sauk River and ultimately the Sauk River Chain of Lakes and Mississippi River. It is a flowage lake of the Sauk River and lies within the boundaries of the Sauk River watershed which is an important component of the Upper Mississippi River

Basin. Sauk Lake is of statewide significance, as the water quality of the lake is identified as impaired and is on the latest state TMDL list, along with the Sauk River and Ashley Creek.

It is very likely that this project will serve as a demonstration for water quality improvement and provide useful information or examples for local, regional or state efforts for nonpoint source pollution control.

Nutrient Reductions to Improve Lake Detroit Water Quality

Detroit Lake is 3,089 acres within the City of Detroit Lakes, in Becker County, Minnesota. A borderline mesotrophic, general development lake, it has experienced over the past several years an increase in frequency and severity of nuisance algal blooms.

Detroit Lake was the subject of a 1993-approved Phase I study. The study's water quality goal for Detroit Lake is to maintain maximum trophic state indices below 50. The management plan emphasized anti-degradation measures to maintain and protect fishing, swimming, boating, and fish/wildlife habitat uses and the level of water quality necessary to support those uses. Pollutant reduction recommendations included reduction of episodes of high nutrient loadings from (1) upstream areas in general and (2) the Rice Lake wetland in particular. Also recommended was control of in-lake nuisance macrophyte populations, including special attention to the exotic aquatic flowering rush.

Project partners will be comprised of the Pelican River Watershed, the City of Detroit Lakes, and Lake Detroiters (a 300-member lake association comprised of lakeshore residents). This partnership proposes the following measures to achieve Lake Detroit's water quality goals:

- Treatment to reduce episodes of internal loading from Rice Lake and adjacent wetlands;



- Agricultural BMPs to control feedlot and other agricultural runoff to Rice Lake;
- Further evaluation and treatment to internal loading within Big Detroit Lake;
- Enhanced implementation of urban BMPs;
- Nutrient control through biomass reduction – harvesting exotic aquatic plants;
- Stimulate the adoption of shoreline best-management practices;
- Enhanced monitoring.

Hawk Creek Watershed Project “Green Corridors”

The Hawk Creek Watershed drains 623,424 acres (974.1 square miles) of land. It is unique among the other major watersheds of the Minnesota River in that it is comprised of a main tributary (Hawk Creek) and several other streams that flow directly into the Minnesota River. Hawk Creek originates in the lakes region of Kandiyohi County and flows approximately 65 miles to its mouth at the Minnesota River, located eight miles southeast of Granite Falls.

It is estimated that nearly 98 percent of the original wetlands in the watershed have been drained to increase agricultural opportunities. Corn, soybeans and sugar beets are the primary crops grown in the watershed. Livestock production includes dairy and swine. Twenty-two communities are found in the Hawk Creek Watershed. Six major recreational lakes also lie within its borders. They include Eagle, Long, Foot, Willmar, Solomon and Ringo Lakes. A diagnostic study found sediment and nutrients well over the 50th percentile of the Western Corn Belt Plains Ecoregion. The focus of this application includes implementation efforts in two subwatersheds of Hawk Creek. They are “Middle” Hawk Creek and Chetomba Creek, as identified in the Diagnostic Study.

The main thrust of this effort is to provide financial incentives to landowners to correct and prevent pollution problems.

Three practices are targeted under this proposal. The first is a financial incentive to landowners to enroll riparian areas into perpetual protection programs such

as Reinvest in Minnesota (RIM), conversion of CRP to RIM, and Conservation Reserve Enhancement Program (CREP). Second is agricultural drainage tile intake improvement. This includes installing orifices in the intakes to slow the water flow, removing intakes, replacing them with subsurface tile lines that have the same volume, and buffering intakes with vegetation. Third is ditch bank stabilization.

Also under this proposal, the project staff will build strong information and education efforts with County Commissioners and other technical agency personnel to inform landowners of the environmental issues faced in this watershed and assist in corrective actions. As a result, necessary watercourse protection will continue on a voluntary basis.

Lambert Creek Water Quality Improvement Project

These monies would be used to restore “sheet flow” and natural catchment of waters in Lambert Lake, a previously ditched wetland draining to Vadnais Lake, the final impoundment reservoir for the St. Paul Regional Water Services.

The primary focus of the work plan is to reduce the mass of phosphorus runoff to Vadnais Lake. Long-term statistical analysis has indicated that in order to lower taste and odor episode frequencies to acceptable levels, total P values need to remain equal to or less than 25 micrograms per liter in mixed layer samples from April through September. This should reduce the frequency of chlorophyll (a) concentrations exceeding 20 micrograms per liter, which is the taste and odor nuisance level. In order to achieve the 25 micrograms per liter management goal, Lambert Creek P loads need to be reduced as much as 50 percent.

Modeling efforts strongly indicate that significant water quality improvements to Vadnais Lake will not occur until there is a reduction in the P load from Lambert Creek. Lambert Creek provides the best opportunity to improve water quality in Vadnais Lake, due to the relatively small scale of the watershed.

The primary strategy calls for construction of a control structure on the outlet in order to impound water. It is hoped that with innovative engineering



methods, water can be dispersed over the wetland area and away from the existing ditch, without the need for an impoundment structure. Techniques utilizing flow dispersion via networks of channels and small ditches are currently being used in the Florida Everglades region as a means of “un-ditching” water and utilizing the natural wetland area. This would still allow for natural wetland functions of infiltration, evapotranspiration and decreased overflow velocities, without massive excavation efforts.

Blue Earth River Watershed Project (Lily & Center Creeks)

The Blue Earth River Watershed is one of 12 major watersheds of the Minnesota River Basin covering a total area of approximately 992,034 acres, 775,590 acres in Minnesota and 216,444 in Iowa. The project area proposed is the Blue Earth River Watershed with priority management areas of Lily Creek and Center Creek subwatersheds.

Lily and Center Creeks were chosen for several reasons:

- 1996 Phase I Diagnostic Report results showed these subwatersheds ranked in the top three for Total Suspended Solids (TSS) Flow Weighted Mean Concentrations (FWMC),
- Center Creek is a Total Maximum Daily Load Project (TMDL) for ammonia and bacteria,
- Environmental Quality Incentive Program (EQIP) Conservation Priority funds are available,
- both are upstream subwatersheds, and
- stream inventories have been completed.

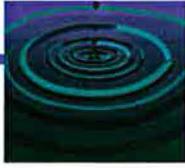
The 1996 data is of historical significance, depicting a detailed “snapshot” in time of the water quality in the Blue Earth River Watershed. According to the data collected in the Blue Earth River subwatershed, it is also one of the top three for TSS FWMC levels. However, steeply eroding banks and economic feasibility complicates project success in this subwatershed. In addition, it is thought that by tackling upstream watersheds first, downstream watersheds will likely see improvements.

A goal for the Lily and Center Creek subwatersheds includes the reduction of sediment by 40 percent or 3,381 tons per year. TSS concentrations will be reduced by targeting sediment reduction practices to identified areas using Geographic Information System (GIS) data from the Diagnostic Study, recent stream inventories, and one-on-one landowner interviews. The sediment reduction goal will also be reached by maximizing existing programs during this project. By targeting sediment for reduction, other nonpoint source pollutants often yield similar reductions. However, to accomplish pollutant reduction, other goals must be achieved such as uniting local people and agency staff to engage in local conservation practices through implementation, education efforts and continued and increased monitoring.

The Lower Maple River Watershed Project

The lower reach of the Maple River meanders approximately 51 miles through Blue Earth County before it joins the Le Sueur River. The riparian corridor is generally wooded, with areas subject to erosion. Some land is threatened by bank erosion or flooding. The primary land use is agriculture, both livestock and corn/soybean rotation. This watershed is densely populated with hog confinement operations. Based on 2000 U.S. Census data, the human population is estimated at 2,085, with half living in one of the three small municipalities located in the watershed. Recreational activities such as canoeing and fishing are common along some stretches of the river. However, fishing habitat is scarce in many reaches and fallen trees make canoeing difficult in other areas.

Water quality data collected in Phase I Clean Water Partnership in the Le Sueur River watershed showed that the lower reach of the Maple River, when compared with other subwatersheds, was a significant contributor of Total Suspended Solids (TSS), Total Phosphorus (TP), Nitrate Nitrogen (N-NO₃) and turbidity. The Clean Water Partnership data also shows that Lower Maple River exceeds the 75th percentile for TSS, TP, N-NO₃ and turbidity compared to water quality standards for minimally impacted streams in the Western Corn Belt Plains Ecoregion. The lower reach of the Maple River is affected by fecal coliform



bacteria counts exceeding the standard for surface water.

Target areas will be selected within this watershed. The 1,200 feet adjacent to the Maple River will be an area of focus. Using GIS and modeling provided by the MPCA, additional target areas will be selected in at least two, smaller subwatersheds. The goals will be to reduce sediment, phosphorus, nitrate, nitrogen and fecal coliform bacteria by 25 percent. To accomplish these pollutant-reduction goals, other efforts will be needed to unite local people and agency staff to engage local citizens in conservation practices through education efforts and monitoring.

Middle Sauk River Rehabilitation Project

Sediment and nutrient loading has impaired lakes on the lower reaches of the Sauk River. These lakes receive the brunt of pollutants being delivered downstream by the river. The Sauk River winds through the heart of productive agricultural communities, which subjects these lakes to potential agricultural runoff. Over the years, increased nutrient loading to the Sauk River has resulted in advanced cultural eutrophication in these lakes.

In addition to the eutrophication process, health issues related to nonpoint source pollutants are also a concern. Nonpoint source pollution from septic systems and farming practices presents potential water quality problems, in addition to point-source contributions from communities and industries in the watershed. The increasing rate of riparian development along the Sauk River (and the Sauk River Chain of Lakes) has prompted concern over the direct, cumulative contributions of on-site septic systems and lawn fertilizers to the water quality of the Sauk River and the Chain of Lakes.

Two studies conducted in 1982 (MPCA's) and 1989 (Wenck & Assoc.) identified the Sauk River as the major (89+ percent) contributor of phosphorus loading to the Sauk River Chain of Lakes, which have been classified as hypereutrophic (overly enriched with nutrients). Without corrective actions within the Sauk

River Watershed, degradation can be expected to continue, which will have negative economic impacts to the local communities, especially the cities surrounding the Sauk River Chain of Lakes.

The Middle Sauk River Rehabilitation Project will focus efforts in the agricultural community:

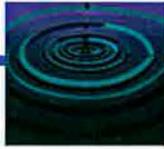
- Address priority feedlots within the watershed, particularly the major tributaries to the Sauk River.
- Work with the agricultural community to address erosion along ditches, creeks and the Sauk River.
- Enhance the current monitoring program to determine project effectiveness and mark progress toward achieving long-term water quality goals.
- Address rural septic systems, especially where drain fields are attached to agricultural drain tiles.
- Work with the agricultural community on land-use BMPs to reduce runoff and protect area surface waters.
- Enhance education programs to increase awareness of water quality concerns.
- Provide data to local and state agencies for future management decisions.

Osakis Lake Watershed Management Project

At the Sauk River headwaters lies Osakis Lake, which is a large and highly popular recreational lake located in central Minnesota. As the largest lake in the Alexandria – St. Cloud area, this lake is highly sought for fishing and recreational uses. The City of Osakis is greatly affected by economic gains (or losses) from the tourist industry.

The primary focus of the project is to prevent the lake from further degradation and to improve or maintain its current condition by addressing the water quality concerns within each subwatershed. Maintaining Osakis Lake water quality has a significant impact on the local area's economic diversity. Improving water quality has positive effects on property values, recreational opportunities and jobs created in the local economies.

Water quality monitoring of Osakis Lake and its tributaries has shown that the total phosphorus levels have declined, however the current concentration levels



still remain higher than the goals, especially in the Faille Lake subwatershed. Further efforts are needed to improve and protect the current water quality of Osakis Lake. The following efforts are proposed:

- Address three priority feedlots (particularly a full abandoned manure pit) on the upper reaches of Faille Lake.
- Work with the City of Osakis to develop environmental ordinances (i.e. urban lawn care), assist residents regarding urban BMPs and address storm water discharge issues affecting Town Bay (south end of the lake).
- Continue to address the JD2 subwatershed to further reduce sediment loading to Osakis Lake.
- Continue shoreland restoration via education, cost share and demonstrations using biological restoration.
- Continue monitoring to determine project effectiveness and to mark progress toward achieving long-term water quality goals.
- Continue to pursue 100 percent compliance in septic system upgrades within the watershed.
- Enhanced education programs to increase awareness of water quality concerns.

Seven Mile Creek Watershed Project

The results of several years of monitoring indicate that Seven Mile Creek contributes high levels of sediment, nitrogen, phosphorus, and bacteria at its outlet to the Minnesota River relative to much larger watersheds in the Minnesota River Basin.

Project partners will attempt to accomplish the following reductions:

- Nitrate-nitrogen-40 percent
- Phosphorous-40 percent
- Total Suspended Solids-25 percent
- Fecal Coliform Bacteria-Levels below 200 col./100 ml

Partners will accomplish these goals by working together with local, state and federal agencies, local businesses, farmers, and citizens of the watershed. To

achieve this, the project will increase understanding of detrimental practices, and facilitate the adoption of best management practices specifically designed for the agro-ecoregion. The BMPs selected for the watershed fall into four categories:

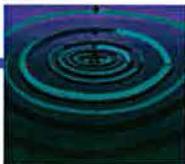
- Nutrient management,
- Vegetative practices,
- Primary tillage systems, and
- Structural practices.

In addition to lowering pollutant loads, this project will use a variety of demonstrations to prove to area residents and fertilizer dealers that environmental improvements do not require economic sacrifice, thus ensuring long-term change. For example, to reduce “insurance” nitrogen applications, the project will coordinate with private agronomists and fertilizer dealers to establish economical optimum nitrogen rate demonstrations on farmer’s fields.

The Seven Mile Creek Watershed has become a laboratory with exciting research projects including: University of Minnesota School of Public Health E. coli study, Red Top Farms, a U.S. Department of Agriculture and University of Minnesota Paired Watershed Project, proposed McKnight Foundation support through a special wetlands project, a new sediment and nutrient delivery modeling program, and Department of Natural Resources Environmental Partnerships grant. These collaborations, coupled with on-land improvements proposed in the implementation plan, guarantee that project financial resources will be maximized. Promoting and accelerating already existing state and federal conservation programs, such as the new pilot Farmed Wetland Program and CREP, to secure wetlands and water storage within the watershed are paramount in the implementation plan of Seven Mile Creek.

