



**CLEAN
WATER
LAND &
LEGACY
AMENDMENT**



Clean Water Fund Performance Report

A report of Clean Water Funds invested, actions taken
and outcomes achieved in 2010-2011



Minnesota
Pollution
Control
Agency



Water Resources Center
UNIVERSITY OF MINNESOTA
Driven to Discover™



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More information on the status and trends summarized in this publication can be found on the Minnesota's Legacy Website at www.legacy.leg.mn/funds/clean-water-fund.

Project Team: Bill Dunn (MPCA), Tannie Eshenaur (MDH), Suzanne Hanson (MPCA), Andy Holdsworth (DNR), Jennifer Maleitzke (MPCA), Jeff Risberg (MPCA), Lanya Ross (Metropolitan Council), Deb Swackhamer (University of Minnesota), Dana Vanderbosch (MPCA), Margaret Wagner (MDA), Marcey Westrick (BWSR), David Wright (DNR)

Collaborators: David Bennett (Clean Water Council), Adam Birr (MDA), Mark Briggs (DNR), Kellie Dubay (TetraTech), Randy Ellingboe (MDH), Jeff Freeman (PFA), Marco Graziani (MPCA), Sheila Grow (MDH), Paul Hoff (MPCA), Brian Livingston (MPCA), Shannon Lotthammer (MPCA), Bruce Monson (MPCA), Scott Pengelly (DNR), Steve Pedersen (Clean Water Council), Michele Ross (MDH), Cori Rude-Young (MPCA), Mike Sandusky (MPCA), Rob Sip (MDA), Glenn Skuta (MPCA), Randy Thorson (MPCA), Barbara Weisman (MDA), Julie Westerlund (DNR)

Clean Water Fund Coordination Team: Julie Blackburn (BWSR), Linda Bruemmer (MDH), Rebecca Flood (MPCA), Terry Kuhlman (PFA), Jennifer Maleitzke (MPCA), Mary McConnell (DNR), Lanya Ross (Met Council), Deb Swackhamer (University of Minnesota), Matthew Wohlman (MDA)

Designer: Carol Pruchnofski

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Clean Water Fund Performance Report

About this report

Minnesotans care deeply about the state's natural resources and cultural heritage. Since the first decades of statehood, Minnesota has responded to many water quality and other natural resource challenges. For instance, through state, federal and private actions, we have made great strides in protecting drinking water supplies and reducing industrial pollution. However, these investments have not kept pace with the scope of water quality challenges.

In 2008, Minnesotans demonstrated a renewed commitment to clean water. We voted to increase our sales tax and pass the Clean Water, Land and Legacy Amendment¹, providing 25 years of constitutionally-dedicated funding for clean water, habitat, parks and trails and the arts.

With that vote came high expectations for results. Minnesotans want to know if our water quality is improving, declining or staying the same. We want to know if investments from the Clean Water Fund are making a difference. Each year until 2034, approximately \$85 million from the Clean Water Fund will be invested in various water management activities—from testing and assessing the state's lakes, streams and groundwater, to installing conservation practices on the ground to protect and restore our waterbodies. This work is being done by thousands of people, from state policy makers to local landowners.

How will we know if these dollars are making a difference? How will we know how much progress has been made after 5, 10 and 25 years?

Developing a tracking framework

Tracking the connections between dollars invested, water resource management actions taken, and clean water outcomes achieved is the charge of a multi-agency team (Team) that was assembled after the Clean Water Legacy Act² (Act) was passed. The Act required agencies to “establish and report outcome-based performance measures that monitor the progress and effectiveness of protection and restoration measures.”

The Team developed Minnesota's Clean Water Tracking Framework (Framework) in response to the new requirement.³ The development of the Framework and its suite of outcome-based performance measures continued after the Legacy Amendment was passed, and was enhanced to track Clean Water Fund investments and outcomes.

The Framework includes a set of performance measures that will convey the most meaningful information about clean

¹ **Clean Water, Land and Legacy Amendment:** In 2008, Minnesota's voters passed the Clean Water, Land and Legacy Amendment (Legacy Amendment) to the Minnesota Constitution to: protect drinking water sources; to protect, enhance, and restore wetlands, prairies, forests, and fish, game, and wildlife habitat; to preserve arts and cultural heritage; to support parks and trails; and to protect, enhance, and restore lakes, rivers, streams, and groundwater. The Legacy Amendment increases the state sales tax by three-eighths of one percent beginning on July 1, 2009 and continuing until 2034. The additional sales tax revenue is distributed into four funds as follows: 33 percent to the Clean Water Fund; 33 percent to the outdoor heritage fund; 19.75 percent to the arts and cultural heritage fund; and 14.25 percent to the parks and trails fund.

² **Clean Water Legacy Act:** The purpose of the Clean Water Legacy Act is to protect, restore, and preserve the quality of Minnesota's surface waters by providing authority, direction, and resources to achieve and maintain water quality standards for surface waters as required by section 303(d) of the federal Clean Water Act, United States Code, title 33, section 1313(d), and applicable federal regulations.

³ For more information on the Framework, see Minnesota's Clean Water Tracking Framework; May 2011 Progress Report, available here: www.pca.state.mn.us/index.php/view-document.html?gid=15911



water activities to key audiences across Minnesota. These 36 performance measures generally fall into the following four categories:

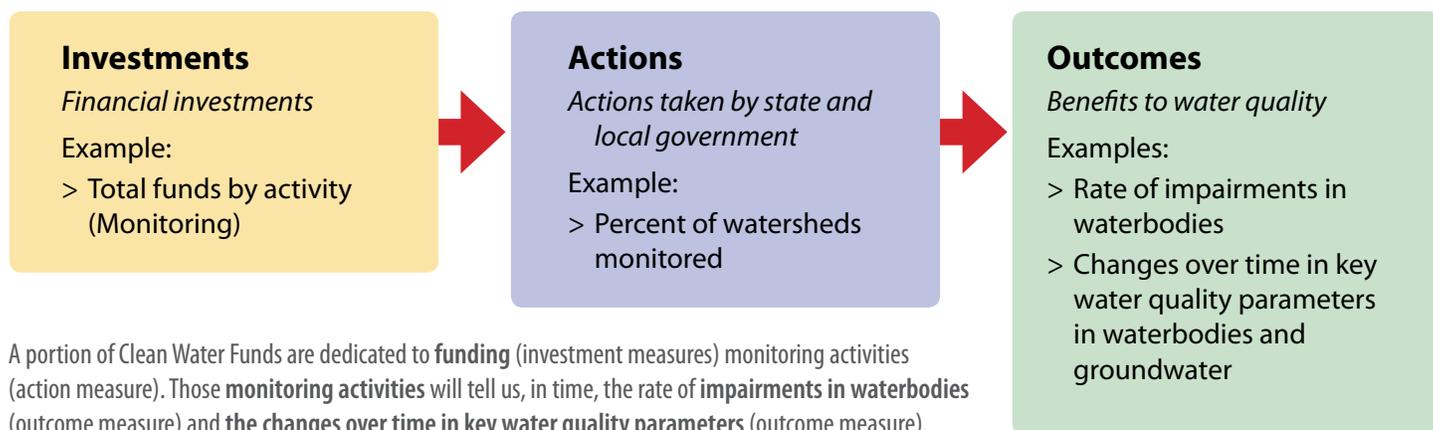
- **Environmental and Drinking Water measures** to track whether our water is getting cleaner;
- **Partnership and Leveraging measures** to track local government and citizen actions supported by the Clean Water Fund;
- **Organizational Performance measures** to track state government-led actions supported by the Clean Water Fund; and
- **Financial measures** to track how much and where Clean Water Fund money is being spent.

Two additional categories are in development:

- **Social measures** to track the level of public involvement and the capacity of individuals and communities to protect and restore water quality; and
- **Stressor measures** to track factors that will influence our ability to achieve clean water outcomes, such as land-use change, climate change, etc.

The Framework also describes the connection between short-term activities and long-term results. The multi-agency Team grouped the measures into three other categories: financial investments, actions taken, and outcome measures. Together these measures track how Clean Water Fund investments result in actions taken and ultimately, clean water outcomes achieved. In the early years of the Clean Water Fund, more progress will be reported in short-term actions taken than long term outcomes.

Measure connections



Caveats and limitations

We recognize that people are hungry for immediate results; however, managing water resources is an ongoing task, and some clean water outcomes may take several years to measure. For example, reducing the loading of phosphorus to a lake may take years to be reflected in lake phosphorus concentrations. Also, downward trends require several years of monitoring to document. Once a best management practice has been implemented, it often takes many years, or decades, before a positive environmental outcome is achieved in a highly degraded river, lake or groundwater source.



Additionally, while the goal of the Framework is to clarify connections between Clean Water Funds invested, actions taken and outcomes achieved, it is important to note that there are many other water resource management activities underway. These activities have various sources of funding. It would be impossible to measure everything in one report or project. The Team acknowledges that environmental outcomes may not all be directly related to only Clean Water Fund investments, but rather, a result of the many activities that are underway.

Report organization

This report includes 18 measure profiles to provide a snapshot of how Clean Water Fund dollars are being spent and what progress has been made. These measure profiles are organized into three sections: investment measures, surface water quality measures and drinking water protection measures. This first Clean Water Fund Performance Report includes those measures where data are currently available. More information on other measures will be released over time.

Each measure profile page includes the following:

- Measure type: investment, action, or outcome.
- Measure narrative: why the measure is important, what state agencies are doing, and what progress has been made.
- A graphic that summarizes the measure's data.
- Measure score for action and outcome measures. The qualitative scores summarize the measure's status using the following criteria:

Action measures:

-  We are making good progress
-  We anticipate difficulty, it is too early to assess; or there is too much variability across regions to assess statewide
-  Progress is slow/we are not meeting the target; or the activity or target is not commensurate with the scope of the problems

Outcome measures:

-  Water quality is high—we are on track to meet long-term water resource needs and citizen expectations
-  Water quality needs improvement or it is too early to assess—it is unclear if we will meet long-term water resource needs and citizen expectations; and/or water quality varies greatly between regions
-  Water quality is under intense pressure—long-term water resource needs and/or citizen expectations exceed current efforts to meet them.

Measure trend information:

-  Improving trend
-  No change
-  Declining trend



Clean Water Fund Report Card

Minnesotans care deeply about the state's natural resources and cultural heritage. In 2008, we voted to increase our sales tax and pass the Clean Water, Land and Legacy Amendment, providing 25 years of constitutionally-dedicated funding for clean water, habitat, parks and trails, and the arts.

With that vote came expectations for results. Minnesotans want to know if our water is improving, declining or staying the same. They want to know if investments from the Clean Water Fund are making a difference.

In the first biennium (FY10-11) of Clean Water Funding, (July 2009-June 2011), approximately \$152M was invested in water resource

management activities. The following report card indicates that the state is generally on track with its Clean Water Fund investments so far.

This report card is based on scores for 18 measures highlighted in this report. The scores provide a qualitative assessment of how well actions are being implemented and what outcomes are being achieved. Scores were developed using data-informed professional judgment of agency technical staff and managers. Action and outcome measures are scored for their status as of the end of FY11 and for their trend over time. In many cases, it is too early to report status and trend for outcome measures after just one completed biennium of Clean Water Funding.

Measure	Status	Trend	Description	
Investment Measures				
INVESTMENTS	Total Clean Water Fund dollars appropriated by activity.	FY10-11: \$152.2 million FY12-13: \$179.4 million	Trend data will be available following completion of FY12-13 biennium.	Appropriation levels will vary by biennium and the strength of the economy. FY10-11 funds have been allocated, while FY12-13 allocations are in progress.
	Total Clean Water Fund dollars per watershed or statewide for 1) monitoring/assessment, 2) watershed restoration/protection strategies, 3) protection/restoration implementation activities, and 4) drinking water protection.	Most watersheds in the state are benefiting from local and statewide projects.	Trend data will be available following completion of FY12-13 biennium.	For FY10-11, nearly all 81 watersheds benefitted from Clean Water Fund-supported activities. Implementation activities comprise the largest portion of spending in watersheds statewide.
	Total Clean Water Fund dollars awarded in grants and contracts to non-state agency partners.	\$68.7 million was awarded in grants and contracts to non-state agency partners in FY10-11.	Trend data will be available following completion of FY12-13 biennium.	Eighty-six percent of grant and contract awards are for implementation activities. Forty-five percent of total FY10-11 appropriations were awarded to non-state agency partners.
	Total dollars leveraged by Clean Water Fund implementation activities.	\$68.3 million dollars were leveraged by Clean Water Fund in FY10-11, or \$1.45 for every implementation dollar invested.	Trend data will be available following completion of FY12-13 biennium.	Required Clean Water match funds were met and exceeded.
Surface water measures				
ACTION	Percent of state's major watersheds intensively monitored through the watershed approach.			Good progress. The monitoring schedule set forth in 2008 is being followed and met.
	Number of non-point source best management practices implemented with Clean Water Funding and estimated pollutant load reductions.			Although funding has increased and there is a continued increase in practices being implemented, the total requests for projects was approximately three times greater than available funds.
	Number of municipal point source construction projects implemented with Clean Water Funding and estimated pollutant load reductions.			Good progress. Pace affected by uncertain municipal budgets and changing construction schedules. Pollutant load reductions are expected to increase as more cities seek financial assistance to move their projects from planning to construction.
OUTCOME	Rate of impairment/unimpairment of surface water statewide and by watershed.	Stream swimming	Not enough information for a trend determination at this time.	Water quality varies greatly by region. Watersheds yet to be assessed will influence the statewide impairment/unimpairment rate. It is unclear if long-term goals will be met.
		Lake swimming		
		Stream aquatic life		
	Changes over time in key water quality parameters for lakes, streams, and wetlands.	Lake clarity	Not enough information for a trend determination at this time.	Lake clarity: For lakes monitored by citizens, there are improving trends in lake water clarity in more lakes than not.
Stream fish		Stream fish: Fish community health varies greatly by region, but statewide percents of poor vs. good fish community health are similar.		
Wetland invertebrates		Wetland invertebrates: Statewide, most wetlands have good quality wetland aquatic insect communities.		

	Measure	Status	Trend	Description
OUTCOME	Number of previous impairments now meeting water quality standards due to corrective actions.			There is much variability in water quality across the state, but many projects are making progress in improving water quality. Restorations take several years to complete.
	Trends of mercury in fish and mercury emissions in Minnesota.	Fish 		Many lakes and rivers are currently impaired because of high mercury concentrations in fish. Significant progress has been made reducing mercury emissions in Minnesota. However, emissions are increasing on a world-wide scale.
		Minnesota emissions 		
	Changes over time in municipal wastewater phosphorus discharges.			Long-term ramp-up in requirements coupled with new Clean Water Fund investments are helping wastewater sources continue to reduce phosphorus discharges.

Drinking water measures

ACTION	Number of community public water supply systems assisted with developing source water protection plans.			Met target for FY10-11. On track to meet long-term target of every community public water supplier engaged in source water protection planning by 2020.
	Number of local government partners participating in Clean Water Funded groundwater nitrate monitoring and reduction activities.			Agencies are working with many local partners and continue to establish effective partnerships.
	Number of new health-based guidance values for contaminants of emerging concern.			Target of 10 new guidance values for FY10-11 was met. On track to meet FY12-13 target. Expanding outreach and education for citizens.
OUTCOME	Changes over time in pesticides, nitrate and other key water quality parameters in groundwater.	Pesticides 		Pesticides: There are decreasing concentrations of five common pesticides, although pesticides are still frequently detected at low levels in vulnerable groundwater.
		Nitrate 	Nitrate: Not enough information for a trend determination at this time.	Nitrate: There is significant local variability in nitrate monitoring results. However, nitrate levels continue to exceed drinking water standards and are increasing in certain vulnerable aquifers.
	Changes over time in source water quality used for community water supplies.		Not enough information for a trend determination at this time.	Currently collecting samples to compare with data from a similar study conducted 25 years ago.
	Nitrate concentrations in newly constructed wells.			Although nitrate levels in less than one percent of new wells exceed the drinking water standard for nitrate, there is a slight increase in recent years.

