

Clean Water Council

Advising the Legislature and the Governor on the administration and implementation of the Clean Water Legacy Act

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November 28, 2018

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Dear Chris Steller:

On behalf of the Clean Water Council (Council), we are submitting our *FY 20-21 Clean Water Fund and Policy Recommendations Report (Report)*. The Minn. Stat. § 114D.30, Subd. 7, directs the Council to submit a biennial report to the Legislature by December 1 of each even-numbered year; this report fulfills that requirement.

As instructed in the Legislative Reference Library's website, we are submitting an electronic copy of the Report and two physical copies of the Report.

Sincerely,



Frank Jewell
Chair, Clean Water Council



Pam Blixt
Vice Chair, Clean Water Council

FJ/PB/DD:bcf

Enclosure



Clean Water Council

FY 20-21 Clean Water Fund and Policy Recommendations Report

*Biennial Report to the Legislature
November 30, 2018*

Mni Sota Makoce (Dakota)
Land where the waters reflect the clouds

2017-2018 CLEAN WATER COUNCIL OFFICERS

Frank Jewell

Chair, Clean Water Council

Pam Blixt

Vice-Chair, Clean Water Council

Todd Renville

Chair, Budget and Outcomes Committee

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Vice-Chair, Policy Committee

Legislative Charge: This report fulfills the requirements of Minn. Stat. § 114D.30, Subd. 7, of the Clean Water Legacy Act (CWLA), for the Clean Water Council (Council) to submit a biennial report to the Legislature by December 1 of each even-numbered year.

The report also fulfills the CWLA requirement for the Council to recommend to the Governor and the Legislature the manner in which money from the Clean Water Fund should be appropriated for the purposes stated in Article XI, Section 15, of the Minnesota Constitution and Minn. Stat. § 114D.50.

For further information about this report, please contact the current Clean Water Council Chair or Coordinator whose contact information is on the Council's website at www.pca.state.mn.us/cleanwatercouncil.

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ACRONYMS AND ABBREVIATIONS

1W1P – One Watershed, One Plan, also known as Comprehensive Water Management Plan

AgBMP – Agricultural Best Management Practices

BMP – Best Management Practices

BOC – Budget and Outcomes Committee

BWSR – Board of Water and Soil Resources

Ch. – Chapter

Council – Clean Water Council

CEC – Contaminants of Emerging Concern

CREP – Conservation Reserve Enhancement Program

CWA – Clean Water Act (federal)