Springbrook Subwatershed Implementation Project

The water of concern is the wetland within the Springbrook Nature Center, located in the City of Fridley. This is state-protected Public Water 2-688P. It is a type 4 wetland of 37 acres. The wetland receives



storm water runoff from approximately 2,500 acres of land in the Springbrook watershed. This land area includes portions of four different cities -- Blaine, Coon Rapids, Fridley and Spring Lake Park. Water draining from the wetland enters the Mississippi River after traveling approximately ¾ of a mile through the remaining natural portion of Springbrook Creek. Only one-half mile downstream is the St. Paul Water Supply intake, and the Minneapolis water supply intake is three miles downstream.

The reason why the Springbrook wetlands are a water of concern is that emergent vegetation has rapidly disappeared in a short time frame. There was an 8.5 acre loss in emergent plant vegetation cover from 1989 to 1997. There has also been a decrease in plant and aquatic invertebrate diversity. Water quality has diminished with an increase in algae. The recreational value of the wetland has been severely reduced by the changes in appearance and ability to provide adequate wildlife habitat. Entire species, like yellow-headed blackbirds, that used to be regularly viewed in the wetland have completely disappeared.

Since the wetlands are a part of a regionally-significant, 127-acre municipal nature center, the environmental health of the wetland complex is critical to the region for providing natural habitat for many species of waterfowl and animals. The health of the wetlands is also important for water quality protection of the Mississippi River, as far as the wetland's ability to filter storm water runoff.

The CWP Phase I Resource Investigation monitoring showed that large volumes of storm water with fairly high pollutant loads were coming into the wetlands from two of the five inlets into it. The most problematic inlet is the east inlet. This inlet carried about 45 percent of the storm water volume coming into the wetlands, yet only covers 10 percent of the watershed. There was rapid bounce levels during even minor storm events, and readings for phosphorus, nitrogen and total suspended solids was highest at this site. The northwestern inlet into the wetlands had the highest flow readings, but showed moderate readings for phosphorus and suspended solid concentrations.

As a result of this information, implementation

strategies are being focused on the northwestern inlet and, primarily, the east inlet. Various opportunities to infiltrate storm water on site are going to be further analyzed. Low impact development storm water detention options like rainwater gardens, porous pavement, storm chambers, or roof top gardens are expected to be the most cost effective means to accomplish this goal of reducing storm water pollutant loads and bounce levels so that the wetland habitat can be restored.

The overall goal of this implementation project is to restore the Springbrook wetland ecosystem by reestablishing a 66:33 emergent plant/open water balance. The objectives for reaching this goal are:

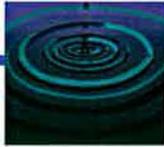
- Restore vegetation within the Springbrook Nature Center wetlands.
- Reduce storm water flows and improve water quality into the Nature Center wetlands complex.
- Modify water flows into and within the Nature Center to increase storm water infiltration and reduce erosion.

The goal is to reduce storm water runoff rates to 1988 levels.

BERBI Nonpoint Source Accelerated Implementation

The water of concern is the Blue Earth River and its tributaries, which include the Watonwan and LeSueur Rivers. This watershed area is approximately 20 percent, geographically, of the Minnesota River watershed, yet it contributes more than 50 percent of the pollutant load (sediment, nitrogen, phosphorus) to the Minnesota River. Several reaches are listed on the State's TMDL 303[d] List of Impaired Waters. This region is also identified as an area of high priority for nitrogen contributions to the hypoxia condition in the gulf.

This project plans to accelerate this implementation of conservation practices that address nonpoint source pollution within the greater Blue Earth River system in order to meet Minnesota Watermarks 2000 objectives, TMDL goals and hypoxia reduction goals. The Blue Earth River Basin Initiative (BERBI) has an established



system of delivery for implementation projects and experience working with member SWCDs to get conservation practices on the land effectively and efficiently. There are four main components to this proposal that are outlined below:

- Accelerated implementation of agricultural BMPs – BERBI is requesting funding for accelerated implementation of BMPs that are proven and effective in reducing nonpoint source pollution.
- Innovative easements – Funds would be used to purchase 30-year easements to take critical areas out of annual row crop production and put them into perennial vegetation.
- Ag waste pit abandonment training and demonstration – This proposal would build off the work that has been done in Barron County, Wisconsin, on the abandonment of earthen basins.
- Implementation coordination – Coordination of implementation activities within the watershed to build and strengthen alliances among government, the private sector and landowners/operators is critical to the success of nonpoint source pollution reduction within the region.

Projects for Big Sandy Watershed's Future

Since the project's beginning in 1991, the Big Sandy Area Lakes Watershed Management Plan (BSALWMP) has developed innovative projects to protect and improve water quality, wildlife and fishery resources in the Big Sandy Lakes watershed. These projects focused on the main ecological problems and sources of nutrient loading to Big Sandy Lake and other watershed lakes. Recent monitoring continues to indicate that there are areas in the watershed that are in need of improvement. This project will focus efforts on improving conditions, as well as preventing further degradation, by implementing plans that will benefit Big Sandy Lake, as well as Minnewawa and Prairie Lakes and watershed streams.

The goals of this project are to improve and protect water quality, wildlife, fisheries and aesthetic concerns

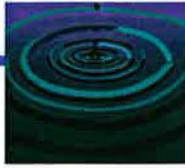
in sensitive areas of the watershed. The group intends to attain these goals with the following projects:

- Conduct a cluster septic system feasibility study for Big Sandy, Minnewawa and Prairie Lakes as an initial scoping effort to determine sensitive areas and potential for these systems.
- Implement a shoreline educational program on Big Sandy Lake that involves an inventory of existing landowners and their shoreland land-use practices, as well as an educational component to improve lakeshore stewardship as outlined in the Minnesota Lakes Association's Sustainable Lakes Planning Workbook.
- Obtain funds or materials for farmers to compensate them for loss of usable land as a result of protecting areas sensitive to water quality impacts.
- Hold several watershed-wide educational presentations from highly qualified research professionals in the following subject areas:
 - Wetlands and their functional relationships to water quality in an altered and natural condition.
 - Stream channel restoration.
 - Shoreline management to improve water quality, wildlife habitat and aesthetics.
- Continue water quality monitoring to develop a long-term database that will explain the effects of wet and dry cycles and to measure the effectiveness of watershed projects.

Best Management Practices Implementation Program

It is the intention of Carnelian Marine Watershed District (CMWD) in Washington County to manage each lake, corresponding shoreland, and contributing subwatershed according to its specific lake management plan.

Basic strategies and goals are to maintain the water quality of the existing high quality/high value lakes, and to improve the water quality of the existing lesser quality/higher priority lakes. Water quality ranges from



exceptional in the three largest lakes to very poor in several of the small lakes. There is one oligotrophic lake, four mesotrophic, seven eutrophic lakes, and eight hypereutrophic lakes. The maximum recommended phosphorus concentration for lakes in the North Central Hardwood Forests (40µg/L) is exceeded in 14 of these 20 lakes, based on the average of summer readings. The CMWD's overall objectives are to protect and improve water quality, to prevent flooding and to protect and improve fish and wildlife habitat. The BMP Program will assist in accomplishing these objectives.

Through various analyses, the CMWD has determined priority sources of pollution to include: lakeshore development runoff, agricultural runoff from cropland and livestock, nonconforming septic systems, and habitat modification.

Specifically this project will:

- Inform landowners of the adverse nonpoint pollution sources that exist on their properties. One-on-one contacts will be made in priority areas to address priority nonpoint source pollution concerns.
- Conduct site investigations and provide landowners with best management practice solutions, along with cost-share incentives.
- Implement BMPs with landowners. Provide ongoing technical and resource support to cooperative landowners.
- Conduct shoreland management demonstrations and BMP site tours for the landowners and citizens of the Carnelian-Marine Watershed District.
- Provide ongoing educational support and project updates to, District residents, the District's Citizen Advisory Committee and participating government agencies, through special meetings, the biannual CMWD newsletter, etc.
- Maintain contact with cooperative landowners and conduct progress inspections at regular intervals.

Red Lake River Restoration and Habitat Improvement Project

The City of Crookston is situated in northwest

Minnesota about 20 miles east of Grand Forks, North Dakota. The Red Lake River flows through Crookston on its way to the Red River of the North. The Red Lake River is an important tributary of the Red River, both in terms of flow contribution and fisheries habitat.

The City of Crookston is undertaking this project to accomplish the following goals:

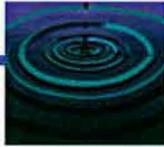
- Correct erosion problems.
- Improve water quality of the Red Lake River.
- Reduce sedimentation, improve clarity and dissolved oxygen.
- Improve fish habitat by removing barriers to fish migration.
- Enhance public safety by removal of a dam hazard.
- Create river recreational opportunities and restore river aesthetics.
- Protect City of Crookston infrastructure (wastewater lines, flood dikes, city park, and existing riverbanks) and residential areas.
- Provide a local example of innovative multi-benefit stream restoration techniques for other communities faced with similar problems and opportunities.

East Branch Chippewa River Implementation

The East Branch Chippewa River is a major tributary of the Chippewa River, which in turn is one of 13 major tributaries of the Minnesota River. The Minnesota River has been identified as the most polluted tributary of the Mississippi River north of St. Louis and is considered one of the 10 most threatened rivers in the nation. The East Branch Chippewa River is therefore a direct contributor to hypoxia in the Gulf of Mexico.

Plans for implementation include the following:

- Buffer strip incentive program.
- Shoreline naturalization.
- Cattle exclusion.
- Biomonitoring.
- Education and information.
- Conservation tillage.



- Managed intensive grazing.
- Nutrient management.

Goals and objectives for this project are based on sampling results, land-use assessments, and judgments about reasonable expectations for rivers and streams in this area of the state. The East Branch Chippewa River carries high sediment and nutrient loads during the growing season from rainfall-driven runoff that occurs throughout most of the watershed. The usefulness and aesthetic qualities of the river are impaired and conditions of the East Branch (and in turn the Chippewa River) are not likely to improve unless changes are made in land-use and water-management practices within the watershed. These changes can be accomplished through an implementation plan that addresses real problems occurring on the land, and clearly identifies solutions while developing sufficient resources to attain success.

In setting goals and objectives, consideration is given to important watershed characteristics. First, agriculture is the predominant land use in the watershed and improvements to water quality will require changes in agricultural practices. This requires education and solutions that are economically viable to the agricultural community. Second, pollutant transport in the watershed is primarily affected by uncontrolled runoff through the many hydrologic pathways present (i.e. the extensive drainage system). Third, the watershed residents, through their involvement and actions, hold the key to protecting and enhancing the East Branch.

Elk Creek Conservation Tillage Incentive Program

A diagnostic study was conducted in 1991. The study determined 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. It was also determined that streambank erosion is very evident at the Elk Creek sampling site and may be a problem throughout the watershed.

The loss of valuable topsoil from erosion, and the resulting sedimentation, continue to contribute to

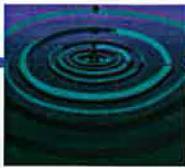
water-quality degradation. These result in nutrient and financial loss for the farm operator.

To address these concerns, it is the intent of this proposal to provide incentives for landowners to continue with and enhance existing conservation tillage practices or implement new conservation tillage practices.

Grazing Management for Trout Stream Improvement

A primary element of achieving water quality and ecological goals, as outlined in the Basin Alliance for the Lower Mississippi in Minnesota (BALMM) scoping document, is to maintain or increase the acreage of permanently vegetated land within the basin. The trend in the basin is toward fewer livestock farmers, which translates to fewer acres of farmland in pasture or hay and more area devoted to row crops. Runoff and soil erosion losses are higher with annually cultivated land. Habitat values are also diminished. Overgrazing of pastures, particularly in riparian corridors, is a major contributor to increased erosion, fecal coliform loading and streambank sloughing.

The objectives of this project are to train service providers to develop managed grazing plans and to properly plan facilitating practices such as fencing, livestock watering systems, and protection of sensitive areas. In addition, workshops will be given to producers to provide them with assistance in development of their managed grazing plans, installation of fences and watering systems, monitoring the condition of pastures, and management of sensitive areas. Many of the training and workshop materials have been developed already for Minnesota, specifically the blufflands region. A network of grazing clubs exists within the project area which will be useful in transferring knowledge throughout the grazing community. Ultimately, this will lead to more acres of properly managed pastures, which will result in increased infiltration of rainfall, reduced soil erosion, reduced nutrient movement to streams, and reduced fecal coliform levels in the streams in the



basin.

The water quality concerns for the project include sediment impacts on trout habitat (turbidity and fine sediment impacting streambeds), fecal coliform levels and nitrate nitrogen levels. Significant reaches of trout streams within the counties included in this project are on the 1998 Impaired Waters List. These concerns may be addressed to a significant degree by the proper management of existing grazing lands and the conversion of annually tilled cropland to permanent vegetation, as required for pastureland. Much of this pastureland is within riparian zones of streams or on adjacent steeply sloping areas where runoff is rapid and delivery to streams is efficient. It is also accepted that the conversion to pasture and the improved management of pasture in the watersheds feeding these trout streams is beneficial to reduction of pollution loading.

A properly developed grazing system can reduce the time that livestock spend in confined situations, reducing or eliminating the need for feedlots. This project will build on, and complement, the major emphasis on feedlots as through the "Targeted Feedlot Runoff Reduction Project" funded through the Section 319 process in 2000.

This project will provide educational and on-farm technical assistance to producers in these four counties. Education/training of local service providers, such as SWCD technicians, is also an important aspect of the project to provide continuing farmer education and technical assistance after the project is complete. Experience to date has shown that many farmers are interested in intensive rotational grazing but lack the confidence to convert their operations. The bottleneck in making this conversion is a lack of one-on-one technical assistance to farmers. This project is designed to relieve this bottleneck in the short term by hiring a grazing lands specialist, and in the long term by building the capacity of the local service providers (SWCD technicians and extension personnel) through training and providing technical consultation on difficult systems. Project deliverables include:

- Rotational grazing plans developed with producers;

- Educational activities that support the development of such plans;
- Transmission of project lessons to other areas in the state, with a high degree of interest in intensively managed rotational grazing.

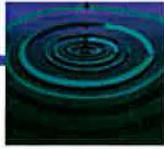
Manure Management within Ecologically Sensitive Areas in Stearns County, Minnesota

The water quality concerns of the public and natural resources managers within ecologically sensitive areas include elevated levels of phosphorus and nitrogen. However, emerging environmental issues, unregulated contaminants, and unknown impacts of manure application and other agricultural practices now weigh heavily in local concern. The key to addressing these issues includes implementation and promotion of BMPs, education and outreach, and local controls (applicable rules and regulations). Local units of government, such as the ESD and SWCD, use these approaches.