Legend	
Action Status Scores	Outcome Status Scores
We are making good progress/meeting the target	Water quality is high – we are on track to meet long-term water resource needs and citizen expectations
We anticipate difficulty; it is too early to assess; or there is too much variability across regions to assess	Water quality needs improvement or it is too early to assess – it is unclear if we will meet long-term water resource needs and citizen expectations; and/or water quality varies greatly between regions
Progress is slow/we are not meeting the target; or the activity or target is not commensurate with the scope of the problems	Water quality is under intense pressure – long-term water resource needs and/or citizen expectations exceed current efforts to meet them
	Trend
	Improving trend
	No change
	Declining trend



Investment measures

The four measures contained on pages 7-11 illustrate FY10-11 Clean Water Fund investments to restore and protect surface water and drinking water.

Investments

1. Total dollars appropriated
2. Total dollars by watershed or statewide
3. Total dollars awarded
4. Dollars leveraged

This first report establishes a baseline against which future actions and outcomes can be evaluated. It is a work in progress to be improved in future years based on the input and feedback received from stakeholders and the public.





Total dollars appropriated

INVESTMENT

Measure: Total Clean Water Fund dollars appropriated by activity

Why is this measure important?

Many Minnesotans want to know how money from the Clean Water Fund is being spent. This measure illustrates the overall amount of Clean Water Funds allocated in a particular biennium and provides a breakdown of that funding in specific categories to demonstrate trends over time. It is the first of four financial measures, providing context for the others. In future years, this measure will be tracked to determine overall appropriation trends. It is the primary investment that enables resources to be spent on the actions that will ultimately help achieve outcomes.

What are we doing?

State agencies, local government and nonprofit organizations are spending Clean Water Funds on hundreds of projects to protect and restore the state's surface water, groundwater and drinking water. Project categories include water-quality monitoring and assessment, watershed restoration and protection strategies, protection and restoration implementation activities and drinking water protection activities.

What progress has been made?

Voter approval of the Clean Water, Land and Legacy Amendment increased the sales and use tax rate by three-eighths of one percent on taxable sales, starting July 1, 2009 through 2034. Of those funds, approximately 33 percent were dedicated to the Clean Water Fund.

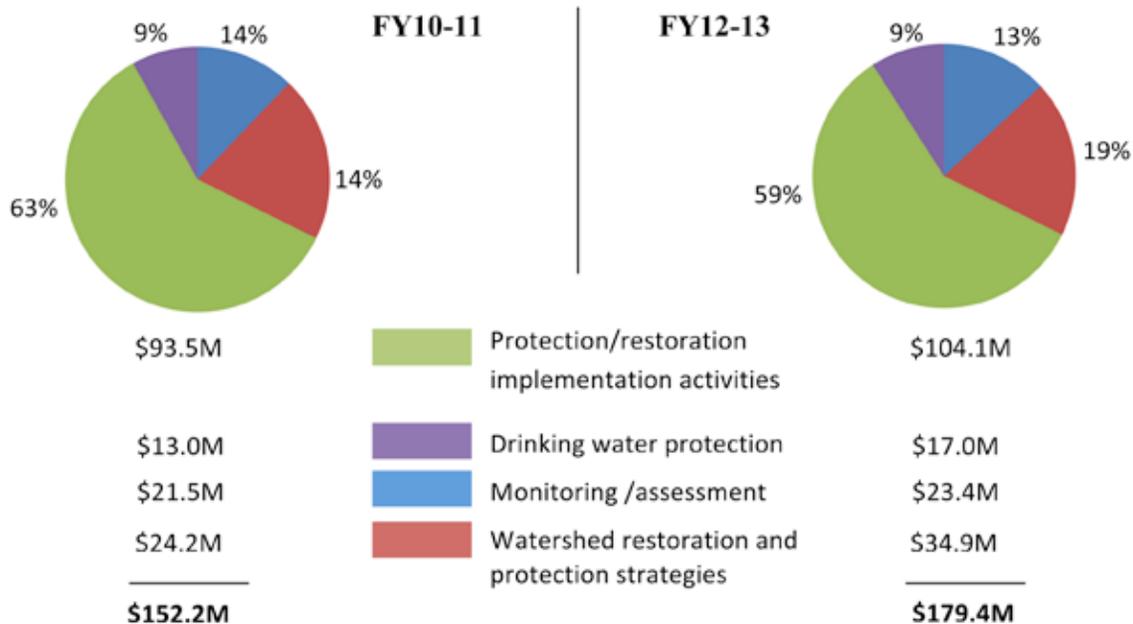
Of the sales tax receipts received since 2009, the Minnesota Legislature appropriated approximately \$152.2 million for FY10-11 and \$179.4 million in FY12-13. The chart below shows how that was appropriated.

Learn more

Find more information about this measure and its data at www.legacy.leg.mn/funds/clean-water-fund.

Status	Trend	Description
FY10-11: \$152.2M	Trend data will be available following completion of FY12-13 biennium.	Appropriation levels will vary by biennium and the strength of the economy. FY10-11 funds have been allocated, while FY12-13 allocations are in progress.
FY12-13: \$179.4M		

Clean Water Fund Appropriations





Total dollars by watershed or statewide

INVESTMENT

Measure: Total Clean Water Fund dollars per watershed or statewide for 1) monitoring/assessment, 2) watershed restoration/protection strategies, 3) protection/restoration implementation activities, and 4) drinking water protection

Why is this measure important?

Many Minnesotans want to know how much money from the Clean Water Fund is being invested, either in their community or throughout the state. This measure tracks Clean Water Fund investments by the 81 major watersheds in the state, as well as investments on statewide activities that benefit all watersheds. It shows how the funds are supporting specific activities in four major activity categories: water quality monitoring/assessment, watershed restoration/protection strategy development, restoration/protection implementation activities, and drinking water protection.

What are we doing?

Clean Water Fund-supported projects are underway across the state. They include local government-led implementation of practices to clean up wastewater, stormwater and agricultural runoff. They also include testing water quality in lakes and rivers to determine waterbody health, strategy development to guide effective watershed restoration and protection and implementation of source water protection plans for drinking water. Groundwater monitoring is also funded through Clean Water Fund dollars and is used to ensure drinking water and groundwater protection.

State agencies provide monitoring activities, development of watershed protection and restoration strategies, as well as technical assistance and administrative oversight for all activities taken by local government units and other partners. The agencies include: Board of Water and Soil Resources, Minnesota Department of Natural Resources, Minnesota Department of Agriculture, Minnesota Department of Health, Metropolitan Council, Minnesota Pollution Control Agency and the Public Facilities Authority.

What progress has been made?

For FY10-11, Clean Water Fund allocations to surface water and drinking water projects will benefit most of the 81 watersheds of the state.

Of the four activity categories, funding for implementation activities comprised the largest portion of spending statewide. However, the costs of implementation can vary significantly by watershed, depending on the type of project and the problem being addressed.

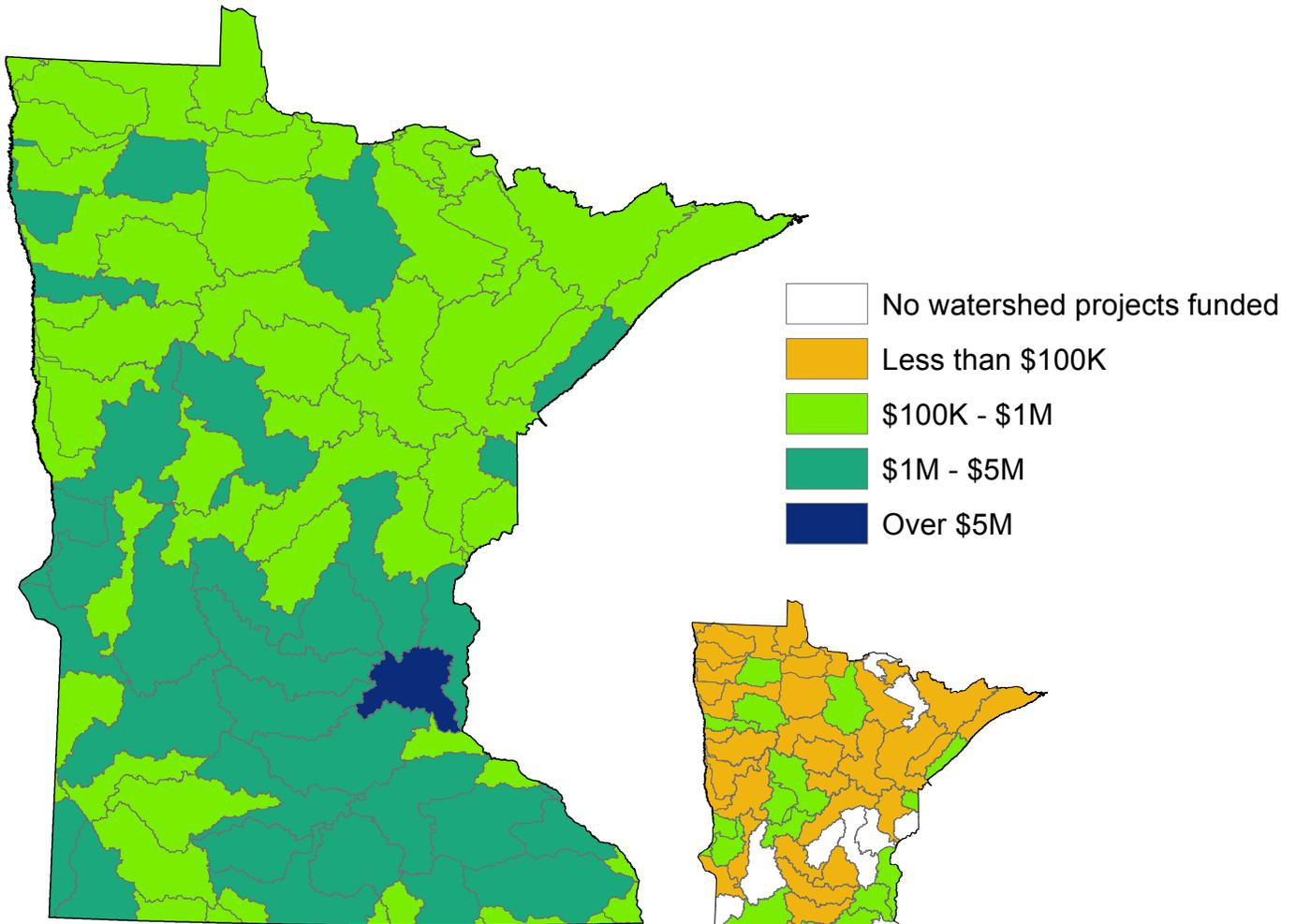
This report reflects only the first two years of work and not all watersheds got direct funding in this time period. Over the life of the Clean Water Fund, it is expected that all watersheds will experience direct funding as well as statewide benefits.

Learn more

Find more information about this measure and its data at www.legacy.leg.mn/funds/clean-water-fund.

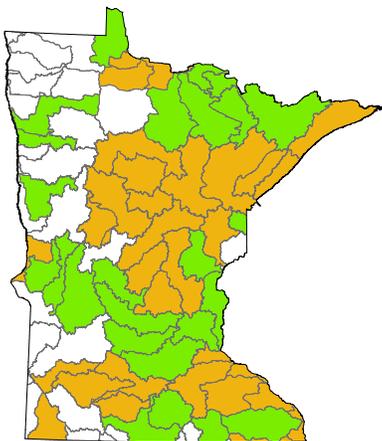
Status	Trend	Description
Most watersheds in the state are benefiting from local and statewide projects.	Trend data will be available following completion of FY12-13 biennium.	For FY10-11, nearly all 81 watersheds benefitted from Clean Water Fund-supported activities. Implementation activities comprise the largest portion of spending in watersheds statewide.

Total FY10-11 Clean Water Fund dollars by watershed

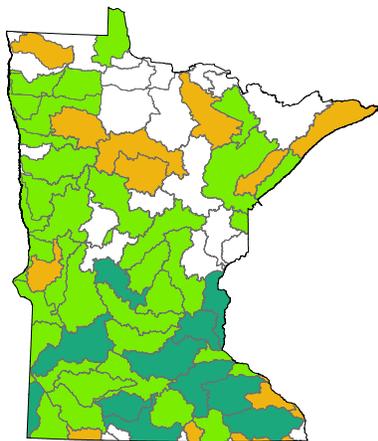


(a) combined watershed-specific projects, statewide activities and technical assistance that benefit all watersheds

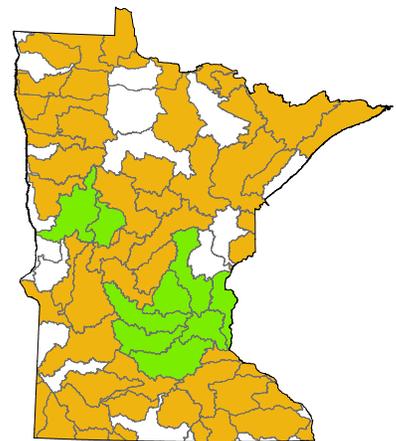
(b) monitoring and assessment



(c) watershed restoration/
protection strategies



(d) protection/restoration
implementation activities



(e) drinking water protection



Total dollars awarded

INVESTMENT

Measure: Total Clean Water Fund dollars awarded in grants and contracts to non-state agency partners

Why is this measure important?

This measure tracks the amount of Clean Water Funds that are awarded in grants and contracts to external, non-state agency partners to conduct a wide range of clean water activities. The measure provides context to how funding is distributed between state, federal and local agencies to perform Clean Water Fund-supported work.

What are we doing?

Hundreds of Clean Water Fund-supported projects, led largely by local government, are underway across the state. Non-state agency partners include cities, counties, soil and water conservation districts, watershed management organizations, federal agencies, universities, nonprofit organizations and private consulting firms working with local and state agencies.

Funded activities include implementation of practices to clean up wastewater and stormwater and agricultural runoff. They also include testing water quality to

determine the health of lakes and rivers, strategy development to guide effective watershed restoration and protection, and implementation of source water protection plans for drinking water. Groundwater monitoring is also funded through Clean Water Fund dollars and is used to ensure drinking water and groundwater protection.

For all activities taken by local government units and other partners, state agencies provide monitoring activities, development of watershed protection and restorations strategies, as well as technical assistance and administrative oversight. They include: Board of Water and Soil Resources, Department of Natural Resources, Minnesota Department of Agriculture, Minnesota Department of Health, Metropolitan Council, Minnesota Pollution Control Agency, and Public Facilities Authority.

What progress has been made?

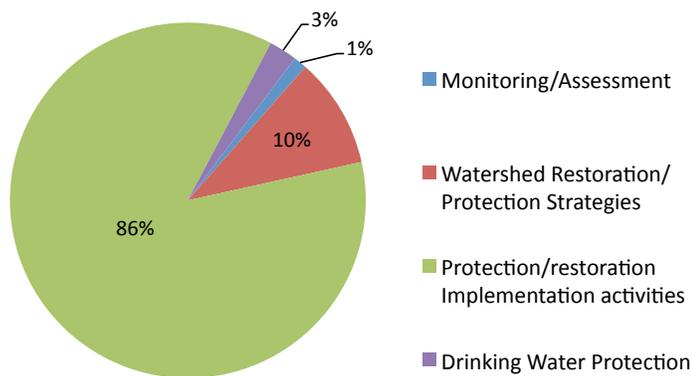
As shown in the pie chart, a total of \$68.7 million in Clean Water Funds was awarded to non-state agency partners in FY10-11, with the largest share of that going to protection and restoration implementation activities. This total represents 45 percent of the total \$152.2 million in Clean Water Fund appropriations for FY10-11.