CWC – Clean Water Council

CWF – Clean Water Fund

CWLA – Clean Water Legacy Act

DNR – Minnesota Department of Natural Resources

FGI - Forever Green Initiative

FY – Fiscal Year

GRAPS – Groundwater Restoration And Protection Strategies

IBI – Index of Biological Integrity

LCC – Legislative Coordinating Commission

LIDAR – Light Detection And Ranging

MAWQCP – Minnesota Agricultural Water Quality Certification Program

MDA – Minnesota Department of Agriculture

MDH – Minnesota Department of Health

Met Council – Metropolitan Council

Minn. – Minnesota

MPCA – Minnesota Pollution Control Agency

MS4 – Municipal Separate Storm Sewer Systems

NPDES – National Pollution Discharge Elimination System

PFA – Public Facilities Authority

PSIG – Point Source Implementation Grants

SSTS – Subsurface Sewage Treatment System

Stat. – Statute

Subd. – Subdivision

Subp. – Subpart

TCMA – Twin Cities Metropolitan Area

TMDL – Total Maximum Daily Load

UMN – University of Minnesota

WRAPS – Watershed Restoration and Protection Strategies

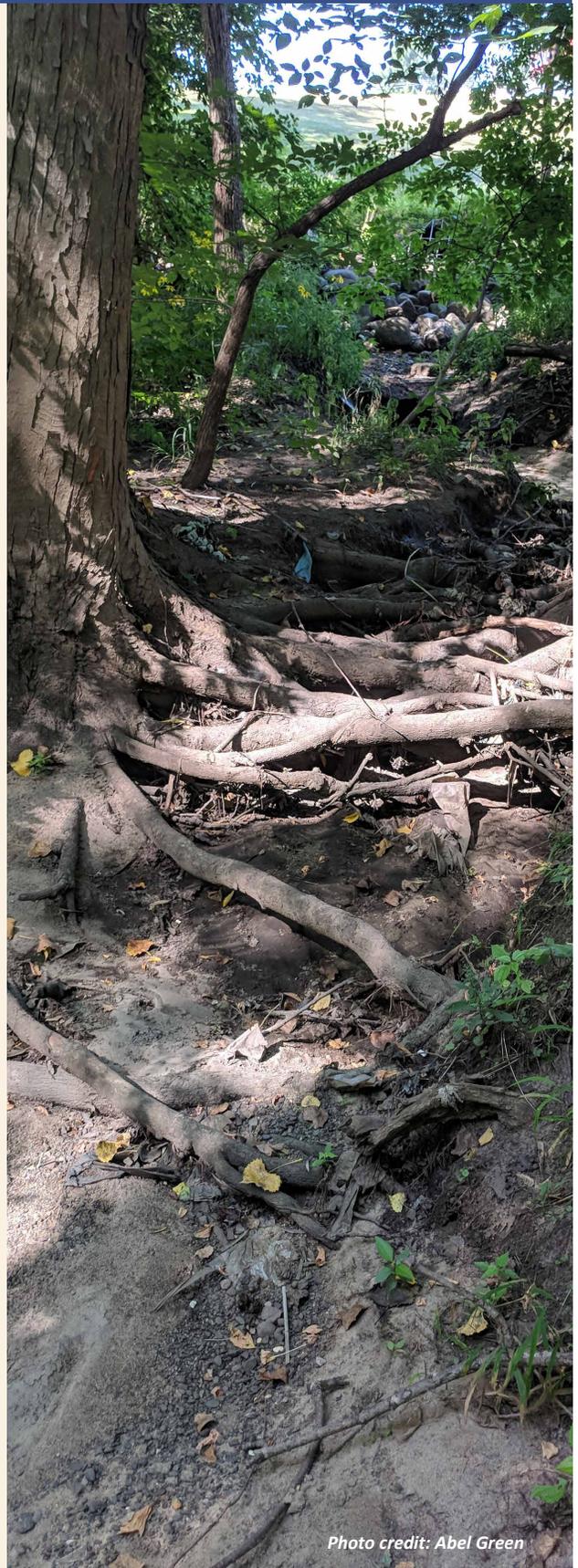


Photo credit: Abel Green

EXECUTIVE SUMMARY

Clean Water Council

The Legislature established the Clean Water Council (Council) in 2006 to advise the Legislature and the Governor on the administration and implementation of the Clean Water Legacy Act (CWLA). The CWLA requires the Council to submit a report every even numbered year to the Legislature and Governor to recommend Clean Water Fund (CWF) appropriations, summarize progress on CWF activities, and identify future funding needs. This report fulfills that requirement and provides funding recommendations for Fiscal Years 2020 and 2021 (FY 20-21).

The Council's FY 20-21 CWF recommendations, totaling **\$262.704 million**, reflect its funding and policy priorities. The Council based its recommendations on multiple discussions between Council members, stakeholders and State agency personnel. The Council also factored input from 2500+ citizens during the Governor's 2017 town hall sessions and other interactions.



Lake Pepin

EXECUTIVE SUMMARY

Highlights of the Council's Achievements

The Council, in coordination with stakeholders and with input from State agencies developed a Mission, Goals and Objectives framework to guide its activities in the long-term. The Council's mission is to **Protect and Restore Minnesota's Waters for Generations to Come**. See page 10 for goals and objectives.

Highlights of the Council's FY 20-21 CWF Budget Recommendations

Monitoring, Assessment and Characterization \$37.783 million (14.4%)

Funds are used to determine the conditions of States' surface and groundwater, both before restoration/protection actions and to determine the effectiveness of such interventions. See pages 14 to 23 for all FY 20-21 budget recommendations.