This grant application is focusing on livestock operations and landowners located in the designated priority areas. The goals are to further enhance, sustain, conserve, and protect county surface and groundwater resources.

Ecologically Sensitive Areas include Wellhead Protection Areas (WHPA) and Drinking Water Supply Management Areas (DWSMA), designated lakesheds and shoreland areas, lands identified on Minnesota County Biological Survey Maps, Watershed Management Districts, "Special Protection Areas," and areas with coarse-textured soils. Of particular concern are Special Protection Areas according to Minnesota Rules, Chapter 7020 (State Animal Feedlot Rules). Special Protection Areas are lands within 300 feet of all (A) Protected waters and protected wetlands and (B) Intermittent streams and ditches.

Stearns County is a delegated county for the state Feedlot Program. Currently, there are approximately 2,900 livestock operations in Stearns County, with 2,000 of these operations having 300 animal units or less. The remaining 900 operations are between 300 and 999 animal units. Proper manure management



within and near Ecologically Sensitive Areas will lead to enhanced or sustained surface and groundwater quality throughout the County. Minnesota Rules, Chapter 7020, sets forth a number of requirements for the land application of manure within Special Protection Areas. Other areas identified within Chapter 7020 include manure application and process wastewater application within 300 feet of open tile intakes in agricultural fields and near mines, quarries and wells. Other requirements of livestock producers set forth by Minnesota Rules, Chapter 7020 include the following:

- Manure nutrient testing requirements – Manure from all manure-storage areas storing manure produced from more than 100 animal units must be tested by the owner of the livestock operation for nitrogen and phosphorus content in accordance with specific items within State Rules.
- Nutrient application rate standards – Portions of these requirements apply to all manure and process wastewater application sites and to livestock operations with a capacity of 300 or more animal units and manure storage areas capable of holding the manure produced by 300 or more animal units.

Approximately 1,500 livestock producers that are eligible for the Open Lot Certification Program (OLCP) had until October 1, 2001 to reduce Chemical Oxygen Demand (COD) and Phosphorus (P) loading by 50 percent and until October 2010 to reduce COD and P loadings by 100 percent. This will be done by implementing BMPs and pollution abatement structures, which is dependent upon funding via this grant. Stearns County will work towards enrolling livestock producers that are eligible for this program.

This project prevents water pollution related to runoff from livestock operations and agricultural fields.

Targeted Residential Wastewater Treatment Project

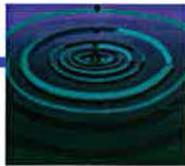
Targeted Residential Wastewater Treatment Project is the second part of a two-pronged strategy to reduce the risk of human illness from excessive levels of fecal coliform bacteria in the streams of the Lower Mississippi River Basin in Minnesota. The first strategy addresses the impact of animal contributions

to bacteria levels by providing assistance in proper feedlot and manure management, as well as a proposed riparian buffer strip initiative that targets manured fields. The second strategy addresses the impact of human sources of bacteria through a combination of education, technical assistance, and financial assistance to owners of failing Individual Sewage Treatment Systems (ISTS). To this end, the Basin Alliance of the Lower Mississippi in Minnesota (BALMM), the Southeast Minnesota Water Resources Board, the Cannon River Watershed Partnership, and the U of M Extension Service have formed a partnership that will involve 12 of the 14 counties in the Basin.

Within the three-year project period, the partnership proposes to double the average rate at which ISTSs are being corrected through local efforts across the Basin from 300 to 600 per year. By 2012, a sustained effort of this magnitude should achieve the desired 60 percent reduction. The project will build on existing local efforts through a target-marketing approach to achieving behavioral change.

The Lower Mississippi River Basin in Minnesota is considered an impaired watershed in need of restoration with regard to several types of pollutants. Among the pollutants found in the surface water is fecal coliform bacteria which exceeded the state standards throughout the Basin in many of the 613 samples taken between 1997-2000. The mean concentration of bacteria in the Basin was shown to be 400 organisms/100 ml or twice the state standard. This concentration is also twice the level used by state sanitarians to determine when swimming beaches will be closed. Fecal coliform bacteria can also be an indicator of the presence of other nonpoint source contaminants in the water. The two major sources of bacteria in the Basin are animal contributions from feedlot runoff and human contributions from failing sewage treatment systems.

This project takes a comprehensive approach to addressing the problems of failing ISTS through public education, technical assistance to unsewered communities, and financial incentives to septic system owners. Each of these approaches is multilayered and designed to accelerate the repair of failing systems while preventing the occurrence of failures in the



future. The project addresses the two categories of failing septic systems which pose the greatest risks to human health – ISTS which are determined to be an imminent public health threat and clusters of homes on ISTS (unsewered communities) where failure of a majority of the systems is imminent.

As part of a comprehensive basin strategy, work toward a 20% reduction in mean concentrations of fecal coliform bacteria in the Basin's streams. This will be done through the targeted repair of 600 failing ISTS that pose an Imminent Public Health threat or are located in targeted watersheds and communities. By the end of the third year of the project, the counties in the basin should be correcting a total of 600 systems that may be imminent public health threats. By sustaining this level of effort, while preventing additional failures, counties in the basin should be able to achieve the longer term goal of a 60 percent source reduction. An additional goal of the project is to engage 20-30 communities (in addition to those currently in process) in the process of seeking a treatment solution.

Dairy Milkhouse Wastewater Treatment Demonstration

The purpose of this proposal is to evaluate and demonstrate effective techniques and/or systems to reduce environmental pollution contained in dairy milkhouse wastewater and disseminate the results to dairy producers in Minnesota. Many small and mid-sized dairy operations in Minnesota handle their manure as a solid and do not have a system to handle milkhouse wastewater that complies with Minnesota Feedlot Rules (Minnesota Rules Chapter 7020). For these operations to become better environmental stewards, to remain economically viable, and to comply with current environmental regulations, they need economical and effective options for handling milkhouse wastewater. The primary audience for this project will be those dairy farmers and advisors in Carver and Wright counties. However, results of the demonstration project will be disseminated to dairy farmers and technical advisors throughout Minnesota. According to the data from USDA, small and mid-sized dairy producers account for about 88 percent of

the total dairy operations in Minnesota, which is obviously a significant audience for this project.

In this project, six types of on-farm milkhouse wastewater handling systems will be considered for evaluation and demonstration:

- septic tank with a bark bed treatment field,
- septic tank with wide trench treatment field,
- short-term storage with land application,
- hydrated lime flocculator with treatment field,
- aerobic treatment unit with rock-filled treatment trenches, and
- recirculation filter with rock-filled treatment trenches.

Northstar NEMO Initiative

Nonpoint source (NPS) pollution from stormwater runoff has been identified as a leading cause of pollution to our waters. NPS pollution is the result of the cumulative, incremental impacts of individual behaviors and local land-use activities. Growth and development generate significant erosion and pollution loads containing sediments, phosphorus, nitrogen, pathogens, heavy metals, hydrocarbons, debris and thermal changes that run off into, and threaten the quality of, our surface waters.

Changing land-use policies is a complex challenge, one that must be met if NPS pollution is ever to be effectively addressed. Land-use decisions are made primarily at the local level by a combination of elected, appointed, and volunteer officials serving on city councils, planning and zoning commissions, environmental commissions, and boards of watershed management units. A number of factors create barriers in educating elected officials and board members on water resource protection, including:

- High turnover rate,
- Lack of adequate technical training and support services,
- Full agenda of responsibilities, and
- Lack of means to follow up and evaluate the impacts of land-use decisions on NPS pollution.

The most effective approach toward reducing NPS is



to address it at the local level, establishing a new focus on “community-based environmental protection.” Educating and assisting these individuals is, in many respects, the bottom line of NPS pollution prevention. This program is an effort to educate municipal officials using commonly available tools and applying them to a local situation.

The first goal of the project is to expand the nonpoint source education program for a targeted audience of local land-use officials that has started in the Twin Cities area. There has been tremendous interest in the program and with the funds provided by this Section 319 grant partners would concentrate efforts on communities within a 100-mile radius of the Twin Cities Metro area. In subsequent funding cycles, the project sponsors hope to expand the program to include the entire state. This program will deliver a message that is endorsed by local and state agencies and is presented in a consistent manner to all audiences. The program will help participants understand the nature of the problem and its impact on their lives, community and natural resources. This education will then enable these decision-makers to plan for growth while addressing water quality through educated land-use decisions.

The second goal of the project is to incorporate the principles that are promoted in the educational message into changes in policies, practices, and plans at the local level.

The third goal of the project is to bring together and develop the relationships among regional and state agencies, water management organization, conservation districts and other associations interested in the protection of our water quality and natural resources through effective land-management decisions. The affiliation of this project with Northstar NEMO Initiative will take advantage of an existing group and its momentum, fueled by cooperative efforts underway elsewhere in the state.

Pond Sediment Characterization

The stormwater pond is perhaps the most common structural management practice used to control and/or treat urban stormwater discharges. Removal and disposal or reuse of accumulated sediment is the primary long-term maintenance activity for stormwater ponds. Relatively high sediment loads are expected during the period required for build-out of a typical development. After removing this initial sediment load, solids may accumulate in the pond for many years. The Minnesota Pollution Control Agency (MPCA) recommends that ponds should be constructed with approximately 25 years of sediment storage. Pond cleaning is thus conducted on an infrequent basis and there is a dearth of data on the quantity and quality of the sediment that is removed.

The purpose of this project is to characterize pond sediments (quantity and quality) in the Twin Cities Metro area and to provide that information to agencies with responsibilities in the areas of public health and water quality. This will be accomplished by collecting and analyzing samples from a total of 10 ponds where the drainage areas have been sized and characterized. The sediment accumulation rate will be estimated for each pond and a number of the physical, chemical and biological characteristics will be quantified.

The project summary report will be shared with all state agencies participating in the criteria survey and all counties and watershed districts in Minnesota. Copies of the full report will be made available as requested. It is anticipated that the summary and full report will be published on the Metropolitan Council Environmental Services Web site. In addition, project results will be publicized in the technical community via local, regional and national conferences. Finally, appropriate news releases and stories will be prepared and distributed to inform the general public about the environmental and public health issues related to sediment handling and disposal.

Small-Group Preparation of Nutrient Management Plans

The University of Minnesota Extension Service and Water Resources Center, in cooperation with the



Minnesota Department of Agricultural, the Minnesota Pollution Control Agency (MPCA), the Board of Water and Soil Resources (BWSR), and the USDA Natural Resources Conservation Service (NRCS) will organize the delivery of county-based small-group plan writing workshops for farmers and agricultural professionals. Following a successful model used extensively in Iowa since 1997, Extension and its partners will work with Soil and Water Conservation Districts (SWCDs), County Feedlot Officers and other agricultural and local groups to invite farmers and professionals to participate. In the workshops farmers will each be assisted in writing a manure and crop nutrient management plan for two fields of their own farms.

The project goals are to improve nutrient and manure management practices by:

- Directly increasing the number of crop nutrient and manure management plans written by farmers and agricultural professionals in Minnesota through a personalized education program, and
- Providing clear access to all necessary information for nutrient and manure management through development of a central Web site.

Upper Mississippi River Source Water Protection Project

The Upper Mississippi Source Water Protection Project (UMRSWPP) will collaboratively develop and implement source water protection plans for many water suppliers on the Upper Mississippi River. This proposed project follows the completion of a Clean Water Partnership Phase I Diagnostic Project involving the St. Cloud, St. Paul and Minneapolis water suppliers, all of whom draw their public water supplies primarily or exclusively from the Mississippi River. Twenty-nine other communities along the Mississippi River that pump from shallow aquifers paralleling the river also participated in this Phase I project. Through this project, source water assessments were or soon will be completed for each of these communities. Source water plans are not required by the Safe Drinking Water Act, but are the logical extension of source

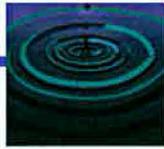
water assessments. The UMRSWPP is a first attempt in Minnesota, and perhaps in the country, to implement source water protection at a watershed level among several water suppliers who share a common source water resource. As such, it represents a model approach for other water suppliers in Minnesota and around the country.

The UMRSWPP proposes several activities to prepare source water protection plans and strategies based on the assessments. These activities include:

- Calculate times of travel for Mississippi River tributaries within the source water assessment areas for the cities of St. Cloud, St. Paul and Minneapolis;
- Conduct a comprehensive contaminant source inventory;
- Identify potential drinking water contaminants for possible addition to Minnesota's Total Maximum Daily Load (TMDL) program and identify and prioritize river reaches and subwatersheds for possible TMDL source water protection projects;
- Prioritize public water supply wells relative to river/aquifer interaction;
- Develop a formal process for recognizing source water protection areas by local, state and federal government;
- Develop and implement education and outreach activities that will support source water protection;
- Develop a structure and process for source water protection for the cities of St. Paul and Minneapolis;
- Coordinate source water protection and wellhead protection with ground water suppliers within the source water assessment areas where land uses may have an adverse impact on the quality of surface or ground water that is used for drinking, including public and private water supplies. Certain source water protection activities, such as monitoring for *Cryptosporidium*, will be proposed for funding from other sources.

This project is focused on several audiences at the local, state and federal levels:

- Community water suppliers and the citizens and businesses they serve;



- Local officials who have knowledge relating to contaminant sources and who have substantial land and water authority;
- State and federal agencies with a program focus on the Upper Mississippi River, including the Minnesota Pollution Control Agency's (MPCA) Upper Mississippi River Basin Planning Program, the Minnesota Environmental Quality Board's (EQB's) Water Unification Initiative, and the U.S. Geological Survey's (USGS) National Water Quality Assessment Program.

This project has been and will continue to be carried out in collaboration with these and other related initiatives. Because the UMRSWPP will contribute to and draw from these programs, there is considerable incentive for cooperation among the entities involved.



Projects Currently Active (listed by year of award)

Project KEY Section 319 Projects in BROWN CWP Projects in BLUE

1996

Project: Heron Lake State Revolving Fund Loans

Sponsor: First National Bank of Brewster
Funding: CWP (Loan), \$444,036 Awarded: 1996
Purpose: Provide funding for best management practices implementation in the Heron Lake Watershed.

1998

Project: Cold Spring Wellhead Protection Partnership

Sponsor: City of Cold Spring
Funding: CWP (Grant), \$100,620 Awarded: 1998
Purpose: Conduct groundwater studies in Cold Spring area, develop joint wellhead protection plan.

Project: Dunns Lake/Richardson Lake Study

Sponsor: Meeker County
Funding: CWP (Grant) \$33,750 Awarded: 1998
Purpose: Determine baseline hydrologic, water quality and ecological information to make remedial decisions.