The balance of remaining appropriations is largely used by state agencies to provide statewide monitoring, watershed protection and restoration strategy development, technical assistance and oversight on Clean Water Fund-supported projects. Note: Due to law, some funds are allocated in phases, and thus, over time the information in this measure will change.

Learn more

Find more information about this measure and its data at www.legacy.leg.mn/funds/clean-water-fund.

FY10-11 grant and contract awards by major activity



The percentage of total grant and contract awards (\$68.7 million) in FY 10-11 for each major Clean Water Fund-supported activity. Allocations to implementation activities are expected to stay steady or grow in future years as more projects move from strategy development to implementation.

Status	Trend	Description
\$68.7 million was awarded in grants and contracts to non-state agency partners in FY10-11.	Trend data will be available following completion of FY12-13 biennium.	Eighty-six percent of grant and contract awards are for implementation activities. Forty-five percent of total FY10-11 appropriations were awarded to non-state agency partners.



Dollars leveraged

INVESTMENT

Measure: Total dollars leveraged by Clean Water Fund implementation activities

Why is this measure important?

Throughout Minnesota, the demand for funding to protect and restore water resources far exceeds the available dollars. The ability to use state funds to leverage local and federal dollars means millions more dollars are available – increasing the number of projects implemented and making projects more cost effective for communities.

What are we doing?

Clean Water Fund grant and loan programs fund actions to prevent polluted runoff from fields, streets, lawns, roofs and other similar sources. They also fund improvements to municipal wastewater and stormwater treatment. Partnerships with state agencies and various local units of government are critical to implement these water quality improving activities. Additionally, federal partners are leveraging their dollars with Clean Water Funds to assist in critical data gathering and restoration efforts.

What progress has been made?

During FY10-11, more than \$27 million in competitive state grants were awarded to local communities and governments (watershed management organizations, soil and water conservation districts, counties, etc.) for projects to implement wellhead protection plans and reduce runoff from agricultural fields, streets, lawns and other areas. Local match and leveraged federal funds increased the project dollars by an additional \$44 million (more than 161 percent).

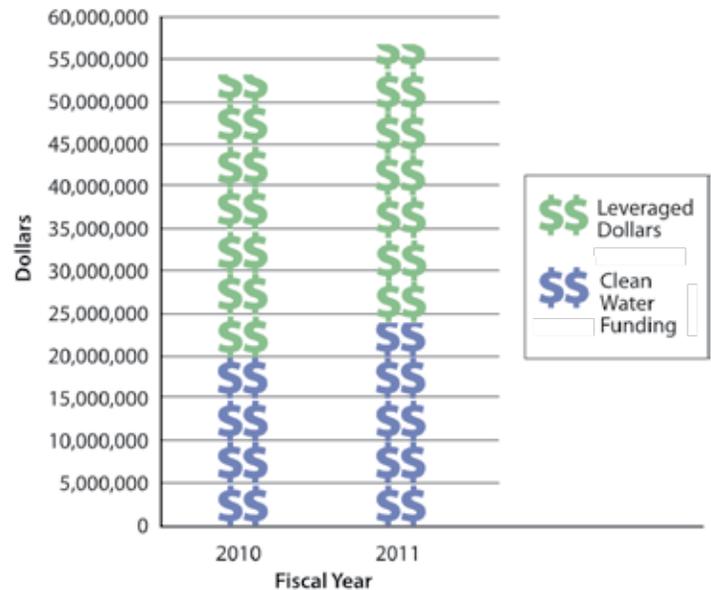
During the same time period, approximately \$16 million in state grants were awarded to improve municipal wastewater and stormwater treatment, and to help small communities invest in new infrastructure. Local match and leveraged federal funds increased the project dollars by \$22 million (more than 137 percent).

Finally, approximately \$3.4 million from the AgBMP loan program leveraged an additional \$2.3 million (68 percent) for practices that prevent non-point source water pollution or solve existing water quality problems.

Learn more

Find more information about this measure and its data at www.legacy.leg.mn/funds/clean-water-fund.

Implementation dollars leveraged by Clean Water Fund



In the past two years, Clean Water Fund grants and loans leveraged \$1.45 for every dollar the state invested. In 2010, \$21.4 million in Clean Water Funds grant awards leveraged more than \$34.4 million in additional funding from other sources. In 2011, \$25.6 million in Clean Water Funds leveraged more than \$33.9 million in supplemental funding.

Status	Trend	Description
\$68.3 million dollars were leveraged by Clean Water Fund in FY10-11, or \$1.45 for every implementation dollar invested.	Trend data will be available following completion of FY12-13 biennium.	Required Clean Water match funds were met and exceeded.



Surface water quality measures

The eight measures contained on pages 13-28 illustrate important Clean Water Fund-supported actions and outcomes undertaken to protect Minnesota's surface water quality.

Actions

1. Percent of major watersheds monitored
2. Nonpoint source BMP implementation
3. Municipal infrastructure projects

Outcomes

4. Surface water health
5. Lake, stream and wetland water quality
6. Waters restored
7. Mercury trends
8. Municipal wastewater phosphorus changes

This first report establishes a baseline against which future actions and outcomes can be evaluated. It is a work in progress to be improved in future years based on the input and feedback received from stakeholders and the public.





Percent of major watersheds monitored

ACTION

Measure: Percent of state's major watersheds intensively monitored through the Watershed Approach

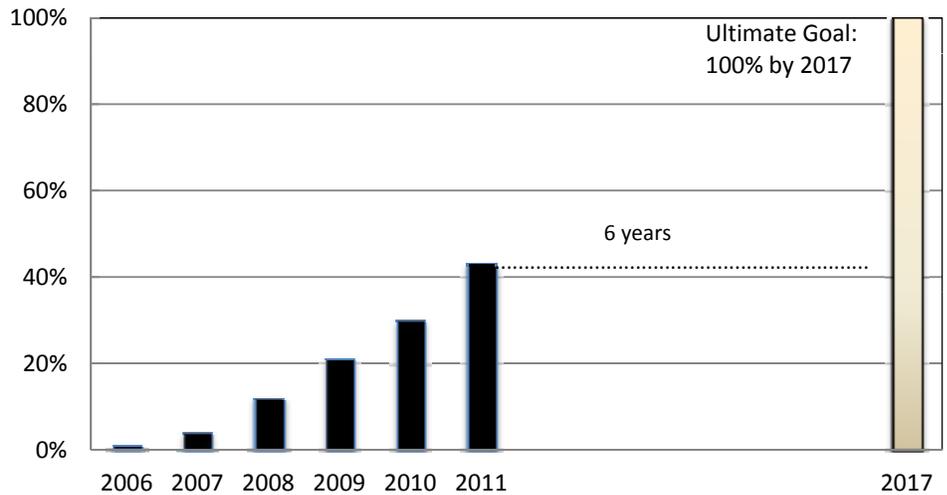
Why is this measure important?

As of 2006, only 18 percent of Minnesota lakes and 14 percent of streams had been monitored for basic water quality. The information gathered from monitoring is vital in determining if water quality standards to protect public health, recreation and aquatic life are being met.

It was determined that a strategic approach was needed to gain a better understanding of what was going on with Minnesota waters, as well as assess and monitor a larger number of water bodies. This is called the Watershed Approach.

Additional resources were needed to develop the comprehensive Watershed Approach. Through Clean Water Fund dollars, intensive sampling and assessment of lakes and streams in all 81 major watersheds allows for better protection of Minnesota's clean waters, and restoration of the polluted ones.

Cumulative percent of watersheds completed



lake chemistry. These data from monitoring activities determine if thresholds to protect public health, recreation and aquatic life for any number of pollutants, ranging from bacteria to nutrients, are being met. Once assessments of basic water quality are made, the monitoring data gathered during intensive monitoring serves as a starting point in determining the sources and magnitude of pollution for polluted waters, or as a baseline to set protection measures for those waters that are not polluted.



The MPCA and partner organizations evaluate water conditions, establish improvement goals and priorities, and take actions designed to restore or protect water quality on a 10-year cycle.

What progress has been made?

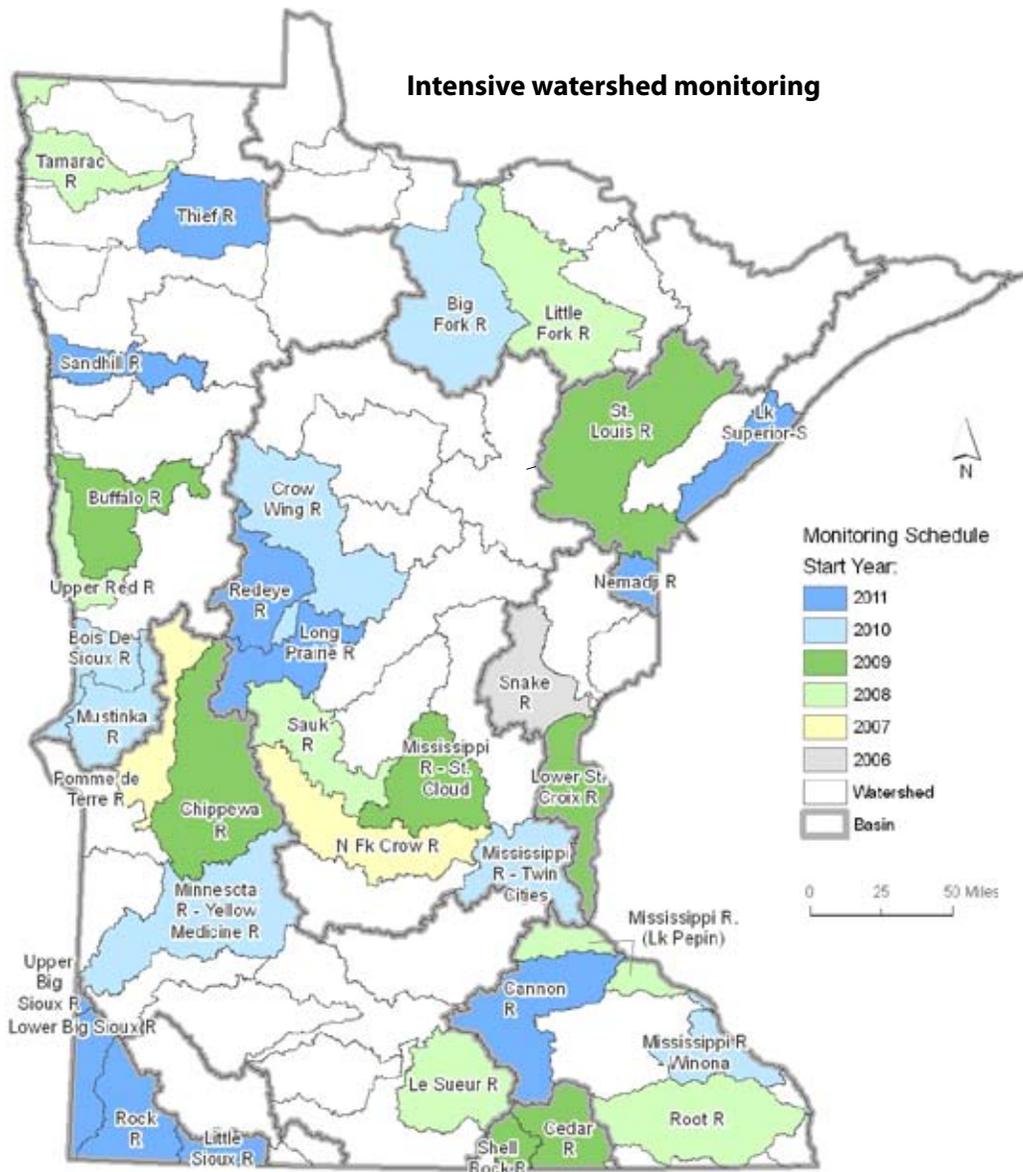
The first 10-year cycle began in 2008, after two years of piloting the approach of monitoring by watershed. To date, watershed monitoring plans are on track.

- 30 percent of major watersheds are completely monitored.
- Monitoring began in 2011 for 11 additional watersheds.

What are we doing?

The Watershed Approach was developed and tested, using the Snake River watershed as a pilot project. Now that approach is expanding state-wide. The approach is a ten-year rotational cycle where an average of eight of Minnesota's 81 major watersheds is intensively monitored each year for stream water chemistry, biology, and

In 2018, a new cycle begins, which means returning to the watersheds that were monitored 10 years earlier. Re-monitoring lakes and stream sites gives a better understanding if water quality has improved, declined or remained the same.



State's major watersheds intensively monitored through the Watershed Approach through 2011.

November 2010
Minnesota Pollution Control Agency

Learn more

- Find more information about this measure and its data at www.legacy.leg.mn/funds/clean-water-fund.
- Find your watershed at www.pca.state.mn.us/jsrid8f.
- Learn when the MPCA will be intensively monitoring your watershed: www.pca.state.mn.us/index.php/view-document.html?gid=10232.

Status	Trend	Description
●	➔	Good progress. The monitoring schedule set forth in 2008 is being followed and met.



Non-point source BMP implementation

ACTION

Measure: Number of non-point source best management practices implemented with Clean Water Funding and estimated pollutant load reductions

Why is this measure important?

Minnesotans want their water resources protected and restored. Unfortunately, it can take many years for pollution control practices to result in clean water. This measure helps us monitor progress towards the long-term goal of clean water by tracking the actions of people and organizations to implement best management practices, in cities and on the farm. This measure also tracks the estimated amount of pollution those practices are expected to reduce.

What are we doing?

Local governments—cities, watershed districts, counties and soil and water conservation districts—are leading both clean-up and protection efforts across the state. They work directly with communities, individual landowners and various non-profit organizations to implement best management practices. Best management practices are conservation practices that improve or protect water quality in agricultural, forested and urban areas. These practices include reducing polluted runoff from city streets, agricultural fields and feedlots, stabilizing stream channels and upgrading septic systems.

Estimating the environmental benefit of specific management practices can be done numerous ways. The most common are to develop computer models, use values from the scientific literature, or base estimates on the best professional judgment of experts. Regardless of the method used, some uncertainty remains in every estimate. As a result, there are several ongoing research efforts to improve and refine our estimates, so we can better quantify the environmental benefits of conservation practices.

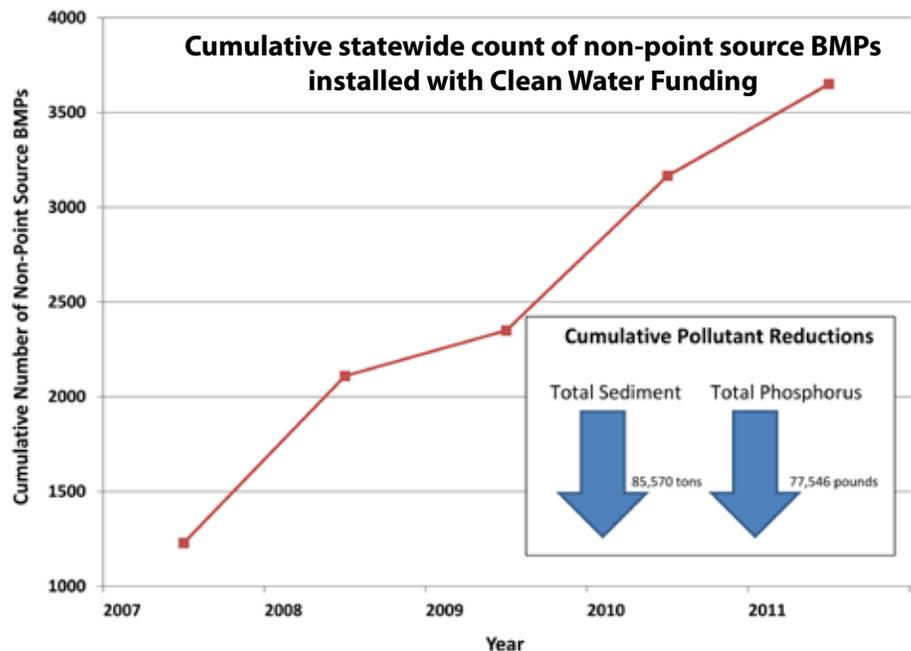
What progress has been made?