Watershed and Groundwater Restoration/ Protection Strategies

\$26.926 million (10.2%)

Funds used to support local entities in developing Watershed Restoration and Protection Strategies (WRAPS) for each of the 81 major watersheds in Minnesota, Groundwater Restoration and Protection Strategies (GRAPS) and drinking water resource planning.

Comprehensive Local Watershed Management Plans (One Watershed, One Plan or 1W1P) Development

\$4.540 million (1.7%)

Funds that support local entities in developing comprehensive watershed management plans using prior sampling, WRAPS, GRAPS and local knowledge and priorities.

Local Implementation

\$180.889 million (68.9%)

Funds used for conservation easements, reducing soil erosion, upgrading wastewater, stormwater and septic system infrastructure, and protecting community wellhead areas and other drinking water sources.

The implementation funding recommendations are further divided into the following sub categories:

- Nonpoint source (\$136.473 million, 51.95%)
- Point source (\$21.100 million, 8.03%)
- Groundwater and drinking water (\$23.316 million, 8.88%)



Photo Credit: Celine Lyman

Research, Evaluation and Tool Development \$11.836 million (4.5%)

Funds that support research, developing and evaluation of new methods of restoration and protection activities as well as the cost-effectiveness of implementation actions.

Administrative Expenses

\$0.729 million (0.3%)

Funds to operate the Council, CWF's portion of the cost of maintaining Legacy website, and to conduct a citizen information campaign. The purpose of this campaign is to apprise Minnesotans of local and State agency efforts to restore and protect their waters, and engage them in the continuation of this process.

Highlights of the Council's FY 20-21 Policy Recommendations

The CWF dollars alone are not sufficient to achieve the Council's mission of protecting and restoring Minnesota's waters for generations to come. During 2017 and 2018, to further protect water quality, the Council adopted three policy recommendations:

- Reducing de-icing chloride (road salt) use to address the increasing chloride in urban surface waters and some shallow groundwater sources.
- Preventing water pollution from unwanted pharmaceuticals through proper disposal.
- Enhancing water quality by increasing continuous vegetative cover and establishing administrative infrastructure necessary to achieve this goal by bringing producers, the agricultural industry and crop developers together.

BACKGROUND

The Clean Water Council and Clean Water Fund

In 2006, the Minnesota Legislature passed the Clean Water Legacy Act (CWLA), Minn. Stat. Ch. 114D. This same legislation established the Clean Water Council (the Council or CWC) to advise the Legislature and the Governor on administration and implementation of the Federal Clean Water Act (CWA). In 2008, Minnesota voters approved an amendment to the Minnesota Constitution (known as the Legacy Amendment) to collect an additional 3/8 of one percent (0.375 %) of sales tax and dedicate the monies to outdoor heritage, clean water, parks and trails, arts and cultural heritage. The Legacy Amendment directed the State to deposit thirty three percent (33%) of the additional sales tax collected into the Clean Water Fund (CWF). The monies in the CWF can be spent only to:

- protect, enhance, and restore water quality in lakes, rivers, and streams; and
- protect groundwater from degradation, with at least five percent of the clean water funds spent to protect drinking water sources.

The Clean Water Council Membership

The CWLA requires the Governor to appoint seventeen voting members to the Council representing a wide range of stakeholder groups, and requires the State Senate to approve all appointments. The CWLA stipulates that the Council members must not be registered lobbyists or legislators. The voting members are appointed in the following manner:

- Two members representing statewide farm organizations;
- Two members representing business organizations;
- Two members representing environmental organizations;
- Two members representing organizations of county governments, one member representing the interests of rural counties and one member representing the interests of counties in the seven-county metropolitan area;
- Two members representing organizations of city governments;
- One member representing soil and water conservation districts;
- One member representing watershed districts;
- One member representing nonprofit organizations focused on improvement of Minnesota lakes or streams;
- One member representing township officers;
- One member representing the interests of tribal governments;
- One member representing statewide hunting organizations; and
- One member representing statewide fishing organizations.