Project: Lake Francis Diagnostic Feasibility Project

Sponsor: Isanti County
Funding: CWP (Grant) \$16,981 Awarded: 1998
Purpose: Determine baseline hydrologic, water quality and ecological information to make decisions for improvement.

Project: Lake Superior Protection Project

Sponsor: Cook County
Funding: CWP (Loan) \$940,000 Awarded: 1998
Purpose: Provide CWP loan funding to stabilize the Lake Superior shoreline in Lake and Cook Counties.

Project: Square Lake Management Plan

Sponsor: Washington County
Funding: CWP (Grant) \$56,000 Awarded: 1998
Purpose: Identify existing lake conditions and methods to reduce or eliminate threats.

Project: South Branch Root River Watershed Project

Sponsor: Fillmore County
Funding: CWP (Grant) \$61,500 Awarded: 1998
Purpose: Watershed survey/prioritization, karst investigations, surface monitoring and education.

Project: South Zumbro Watershed Partnership

Sponsor: Olmsted County
Funding: CWP (Grant) \$228,510 Awarded: 1998
Purpose: Continue implementing best management practices in the Zumbro River watershed.

Project: Upper Mississippi River Protection Project

Sponsor: City of St. Cloud
Funding: CWP (Grant) \$125,000 Awarded: 1998
Purpose: Identify nonpoint sources of pollution that are threats to drinking water.

Project: Whitewater Watershed Project, Phase II

Sponsor: Whitewater River Watershed Joint Powers Board
Funding: CWP (Grant) \$218,800 Awarded: 1998
Purpose: Provide financial and technical assistance for watershed best management practices and education.

1999

Project: Accelerated Water Quality Improvements

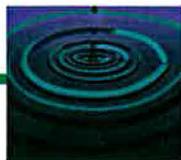
Sponsor: Stearns County SWCD
Funding: Section 319 (Grant) \$200,000 Awarded: 1999
Purpose: Work with agricultural producers located within targeted subwatershed of the Sauk River Watershed on best management practices.

Project: Benefits and Impacts of Chemical Treatment on Lake Inflow

Sponsor: Univ. of Minn. -- Office of Research and Tech.
Funding: Section 319 (Grant) \$81,781 Awarded: 1999
Purpose: Focus on Fish Lake alum treatment system and conduct lab and field studies applicable to all chemical treatment systems in Minnesota.

Project: Best Management Practices Implementation in the Lake Superior Drainage Area

Sponsor: Minnesota Board of Soil and Water Resources
Funding: Section 319 (Grant) \$30,860 Awarded: 1999
Purpose: To educate landowners, design best management practices, and provide construction oversight for erosion control and water quality improvements in the Lake Superior Basin.



Project: Big Fish and Long Lakes Watershed Protection Project

Sponsor: Sauk River Watershed District
Funding: CWP (Grant) \$33,000 Awarded: 1999
Purpose: Conduct diagnostic study to determine functioning watershed elements

Project: Big Ten Mississippi Watershed EQIP Project

Sponsor: Morrison County Soil and Water Conservation District
Funding: Section 319 (Grant) \$310,000 Awarded: 1999
Purpose: Water quality improvement through EQIP projects in the Big Ten Mississippi watershed.

Project: Cass Lake/Lake Winnibigoshish Watershed Project

Sponsor: Beltrami County
Funding: CWP (Grant) \$93,500 Awarded: 1999
Purpose: Identify concerns within watershed that could result in water quality degradation.

Project: Cation/Anion and Isotope Analysis Project

Sponsor: University of Minnesota Department of Geology and Geophysics
Funding: Section 319 (Grant) \$5,219 Awarded: 1999
Purpose: Analyze water samples from MPCA ground and surface water projects for cations, anions and total suspended sediments.

Project: Compare Effectiveness of Shoreline Vegetation Management (see page 26)

Sponsor: Beltrami Soil and Water Conservation District
Funding: Section 319 (Grant) \$37,250 Awarded: 1999
Purpose: Establish a demonstration project site that will compare the cost and effectiveness of several management techniques for shoreline vegetation.

Project: Conservation Tillage Guidelines for the Mississippi River Basin

Sponsor: University of Minnesota Extension Service
Funding: Section 319 (Grant) \$17,000 Awarded: 1999
Purpose: Develop guidelines for conservation tillage that farmers can use to manage their crop in reduce tillage systems while protecting water quality.

Project: Dunns and Richardson Lakes Phase I Study

Sponsor: Meeker County
Funding: CWP (Grant) \$33,750 Awarded: 1999
Purpose: Determine baseline hydrologic, water quality and ecological information to make remedial decisions.

Project: Grazing Lands Improvement Project

Sponsor: Minnesota Board of Soil and Water Resources
Funding: Section 319 (Grant) \$61,200 Awarded: 1999
Purpose: Assisting landowners to develop and maintain prescribed grazing systems and provide technical support.

Project: Hastings Area Nitrate Study

Sponsor: Dakota County
Funding: CWP (Grant) \$75,000 Awarded: 1999
Purpose: Determine cause and extent of nitrate contamination in the Prairie du Chien/Jordan aquifer.

Project: Hawk Creek Watershed Project

Sponsor: Renville County
Funding: CWP (Grant) \$148,000 Awarded: 1999
Purpose: Conduct diagnostic study to assess Hawk Creek's water quality, develop cooperation and support for improvements.

Project: Hawk Creek Watershed Water Quality Enhancement Project EQIP

Sponsor: Prairie Country RC&D
Funding: Section 319 (Grant) \$320,000 Awarded: 1999
Purpose: Developing strategies to reduce excessive soil losses on cropland and reduce degradation of surface water due to sediment, excessive nutrients.

Project: Hawk Creek Watershed Water Quality Enhancement Project EQIP

Sponsor: Prairie Country RC&D
Funding: Section 319 (Grant) \$320,000 Awarded: 1999
Purpose: Install land use best management practices, monitor and analyze the results on the watershed, develop a Citizen Network, conduct outreach and education.

Project: Heron Lake Continuation, SRF Loans

Sponsor: First National Bank of Brewster
Funding: CWP (Loan) \$500,000 Awarded: 1999
Purpose: Continue best management practices activities in Heron Lake Watershed (Jackson, Murray and Nobles Counties).

Project: Implementation of Locally Administered Nitrate Testing and Education

sponsor: Minnesota Department of Agriculture
Funding: Section 319 (Grant) \$100,000 Awarded: 1999
Purpose: Develop equipment distribution network and cooperative training program, provide oversight to local nitrate water testing clinics.



Project: Knife River Watershed EQIP Project

Sponsor: South St. Louis County Soil and Water Conservation District
Funding: Section 319 (Grant) \$78,322 Awarded: 1999
Purpose: Develop forest stewardship plans, stabilization and reduction of active bank erosion, stabilize stream temperature.

Project: Lake Francis Diagnostic-Feasibility Study

Sponsor: Isanti County
Funding: CWP (Grant) \$24,150 Awarded: 1999
Purpose: Determine baseline hydrologic, water quality and ecological information to make decisions for improvements.

Project: Long and Spring Lakes Restoration

Sponsor: Meeker County
Funding: CWP (Grant) \$26,689 Awarded: 1999
Purpose: Develop and implement best management practices for erosion control, agriculture shoreline management and education.

Project: Long and Spring Lakes Restoration

Sponsor: Meeker County
Funding: Section 319 (Grant) \$15,000 Awarded: 1999
Purpose: Identify, prioritize, coordinate work with lakeshore owners on best management practices for shoreline stabilization.

Project: Mille Lacs Lake Watershed Management Project

Sponsor: Mille Lacs County
Funding: CWP (Grant) \$170,000 Awarded: 1999
Purpose: Establish baseline database of watershed resources and water quality for subsequent promotion of best management practices.

Project: Minneapolis Chain of Lake Project (see page 41)

Sponsor: Minneapolis Park and Recreation Board
Funding: Section 319 (Grant) \$100,000 Awarded: 1999
Purpose: Treat Lakes Calhoun and Harriet with alum, measure for effects on lake phosphorus levels by monitoring and modeling.

Project: Nemadji River Basin Project

Sponsor: Carlton County
Funding: 319 (Grant) \$143,500 Awarded: 1999
Purpose: Manage healthy riparian zones, restore damaged areas (stream banks), implement other best management practices.

Project: Olmsted County Intensive Manure Management Program

Sponsor: Olmsted County Extension Service
Funding: Section 319 (Grant) \$73,000 Awarded: 1999
Purpose: Develop manure management plans for livestock producers and work with NRCS to develop EQIP plans.

Project: Osakis Lake Improvement Project Phase II Continuation

Sponsor: Sauk River Watershed District
Funding: CWP (Grant) \$56,830 Awarded: 1999
Purpose: Continue implementation of water monitoring, education and septic system upgrades.

Project: Osakis Lake Improvement Project, SRF Loans

Sponsor: Sauk River Watershed District
Funding: CWP (Loan) \$400,000 Awarded: 1999
Purpose: Continue SRF loan program for septic systems around Osakis Lake.

Project River Friendly Farmer Expansion

Sponsor: Minnesota Board of Soil and Water Resources
Funding: Section 319 (Grant) \$70,000 Awarded: 1999
Purpose: Promoting farming practices that benefit rivers and informing the public about farmers' contributions to clean water activities.

Project: Rum River Watershed EQIP Project

Sponsor: Anoka County Conservation District
Funding: Section 319 (Grant) \$310,000 Awarded: 1999
Purpose: Review and inventory monitoring efforts in the watershed, and develop procedures to select farms for assessment.

Project: Rush Lake Watershed Enhancement Project

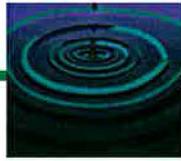
Sponsor: Sibley County
Funding: CWP (Grant) \$70,000 Awarded: 1999
Purpose: Identify point and nonpoint pollution sources in the watershed through a diagnostic study.

Project: Tile Intake Initiative

Sponsor: Blue Earth River Basin Initiative (BERBI)
Funding: Section 319 (Grant) \$103,750 Awarded: 1999
Purpose: Bring awareness about the environmental impacts of open tile intakes. Alter at least 234 open tile inlets.

Project: Tillage Transect Program

Sponsor: Minnesota Board of Soil and Water Resources
Funding: Section 319 (Grant) \$44,000 Awarded: 1999
Purpose: Establish baseline data and monitor trends of CRM. Attain significant reductions in erosion and sedimentation.



Project: Unsewered Community Guidebook

Sponsor: University of Minnesota Water Resources Center
Funding: Section 319 (Grant) \$11,750 Awarded: 1999
Purpose: Compile, assemble and revise information applicable to small community wastewater treatment; produce and market a guidebook.

Project: Upper Elk Creek Erosion Control and Water Quality Improvement Project

Sponsor: Heron Lake Watershed District
Funding: Section 319 (Grant) \$51,900 Awarded: 1999
Purpose: Install best management practices in the Upper Elk Creek subwatershed of the Heron Lake watershed. Slow water flow, decrease erosion.

Project: Water Quality Improvement Project for County Ditches 7 and 32

Sponsor: North Fork Crow River Watershed District
Funding: Section 319 (Grant) \$50,000 Awarded: 1999
Purpose: Feedlot management, erosion control, land use best management practices, education and monitoring for inputs to the Crow River.

Project: Yellow Medicine River Watershed EQIP Project (see page 32)

Sponsor: Lincoln County Soil and Water Conservation District
Funding: Section 319 (Grant) \$190,000 Awarded: 1999
Purpose: Increase implementation of conservation practices that reduce soil erosion and flooding, as well as sedimentation and nutrient loading.

2000

Project: Agricultural and Rural Water Management: On Farm Demonstrations

Sponsor: Minnesota Department of Agriculture
Funding: Section 319 (Grant) \$200,000 Awarded: 2000
Purpose: Plan and implement four on-farm water management demonstrations; design and target educational materials, workshops and programs.

Project: Ashley and Hoboken Creeks Water Quality Improvement Project

Sponsor: Sauk River Watershed District
Funding: Section 319 (Grant) \$231,500 Awarded: 2000
Purpose: Evaluation of agricultural waste management, best management practice implementation and monitoring for program effectiveness.

Project: Blue Earth River - Watonwan Basin Implementation

Sponsor: Blue Earth River Clean Water Partnership
Funding: CWP (Grant) \$500,000, (Loan) \$2,156,345
Awarded: 2000
Purpose: Provide SRF loans to fund best management practices in Watonwan, Jackson and Cottonwood Counties.

Project: Clearwater River Stream Bank Stabilization/Revitalization

Sponsor: Red Lake Watershed District
Funding: Section 319 (Grant) \$134,500 Awarded: 2000
Purpose: Erosion control through data collection and analysis, design, construction, monitoring and education.

Project: Construction Site Erosion Control Ordinance Implementation

Sponsor: Minnesota Erosion Control Association
Funding: Section 319 (Grant) \$60,000 Awarded: 2000
Purpose: Provide erosion control specialist to implement certified erosion control education and training.

Project: Cottage Grove Nitrate Study

Sponsor: Washington County
Funding: CWP (Grant) \$75,000 Awarded: 2000
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

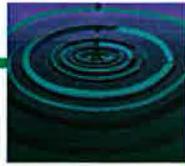
Sponsor: Redwood-Cottonwood River Control Area
Funding: CWP (Grant) \$400,700, (Loan) \$370,000
Awarded: 2000
Purpose: Make the Cottonwood River navigable and canoe accessible. Increase game fish populations, produce and construct trails.

Project: Crop Nutrient Management for St. Peter Wellhead Protection Area

Sponsor: Brown-Nicollet-Cottonwood Water Quality Board
Funding: Section 319 (Grant) \$60,000 Awarded: 2000
Purpose: Enroll agricultural lands in federal and state programs, provide support for nutrient management, develop and produce educational materials.

Project: Crow River Watershed Water Quality Enhancement Project

Sponsor: Prairie Country RC&D
Funding: Section 319 (Grant) \$453,790 Awarded: 2000
Purpose: Stabilize seven streambank or lakeshore sites, install 14 agricultural waste systems, install other best management practices to reduce sedimentation.



Project: Digital Soil Data for Management of Wetlands and Rivers

Sponsor: Minnesota Board of Water and Soil Resources
Funding: Section 319 (Grant) \$68,400 Awarded: 2000
Purpose: Develop digitizing lab, establish procedures, secure agreements, obtain NRCS survey certification.

Project: Education to Improve Feedlot, Manure and Nutrient Management

Sponsor: University of Minnesota
Funding: Section 319 (Grant) \$97,000 Awarded: 2000
Purpose: Develop educational materials and present workshops to county feedlot officers and producers on feedlot registration.