With Clean Water Funding, the implementation of practices to improve and protect Minnesota's water resources has accelerated.

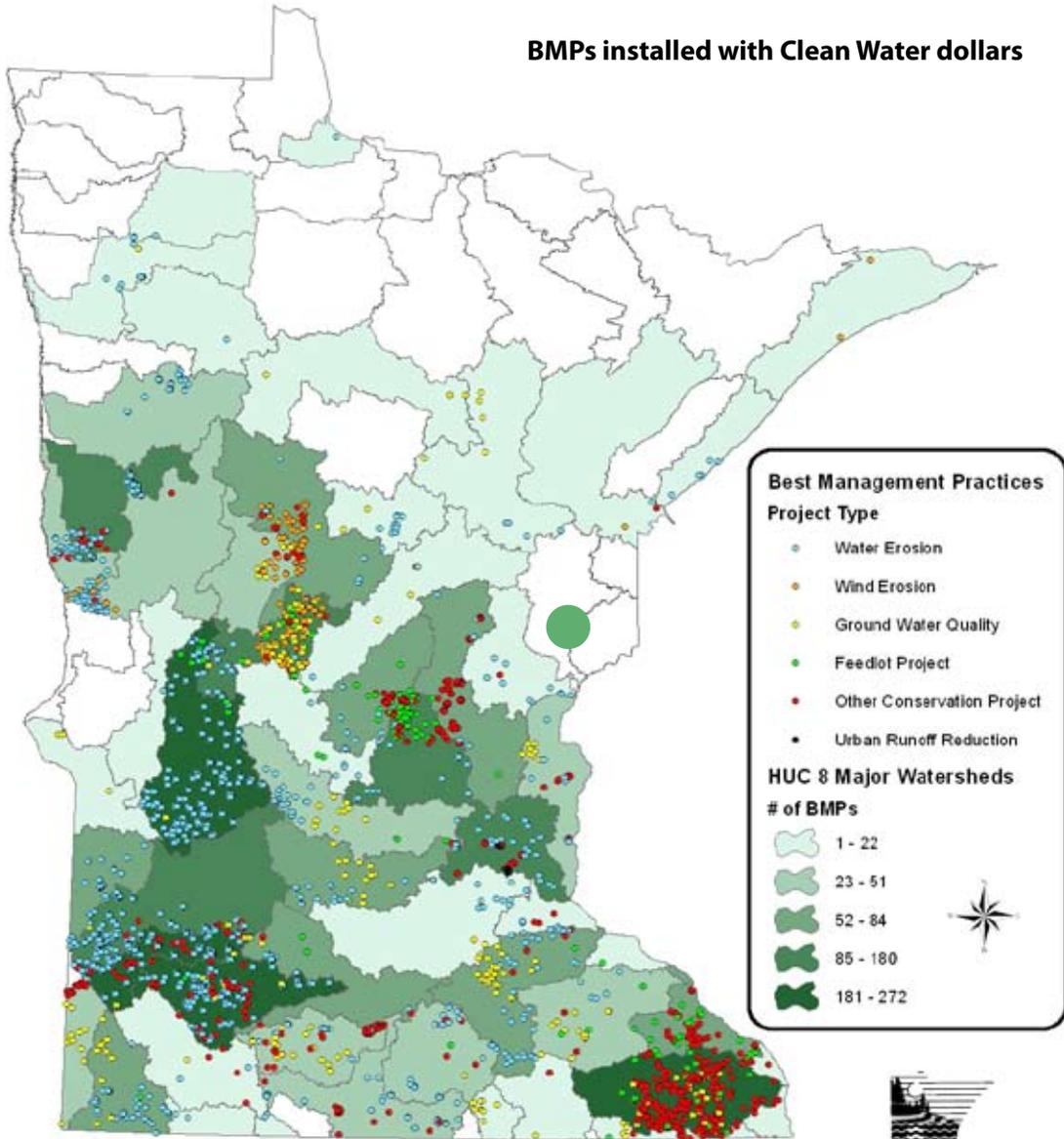
In FY10-11:

- More than 159 projects to protect and restore Minnesota water resources were funded,
- More than 195 loans to prevent non-point source water pollution or solve existing water quality problems were issued,
- More than 186 permanent conservation easements along riparian corridors and within wellhead protection areas were secured,
- 246 imminent health threat Subsurface Sewage Treatment Systems were repaired, and
- 89 feedlots located within riparian shore land areas were fixed.

Communities across the state are benefitting from Clean Water Funds and implementation projects to improve and protect water quality. For example, the Medicine Lake Total Maximum Daily Load (TMDL) prescribes a phosphorus reduction of 1,287 pounds from watershed pollutant loading. To date, Clean Water Funding has helped fund two projects that have an estimated phosphorus reduction of 396 pounds, or 31 percent of the reduction target set by the TMDL.



BMPs installed with Clean Water dollars



Note: This includes only features that were mapped in eLINK. BMPs that were reported but not mapped are not included



December 2011

Learn more

- Find more information about this measure and its data at www.legacy.leg.mn/funds/clean-water-fund.
- BWSR clean water stories: www.bwsr.state.mn.us/cleanwaterstories.
- MDA and the Clean Water Fund: www.mda.state.mn.us/cleanwaterfund.
- AgBMP Loan Program: www.mda.state.mn.us/grants/loans/agbmploan.aspx.

Status	Trend	Description
●	➔	Although funding has increased and there is a continued increase in practices being implemented, the total requests for projects was approximately three times greater than available funds.



Municipal infrastructure projects

ACTION

Measure: Number of municipal point source construction projects implemented with Clean Water Funding and estimated pollutant load reductions

Why is this measure important?

Significant progress has been made statewide to reduce pollution from municipal wastewater facilities. These investments significantly reduced pollution loading, however, more work is needed because many waters fail to meet water quality standards. This measure helps to track the point source pollutant reductions achieved by municipalities with the help of the Clean Water Fund. These reductions are in addition to the major water quality benefits already being achieved by municipalities through ongoing investments in wastewater and stormwater infrastructure.

What are we doing?

Wastewater and stormwater projects are tackling some of the most challenging pollutants:

- Fecal coliform in water bodies can have an affect on human and environmental health because it indicates a higher risk of pathogens being present in the water. Clean Water Funds provide grants and loans to unsewered areas to plan and construct replacement subsurface sewage treatment systems (SSTS) that prevent the release of untreated or partially treated wastewater.
- Phosphorus has been directly linked as a primary source of algae growth and nutrient loading. Clean Water Funds provide grants to municipalities to install treatment equipment to meet a Total Maximum Daily Load (TMDL) or permit-driven standard of 1.0 mg/L or less.

What progress has been made?

In 2010-2011, Clean Water Fund dollars helped 28 municipalities build wastewater and stormwater construction projects that will prevent more than 100,000 pounds per year of phosphorus from being discharged



The Watonwan River with diatom (major group of algae) bloom in 2007.

into Minnesota waters. By reducing phosphorus and other pollutants from wastewater discharge, these municipalities are meeting their responsibilities toward the goal of cleaning up Minnesota waters.

In addition, when municipalities invest in infrastructure improvements, there are long-term benefits to the local area and downstream. Clean Water Funds are targeted to projects to achieve specific waste load reductions, and systems are installed to track gains and improvements.

For example, much progress has been made in the Watonwan River watershed. In 2004, the Minnesota River Dissolved Oxygen TMDL set a total phosphorus loading target of just over 45,000 pounds. The Watonwan watershed portion of that load was just under 1,000 pounds. Since that time, six municipal wastewater projects were funded using Clean Water Funds, and Watonwan surpassed the goal with an overall reduction in point source discharge of 64 percent.

Similarly, the communities of Odin and Ormsby received Clean Water Fund grants to eliminate “straight pipe”



City of Odin outfall in 2008: Although the liquid is clear, it contains high levels of fecal coliform.

discharges to the Watonwan watershed that had little to no treatment for the wastewater. This meant raw sewage was being discharged to the watershed. These communities, with a combined population of 250 people, developed their own sewer collection systems and built a joint treatment facility which now meets Minnesota water quality treatment standards.

Learn more:

- Find more information about this measure and its data at www.legacy.leg.mn/funds/clean-water-fund.
- Minnesota Public Facilities Authority (PFA): www.positivelyminnesota.com/pfa.
- Minnesota Pollution Control Agency (MPCA): www.pca.state.mn.us/ppl.

Status	Trend	Description
●	➔	Good progress. Pace affected by uncertain municipal budgets and changing construction schedules. Pollutant load reductions are expected to increase as more cities seek financial assistance to move their projects from planning to construction.



Surface water health

OUTCOME

Measure: Rate of impairment/unimpairment of surface water statewide and by watershed

Why is this measure important?

Many Minnesotans want to know if they can swim and fish in their favorite lake or stream. Until recently, a relatively small percentage of lakes and streams had enough water quality information to determine if Minnesota's water goals were being met. In order to determine a waterbody's health, state agencies need basic water quality information that is obtained through monitoring. Without this basic information, work to develop plans to reverse water pollution and to protect high quality lakes and streams has been delayed.

What are we doing?

Clean Water Funding significantly increased water monitoring and assessment activities. In 2008, the MPCA implemented the Watershed Approach. This is a 10-year cycle where approximately eight of Minnesota's 81 major watersheds are intensively monitored each year for stream water chemistry and biology, and for lake chemistry. These data from monitoring activities are then assessed to determine if goals to protect recreational activities such as fishing and swimming, as well as to safeguard fish and aquatic ecosystems, are being met. By considering all lake and stream data for a given watershed at one time, a complete picture of the watershed's overall health develops. State agency and local partners are working together to conduct the intensive monitoring, assess the resulting monitoring information and to develop restoration and protection plans.

What progress has been made?

As of June 2011, 17 out of 81 watersheds have been assessed (see map on next page). An additional seven

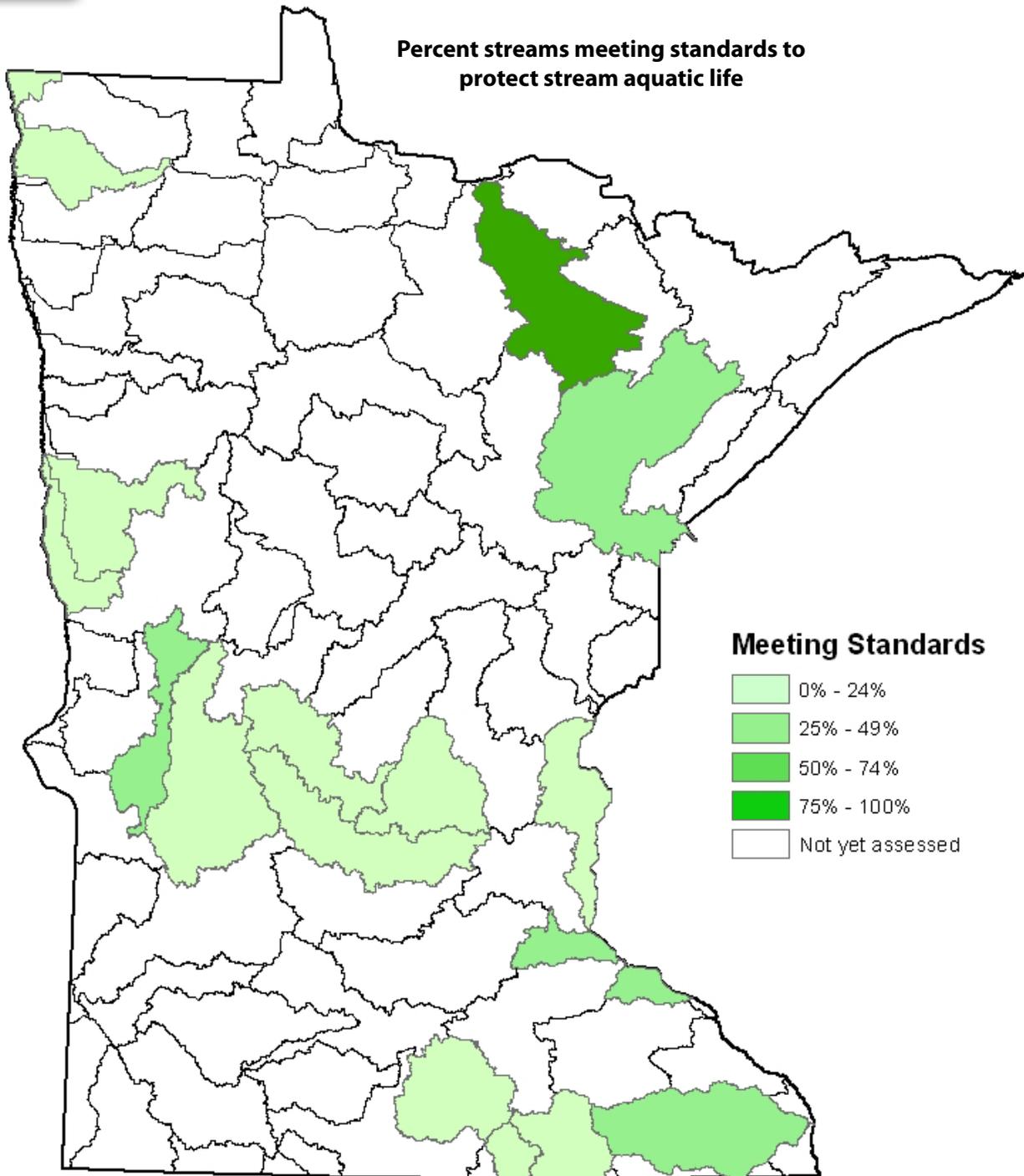


watersheds will be assessed starting in February 2012, with the remaining watersheds scheduled for monitoring and assessment through 2019. The assessment results are located on the MPCA's Minnesota Watershed web page at www.pca.state.mn.us/watersheds.

Learn more

- Find more information about this measure and its data at www.legacy.leg.mn/funds/clean-water-fund.
- Find water quality assessment results for specific lakes and streams at <http://cf.pca.state.mn.us/water/watershedweb/datasearch/waterSearch.cfm>.
- Visit www.pca.state.mn.us/index.php/view-document.html?gid=10232 to find out when your watershed will be monitored.

Status	Trend	Description
● Stream swimming	Not enough information for a trend determination at this time.	Water quality varies greatly by region. Watersheds yet to be assessed will influence the statewide impairment/unimpairment rate. It is unclear if long-term goals will be met.
● Lake swimming		
● Stream aquatic life		



Streams are monitored for water chemistry, fish, and aquatic insects to determine if a stream has healthy aquatic ecosystems. Water monitoring information is also evaluated to determine if lakes and streams are suitable for swimming and other water recreation, and to determine if consumption of fish should be limited.



Lake, stream and wetland water quality

OUTCOME

Measure: Changes over time in key water quality parameters for lakes, streams, and wetlands

Why is this measure important?