In addition to the voting members, Legislative leaders and the leaders of the following entities can appoint one non-voting member each to the Council:

- House Majority party
- House Minority party
- Senate Majority party
- Senate Minority party
- Board of Water and Soil Resources
- Department of Agriculture
- Department of Health
- Department of Natural Resources
- Metropolitan Council
- Pollution Control Agency
- University of Minnesota

The 28-member Council represents organizations and entities with major roles in achieving clean water; enabling consensus building and coordination on a wide array of issues critical to the people of Minnesota. The Council holds monthly public meetings to discuss a variety of water topics.



Photo credit: Todd Renville

BACKGROUND

Biennial Report to the Legislature and the Governor

The CWLA also requires the Council to submit a report to the Minnesota Legislature and the Governor by December 1 of each even-numbered year (Minn. Stat. Ch. 114D.30, Subd. 7). The report includes:

- The activities for which money has been, or will be, spent for the current biennium;
- The activities for which money is recommended to be allocated in the next biennium;
- The impact on economic development due to the implementation of efforts to protect and restore groundwater and the impaired waters program;
- An evaluation of the progress made in implementing the CWLA and the provisions of Article XI, Section 15, of the Minnesota Constitution relating to clean water;
- The need for funding of future implementation; and
- Recommendations for other sources of funding.

Stakeholder Engagement

Stakeholder engagement is a critical part of the Council's decision-making. In addition to having diverse water related interests represented on the Council, all Council and committee meetings are open to the public and are live streamed. The Council meets at the offices of the MPCA and BWSR, and the meeting dates are listed on the Council website: <https://www.pca.state.mn.us/about-mpca/clean-water-council>. The Council staff share the meeting agendas via email and place them on the Council website prior to meetings. Staff record detailed meeting minutes and share them with stakeholders via email and the Council website. Prior to launching the biennial budget process, the Council members seek input and engagement of the groups they represent. In addition, the Council holds stakeholder meetings prior to discussing funding recommendations and solicit stakeholder input via email. The Council members and staff share the draft budget with stakeholders, and document all responses received.



*This highly erodible section of Knife River bank was stabilized with CWF money. Near Two Harbors, MN
Photo credit: Brianna Frisch*

BACKGROUND

Fiscal Years 2018-2019 Clean Water Council Members

The 28-member Council represents organizations and entities with a major role in achieving clean water, enabling consensus building and coordination on a wide array of issues critical to the people of Minnesota. The Council holds public meetings monthly to discuss a variety of water topics.



Clean Water Council Members *(Note that the entity each member represents is in parentheses.)*

Front Row (left to right): **Douglas Losee** (Business Organizations), **Tannie Eshenaur** (Minnesota Department of Health), **Sharon Doucette** (City Governments), **Sandy Rummel** (Metropolitan Council), **Victoria Reinhardt** (Metro Area Governments), and **Sharon Day** (Tribal Governments)

Middle row (left to right): **Jason Moeckel** (Minnesota Department of Natural Resources), **John Barten** (Nonprofit Organizations for Lakes and Streams), **Patrick Shea** (City Governments), **Representative Jean Wagenius** (Minnesota House of Representatives), **Rylee Main** (Environmental Organizations), **Glenn Skuta** (Minnesota Pollution Control Agency), **Susan Stokes** (Minnesota Department of Agriculture), and **Raj Rajan** (Business Organizations)

Back row (left to right): **Todd Renville** (Statewide Hunting Organizations), **Doug Thomas** (Minnesota Board of Water and Soil Resources), **Mark Abner** (Environmental Organizations), **Steven Besser** (Statewide Fishing Organizations), **Gary Burdorf** (Township Officers), **Frank Jewell** (Rural County Governments), **Warren Formo** (Statewide Farm Organizations), **Robert Hoefert** (Statewide Farm Organizations), and **Jeff Peterson** (Higher Education)