Project: Feedlot Pollution Abatement and Erosion Control

Sponsor: Stearns Soil and Water Conservation District
Funding: Section 319 (Grant) \$250,000 Awarded: 2000
Purpose: Analyze surface water, manage GIS database, investigate unpermitted manure storage structures, identify priority feedlots for technical assistance or enforcement.

Project: Green Lake and Middle Fork Crow River Watershed Project

Sponsor: Kandiyohi County
Funding: CWP (Grant) \$105,000 Awarded: 2000
Purpose: Conduct a resource investigation of the Green Lake and Middle Fork Crow River watershed area.

Project: High Island Creek Watershed Assessment Project

Sponsor: Sibley County
Funding: CWP (Grant) \$23,000 Awarded: 2000
Purpose: Resource assessment of hydrologic, water quality and ecological status of High Island Creek watershed.

Project: Holland-Edgerton Wellhead Management

Sponsor: Pipestone County Conservation and Planning
Funding: Section 319 (Grant) \$92,960 Awarded: 2000
Purpose: Accelerate implementation of agricultural best management practices, use incentives to obtain land use changes and provide education.

Project: Horseshoe Chain of Lakes Improvement Project

Sponsor: Sauk River Watershed District
Funding: CWP (Grant) \$135,000, (Loan) \$600,000
Awarded: 2000
Purpose: Establish agricultural best management practices, monitoring, and education.

Project: Implementing Comprehensive Nutrient Management Plans --TMDLs

Sponsor: Blue Earth River Basin Initiative
Funding: Section 319 (Grant) \$18,275 Awarded: 2000
Purpose: Identifying 25 Elm Creek watershed farms affecting water quality and assisting farmers in developing a comprehensive nutrient management plan.

Project: Information and Education Coordinator (see page 24)

Sponsor: University of Minnesota Extension Service
Funding: Section 319 (Grant) \$69,500 Awarded: 2000
Purpose: To continue to coordinate and assist water planners and counties with nonpoint source education.

Project: In-Situ Measurement of Denitrification

Sponsor: University of North Dakota
Funding: Section 319 (Grant) \$117,273 Awarded: 2000
Purpose: Determine the capacity of the aquifer to denitrify.

Project: Lake Jessie Watershed Project

Sponsor: Itasca County
Funding: CWP (Grant) \$72,000 Awarded: 2000
Purpose: Implementing best management practices in the Lake Jessie watershed.

Project: Lake Shaokatan Restoration Project

Sponsor: Yellow Medicine River Watershed District
Funding: CWP (Grant) \$50,000, (Loan) \$100,000
Awarded: 2000
Purpose: Upgrade septic systems around Lake Shaokatan.

Project: LARS-LUG Annual Reporting System

Sponsor: Minnesota Board of Water and Soil Resources
Funding: Section 319 (Grant) \$122,400 Awarded: 2000
Purpose: Hire program specialist to develop pollutant reduction estimates, refine soil loss equations, integrate LARS data with other databases.

Project: Long Prairie River Monitoring Project

Sponsor: Todd County Soil and Water Conservation District
Funding: CWP (Grant) \$316,565 Awarded: 2000
Purpose: Establish riparian buffers, erosion control, pollution control and monitoring systems.

Project: Midway River Watershed Restoration Project

Sponsor: South St. Louis County Soil and Water Conservation District
Funding: Section 319 (Grant) \$35,750 Awarded: 2000
Purpose: Identify sites contributing sediment loads, provide information and education, prepare GIS inventory and plant trees to stabilize erosion.



Project: Mississippi River Headwaters Board Nonpoint Source Remediation Effort

Sponsor: Mississippi Headwaters Board
Funding: Section 319 (Grant) \$172,832 Awarded: 2000
Purpose: Develop and implement Whiskey Creek retention pond, stabilize Itasca County shoreline, conduct best management practices workshops.

Project: Pollution Reduction Project, Cannon River Watershed

Sponsor: Cannon River Watershed Partnership
Funding: Section 319 (Grant) \$65,000 Awarded: 2000
Purpose: Implementing best management practices in the Cannon River watershed.

Project: Rice Lake and Koronis Lake Restoration Project (see page 21)

Sponsor: North Fork Crow River Watershed District
Funding: CWP (Grant) \$80,000, (Loan) \$500,000
Awarded: 2000
Purpose: Wetland restoration, feedlot management, general erosion control and agricultural best management practices to improve watershed water quality.

Project: River Friendly Farmer Expansion

Sponsor: Minnesota Board of Water and Soil Resources
Funding: Section 319 (Grant) \$30,000 Awarded: 2000
Purpose: Develop team to review, select, design, test and prepare promotional and instructional materials.

Project: Salem Creek Bacteria Reduction Project

Sponsor: Dodge County Environmental Quality Department
Funding: Section 319 (Grant) \$21,000 Awarded: 2000
Purpose: Target sources of bacteria contamination in Salem Creek through education, outreach, citizen monitoring and one-on-one discussions with landowners.

Project: Shoreland Reclamation for Improving Water Quality

Sponsor: Carnelian-Marine Watershed District
Funding: Section 319 (Grant) \$23,250 Awarded: 2000
Purpose: Develop cost-sharing best management practices program and provide information and training on the use of best management practices.

Project: Training, Technical Assistance and Incentives for Nutrient Management

Sponsor: Minnesota Board of Water and Soil Resources
Funding: Section 319 (Grant) \$30,000 Awarded: 2000
Purpose: Select priority watershed, develop and deliver nutrient management workshops to local staff, develop local nutrient management plans.

Project: Trapper's Run Best Management Practices Cost Share Project

Sponsor: Pope County
Funding: CWP (Grant) \$150,000 Awarded: 2000
Purpose: Identification of noncompliant feedlots, encourage placement of land in CREP, CRP and RIM programs.

Project: Vermillion River Watershed Total Maximum Daily Load (TMDL) Project

Sponsor: Vermillion River WMO
Funding: Section 319 (Grant) \$57,800 Awarded: 2000
Purpose: Identify possible nonpoint sources of fecal coliform bacteria through monitoring, land use assessment and landcover GIS data.

2001

Project: Agnes Henry Winona Clean Lake Monitoring Program

Sponsor: Douglas County
Funding: Section 319 (Grant) \$261,700 Awarded: 2001
Purpose: Construct two stormwater detention ponds, monitor effectiveness.

Project: Big Birch Lake Improvement Project

Sponsor: Sauk River Watershed District
Funding: Section 319 (Grant) \$50,000 Awarded: 2001
Purpose: Implement shoreline best management practices, information and education initiatives, develop erosion control projects, and reestablish shoreline vegetation.

Project: Dalen Coulee Natural Waterway Project

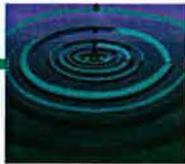
Sponsor: Wild Rice Watershed District
Funding: Section 319 (Grant) \$50,000 Awarded: 2001
Purpose: Construct weirs and natural channels, place adjacent land in set-aside program, complete sediment and debris reduction structures.

Project: Internet Technology to Enhance Communication of Nonpoint Source Information

Sponsor: Minnesota Lakes Association
Funding: Section 319 (Grant) \$10,000 Awarded: 2001
Purpose: Update and enhance computerized bibliography and web for nonpoint source best management practices information and resources.

Project: Local Nitrate Testing and Education/Outreach

Sponsor: Minnesota Department of Agriculture
Funding: Section 319 (Grant) \$110,000 Awarded: 2001
Purpose: Provide support and technical assistance to LUGs to provide nitrate water testing services and educational outreach.



Project: Local Shoreland Landscape Networks

Sponsor: University of Minnesota Water Resources Center
Funding: Section 319 (Grant) \$48,000 Awarded: 2001
Purpose: Conduct three shoreland workshops, prepare and distribute related shoreland materials, evaluate and report.

Project: Minneapolis Chain of Lakes Project (see page 41)

Sponsor: Minneapolis Parks and Recreation Board
Funding: Section 319 (Grant) \$100,000 Awarded: 2001
Purpose: Apply an alum treatment to Lake Calhoun, prioritize and document its effects on internal loading.

Project: Nemadji River Basin Project

Sponsor: Carlton County
Funding: Section 319 (Grant) \$50,450 Awarded: 2001
Purpose: Assess dams for Red Clay Project, implement four upland wetland demonstrations, and develop a 15-acre riparian restoration.

Project: Red Lake River Restoration and Habitat Improvement Project

Sponsor: City of Crookston
Funding: Section 319 (Grant) \$420,000 Awarded: 2001
Purpose: Develop and implement streambank and bed stabilization practices, remove dam, construct rapids and provide additional bank restoration.

Project: Rush River Assessment Project

Sponsor: Sibley County
Funding: CWP (Grant) \$312,518 Awarded: 2001
Purpose: Develop diagnostic study and implementation plan for Rush River watershed.

Project: Sauk Lake Restoration Project

Sponsor: Sauk River Watershed District
Funding: Section 319 (Grant) \$325,000 Awarded: 2001
Purpose: Apply agricultural conservation practices, develop agriculture best management practices, collect water quality data, develop shoreland management practices.

Project: Sauk River Chain of Lakes Watershed Basin Restoration

Sponsor: Sauk River Watershed District
Funding: Section 319 (Grant) \$200,000 Awarded: 2001
Purpose: Provide agricultural waste management assistance, land use best management practices, shoreland restoration, upgrades to septic systems, information and education.

Project: Targeted Feedlot Runoff Reduction Project

Sponsor: Southeast Minnesota Water Resources Board
Funding: Section 319 (Grant) \$586,080 Awarded: 2001
Purpose: Hire experienced agriculturalist for each of eight counties, prepare information on an open lot agreement, train agriculturalists on best management practices.

Project: Whitewater River Watershed National Monitoring Program (see page 16) -- Paired Watershed Monitoring

Sponsor: Robert Finley
Funding: Section 319 (Grant) \$50,000 Awarded: 2001
Purpose: Evaluate surface and groundwater interactions and detect improvements through use of feedlot management, erosion control, land use best management practices, education and monitoring.

Projects Completed History (listed by year of award)

Project KEY Section 319 Projects in BROWN CWP Projects in BLUE

Project: Boy River Recreational Area Diagnostic/Feasibility Study

Sponsor: Cass County
Funding: CWP (Grant) \$59,862 Awarded: 1989
Purpose: Prevent degradation of resources through identification of nonpoint sources controls and education.

Project: East Side Lake Improvement Project

Sponsor: Mower County
Funding: CWP (Grant) \$39,650 Awarded: 1989
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) \$46,779 Awarded: 1989
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) \$18,632 Awarded: 1989
Purpose: Reduce algal blooms and weed growth through wetland restoration and feedlot management.

Project: Lake Bemidji Watershed Study

Sponsor: Beltrami County
Funding: CWP (Grant) \$84,425 Awarded: 1989
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) \$30,250 Awarded: 1989
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) \$27,570 Awarded: 1989
Purpose: Prioritize and implement best management practices in subwatersheds of Lake Redwood.

Project: Lambert Creek/Vadnais Lake Water Quality Improvement Project

Sponsor: Vadnais Lake Area Water Management Organization
Funding: CWP (Grant) \$97,000 Awarded: 1989
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) \$32,485 Awarded: 1989
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) \$67,500 Awarded: 1989
Purpose: Municipal wellhead protection, monitoring and development of protection strategy.

Project: Okabena-Ocheda-Bella Diagnostic/Feasibility Study

Sponsor: City of Worthington
Funding: CWP (Grant) \$57,740 Awarded: 1989
Purpose: Reduce algal blooms, preserve and restore wetlands, protect the water supply aquifer.

Project: Olmsted County Groundwater and Wellhead Protection Project

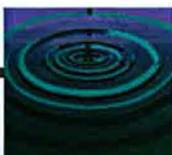
Sponsor: Olmsted County
Funding: CWP (Grant) \$180,114 Awarded: 1989
Purpose: Install monitoring network for wellhead protection, develop land use strategies that protect the water supply.

Project: Trout Lake Diagnostic Feasibility Project

Sponsor: City of Coleraine
Funding: CWP (Grant) \$38,700 Awarded: 1989
Purpose: Restore swimming by reducing algal blooms, reintroduce trout, develop a management plan.

Project: Agnes, Henry and Winona Clean Lakes Monitoring Project

Sponsor: Douglas County
Funding: CWP (Grant) \$60,233 Awarded: 1990
Purpose: Monitoring three hypereutrophic lakes, management plan to improve recreational uses.



Project: Buffalo River Aquifer – Buffalo River Monitoring Project

Sponsor: Clay County Health Department
Funding: CWP (Grant) \$69,998 Awarded: 1990
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) \$44,750 Awarded: 1990
Purpose: Control severe algal blooms through wetland restoration and watershed management.

Project: Dept. of Natural Resources Water Coordinator

Sponsor: Minnesota Department of Natural Resources
Funding: Section 319 (Grant) \$50,000 Awarded: 1990
Purpose: Initiate DNR Waters and Forestry 319 work plans and coordination efforts.

Project: Duck Lake Water Quality Improvement Project

Sponsor: Blue Earth County
Funding: CWP (Grant) \$42,840 Awarded: 1990
Purpose: Reduce algal blooms using agricultural and urban best management practices, improve recreational uses.

Project: Ground Water Analysis of East Brown and West Nicollet Counties

Sponsor: Brown-Nicollet-Cottonwood Water Quality Board
Funding: CWP (Grant) \$50,340 Awarded: 1990
Purpose: Monitor nitrate contamination of wells, focus on nitrogen best management practices implementation.

Project: Lake Sarah Project

Sponsor: Pioneer-Sarah Creek Watershed Management Commission
Funding: CWP (Grant) \$51,830 Awarded: 1990
Purpose: Reduce algal blooms, reduce weeds to improve recreation with BMPs and wetland restoration.

Project: Loon Lake Project

Sponsor: City of Waseca
Funding: CWP (Grant) \$38,000 Awarded: 1990
Purpose: Construct treatment pond to reduce phosphorus and sediment from stormwater.

Project: Minneapolis Chain of Lakes

Sponsor: Minneapolis Parks and Recreation Board
Funding: CWP (Grant) \$150,000 Awarded: 1990
Purpose: Improve and maintain recreational uses of Minneapolis Chain (Lakes Cedar through Harriet) using urban best management practices.

Project: Minnesota Nonpoint Source Implementation Program

Sponsor: University of Minnesota Extension Service
Funding: Section 319 (Grant) \$80,000 Awarded: 1990
Purpose: Development of best management practices, manure management, farmstead and on-site workshops.

Project: Mountain Lake Project

Sponsor: City of Mountain Lake
Funding: CWP (Grant) \$28,885 Awarded: 1990
Purpose: Reduce weed growth for recreational uses through control of agricultural and urban runoff and sediment.