Water quality in a lake or stream can change from year-to-year depending on a variety of factors ranging from rain quantity or summer temperatures to runoff from agricultural areas, parking lots, roads and lawns. Because of factors like these, waters must be sampled for many years to detect true water quality trends. The information that is gathered over the years is valuable because it gives insights into general water quality patterns and trends across the state, such as where to target restoration and protection efforts in the future and how to determine the effectiveness of current activities put in place to restore polluted waters and protect those that have good water quality.

What are we doing?

Federal, state and local organizations have been monitoring Minnesota's lake, stream and wetland water quality for decades. Data has been collected throughout the state, and the results of this work have been widely reported to support various program goals. Taken together, Minnesota's water quality data paint a picture of general condition and changes in Minnesota's lakes, streams, and wetlands.

This measure tracks those water quality factors that tend to be the largest sources or indicators of pollution. Some of these parameters include:

Lakes

- Contributor to algae – total phosphorus
- Measurement of algae – chlorophyll-a
- Measurement of water clarity - Secchi

All three of these elements combined indicate if lake water quality is good for recreation, such as swimming and fishing.

Streams

- Total phosphorus
- Nitrate
- Total suspended solids (sediment)
- Fish and invertebrates (aquatic insects)

Phosphorus, nitrate and suspended solids in high concentrations affect the survival rate of fish, and their



Water clarity is monitored using a Secchi disk.

food source, aquatic insects. All of these parameters combined measure the ability of the stream to support healthy fish populations and aquatic ecosystems.

In addition to analyzing data from existing sites, state and local partners are expanding the monitoring network to provide information in new areas or places facing new threats.

What progress has been made?

Expansion of the monitoring network supports this effort to evaluate water quality trends in the state of Minnesota. The following activities are key highlights:

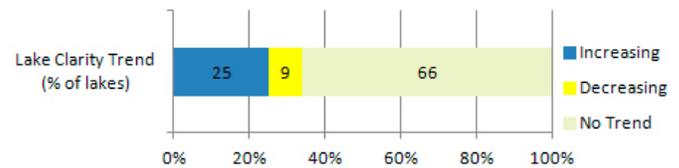
- MPCA's Major Watershed Load Monitoring network began in 2008. Baseline watershed yield information is now available.
- For more than 10 years, the Citizen Lake and Stream Monitoring program annually collect lake and stream water clarity information. This volunteer program is vital in gathering long-term trend analyses.

- Over the past several years, the MPCA participated in the National Aquatic Resources Surveys for lakes, streams/ivers, and wetlands, giving baseline information. In 2010-11, the MPCA participated in the second national stream/river survey. Results should be available in 2012.
- The first 10-year rotation of intensive watershed monitoring will span 2008-2017. Information comparing the condition of watersheds from the first cycle to the second will begin to be available by 2021.
- The Comprehensive Wetland Assessment program gave a baseline of the condition of depressional wetlands for 2007-2009, and that data are presented here.

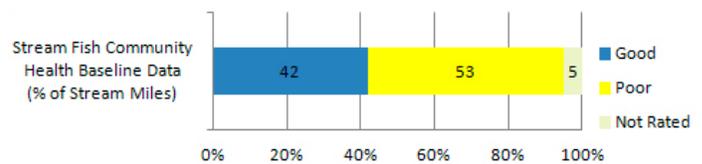
Most often, changes over time in key parameters are a complicated mix of improvements in some aspects of water quality and declines in others.

Learn more

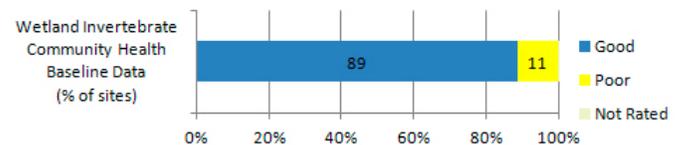
- The MPCA has a rich array of graphics that, combined, provide a more comprehensive picture of the state of Minnesota’s water resources. Graphics can be produced for multiple combinations of waterbody types, pollutants/parameters, and monitoring approaches. Find more information about this measure and its data at www.legacy.leg.mn/funds/clean-water-fund.
- The Minnesota Department of Agriculture publishes annual monitoring reports that include water quality information on pesticides and other agricultural chemicals for both surface and groundwater. Those reports can be found at www.mda.state.mn.us/monitoring.



Trends in lake water clarity between 1973 and 2010. While water clarity, in general, is poorer in southern Minnesota, increasing and decreasing lake clarity trends are fairly evenly scattered through north and south central Minnesota. There is no discernable trend in water clarity for two-thirds of the lakes represented here.



Fish community health in streams is best in the northeast and southeast, and gradually declines moving toward the west and southwest. This data provides a baseline to measure change against.



Wetland invertebrate communities across the state are doing well overall, with those sites not faring as well being mostly in the former prairie region of the southwest. This data provides a baseline to measure change against.

Status	Trend	Description
● Lake clarity	Not enough information for a trend determination at this time.	Lake clarity: For lakes monitored by citizens, there are improving trends in lake water clarity in more lakes than not.
● Stream fish		Stream fish: Fish community health varies greatly by region, but statewide percents of poor vs. good fish community health are similar.
● Wetland invertebrates		Wetland invertebrates: Statewide, most wetlands have good quality wetland aquatic insect communities.



Waters restored

OUTCOME

Measure: Number of previous impairments now meeting water quality standards due to corrective actions

Why is this measure important?

According to the 2010 assessment of water quality in Minnesota, there are 436 rivers and 1,205 lakes that are “impaired.” This means they are not meeting federal water quality standards set to protect public health, recreation and aquatic life from any number of pollutants, ranging from bacteria and sediment to mercury and nutrients.

This measure tracks how actions taken on the ground led to success. While it can take decades to clean up a problem, we have a growing number of waters that are now meeting restoration targets.

What are we doing?

Pollution problems are initially identified through water quality monitoring, followed by the completion of studies and plans to determine what corrective actions are needed. Partnering with state and federal agencies, local governments – cities, watershed management organizations (WMO), counties and soil and water conservation districts (SWCD) – are leading these clean-up efforts, working with organizations, landowners and citizens. These actions include upgrading wastewater treatment plants and septic systems; reducing polluted runoff from city streets, agricultural fields and feedlots; and implementing other on-the-ground actions called best management practices or BMPs.

What progress has been made?

Ultimately, the target for this measure is to restore all impaired waters in Minnesota. The Minnesota Pollution Control Agency (MPCA) began listing impaired waters in 1998; since that time 15 previously impaired lakes and river segments are now meeting water quality standards due to corrective actions (see map on next page).

One recent example comes from Scott County, where, over the past decade, the City of Savage, Scott SWCD, and Scott WMO partnered to complete numerous projects in the watershed. One notable success story is the recovery of a turbidity-impaired section of the Credit River. The Utica Ravine, located in Savage, drains into the Credit River. The ravine is 2,740 feet long and was causing significant erosion. Through a grant from the Clean Water Fund and with matching funds from both the Scott WMO

and the City of Savage, 730 feet at the upstream end and an additional 1,100 feet on the downstream end were stabilized in 2010.



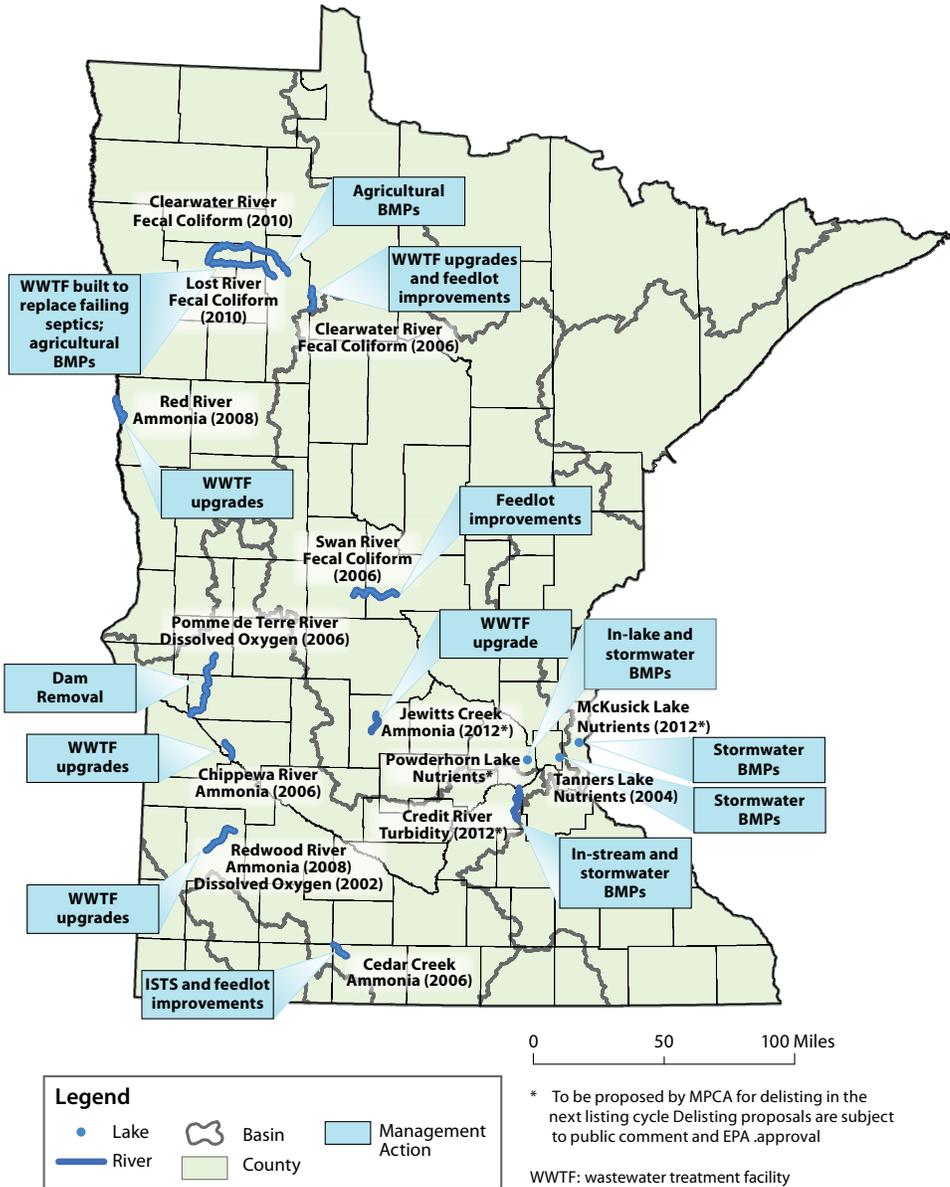
Significant erosion from the Utica Ravine in the City of Savage was a large source of sediment to the turbidity-impaired Credit River.



Scott WMO, working with the City of Savage and Scott SWCD, received \$130,000 from the Clean Water Fund to install this BMP to stabilize the Utica Ravine, and help restore the Credit River.

Number of previous impairments now meeting water quality standards due to corrective actions

December 2011 — 15 listings



Many other waters are improving

In most cases, the 15 success stories depicted on this map are the result of several years of diligent efforts at the local level both prior to and with Clean Water Funds. However, the map does not give a sense of the numerous lakes and streams making restoration progress. For example, in a 2008 study of 15 large lakes (more than 1000 acres) in Crow Wing County, showed that two-thirds of these lakes are improving or maintaining water quality, despite increasing development and recreational pressures. This is due to a wide range of management activities during the past few decades. Although full restoration of Minnesota's waters will take time, the Clean Water Fund investments will help accelerate the pace of these activities.

Learn more

- Find more information about this measure and its data at www.legacy.leg.mn/funds/clean-water-fund.
- Find your watershed and restoration projects at: www.pca.state.mn.us/jsrid8f.
- Crow Wing County Large Lakes Assessment, 2008: www.co.crow-wing.mn.us/index.aspx?NID=705.

Status	Trend	Description
●	➔	There is much variability in water quality across the state, but many projects are making progress in improving water quality. Restorations take several years to complete.



Mercury trends

OUTCOME

Measure: Trends of mercury in fish and mercury emissions in Minnesota

Why is this measure important?

Many Minnesota lakes and rivers contain contaminants, primarily mercury, which accumulate in fish and may pose a risk to humans as well as fish-eating wildlife. Because air pollution is the primary source of mercury, reducing mercury in fish requires large reductions in mercury emissions from sources in Minnesota and throughout the world. To evaluate if Minnesota waters are getting cleaner, mercury emission levels can be tracked over time through periodic emissions inventories and then measured against how fish mercury levels respond. Because of the large variation in mercury concentrations from year to year within and among lakes, long-term trends of mercury in fish are necessary to see if pollution control efforts are sufficient.

What are we doing?

The Minnesota Department of Natural Resources (DNR) is leading efforts to track mercury levels in fish. The DNR collects fish from approximately 150 lake and river sites annually throughout Minnesota and prepares samples for testing. Each year, thousands of walleyes, northern pike, panfish, and other species are tested; Clean Water Funding has expanded the number of sites tested each year by 80. The Minnesota Pollution Control Agency (MPCA), Minnesota Department of Health (MDH), and U.S. Forest Service provide input on where samples should be collected; the Minnesota Department of Agriculture’s (MDA) laboratory analyzes the samples.

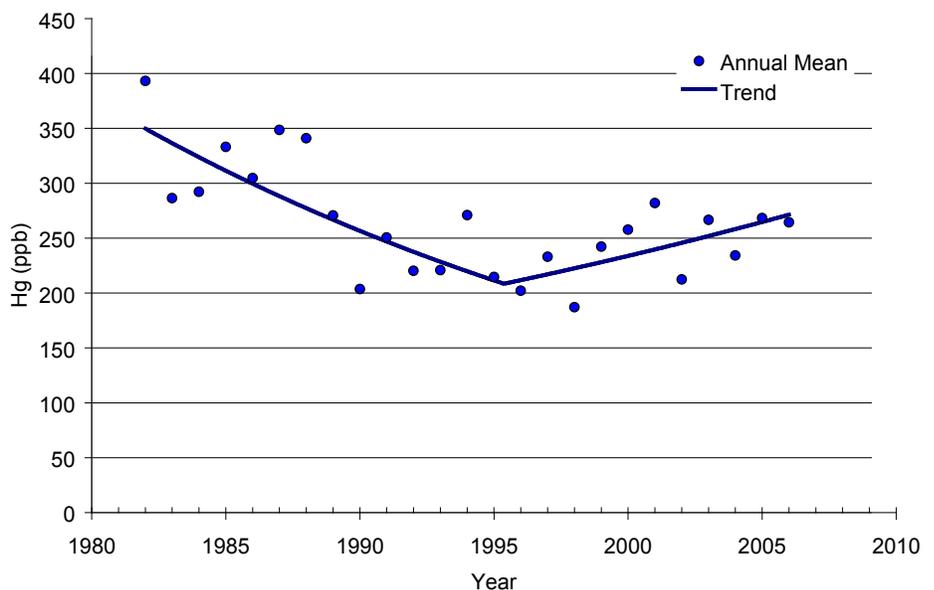
Decades of monitoring has shown that most fish contain some mercury, that the average mercury level generally increases from south to north in Minnesota, and that panfish have lower mercury levels than top predator fish. Sampling previously tested waters to look for trends in fish-mercury levels has been a priority in the last 15 years. Between 1982 and about 1996, a clear downward trend in mercury concentrations in northern pike and walleyes was observed.

However, that pattern was reversed and the 1996 to 2007 period shows a significant upward trend (figure below). The fish mercury trend analysis will be updated in 2012 and every five years thereafter.