Not pictured: **Pam Blixt** (Watershed Districts), **Holly Kovarik** (Soil and Water Conservation Districts), **Senator David J. Osmek** (Minnesota Senate), **Senator Ann H. Rest** (Minnesota Senate), **Representative Paul Torkelson** (Minnesota House of Representatives)

CLEAN WATER COUNCIL ACTIVITIES SINCE THE 2016 REPORT

Clean Water Council Mission, Goals and Objectives Statement

The Clean Water Council developed a mission, goals and objectives in an effort to align activities funded by the CWF with the Legacy Amendment and the CWLA. Input and discussion with stakeholders were instrumental to developing the statement.

Mission:

Protect and Restore Minnesota's Waters for Generations to Come

Goals and Objectives:



Drinking water is safe for everyone, everywhere in Minnesota

- Protect public water supplies
- Ensure private well users have safe water



Groundwater is clean and available

- Improve and protect groundwater quality
- Ensure sustainable long-term trends in aquifer levels
- Avoid adverse impacts to surface water features due to groundwater use



Surface waters are swimmable and fishable

- Prevent and reduce pollution of surface waters
- Maintain and improve the health of aquatic ecosystems
- Protect and restore hydrologic systems



Minnesotans value water and take actions to sustain and protect it

- Build capacity of local communities to protect and sustain water resources
- Encourage systems and approaches that support, protect, and improve water
- Provide education and outreach to inform Minnesotans' water choices
- Encourage citizen and community engagement on water issues

CLEAN WATER COUNCIL ACTIVITIES SINCE THE 2016 REPORT

Progress Towards Cleaner Water

In Minnesota, evaluating and restoring our waters requires collaboration and effort from many entities. The State agencies performed most of the water quality monitoring during the early years after the passage of CWLA. However, in recent years, many local entities including Soil and Water Conservation Districts (SWCD), Watershed Districts, Township, City and County government units and citizens' groups partnered with State agencies to monitor and evaluate necessary actions and to implement restoration activities in their local waters. As the local capacity increases over time, State agencies will reduce direct involvement and will provide funding, coordination and technical support to enable local decision-making.

To date, State agencies, with support from local partners have evaluated **over 5,000** lakes and river segments throughout Minnesota and determined that **2,670 are impaired**. In 2018, the State agencies published a report card highlighting the progress made towards cleaner water in the previous two years. A synopsis of the *2018 Clean Water Fund Progress Report Card* is provided in Appendix B. Local partners and State agencies are on track to intensely sample each of the watersheds and complete Watershed Restoration and Protection Strategies (WRAPS) for all 81 watersheds by 2022. In addition, local partners and State agencies have completed or are preparing 18 Comprehensive Water Management Plans (Plans), and plan to complete up to 60 watersheds outside the seven county Twin Cities Metropolitan Area (TCMA) by 2026. The TCMA has its own statute that governs water planning and the entities within TCMA have applied for CWF grants, and have been very successful in obtaining funding for various restoration and protection actions.



Seventy five percent of Minnesotans get their drinking water from groundwater. Groundwater is also used for irrigation and vital to healthy surface waters as water levels in lakes, streams, wetlands, trout streams and calcareous fens often depend on groundwater. The quality and quantity of groundwater can be a major economic driver; however, the overuse and contamination threaten the availability and usability of groundwater in Minnesota. The availability of CWF monies allowed significant expansion of the statewide network of wells, which supports groundwater monitoring and trend analysis. Data from this network also supports a multiagency effort to develop Groundwater Restoration and Protection Strategies (GRAPS) that package existing groundwater information into easily usable form for local planning partners. The State agencies have completed five GRAPS to date, and are committed to completing a GRAPS for each watershed prior to the local entities commence drafting One Watershed, One Plan.

Minnesota's surface and groundwater resources became impaired over many decades and it will take time to restore them. Local partners and State agencies restored 47 waterbodies previously listed as impaired, and continue their work on restoring water bodies remaining on the Impaired Waters List.