Project: Nonpoint Source Analysis of the Nemadji River

Sponsor: Carlton County Soil and Water Conservation District
Funding: Section 319 (Grant) \$25,000 Awarded: 1990
Purpose: Analysis of nonpoint source problems and sources in the Nemadji River Basin.

Project: Nonpoint Source Analysis of the St. Louis River

Sponsor: South St. Louis County Soil and Water Conservation District
Funding: Section 319 (Grant) \$35,000 Awarded: 1990
Purpose: Analysis of nonpoint source problems in the tributaries of the St. Louis River

Project: North Shore Management Board Project on Nonconforming Septic Systems

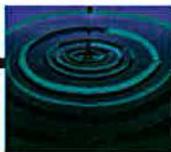
Sponsor: North Shore Management Board
Funding: Section 319 (Grant) \$15,000 Awarded: 1990
Purpose: Assessment of nonconforming septic systems from the Lester to the Encampment Rivers.

Project: Pesticide Management

Sponsor: Minnesota Department of Agriculture
Funding: Section 319 (Grant) \$40,000 Awarded: 1990
Purpose: Management and storage site plans for pesticide collection and disposal.

Project: Schwanz Lake Water Quality Diagnostic Study

Sponsor: City of Eagan
Funding: CWP (Grant) \$29,503 Awarded: 1990
Purpose: Develop solutions for a hypereutrophic lake in a suburban park, using stormwater 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) \$40,000 Awarded: 1990
Purpose: Provide technical assistance on wetland restoration and development.

Project: Whitewater Watershed Project

Sponsor: Winona State University
Funding: CWP (Grant) \$63,000 Awarded: 1990
Purpose: Improve water and land resources, streams and wetland in a cooperative project with the USDA.

Project: Best Management Practices Field Audits on Forest Land

Sponsor: Minnesota Department of Natural Resources
Funding: Section 319 (Grant) \$20,000 Awarded: 1991
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 Awarded: 1991
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 Awarded: 1991
Purpose: Investigate high municipal well nitrate-N and develop reduction methods.

Project: Clearwater Nonpoint Source Study

Sponsor: Red Lake Watershed District
Funding: CWP (Grant) \$142,142 Awarded: 1991
Purpose: Develop 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 Awarded: 1991
Purpose: Coordination and implementation of DNR water nonpoint source efforts.

Project: Farm*A*Syst and Manure Management

Sponsor: University of Minnesota Office of Research and Technology
Funding: Section 319 (Grant) \$39,800 Awarded: 1991
Purpose: Develop Farm*A*Syst displays and brochures, manure management manual and training.

Project: Feedlots in Marshall II

Sponsor: Minnesota Board of Water and Soil Resources
Funding: Section 319 (Grant) \$47,790 Awarded: 1991
Purpose: Provide a feedlot technical assistance specialist in the Marshall Office.

Project: Feedlots in the Marshall Region

Sponsor: Minnesota Board of Water and Soil Resources
Funding: Section 319 (Grant) \$40,000 Awarded: 1991
Purpose: Provide technical assistance to soil and water conservation district staff on addressing high-priority feedlots.

Project: Garvin Brook RCW Project II

Sponsor: Winona County Extension Service
Funding: Section 319 (Grant) \$5,267 Awarded: 1991
Purpose: Continuing well sampling and surveying for nitrogen/nitrates, and providing 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 Awarded: 1991
Purpose: Investigate methods of limiting erosion in the Lake Superior Basin.

Project: Lake Sarah Project

Sponsor: Pioneer-Sarah Creek Watershed Management Commission
Funding: CWP (Grant) \$50,060 Awarded: 1991
Purpose: Reduce algal blooms, reduce weeds to improve recreation through best management practices and wetland restoration.

Project: Lake Shaokatan Restoration Project

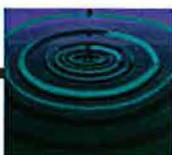
Sponsor: Yellow Medicine River Watershed District
Funding: CWP (Grant) \$48,000 Awarded: 1991
Purpose: Reduce algal and toxic algal blooms, improve fishery and other uses.

Project: Metropolitan Groundwater Study of Highway Runoff

Sponsor: Metropolitan Council
Funding: Section 319 (Grant) \$39,500 Awarded: 1991
Purpose: Determining groundwater impacts of PAHs from infiltrating highway runoff.

Project: Middle Des Moines Watershed Restoration

Sponsor: Jackson County
Funding: CWP (Grant) \$172,000 Awarded: 1991
Purpose: Stop and reduce degradation of surface waters, Heron Lake and wetlands.



Project: Minneapolis Chain of Lakes

Sponsor: Minneapolis Parks and Recreation Board
Funding: CWP (Grant) \$250,000 Awarded: 1991
Purpose: Improve and maintain recreational uses of the Minneapolis Chain (Cedar through Harriet lakes) through urban best management practices.

Project: Minnesota River Play

Sponsor: Theater for Corporate and Community
Funding: Section 319 (Grant) \$5,000 Awarded: 1991
Purpose: Development of 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 SWCD
Funding: Section 319 (Grant) \$48,000 Awarded: 1991
Purpose: Investigation of best management practices to reduce phosphorus in the St. Louis River.

Project: Statewide Nonpoint Source Educational Strategy

Sponsor: Office of Strategic and Long Range Planning
Funding: Section 319 (Grant) \$42,000 Awarded: 1991
Purpose: Develop a statewide nonpoint source pollution educational strategy

Project: Upper Coon Creek Watershed Water Quality

Sponsor: Coon Creek Watershed District
Funding: CWP (Grant) \$48,000 Awarded: 1991
Purpose: Develop an interactive groundwater and surface water project, implement watershed best management practices for water quality.

Project: Wellhead Protection Outreach and Public Information

Sponsor: Minnesota Department of Health
Funding: Section 319 (Grant) \$62,000 Awarded: 1991
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) \$30,000 Awarded: 1991
Purpose: Wetlands restoration throughout the Upper Minnesota River watershed for improved water quality.

Project: Anoka Sand Plain Project

Sponsor: U. S. Geological Survey
Funding: Section 319 (Grant) \$40,000 Awarded: 1992
Purpose: Study of 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 Awarded: 1992
Purpose: Continue forestry best management practices field audits.

Project: Farm*A*Syst and Manure Management Materials

Sponsor: University of Minnesota Office of Research and Technology
Funding: Section 319 (Grant) \$50,000 Awarded: 1992
Purpose: Continuation of Farm*A*Syst Program.

Project: Feedlots in Marshall Project

Sponsor: Minnesota Board of Water and Soil Resources
Funding: Section 319 (Grant) \$52,500 Awarded: 1992
Purpose: 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) \$9,000 Awarded: 1992
Purpose: Continuation of 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 Awarded: 1992
Purpose: Continuation of well sampling in the Garvin Brook area.

Project: Growth Management Project

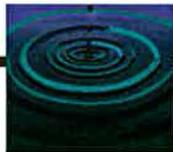
Sponsor: Natural Resources Conservation Service
Funding: Section 319 (Grant) \$40,000 Awarded: 1992
Purpose: Growth management assessment to mitigate nonpoint source pollution.

Project: Jefferson – German Lakes Water Quality Improvement Project

Sponsor: LeSueur County
Funding: CWP (Grant) \$118,000 Awarded: 1992
Purpose: Resource investigation of Jefferson-German Lakes watershed.

Project: Lake Bemidji Watershed Project

Sponsor: Beltrami County
Funding: CWP (Grant) \$274,000 Awarded: 1992
Purpose: Implementation of Phase II to reduce nonpoint 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 Awarded: 1992
Purpose: Sponsorship of citizens interested in improving the water quality in the Minnesota River.

**Project: Natural Resources Conservation Service
Conservationist Best Management Practices
Implementation**

Sponsor: Natural Resources Conservation Service
Funding: Section 319 (Grant) \$58,800 Awarded: 1992
Purpose: Assignment of SCS conservationist to MPCA to assist with best management practices implementation.

Project: Nutrient Management Technical Assistance

Sponsor: Minnesota Department of Agriculture
Funding: Section 319 (Grant) \$58,800 Awarded: 1992
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) \$145,000 Awarded: 1992
Purpose: Resource investigation of surface and groundwater nonpoint source pollution in Hubbard and Becker Counties.

Project: St. Louis River Phosphorus Reduction

Sponsor: South St. Louis County SWCD
Funding: Section 319 (Grant) \$48,000 Awarded: 1992
Purpose: Reduce phosphorus nonpoint 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 Awarded: 1992
Purpose: Continuation of public information and outreach activities promoting wellhead protection.

Project: Anoka Sand Plain Project II

Sponsor: U.S. Geological Survey
Funding: Section 319 (Grant) \$35,000 Awarded: 1993
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 Awarded: 1993
Purpose: Conduct a nonpoint source assessment of biological elements of the Minnesota River.

**Project: Brown-Nicollet-Cottonwood Phase II --
Groundwater Implementation**

Sponsor: Brown-Nicollet-Cottonwood Water Quality Board
Funding: CWP (Grant) \$264,000 Awarded: 1993
Purpose: Implementation of Phase II groundwater monitoring and improvements.

**Project: French Lake Water Quality Improvement
Project, Phase II**

Sponsor: Rice County Highway Department
Funding: CWP (Grant) \$139,000 Awarded: 1993
Purpose: Implementation stage of 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) \$1,074 Awarded: 1993
Purpose: Continuation of the Garvin Brook Clean Water Project to assess ground water quality.

Project: Growth Management Project II

Sponsor: Natural Resources Conservation Service
Funding: Section 319 (Grant) \$33,750 Awarded: 1993
Purpose: Phase II project to prevent nonpoint source pollution via growth management strategies.

Project: Information and Education Coordinator

Sponsor: University of Minnesota Extension Service
Funding: Section 319 (Grant) \$92,000 Awarded: 1993
Purpose: Coordinator to provide educational programming to reduce nonpoint source pollution.

**Project: Isotopic and Chemical Analyses of Waters
from the Whitewater/Minnesota River Basin**

Sponsor: U of M Office of Research and Technology
Funding: Section 319 (Grant) \$10,000 Awarded: 1993
Purpose: Evaluate implemented best management practices and pollutant flow paths, assess BMP timeframe impacts.

Project: Lake Harriet Watershed Assistance Project

Sponsor: Minnesota Department of Agriculture
Funding: Section 319 (Grant) \$50,000 Awarded: 1993
Purpose: Implementation and evaluation of best management practices in the Lake Harriet watershed.

Project: Lake Shaokatan Restoration Project, Phase II

Sponsor: Yellow Medicine River Watershed District
Funding: CWP (Grant) \$240,000 Awarded: 1993
Purpose: Implementation of the Lake Shaokatan project to reduce algal/toxic algal blooms and improve recreational uses.



Project: Lake Shetek Watershed Improvement Project

Sponsor: Murray County
Funding: CWP (Grant) \$131,000 Awarded: 1993
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) \$70,000 Awarded: 1993
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) \$94,000 Awarded: 1993
Purpose: Resource investigation of Lake Washington to assess and develop improvement plan.

Project: Lambert Creek Improvement Project

Sponsor: Vadnais Lake Area Water Management Org.
Funding: CWP (Grant) \$245,000 Awarded: 1993
Purpose: Implementation of Lambert Creek project to reduce phosphorus in its reservoir lake.

Project: Manure Management Program

Sponsor: U of M Office of Research and Technology
Funding: Section 319 (Grant) \$58,000 Awarded: 1993
Purpose: Develop a manure management program to advance the state's nonpoint source abatement efforts.

Project: Manure Storage Basin Monitoring Project

Sponsor: Morrison County
Funding: Section 319 (Grant) \$2,000 Awarded: 1993
Purpose: Conduct a manure storage basin monitoring project in Morrison County.

Project: NRCS Conservationist Best Management Practices Implementation

Sponsor: Natural Resources Conservation Service
Funding: Section 319 (Grant) \$35,000 Awarded: 1993
Purpose: Continuation of conservation position to work on nonpoint source issues.

Project: Whitewater Project Land Use Data

Sponsor: Whitewater River Watershed Joint Powers Board
Funding: Section 319 (Grant) \$6,000 Awarded: 1993
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 Awarded: 1993
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) \$8,200 Awarded: 1993
Purpose: Monitor runoff from the Whitewater River watershed.

Project: Whitewater Watershed Monitoring -- Finley

Sponsor: Joseph Finley
Funding: Section 319 (Grant) \$300 Awarded: 1993
Purpose: Evaluate effectiveness of best management practices through the use of paired-watershed monitoring.

Project: 1996 Nonpoint Source Conference Management

Sponsor: Southeast Minnesota Water Resources Board
Funding: Section 319 (Grant) \$10,000 Awarded: 1994
Purpose: Provide funding for the 1996 agricultural nonpoint source conference.

Project: Anoka Sand Plain Project III

Sponsor: U.S. Geological Survey
Funding: Section 319 (Grant) \$35,000 Awarded: 1994
Purpose: Continue monitoring activities of the Anoka Sand Plain Project.

Project: Big Sandy Area Lakes Watershed Project

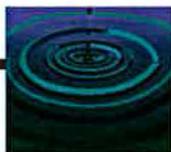
Sponsor: Aitkin County
Funding: CWP (Grant) \$69,000 Awarded: 1994
Purpose: Protect and maintain the beneficial uses of the Big Sandy Lakes watershed.

Project: Boy River CWP Project, Phase II

Sponsor: Cass County
Funding: CWP (Grant) \$38,000 Awarded: 1994
Purpose: Implementation of the improvement plans for the Boy River.

Project: Crystal, Loon, Mills Lakes Water Quality Improvement Project

Sponsor: Blue Earth County
Funding: CWP (Grant) \$93,000 Awarded: 1994
Purpose: Investigate the sources of degradation to Crystal, Loon and Mills Lake.



Project: Fairfax Urban Demonstration Project

Sponsor: Prior Lake-Spring Lake Watershed District
Funding: Section 319 (Grant) \$110,000 Awarded: 1994
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) \$63,000 Awarded: 1994
Purpose: Prove statewide feedlot technical support to implement revolving loan fund program.

Project: Great Lakes Erosion Control II

Sponsor: South St. Louis County SWCD
Funding: Section 319 (Grant) \$40,000 Awarded: 1994
Purpose: Develop projects to correct erosion, sedimentation and pollution problems.

Project: Information and Education Coordinator

Sponsor: University of Minnesota Extension Service
Funding: Section 319 (Grant) \$60,000 Awarded: 1994
Purpose: Continue coordination of educational programming to reduce nonpoint source pollution.