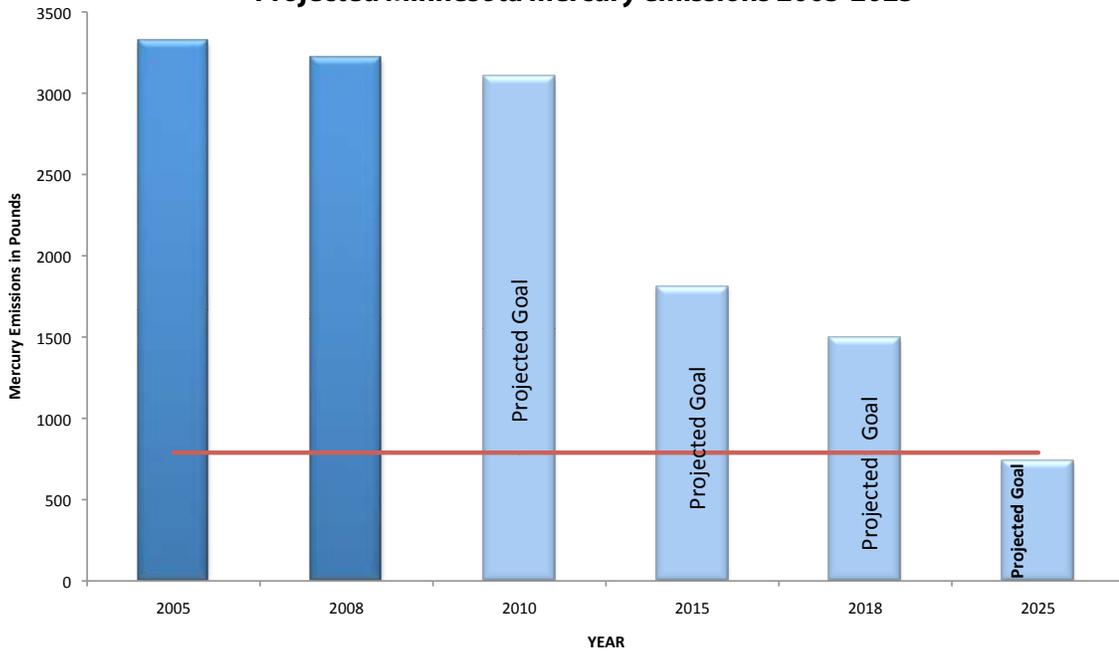
What progress has been made?

To achieve the necessary reductions of mercury in the fish, Minnesota’s Statewide Mercury TMDL established a goal of a 93 percent reduction in mercury input from all human sources. Minnesota receives 90 percent of its mercury pollution from outside the state. Rapid economic growth in Asia and India since 1990 has contributed to increased global emissions of mercury, despite mercury emissions in North America and Europe being cut to half since 1990. The United Nations Environment Program is negotiating reductions among all countries of the world. Minnesota is doing its part, and has taken significant steps towards achieving the identified mercury air emission reductions. Since 1990, removing mercury from latex paint, requiring mercury controls on municipal waste combustors, banning small onsite incinerators, mercury in batteries, and disposal of mercury-containing products has reduced mercury emissions in Minnesota by more than 70 percent.

Trend of mercury in northern pike and walleye from Minnesota lakes



Projected Minnesota mercury emissions 2005-2025



Mercury emissions from Minnesota sources; 2005 and 2008 are based on measured and calculated inventories

To reach the 93 percent reduction goal, air emissions of mercury from all sources in Minnesota must be reduced to 789 pounds per year (figure above). Minnesota’s Statewide Mercury TMDL Plan has set a strategy and timeline to achieve that goal by 2025.

Learn more

- Find more information about this measure and its data at www.legacy.leg.mn/funds/clean-water-fund.
- Fish Contaminant Monitoring (DNR or MPCA): www.pca.state.mn.us/sbiz6b0.
- Fish Consumption Advice (MDH): www.health.state.mn.us/divs/eh/fish/index.html.
- Lake Finder: www.dnr.state.mn.us/lakefind/index.html.
- Mercury TMDL Implementation Plan: www.pca.state.mn.us/index.php/view-document.html?gid=11491.
- UNEP Mercury Emissions Inventory: www.unep.org/hazardoussubstances/Mercury/MercuryPublications/ReportsPublications/tabid/3593/Default.aspx.

	Status	Trend	Description
Fish	●	➔	Many lakes and rivers are currently impaired because of high mercury concentrations in fish. Significant progress has been made reducing mercury emissions in Minnesota. However, emissions are increasing on a world-wide scale.
Minnesota emissions	●	➔	



Municipal wastewater phosphorus changes

OUTCOME

Measure: Changes over time in municipal wastewater phosphorus discharges

Why is this measure important?

Under natural conditions, phosphorus is typically scarce in water. Too much phosphorus can cause water pollution by promoting excessive algae growth. Lakes are more susceptible to algae growth, turning them green and in serious cases, suffocating fish and other aquatic life.

Approximately 30 percent of the phosphorus load to Minnesota waters comes from point sources such as municipal and industrial wastewater treatment facilities. Wastewater treatment facilities are regulated and must treat water that goes down the drain from homes and many businesses. They are required to clean-up phosphorus, as well as many other pollutants, to levels that protect water quality.



Laura Fletcher, process engineer at the Metro Plant in Saint Paul, monitors the aeration tanks. Her work ensures the plant is working effectively and efficiently.

What are we doing?

Clean Water Fund grants to cities help finance upgrades to wastewater treatment systems to reduce phosphorus discharges. Many small cities without adequate wastewater treatment have used these grant and loan programs to construct new wastewater facilities. Additionally, Minnesota has taken other significant regulatory actions and set new permit requirements over the past ten years to reduce phosphorus discharges.

What progress has been made?

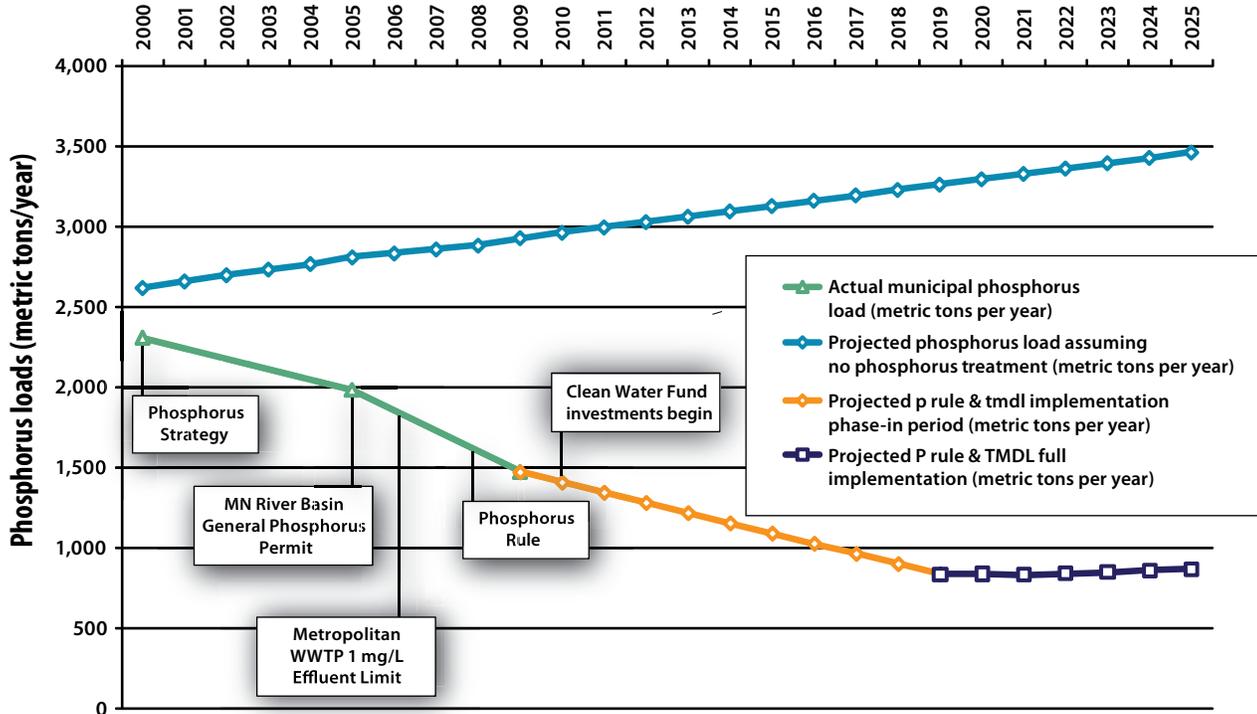
The graphic on the next page represents estimated statewide municipal wastewater treatment facility phosphorus reductions since the year 2000 and estimates future reductions based on the implementation of current permitting policies. It also demonstrates the anticipated increases in phosphorus loading that would have resulted had these changes not occurred. Overall, these combined efforts have led to a steady decline of phosphorus pollution. It is estimated that these discharges will continue at lower levels.

Learn more

Find more information about this measure and its data at www.legacy.leg.mn/funds/clean-water-fund.

Status	Trend	Description
●	↗	Long-term ramp-up in requirements coupled with new Clean Water Fund investments are helping wastewater sources continue to reduce phosphorus discharges.

Municipal wastewater phosphorus trends



Estimated statewide reductions in phosphorus from municipal wastewater treatment facilities since the year 2000 and projections of future reductions based on current permitting policies, implementation of Total Maximum Daily Load (TMDL) requirements, and Clean Water Fund investments.



Drinking water measures

The six measures contained on pages 30-39 illustrate important Clean Water Fund-supported actions and outcomes undertaken to protect Minnesota's drinking water supplies.

Actions

1. Source water protection plans
2. Nitrate monitoring and reduction activities
3. Contaminants of emerging concern

Outcomes

4. Chemicals in Minnesota's groundwater
5. Source water quality changes
6. Nitrate concentrations in wells

This first report establishes a baseline against which future actions and outcomes can be evaluated. It is a work in progress to be improved in future years based on the input and feedback received from stakeholders and the public.





Source water protection plans

ACTION

Measure: Number of community public water supply systems assisted with developing source water protection plans

Why is this measure important?

Source water refers to water from streams, rivers, lakes or aquifers that are used for drinking water. Source water protection prevents contaminants from entering a public water supply at levels that could negatively impact human health. Source water protection activities have many benefits:

- Human health is protected,
- Costs are reduced; the cost of pollution prevention is less than the cost of remediation,
- Risk is reduced; property owners are less likely to become responsible parties to contaminating a source of public drinking water, and
- Sustainable water supplies are ensured for future generations' health and economic needs.

What are we doing?

Source water protection plans are required for all public water systems that use groundwater. Some systems that use surface water have voluntarily developed source water protection plans. These plans protect source water used for drinking water by identifying the area that supplies water to the well or intake, the vulnerability of that area, and implementing appropriate land and water resource management strategies.

Communities receive assistance with source water protection from several partners. The Minnesota Department of Health (MDH) is the primary agency responsible for source water protection; they provide technical assistance, review and approve source water protection plans. However, the Minnesota Department of Agriculture (MDA), Minnesota Department of Natural Resources (DNR), Minnesota Pollution Control Agency (MPCA), Metropolitan Council, Board of Water and Soil

Resources, federal agencies, overlapping watershed districts, and neighboring communities all provide vital information and management tools.

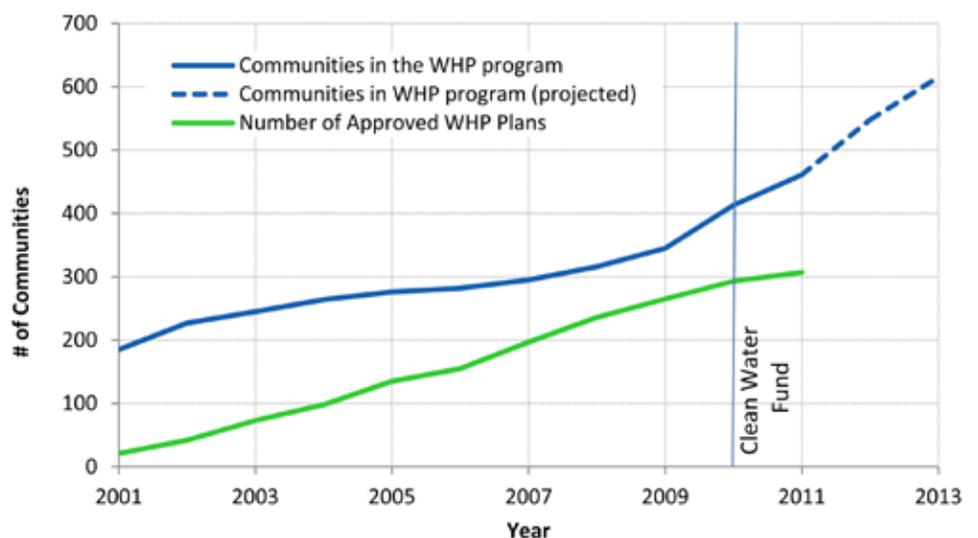
Clean Water Fund support increases the number of communities the MDH is able to assist. In the 2010-2011 biennium, four new planners funded through the Clean Water Fund provided technical assistance to 160 community water supplies, including support to local source water protection plan committees and meeting with them to collaborate in plan development and implementation.

The Clean Water Fund has also improved the quality of source water protection plans and implementation by supporting more robust water resource evaluation and management, more detailed contaminant assessment, and grants to communities to support plan implementation.

What progress has been made?

The goal is to have every community water supply in Minnesota engaged in source water protection by the year 2020. Currently, 452 of the 929 community water

Communities in wellhead protection planning





supplies that use groundwater wells are engaged in efforts to protect their wells (wellhead protection). Of that total, 227 have plans that have been approved by MDH, and 283 are in the process of developing or amending a plan. The chart on previous page shows the modest increase in the number of communities that MDH has brought into the source water protection program since Clean Water Funding has become available and the program has begun to ramp up. The dashed line starting after 2011 shows the number of communities that MDH is projecting to be added through the year 2013. Generally, communities are allowed 2 ½ to 3 years to develop a source water protection plan.

Learn more

- Find more information about this measure and its data at www.legacy.leg.mn/funds/clean-water-fund.
- About source water protection at www.health.state.mn.us/divs/eh/water/swp/index.htm.

Status	Trend	Description
		Met target for FY10-11. On track to meet long-term target of every community public water supplier engaged in source water protection planning by 2020.



Nitrate monitoring and reduction activities

ACTION

Measure: Number of local government partners participating in Clean Water Funded groundwater nitrate monitoring and reduction activities

Why is this measure important?

Nitrate is a water soluble molecule that is made up of nitrogen and oxygen. It is naturally occurring in the environment; however at elevated levels it can have negative effects on human health. Nitrate is one of the most common contaminants in Minnesota’s groundwater and may exceed the drinking water standard in vulnerable aquifers. There is significant local variability in nitrate monitoring results; some areas of the state have shown little change while other areas have shown increasing nitrate trends. The most vulnerable areas of the state are the Central Sands region in central Minnesota and the Karst region located in southeast Minnesota.

Groundwater funding from Minnesota’s Clean Water Fund is being used for activities that help identify potential sources of nitrate contamination and evaluate and implement practices to reduce nitrates in groundwater.

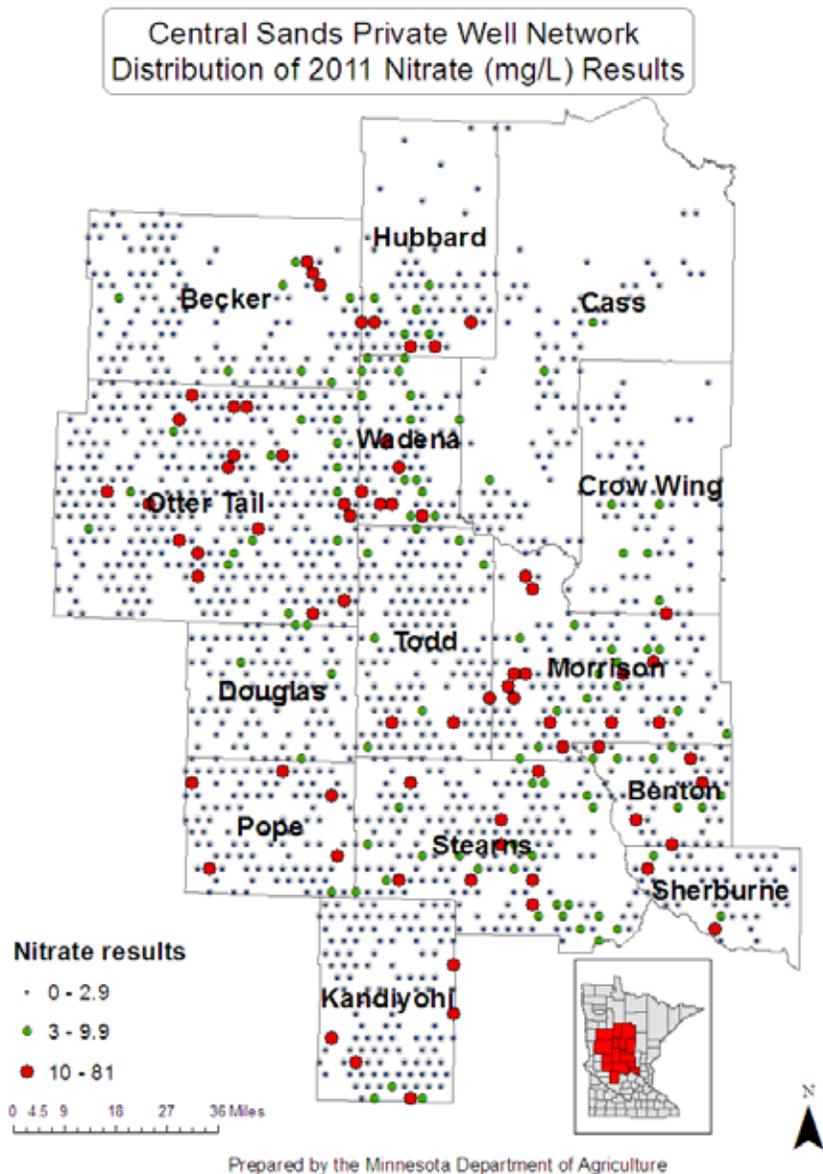
State agencies work closely with local governments (LGUs) on many nitrate monitoring and reduction activities. Working with local government helps ensure that Clean Water funds are spent on priority projects that are relevant and important to community members. LGUs add value by providing expertise and knowledge of local issues.

What are we doing?

The Minnesota Department of Agriculture (MDA) works with 15 LGUs on nitrate monitoring and reduction projects and 40 LGUs on nitrate testing clinics. In general, the LGU is responsible for administrative tasks and the coordination of the project

while the MDA provides technical and design support. Some specific examples include:

- The MDA partnered with the East Otter Tail Soil and Water Conservation District (SWCD) to carry out a series of irrigation workshops and expand



This map show nitrate analysis results from the Central Stands Private Well Monitoring Network in 2010.

programs that promote proper on-farm water and nitrogen management. This partnership will provide Minnesota irrigators with the knowledge, tools and technology to make informed management decisions.

- In Central Minnesota, the MDA partnered with 14 counties to establish a Private Drinking Water Well Monitoring Network. This network will provide a better understanding of nitrate trends in the region and be used to educate private well owners about the quality of their drinking water.
- The MDA partnered with Pope County SWCD, Stearns County SWCD, Prairie Lakes Co-op and the University of Minnesota to accelerate agricultural research and education at the Rosholt Farm in Westport, Minnesota. The goals are to assess nitrogen loss resulting from different fertilizer application rates, application timing, and application methods and to revise nitrogen fertilizer recommendations for irrigated sandy soils.
- The MDA partnered with Dakota County Water Resources Department and the University of Minnesota to evaluate nitrate loss from agricultural production areas. This research will provide a better understanding of nitrogen fertilizer management on a local level and the associated water quality impacts.
- The MDA supports walk-in style water testing clinics with the goal of increasing public awareness about nitrate levels in private well water. Clinics are run by local governments units with technical support from the MDA.

What progress has been made?

Each of the LGUs working with MDA are making valuable contributions toward improving nitrogen management. Accomplishments include:

- The MDA and East Ottertail SWCD developed curriculum and hosted an irrigation workshop in central Minnesota. The MDA installed two weather stations and producers can access information on the SWCD's website.
- As of December 2011, a total of 1,555 well owners in the Central Sands Private Well Monitoring



Field staff installing suction tube lysimeters. Lysimeters collect water that escapes below the root zone of growing crops. Collected water will be analyzed for nitrate-nitrogen.

Network project filled out a survey about their well (construction type, well depth and age) and sent in a sample to be analyzed for nitrate. Approximately 800 well owners will be invited to participate in the long-term monitoring network.

- 2011 marks the first full year of data collection at the Rosholt Farm. There were multiple field days, all well-attended by farmers, agricultural suppliers, academic researchers and private industry representatives.
- The MDA assisted 40 LGUs with nitrate testing clinics. A total of 2,100 water samples were tested.

Learn More

- Find more information about this measure and its data at www.legacy.leg.mn/funds/clean-water-fund.
- MDA Clean Water Fund groundwater protection: www.mda.state.mn.us/protecting/cleanwaterfund/gwdwprotection.aspx.

Status	Trend	Description
●	↗	Agencies are working with many local partners and continue to establish effective partnerships.



Contaminants of emerging concern

ACTION

Measure: Number of new health-based guidance values for contaminants of emerging concern



that can be consumed in drinking water with little to no health risk in parts per billion (ppb).

What are we doing?

MDH is developing health based-guidance (how much of a substance is safe to drink) for contaminants of emerging concern. MDH has provided a way for the public and other interested parties to suggest a chemical for evaluation (Nomination). MDH staff also develops citizen-friendly information that describes the contaminant, ways that people might be exposed and actions that can help reduce exposures. Additionally, MDH awards grants and contracts to conduct special projects. These special projects help to evaluate chemicals in cases where information is lacking. MDH works with

MDH Health-Based Guidance Values (parts per billion in water)	
Chemical Name	MDH Guidance
Acetaminophen (pharmaceutical)	200 ppb
6-Acetyl-1,1,2,4,4,7-hexamethyltetraline (AHTN) (fragrance)	20 ppb
Carbamazepine (pharmaceutical)	40 ppb
N,N-Diethyl-meta-toluamide (DEET) (insect repellent)	200 ppb
1,4-Dioxane (solvent)	1 ppb
Metribuzin degradates (DA, DK, DADK) (pesticide)	10 ppb
Pyraclostrobin (pesticide)	100 ppb
Tris(2-Chloroethyl) phosphate (TCEP) (flame retardant)	5 ppb
1,2,3-Trichloropropane (1,2,3-TCP) (industrial chemical)	0.003 ppb
Triclosan (anti-bacterial)	50 ppb

Why is this measure important?

There are frequently reports in the news about chemicals being found in the environment, our food and water and in us. New or improved laboratory methods for measuring chemicals, new chemicals, and expanded uses for existing chemicals have led to finding more contaminants in more places. For many of these contaminants, it is unknown how much is safe to drink, raising questions and causing uncertainty among Minnesotans. The Minnesota Department of Health (MDH) seeks to answer these questions by evaluating the safety of “contaminants of emerging concern” in drinking water. Contaminants of emerging concern can include medications, cosmetics, plastics, pesticides, etc.

Ten contaminants of emerging concern were reviewed in FY10-11. The guidance values indicate the concentration



other state agencies, including the Minnesota Pollution Control Agency (MPCA) and the Minnesota Department of Agriculture (MDA), to evaluate the results of their water monitoring studies. MPCA is monitoring for contaminants of emerging concern in both Minnesota surface and groundwater using Clean Water Fund project dollars.

What progress has been made?

Ten contaminants were reviewed in FY10-11 (table). The guidance values indicate the concentration of the contaminant which can be consumed in drinking water with little to no health risk. For some contaminants of emerging concern, people are more likely to receive a greater exposure from using a personal care product or taking a medication than from drinking it in water.

Most of these ten chemicals were not found in Minnesota waters at levels above their guidance values. However, for one chemical, 1,2,3-TCP, it was not possible to measure it in water at concentrations as low as the guidance value. In order to see how much 1,2,3-TCP might be in drinking water, MDH identified a more sensitive analytical methodology, and collected and analyzed a small number of drinking water and groundwater monitoring samples for analysis. MDH found no 1,2,3-TCP in the samples. Two other research studies have been completed and one is in progress.

Learn more

- Find more information about this measure and its data at www.legacy.leg.mn/funds/clean-water-fund.
- MDH Contaminants of Emerging Concern (CEC) program information: www.health.state.mn.us/cec.

Status	Trend	Description
		Target of 10 new guidance values for FY10-11 was met. On track to meet FY12-13 target. Expanding outreach and education for citizens.



Chemicals in Minnesota's groundwater

OUTCOME

Measure: Changes over time in pesticides, nitrates and other key water quality parameters in groundwater.

Why is this measure important?

Chemicals are commonly used to control pests, support food production, manage lawns and protect human health. We also use many chemicals for cleaning clothes, maintaining cars and homes, and generally improving our lives.

Unfortunately, the benefits of pesticides, fertilizers and other chemicals are balanced against potential impacts to the state's sensitive groundwater resources. It is only with highly detailed and sophisticated monitoring that the impacts of chemical use to our groundwater resources can be understood and managed.

What are we doing?

The Minnesota Department of Agriculture (MDA) samples groundwater wells in urban and rural agricultural settings. MDA water samples are analyzed for many pesticides as well as nitrate-nitrogen. Results are reported to chemical management groups, farmers and the general public to inform decisions about which chemicals to use and how to use them.

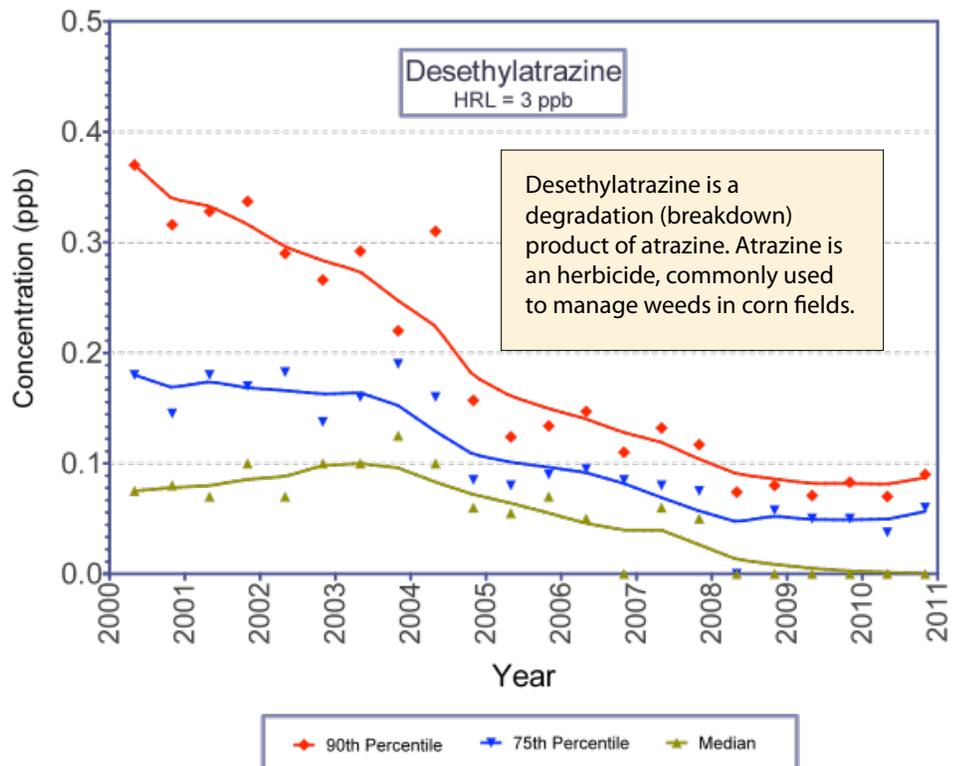
The Minnesota Pollution Control Agency (MPCA) is installing a network of groundwater monitoring wells that measure ambient (or background) conditions for non-agricultural parameters, including nitrates, chloride, volatile organic compounds and emerging contaminants. This network is being installed in two aquifers that are especially vulnerable to man-made contamination. The monitoring well network is an early warning system designed to detect contamination as it enters the groundwater system. This allows us to identify the sources of the contamination and possibly design and implement Best Management Practices (BMPs) to prevent contamination.

The Minnesota Department of Health (MDH) has many roles in the effort to protect groundwater from contamination, including:

- Monitoring drinking water quality to ensure the state's public water systems meet federal and state guidelines,
- Evaluating contaminated sites to determine what chemicals are present, whether exposure is likely, and whether those exposures may pose risks to human health and,
- Monitoring certain chemicals that may pose future risks to support the development of health-based guidance values.

What progress has been made?

Since 1985, the MDA has continuously improved its groundwater monitoring program. Most recently, it initiated an extensive program for monitoring nitrate



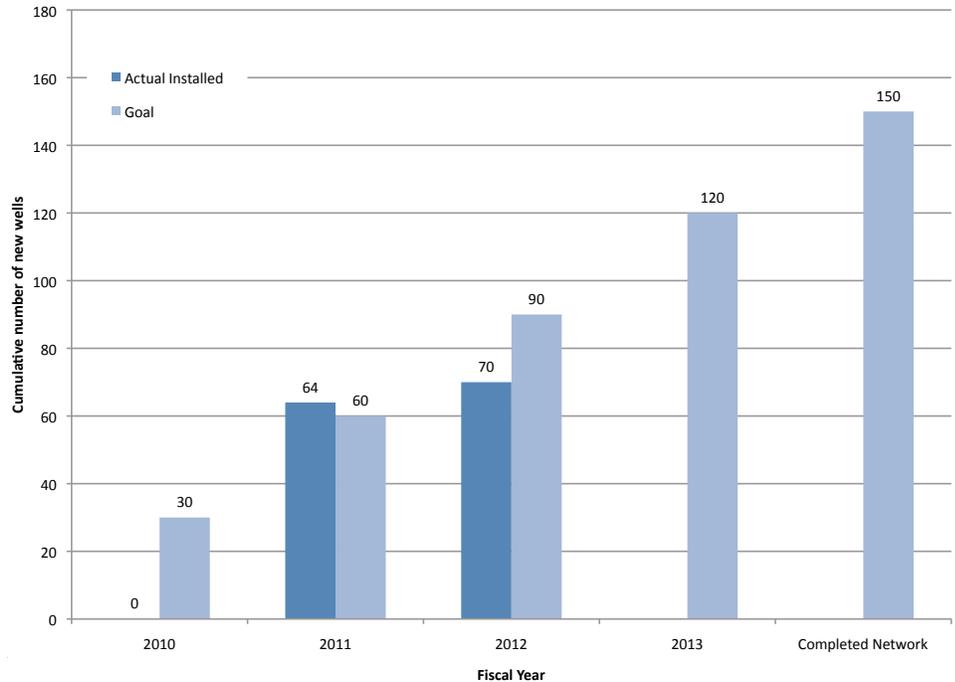
This is an example of results from MDA's monitoring program and displays the trend in desethylatrazine concentration over time.

trends in private drinking water wells in Central Minnesota. The MDA is currently sampling more than 170 monitoring wells, naturally occurring springs and private drinking water wells throughout the state. Although concentrations remain well below health risk levels, five pesticides have been detected frequently enough to be placed in “common detection”. This list includes acetochlor, alachlor, atrazine, metolachlor and metribuzin. These pesticides are being watched and alternative management practices are promoted whenever levels rise.