Project: Knife Lake Demonstration Project

Sponsor: Kanabec County
Funding: CWP (Grant) \$31,500 Awarded: 1994
Purpose: To begin implementation of 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 Awarded: 1994
Purpose: Test the implementation and evaluation of urban best management practices in the Lake Harriet Watershed.

Project: Manure Management Program

Sponsor: University of Minnesota Office of Research and Technology
Funding: Section 319 (Grant) \$54,000 Awarded: 1994
Purpose: Continue one-on-one contact with livestock producers for manure management plans.

Project: Minneapolis Chain of Lakes Implementation Project

Sponsor: Minneapolis Parks and Recreation Board
Funding: CWP (Grant) \$812,000 Awarded: 1994
Purpose: Implementation of 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 Awarded: 1994
Purpose: Cosponsor 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 Awarded: 1994
Purpose: Implementation of improvement plan for Mountain Lake.

Project: Nutrient Management Technical Assistance

Sponsor: Minnesota Department of Agriculture
Funding: Section 319 (Grant) \$95,000 Awarded: 1994
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) \$74,000 Awarded: 1994
Purpose: Demonstration of wetland restoration on nonpoint 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 Awarded: 1994
Purpose: Implementation activities for Prior and Spring Lakes improvements.

Project: Redwood River Clean Water Project

Sponsor: Cotton River Clean Water Partnership
Funding: Section 319 (Grant) \$109,000 Awarded: 1994
Purpose: Implementation of the Redwood River improvement strategies.

Project: Schwanz Lake Clean Water Partnership Phase II Project

Sponsor: City of Eagan
Funding: Section 319 (Grant) \$89,100 Awarded: 1994
Purpose: Implementation of the improvement plan for Schwanz Lake.

Project: Whitewater Watershed Project

Sponsor: Whitewater River Watershed Joint Powers Board
Funding: Section 319 (Grant) \$8,600 Awarded: 1994
Purpose: Water sampling and assessments in the Whitewater River watershed.



Project: Whitewater Watershed Project - U of M

Sponsor: University of Minnesota
Funding: Section 319 (Grant) \$12,700 Awarded: 1994
Purpose: Complete a macroinvertebrate, fishery and habitat assessment in the Whitewater River watershed.

Project: Whitewater Watershed Project Continuation

Sponsor: Whitewater River Watershed Joint Powers Board
Funding: Section 319 (Grant) \$18,000 Awarded: 1994
Purpose: Continuation of water sampling at new sites in the Whitewater River watershed.

Project: 24,000 Scale Hydrology Mapping

Sponsor: St. Cloud State University
Funding: Section 319 (Grant) \$33,000 Awarded: 1995
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) \$261,000 Awarded: 1995
Purpose: Provide technical staffing assistance and support to implement agricultural State Revolving Fund loans.

Project: Anoka Sand Plain Project V

Sponsor: U.S. Geological Survey
Funding: Section 319 (Grant) \$40,000 Awarded: 1995
Purpose: Continuation of monitoring activities in the Anoka Sand Plains area.

Project: Big Birch II SRF Loan Agreements

Sponsor: Sauk River Watershed District
Funding: CWP (Loan) \$403,000 Awarded: 1995
Purpose: Develop loan agreements to assist with best management practices implementation on Big Birch Lake.

Project: Blue Earth River Basin Implementation Framework

Sponsor: Blue Earth River Basin Initiative
Funding: CWP (Grant) \$220,000 Awarded: 1995
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; (Loan) \$1,086,000 Awarded: 1995
Purpose: Continue implementation and diagnostic activities begun in earlier phases of the project.

Project: Cation, Anion and Isotope Analysis Project

Sponsor: University of Minnesota Department of Geology/Geophysics
Funding: Section 319 (Grant) \$5,200 Awarded: 1995
Purpose: Analyze cations, anions and isotopes in samples provided by the MPCA.

Project: Cost-Benefit Analysis for Water Quality Regulation and Decisionmaking

Sponsor: Express Interactive Solutions
Funding: Section 319 (Grant) \$15,000 Awarded: 1995
Purpose: Present seminar on cost/benefit analysis for water quality regulation.

Project: Digital Hydrographic Data Project

Sponsor: U.S. Department of the Interior -- Geological Survey
Funding: Section 319 (Grant) \$68,400 Awarded: 1995
Purpose: To 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) \$3,000 Awarded: 1995
Purpose: Collect and analyze Minnesota River Basin water samples for fecal coliform, enter into database.

Project: Fish and Invertebrate Communities in the Whitewater River

Sponsor: Whitewater River Watershed Joint Powers Board
Funding: Section 319 (Grant) \$6,700 Awarded: 1995
Purpose: Using GIS technology, examine fish and invertebrate communities in Whitewater River watershed.

Project: Fish Lake Phase II Project

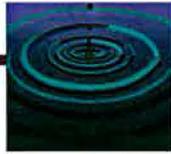
Sponsor: U of M Office of Research and Technology
Funding: CWP (Grant) \$49,000 Awarded: 1995
Purpose: Implement best management practices to reduce phosphorus and nutrient loading to Fish Lake.

Project: French Lake II Loan Agreement

Sponsor: Rice County Highway Department
Funding: CWP (Loan) \$153,000 Awarded: 1995
Purpose: Loan funding to assist with implementation activities for the French Lake Phase II project.

Project: Growth Management Project III, Implementation

Sponsor: Natural Resources Conservation Service
Funding: Section 319 (Grant) \$41,000 Awarded: 1995
Purpose: Implement a land management framework.



Project: Jefferson-German Lakes Water Quality Improvement Project

Sponsor: Le Sueur County
Funding: CWP (Grant) \$96,000 Awarded: 1995
Purpose: To 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; (Loan) \$780,000
Awarded: 1995
Purpose: To 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) \$50,000 Awarded: 1995
Purpose: To determine cause and effect relationships between land use and water quality, develop an improvement plan and implement.

Project: Maplewood Innovative Stormwater Management Project

Sponsor: City of Maplewood
Funding: Section 319 (Grant) \$63,000 Awarded: 1995
Purpose: Implement stormwater methods and infiltrate stormwater using innovative strategies and techniques.

Project: Minnesota River Basin Fecal Coliform Analysis

Sponsor: Mankato State University
Funding: Section 319 (Grant) \$3,000 Awarded: 1995
Purpose: Collect and analyze Minnesota River Basin water samples for fecal coliform, enter in a database.

Project: Mountain Lake Project Phase II

Sponsor: City of Mountain Lake
Funding: Section 319 (Grant) \$100,000 Awarded: 1995
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 Office of Research and Technology
Funding: Section 319 (Grant) \$61,000 Awarded: 1995
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) \$62,000 Awarded: 1995
Purpose: To 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) \$77,000 Awarded: 1995
Purpose: Continue implementation activities begun previously.

Project: Redwood River Phase II Clean Water Project

Sponsor: Cotton River Clean Water Partnership
Funding: Section 319 (Grant) \$109,000 Awarded: 1995
Purpose: Continue implementation and best management practices begun in Redwood River Phase II.

Project: Shoreland Vegetation Best Management Practices to Reduce Erosion and Runoff

Sponsor: University of Minnesota
Funding: Section 319 (Grant) \$33,000 Awarded: 1995
Purpose: Demonstrate pollution prevention by the effectiveness of vegetative plantings.

Project: South Zumbro River Watershed Project

Sponsor: Olmsted County
Funding: CWP (Grant) \$135,000 Awarded: 1995
Purpose: Implement best management practices to reduce ground water and surface water pollution in the Zumbro River watershed.

Project: Whitewater River Fish and Invertebrates

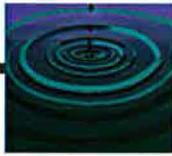
Sponsor: University of Minnesota Office of Research and Technology
Funding: Section 319 (Grant) \$6,700 Awarded: 1995
Purpose: Using GIS technology, examine the fish and invertebrate communities in the Whitewater River.

Project: Whitewater Watershed Project II

Sponsor: University of Minnesota Office of Research and Technology
Funding: Section 319 (Grant) \$27,000 Awarded: 1995
Purpose: Continue macroinvertebrate fishery and habitat assessments for Whitewater.

Project: Whitewater Watershed Project: Automated Monitoring

Sponsor: U of M Office of Research and Technology
Funding: Section 319 (Grant) \$7,800 Awarded: 1995
Purpose: Operate and maintain automated monitoring sites near the Whitewater River watershed.



Project: Whitewater Watershed Project: Biosystems and Ag Engineer

Sponsor: University of Minnesota Office of Research and Technology
Funding: Section 319 (Grant) \$5,000 Awarded: 1995
Purpose: Assist operation of five automated monitoring sites, monitor weather station.

Project: Big Sandy Lake Phase II Restoration Plan

Sponsor: Aitkin County
Funding: CWP (Grant) \$200,000 Awarded: 1996
Purpose: Reduce phosphorus loadings and increase participation in conservation practices.

Project: Bioavailable Phosphorus Credit Pay for Pounds

Sponsor: University of Minnesota Office of Research and Technology
Funding: Section 319 (Grant) \$3,000 Awarded: 1996
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 River Clean Water Partnership
Funding: CWP (Grant) \$214,000 Awarded: 1996
Purpose: Identify water quality contributions of the Watonwan River and determine goals for improvement.

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 Awarded: 1996
Purpose: Fund a position to educate, design best management practices, oversee erosion control in Lake Superior.

Project: Brown-Nicollet-Cottonwood Phase IIB Amendment

Sponsor: Brown-Nicollet-Cottonwood Water Quality Board
Funding: CWP (Grant) \$150,000 Awarded: 1996
Purpose: Continue implementation and diagnostic activities begun, further loan funding for BMP implementation.

Project: Cation/Anion and Isotope Analysis Project

Sponsor: University of Minnesota Department of Geology/Geophysics
Funding: Section 319 (Grant) \$7,800 Awarded: 1996
Purpose: Analyze cation, anion and isotopes in samples provided by the MPCA.

Project: Clearwater River State Revolving Loan Water Quality Improvement Project

Sponsor: U of M Office of Research and Technology
Funding: CWP (Loan) \$567,000 Awarded: 1996
Purpose: Provide SRF loan funding for streambank stabilization, public education and best management practices.

Project: Cottonwood River Restoration Project

Sponsor: Cotton River Clean Water Partnership
Funding: CWP (Grant) \$215,000 Awarded: 1996
Purpose: Document factors affecting sediment/nutrient transport, develop an implementation plan.

Project: Create Wetlands over Acid Generating Tailings

Sponsor: Minnesota Department of Natural Resources
Funding: Section 319 (Grant) \$2,500 Awarded: 1996
Purpose: Convert tailings basins into wetlands to protect water quality and create habitat.

Project: Cross Lake Watershed Project -- Pine County

Sponsor: Pine County Soil and Water Conservation District
Funding: CWP (Grant) \$35,000 Awarded: 1996
Purpose: Collect data, determine nutrient/hydrogeologic budgets, promote awareness.

Project: Economic Evaluation -- Pollutant Reduction

Sponsor: U of M Office of Research and Technology
Funding: Section 319 (Grant) \$20,000 Awarded: 1996
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 Agreement

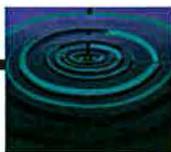
Sponsor: Rice County Highway Department
Funding: CWP (Grant) \$62,000 Awarded: 1996
Purpose: Continue best management practices implementation activities begun in French Lake Phase II.

Project: Grass Lake Restoration Project

Sponsor: Kandiyohi County Soil and Water Conservation District
Funding: Section 319 (Grant) \$100,000 Awarded: 1996
Purpose: Acquire conservation easements and restore drained prairie wetland basin.

Project: Grove Lake Restoration Project, Phase II

Sponsor: North Fork Crow River Watershed District
Funding: CWP (Grant) \$40,000; (Loan) \$143,000 Awarded: 1996
Purpose: Reduce or eliminate nutrient loading through implementing best management practices.



Project: Growth Management Project: Sustainable Land Use Pilots

Sponsor: Natural Resources Conservation Service
Funding: Section 319 (Grant) \$90,000 Awarded: 1996
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; (Loan) \$444,000
Awarded: 1996
Purpose: Reduce pollutant loading, improve wildlife habitat, improve lake management.

Project: Jefferson-German II State Revolving Fund Loan #2

Sponsor: Le Sueur County
Funding: CWP (Loan) \$1,050,000 Awarded: 1996
Purpose: Additional loan for continuation of implementation activities.

Project: Lake Harriet Watershed Best Management Practices Project, Phase III

Sponsor: Minnesota Department of Agriculture
Funding: Section 319 (Grant) \$50,000 Awarded: 1996
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; (Loan) \$1,251,000
Awarded: 1996
Purpose: Improve watershed coordination, reduce watershed loading, develop plans and educational opportunities.

Project: Miller Creek Restoration Project

Sponsor: U.S. Department of Agriculture
Funding: Section 319 (Grant) \$15,000 Awarded: 1996
Purpose: Riparian tree planting, pond side plantings, reestablish spring and fish habitat.

Project: Miller Creek Watershed Preservation and Restoration Project

Sponsor: Natural Resources Conservation Service
Funding: CWP (Grant) \$18,300 Awarded: 1996
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 Awarded: 1996
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 Awarded: 1996
Purpose: Provide funding to assist with implementation of 1996 NALMS conference.

Project: NRCS Conservationist Best Management Practices Implementation

Sponsor: Natural Resources Conservation Service
Funding: Section 319 (Grant) \$15,000 Awarded: 1996
Purpose: Continue the technical assistance to local governmental units of NRCS conservationist.

Project: Oakdale Wellhead Protection Program

Sponsor: City of Oakdale
Funding: CWP (Grant) \$25,000 Awarded: 1996
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) \$37,200 Awarded: 1996
Purpose: Assist farmers and compile information on implementing a manure management strategy.

Project: Osakis Lake Improvement Project

Sponsor: Sauk River Watershed District
Funding: CWP (Grant) \$183,000 Awarded: 1996
Purpose: Define water quality goals, reduce pollutants, increase public awareness, improve coordination of nonpoint source water pollution prevention activities.

Project: Paynesville Wellhead Protection

Sponsor: City of Paynesville
Funding: CWP (Grant) \$12,000 Awarded: 1996
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: U of M Office of Research and Technology
Funding: Section 319 (Grant) \$60,750 Awarded: 1996
Purpose: Increase adoption of best management practices to lower phosphorus inputs to the Blue Earth River.



Project: Pollution Reduction Payments Project

Sponsor: LeSueur County Soil and Water Conservation District

Funding: Section 319 (Grant) \$26,000 Awarded: 1996

Purpose: Develop grant agreements with land managers for best management practices implementation in LeSueur County.

Project: Prior-Spring Lakes Improvement Project

Sponsor: Prior Lake - Spring Lakes Watershed District

Funding: Section 319 (Grant) \$67,200 Awarded: 1996

Purpose: Continue implementation activities begun in earlier Prior-Spring Lakes project.

Project: Redwood River Clean Water Project

Sponsor: Cotton River Clean Water Partnership

Funding: Section 319 (Grant) \$108,790 Awarded: 1996

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 Awarded: 1996

Purpose: Reduce phosphorus loadings through best management practices.

Project: Shoreland Vegetation Best Management Practices to Reduce Erosion and Runoff

Sponsor: Aitkin County

Funding: Section 319 (Grant) \$19,200 Awarded: 1996

Purpose: Continue establishing filter strip demonstration plots to protect water quality.

Project: Shoreland Vegetation II Best Management Practices

Sponsor: Aitkin County

Funding: Section 319 (Grant) \$15,000 Awarded: 1996

Purpose: Continuation of shoreland vegetation activities on Big Sandy Lake.

Project: Snake River Project

Sponsor: Snake River Watershed Management Board

Funding: Section 319 (Grant) \$60,000 Awarded: 1996

Purpose: Implement streambank 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) \$945,000 Awarded: 1996

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) \$54,000 Awarded: 1996

Purpose: Install and monitor water level gages on bridge piers or freestanding structures.

Project: Wetland Treatment of Mine Drainage

Sponsor: Minnesota Department of Natural Resources

Funding: Section 319 (Grant) \$20,000 Awarded: 1996

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 Awarded: 1996

Purpose: Place water quality monitoring stations in two small watersheds to evaluate best management practices effectiveness.

Project: 1998 Minnesota Comprehensive Local Water Planners Conference

Sponsor: West Polk County Soil and Water Conservation District

Funding: Section 319 (Grant) \$3,000 Awarded: 1997

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 Awarded: 1997

Purpose: Provide technical and financial assistance to agriculture in the Sauk River watershed.

Project: Achieving Major Changes in Minor Watersheds

Sponsor: University of Minnesota Office of Research and Technology

Funding: Section 319 (Grant) \$78,000 Awarded: 1997

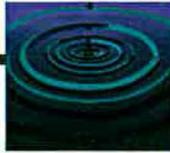
Purpose: Involve landowners and local units of government in developing tailor-made best management practices implementation plans.

Project: Anoka Sand Plain V -- Groundwater Dating

Sponsor: U.S. Geological Survey

Funding: Section 319 (Grant) \$35,000 Awarded: 1997

Purpose: Determine the recharge age of the Anoka Sand Plain groundwater and evaluate agricultural effects.



Project: Biological Monitoring in the Whitewater Watershed Project

Sponsor: Winona State University
Funding: Section 319 (Grant) \$20,000 Awarded: 1997
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) \$206,000 Awarded: 1997
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 Awarded: 1997
Purpose: Monitor Big and Little Comfort Lakes to analyze nutrients.

Project: Designing Stormwater Best Management Practices Workshop

Sponsor: University of Minnesota
Funding: Section 319 (Grant) \$27,000 Awarded: 1997
Purpose: Develop and present workshops on construction site erosion and stormwater detention.

Project: Horseshoe Chain of Lakes Improvement Project

Sponsor: Sauk River Watershed District
Funding: CWP (Grant) \$80,000; (Loan) \$320,000
Awarded: 1997
Purpose: Extend agricultural efforts, address on-site septic systems and shoreland erosion.

Project: Introduction to ArcView Course for MPCA Employees

Sponsor: Rowekamp Associates Inc.
Funding: Section 319 (Grant) \$8,800 Awarded: 1997
Purpose: Provide introduction to ArcView computer training for MPCA employees.

Project: Lake Sallie Restoration

Sponsor: Pelican River Watershed District
Funding: CWP (Grant) \$54,000; (Loan) \$385,000
Awarded: 1997
Purpose: Develop ecosystem management approach with alum treatment and biomanipulation.

Project: Long Prairie River Monitoring Project

Sponsor: Todd County Soil and Water Conservation District
Funding: CWP (Grant) \$35,000 Awarded: 1997
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 Awarded: 1997
Purpose: Continue best management practices implementation activities.

Project: Old Sod Farm Wetland Enhancement and Stormwater Management

Sponsor: Ramsey-Washington Metro Watershed District
Funding: Section 319 (Grant) \$40,400 Awarded: 1997
Purpose: Design/develop wetland learning center, improve stormwater quality, increase diversion of stormwater.

Project: On-Farm Manure Management II

Sponsor: Minnesota Department of Agriculture
Funding: Section 319 (Grant) \$37,000 Awarded: 1997
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) \$72,000 Awarded: 1997
Purpose: Implement sediment control structures for ravines to Pokegama and Cross Lakes

Project: Redwood River Watershed Project IV

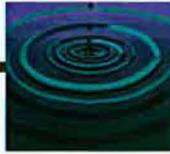
Sponsor: Cotton River Clean Water Partnership
Funding: Section 319 (Grant) \$122,000 Awarded: 1997
Purpose: Continue implementation activities in the Redwood River watershed.

Project: Rice Lake and Koronis Lake Restoration Project

Sponsor: North Fork Crow River Watershed District
Funding: Section 319 (Grant) \$36,000 Awarded: 1997
Purpose: Develop, implement best management practices for the watershed, educate landowners.

Project: Shoreland Vegetation III - Best Management Practices to Reduce Erosion and Runoff

Sponsor: U of M Department of Horticultural Science
Funding: Section 319 (Grant) \$30,000 Awarded: 1997
Purpose: Continue reestablishing native vegetation to reduce erosion and runoff, evaluate impacts.



Project: Springbrook Subwatershed Resource Investigation Project

Sponsor: City of Fridley
Funding: CWP (Grant) \$30,000 Awarded: 1997
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) \$94,000 Awarded: 1997
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) \$30,000 Awarded: 1997
Purpose: Analyze the biological monitoring data collected for the Whitewater Watershed Project.

Project: Workshops for Designing Stormwater Management Practices

Sponsor: University of Minnesota
Funding: Section 319 (Grant) \$27,000 Awarded: 1997
Purpose: Develop and present workshops on construction site erosion and stormwater detention.

Project: 1999 State Water Planning Conference

Sponsor: Southeast Minnesota Water Resources Board
Funding: Section 319 (Grant) \$3,000 Awarded: 1998
Purpose: Provide funds for the 1999 Minnesota State Water Planning Conference June 22-23, 1999.

Project: Alternative Wastewater Demonstration Project

Sponsor: Beltrami County SWCD
Funding: Section 319 (Grant) \$65,000 Awarded: 1998
Purpose: Replace 19 septic systems with a community activated sludge treatment system.

Project: Benefits and Impacts of Chemical Treatment of Lake Inflows

Sponsor: U of M Office of Research and Technology
Funding: Section 319 (Grant) \$40,000 Awarded: 1998
Purpose: Evaluate effectiveness of alum treatment for phosphorus removal at three sites.

Project: Bioavailable Phosphorus Credits in Pay for Pounds

Sponsor: U of M Office of Research and Technology
Funding: Section 319 (Grant) \$17,400 Awarded: 1998
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 Awarded: 1998
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) \$44,000 Awarded: 1998
Purpose: Establish vegetative buffer in Iosco Creek watershed drainage ditches.

Project: Environmental Protection through Shoreline Stewardship

Sponsor: Beltrami County SWCD
Funding: Section 319 (Grant) \$27,000 Awarded: 1998
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 Awarded: 1998
Purpose: Conduct detailed age dating of public well water under water disinfection rule.

Project: Improvement/Implementation of Manure Test Processes

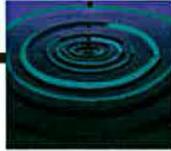
Sponsor: Minnesota Department of Agriculture
Funding: Section 319 (Grant) \$38,000 Awarded: 1998
Purpose: Provide expanded technical assistance and information to Minnesota livestock producers for implementing manure tests.

Project: Information and Education Coordinator

Sponsor: Minnesota Extension Service
Funding: Section 319 (Grant) \$66,000 Awarded: 1998
Purpose: Continue funding for nonpoint source information and education coordinator.

Project: Lake Superior Shoreline Protection Program

Sponsor: Cook County
Funding: Section 319 (Grant) \$60,000 Awarded: 1998
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) \$175,000; (Loan) \$712,000
Awarded: 1998
Purpose: Improve watershed coordination, reduce lake loading, education for landowners, evaluate impacts.

Project: Lakeshed Erosion Control Cost-Share Program

Sponsor: Minnesota Board of Water and Soil Resources
Funding: Section 319 (Grant) \$50,000 Awarded: 1998
Purpose: Provide funds to demonstrate and apply lower-cost land treatment practices to sediment.

Project: LARS-LUG Annual Reporting System

Sponsor: Minnesota Board of Water and Soil Resources
Funding: Section 319 (Grant) \$91,000 Awarded: 1998
Purpose: Provide funds for LARS enhancements, information to local government.

Project: Minneapolis Chain of Lakes Continuation

Sponsor: Minneapolis Parks and Recreation Board
Funding: CWP (Grant) \$250,000; (Loan) \$1,000,000
Awarded: 1998
Purpose: Continue implementation activities begun in Minneapolis Chain of Lakes Phase II.

Project: Redwood River Clean Water Project, Year 5

Sponsor: Cotton River Clean Water Partnership
Funding: Section 319 (Grant) \$122,000 Awarded: 1998
Purpose: Continue best management practices activities in the Redwood River watershed.

Project: Wastewater Facilitator

Sponsor: Blue Earth River Basin Initiative
Funding: Section 319 (Grant) \$92,000 Awarded: 1998
Purpose: Provide facilitator to work in Blue Earth watershed on wastewater problems.

Project: Whitewater Analysis of Biological Monitoring

Sponsor: Winona State University
Funding: Section 319 (Grant) \$50,000 Awarded: 1998
Purpose: Analyze prior biological monitoring data collected for the Whitewater Watershed Project.

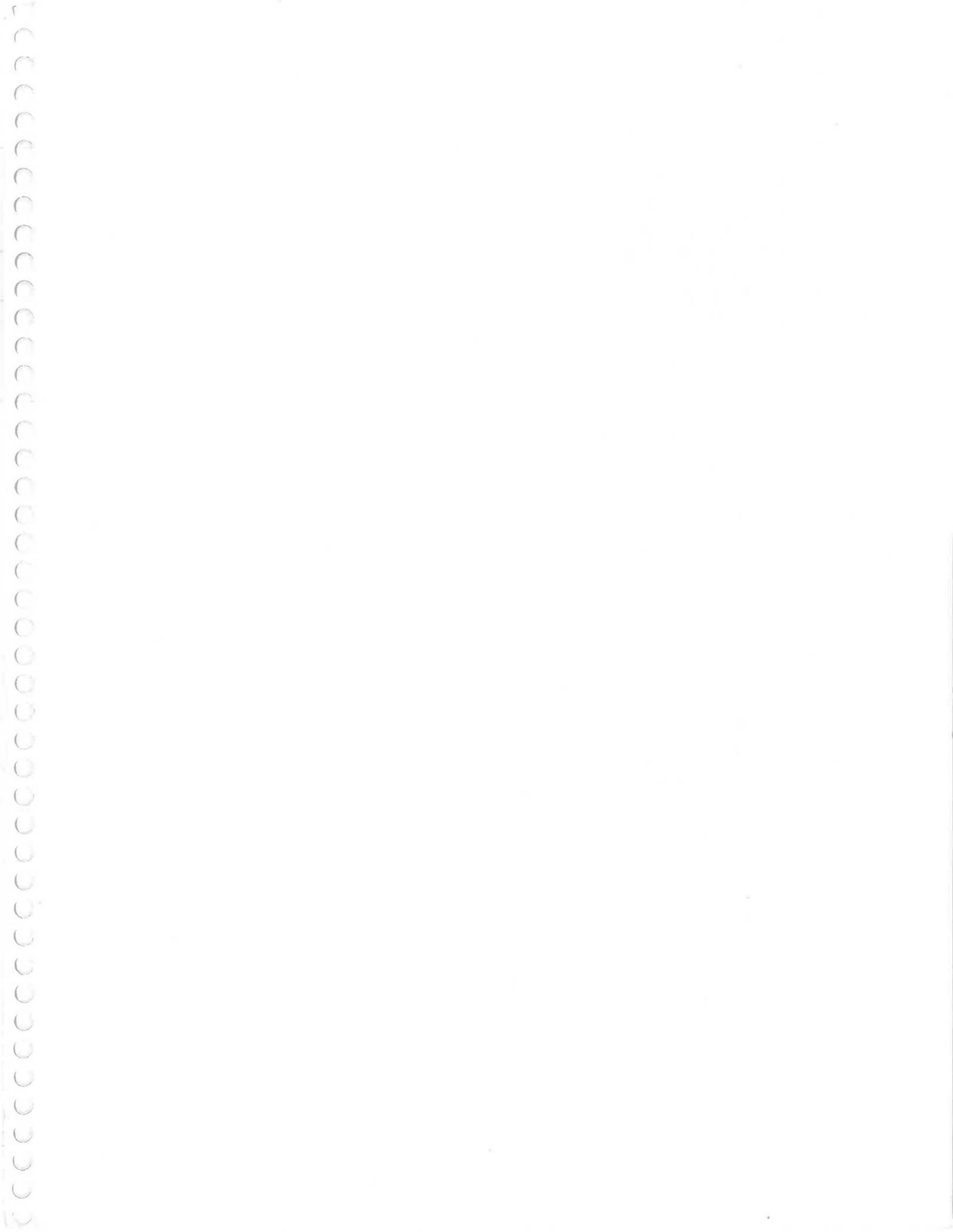
Project: Pollution Reduction Payments Projects

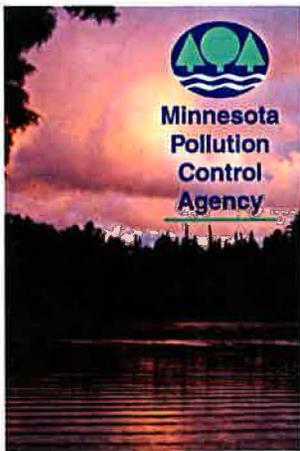
Sponsor: LeSueur County Soil and Water Conservation District
Funding: Section 319 (Grant) \$33,000 Awarded: 1998
Purpose: Implement the Pollution Reduction Payments Project.

Project: Minnesota River Basin: Promoting Best Management Practices

Sponsor: University of Minnesota Office of Technology and Research
Funding: Section 319 (Grant) \$55,200 Awarded: 2000
Purpose: Develop a resource guide that will combine the assessment and information aspects of the Cropland Assessment System.

Notes





Minnesota Pollution Control Agency

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