Currently, the concentrations of acetochlor, alachlor and atrazine are declining, while there is no clear trend in metolachlor or metribuzin concentrations (Desethylatrazine figure on previous page). Detailed analyses of monitoring results are available on the program’s web site (see link below).

The MPCA is continuing progress on its ambient groundwater monitoring network to track trends in groundwater quality. More than 60 new wells were added in FY2010-2011. The new and existing wells in the network are sampled annually for a wide variety of chemicals, such as nitrate, chloride, chemicals which comprise gasoline and solvents, and emerging contaminants. Annual updates on pollutant concentrations are available; trend reporting is expected to begin in 2014.

Ambient groundwater monitoring network well installation



Learn more

- Find more information about this measure and its data at www.legacy.leg.mn/funds/clean-water-fund.
- MDA’s Pesticide Monitoring and Assessment: www.mda.state.mn.us/en/chemicals/pesticides/maace.aspx.
- MDA and MPCA groundwater data portal (Environmental Data Access or EDA): www.pca.state.mn.us/index.php/data/groundwater.html.

Status	Trend	Description
Pesticides ●	↗	Pesticides: There are decreasing concentrations of five common pesticides, although pesticides are still frequently detected at low levels in vulnerable groundwater.
Nitrates ●	Nitrate: Not enough information for a trend determination at this time.	Nitrate: There is significant local variability in nitrate monitoring results. However, nitrate levels continue to exceed drinking water standards and are increasing in certain vulnerable aquifers.



Source water quality changes

OUTCOME

Measure: Changes over time in source water quality used for community water supplies

Why is this measure important?

Minnesotans use both surface water and groundwater as sources for drinking water. When this source water (raw, untreated water) does not meet the standards of the Safe Drinking Water Act, community water suppliers have to pay for increased treatment to make the water safe to drink.

Testing the raw water before it goes through a treatment process is one measure of our efforts to protect drinking water at the source, whether it is surface water or groundwater. Understanding the source water quality and chemistry also improves our understanding of groundwater aquifers, variables that might affect the treatment process and the potential for pollutants to contaminate the source water.

What are we doing?

On a regular basis, the community water supplier or a Minnesota Department of Health (MDH) engineer submits treated water to a certified laboratory to be tested for more than 100 contaminants. Although there is no similar requirement for testing the source water, testing is often done to determine the suitability of the source or what type of treatment may be necessary.

A targeted look at source water quality began in the mid-1980s, when MDH conducted a study of source water quality for community water supplies across the state. This study provided a baseline measure of source water quality. A follow-up study, "The General Water Chemistry Project," is being conducted from 2010-2014 to collect source water samples and to analyze for more than 25 chemicals and water quality parameters. Although this study will not be paid for by Clean Water Funds, the study will provide data about the condition of source waters across the state. This study will also provide data to measure the effectiveness of other activities financed through the Clean Water Fund, such as wellhead protection planning and nitrogen reduction practices in agriculture.

What progress has been made?

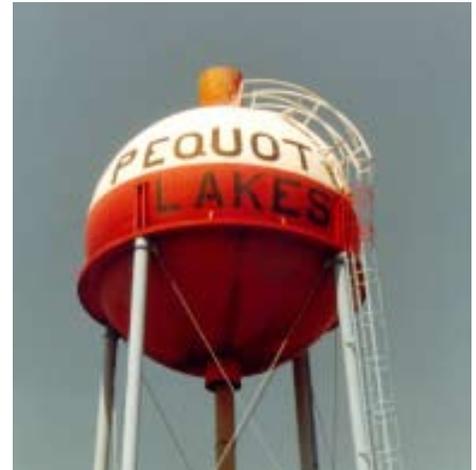
Early successes in the history of public health pinpoint the protection of drinking water sources with dramatic results; safe drinking water is recognized as one of the ten greatest achievements of public health. Year after year,

Minnesota has an outstanding record of ensuring safe drinking water through compliance with the Safe Drinking Water Act.

However, taking safe drinking water for granted could prevent us from taking steps to protect our drinking water sources for future generations.

Ongoing source water quality monitoring will

help us to identify gaps or areas for improvement in our drinking water protection efforts.



80 percent of Minnesota residents rely on public water systems instead of private wells. Public water systems supply our homes, schools, hospitals and workplaces.

Learn more

- Find more information about this measure and its data at www.legacy.leg.mn/funds/clean-water-fund.
- See MDH's Web site on monitoring and testing of drinking water in Minnesota at www.health.state.mn.us/divs/eh/water/factsheet/com/sampling.html.

Status	Trend	Description
●	Not enough information for a trend determination at this time.	Currently collecting samples to compare with data from a similar study conducted 25 years ago.



Nitrate concentrations in wells

OUTCOME

Measure: Nitrate concentrations in newly constructed wells

Why is this measure important?

Nitrate is a common contaminant found in many wells in Minnesota. If an infant is fed water or formula made with water that is high in nitrate, a condition called “blue baby syndrome” (or “methemoglobinemia”) can develop. If nitrate levels in the water are high enough and prompt medical attention is not received, death can result.

Nitrate (NO₃) is a naturally occurring chemical made of nitrogen and oxygen. Natural levels of nitrate in Minnesota groundwater are usually quite low (less than 1 milligram per liter [mg/L] of nitrate-nitrogen). However, where fertilizers, animal wastes or human sewage are concentrated on the ground surface, nitrate may seep down and contaminate the groundwater. Elevated nitrate levels in groundwater are often caused by run-off from barnyards or feedlots, excessive use of fertilizers or malfunctioning or failing septic systems.

What are we doing?

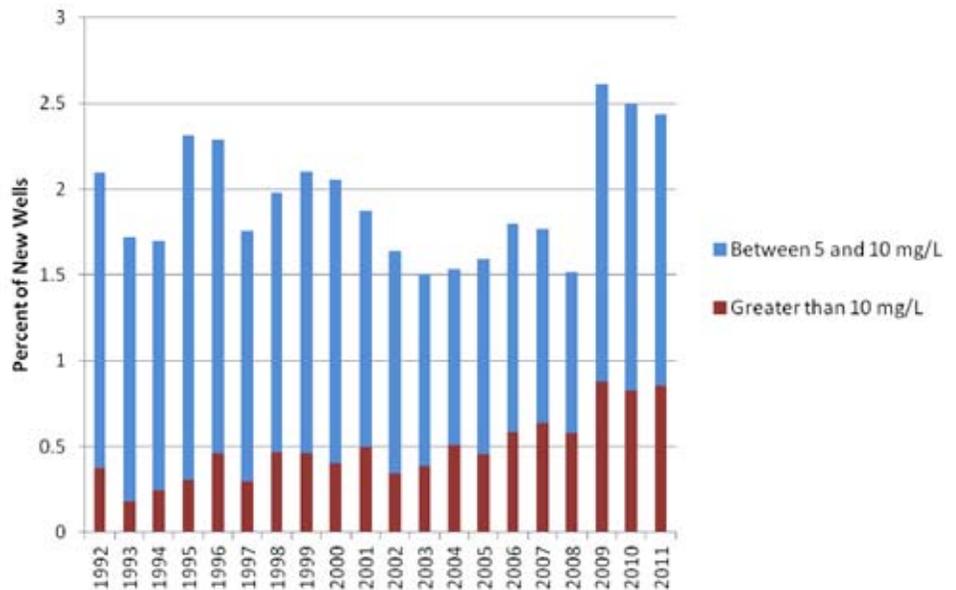
Groundwater is the main source of drinking water for three out of every four Minnesotans. Approximately 20 percent of Minnesotans rely on private wells for their primary drinking water source. Current statutes and rules require that wells are located and constructed in a manner that provides a sanitary source of drinking water and protects groundwater quality. In addition, properly managed nitrate sources such as fertilizers and septic systems can help to reduce input of nitrate into groundwater. Several activities funded by the Clean Water Fund are intended to address nitrate in groundwater.

What progress has been made?

The percentage of new wells with nitrate detected above 5 mg/L is very small, around two percent. And those with concentrations above the drinking water standard of 10 mg/L is even less, typically around 0.5 percent. For comparison, approximately 5.8 percent of all wells in the

state exceed 10 mg/L. While these very low percentages do show that the well code is effective in assuring water safe from nitrate for most wells, it is still very important that the owners of these few wells take other steps to obtain safe drinking water. This measure cannot tell us the specific causes of nitrate contamination because new well construction is not randomly distributed across the state and the number of new wells is not consistent from year to year. However, many of the activities funded by the Clean Water Fund should eventually result in lower concentrations in nitrate in groundwater across the state.

Nitrate in new wells



Learn more

- Find more information about this measure and its data at www.legacy.leg.mn/funds/clean-water-fund.
- Find out more at www.health.state.mn.us/divs/eh/wells/waterquality/nitrate.html.

Status	Trend	Description
●	↘	Although nitrate levels in less than one percent of new wells exceed the drinking water standard for nitrate, there is a slight increase in recent years.



Appendix A

Clean water tracking framework: Complete list of performance measures

The following list of measures was originally created for the May 2011 report: “Minnesota’s Clean Water Tracking Framework,” which can be found at www.pca.state.mn.us/index.php/view-document.html?gid=15911. As described below, this list was prioritized into a subset of measures that was most appropriate for reporting in this Clean Water Fund Performance Report for fiscal years 2010-2011.

The original Framework contained 36 measures under four categories: Environmental and Drinking Water Outcomes, Partnership and Leveraging, Organizational Performance and Financial measures. Two additional categories are in development: social and pressure/stressor measures. Since the release of the May 2011 report, stakeholder input and agency deliberations led to three more measures being added (identified with an asterisk*) and one eliminated since the release of the May report.

To indicate which of these measures were used for the FY10-11 Clean Water Fund Performance Report, 18 are highlighted (*italics*). These were prioritized according to a two-step selection process. The first step included using criteria to rank the measures, including ensuring the data is readily available, the information is suited to a general audience, the measures show progress, and represents financial investment and the work of many partners. The second step looked at “lenses” to evaluate the top-ranked measures, ensuring representation of inputs, outputs and outcomes and distribution of surface and groundwater measures.

The full set of the current 38 measures will be important for all agencies to track progress and outcomes of Clean Water Fund investments.

Performance Measure (measures in italics indicate the subset used for February 2012 Clean Water Fund Performance Report)	Coordinating Agency
Category: Environmental and Drinking Water Outcome Measures (EDWOM)	
<i>EDWOM 1: Rate of impairment/unimpairment of surface water statewide and by watershed</i>	Minnesota Pollution Control Agency
<i>EDWOM 2: Changes over time in key water quality parameters for lakes, streams, and wetlands</i>	Minnesota Pollution Control Agency with support from Department of Natural Resources and Minnesota Department of Agriculture
<i>EDWOM 3: Changes over time in pesticides, nitrates and other key water quality parameters in groundwater</i>	Minnesota Department of Agriculture
<i>EDWOM 4: Changes over time in source water quality from community water supplies</i>	Minnesota Department of Health
EDWOM 5: Changes over time in aquifer levels	Minnesota Department of Natural Resources
EDWOM 6: Changes over time in the age of groundwater	Minnesota Department of Health Minnesota Department of Natural Resources
EDWOM 7: Changes over time in agricultural nitrogen use efficiency	Minnesota Department of Agriculture



Performance Measure (measures in italics indicate the subset used for February 2012 Clean Water Fund Performance Report)	Coordinating Agency
Category: Environmental and Drinking Water Outcome Measures (EDWOM) [cont'd]	
<i>EDWOM 8: Number of previous impairments now meeting water quality standards due to corrective actions</i>	Minnesota Pollution Control Agency
<i>EDWOM 9a: Number of BMPs Implemented with Clean Water Funding and Estimated Pollutant Load Reductions</i>	Board of Water and Soil Resources with support from Minnesota Department of Agriculture
<i>EDWOM 9b*: Number of municipal point source construction projects implemented with Clean Water Funding and estimated pollutant load reductions.</i>	Public Facilities Authority and Minnesota Pollution Control Agency
EDWOM 10: Amount of municipal and industrial wastewater pollution reductions achieved to meet TMDL requirements	Minnesota Pollution Control Agency
<i>EDWOM 11: Changes over time in municipal wastewater phosphorus discharges</i>	Minnesota Pollution Control Agency
<i>EDWOM 12*: Nitrate concentrations in newly constructed wells</i>	Minnesota Department of Health
<i>EDWOM 13*: Trends of mercury in fish and mercury emissions in Minnesota</i>	Department of Natural Resources, Minnesota Pollution Control Agency, Minnesota Department of Health
Category: Partnership and Leveraging Measures (PLM)	
<i>PLM 1: Number of community public water supply systems assisted with developing source water protection plans</i>	Minnesota Department of Health
PLM 2: Number of community public water supply systems and population that are involved in source water planning	Minnesota Department of Health
PLM 3: Percent of intensive watershed monitoring performed by local partners	Minnesota Pollution Control Agency
PLM 4: Number of sites monitored by citizen volunteers through the Citizen Lake and Stream Monitoring Programs	Minnesota Pollution Control Agency
<i>PLM 5: Number of local government partners participating in Clean Water Funded groundwater nitrate monitoring and reduction activities</i>	Minnesota Department of Agriculture
Category: Organizational Performance Measures (OPM)	
<i>OPM 1: Percent of state's major watersheds intensively monitored through the watershed approach</i>	Minnesota Pollution Control Agency
OPM 2: Percent of major watersheds with stream flow monitoring	Department of Natural Resources
OPM 3: Cumulative number of waterbodies sampled annually for fish contaminant concentrations	Department of Natural Resources
OPM 4: Cumulative number of lake biological assessments completed	Department of Natural Resources



Performance Measure (measures in italics indicate the subset used for February 2012 Clean Water Fund Performance Report)	Coordinating Agency
Category: Organizational Performance Measures (OPM) [cont'd]	
OPM 5: Number of counties completing a county geologic atlas for groundwater sustainability	Department of Natural Resources
OPM 6: Percent of groundwater monitoring well networks installed and monitored	Minnesota Pollution Control Agency
OPM 7: Percentage of watershed restoration and protection strategies that are in-progress/completed	Minnesota Pollution Control Agency
OPM 8: Number of MDH grants awarded for source water protection	Minnesota Department of Health
<i>OPM 9: Number of new health-based guidance values for contaminants of emerging concern</i>	Minnesota Department of Health
OPM 10: Number of unused groundwater wells sealed	Minnesota Department of Health
OPM 11: Percent of research projects meeting research efficiency goals	Minnesota Department of Agriculture
OPM 12: Percent of minor watersheds with targeted areas mapped	All agencies
OPM 13: Percent of targeted areas addressed with Clean Water Funds	All agencies
Category: Financial Measures (FM)	
FM 1: Percent of funds spent or BMPs implemented in targeted areas	All agencies
<i>FM 2: Percent of total funds appropriated by activity</i>	All agencies
<i>FM 3: Total Clean Water Fund dollars per watershed or statewide for 1) monitoring/assessment, 2) watershed restoration/protection strategies, 3) protection/restoration implementation activities, and 4) drinking water protection</i>	All agencies
<i>FM 4: Total Clean Water Fund dollars awarded in grants and contracts to non-state agency partners</i>	All agencies
<i>FM 5: Total dollars leveraged by Clean Water Fund implementation activities</i>	All agencies
FM 6: Average dollar per unit of pollutant reduced	Board of Water and Soil Resources
Category: Social Measures	
[Under development]	All agencies
Category: Stressor Measures	
[Under development]	All agencies
*New measure added since release of May 2011 Clean Water Tracking Framework report	



This report and future updates can be found on
the "Minnesota's Legacy" web site

www.legacy.leg.mn/funds/clean-water-fund