The Council has focused on finding, developing and funding innovative solutions to the State's water quality issues. Improving rural public health. In addition, improving economic and social capital is important to the Council. As an example, the Department of Health, at the request of local drinking water suppliers, is using local implementation funding to grow a deep rooted, perennial cash crop **intermediate wheatgrass** (commercially available as Kernza®) in local wellhead protection areas. Kernza® has several benefits:

- As a highly sought-after grain in Minnesota and elsewhere, Kernza® provides economic benefits to producers.
- Kernza® provides a continuous soil cover and significantly reduces soil loss from erosion; and
- Deep roots associated with this crop (as much as 10 feet) can intercept nitrates that normally would leach to shallow groundwater. Nitrate impacts are a major drinking water pollutant in Minnesota.

Another innovative program the Council supports is the **Minnesota Agricultural Water Quality Certification Program (MAWQCP)**. This rigorous, first of its kind national pilot program is a collaboration between the State of Minnesota, the United States Department of Agriculture, the United States Environmental Protection Agency, and private industry and producers. It accelerates the voluntary adoption of on-farm conservation practices that protect and restore Minnesota's lakes, rivers and streams. As of November 2018, MAWQCP has

CLEAN WATER COUNCIL ACTIVITIES SINCE THE 2016 REPORT

certified 668 farms totaling over 428,900 acres; the conservation practices used by the producers are expected to prevent the loss of over 24,000 tons of soil, over 28,250 pounds of phosphorus, and reduce nitrogen loss by nearly 50 percent.

The Council also wants to ensure that approximately 60 percent of Minnesota's surface water bodies that are currently "healthy" remains protected. The Department of Natural Resource's "**Forests for the Future**" program purchases permanent working-forest conservation easements in targeted areas to protect the forests and shorelands that supply clean water to lakes, rivers and streams. This program provides the landowners income while protecting water quality.

The Council's financial assistance to install or upgrade **individual septic systems** and **small community wastewater treatment systems** play a critical role in protecting surface and groundwater in small communities throughout Minnesota. For communities and individuals in rural areas, financial support from the CWF can make the difference between upgrading or installing a wastewater treatment system or continuing to operate failing systems that can pollute nearby lakes, streams and groundwater. Some examples of Council's financial support to manage wastewater include:

- Providing financial support to small communities and individuals near **Voyageurs National Park** (VNP) that have failing or no sewage treatment facilities due to shallow bedrock, low population density and lower incomes. The CWF dollars play a critical role in protecting this pristine area popular with canoeists and others: since 2014, VNP joint powers board leveraged \$5.7 million CWF money to secure \$24.7 million in Federal, State and local funding to install wastewater treatment systems in four small communities bordering VNP.
- Providing technical support to counties to help residents upgrade septic systems;
- Funding Small Community Wastewater Treatment Program that provides technical evaluations and construction in rural areas of the state;
- Funding grants to low-income Minnesotans to install or upgrade individual septic systems.

Governor's 25% by 2025 Town Hall Meetings and CWC Funding Priorities

In 2017, Governor Dayton held town hall meetings* throughout the state to discuss methods and approaches for accelerating improvements to water quality beyond the current pace of progress. The Governor established an ambitious goal of improving Minnesota's water quality 25 percent by 2025.

Over 2,500 Minnesotans across the State participated in town hall, online or community meetings to discuss actions that citizens, local leaders and State agencies can take to improve water quality 25 percent by 2025. Common themes that emerged from these meetings were:

- Education, communication, and engagement;
- Reducing runoff by holding more water on the land;
- Working together across levels of government and with the public;
- Locally led watershed planning;
- Reducing pollutants in drinking water;
- Reducing de-icing (road) salt pollution;
- Address failing septic systems;
- Need for long-term, stable funding; and
- Providing a balance of incentives and regulation.

Many of the Council's FY 20-21 budget recommendations directly or indirectly fund the actions that citizens believe are necessary to improve water quality 25 percent by 2025. The Council will continue to consider citizen recommendations in 2019 to optimize future CWF appropriations.

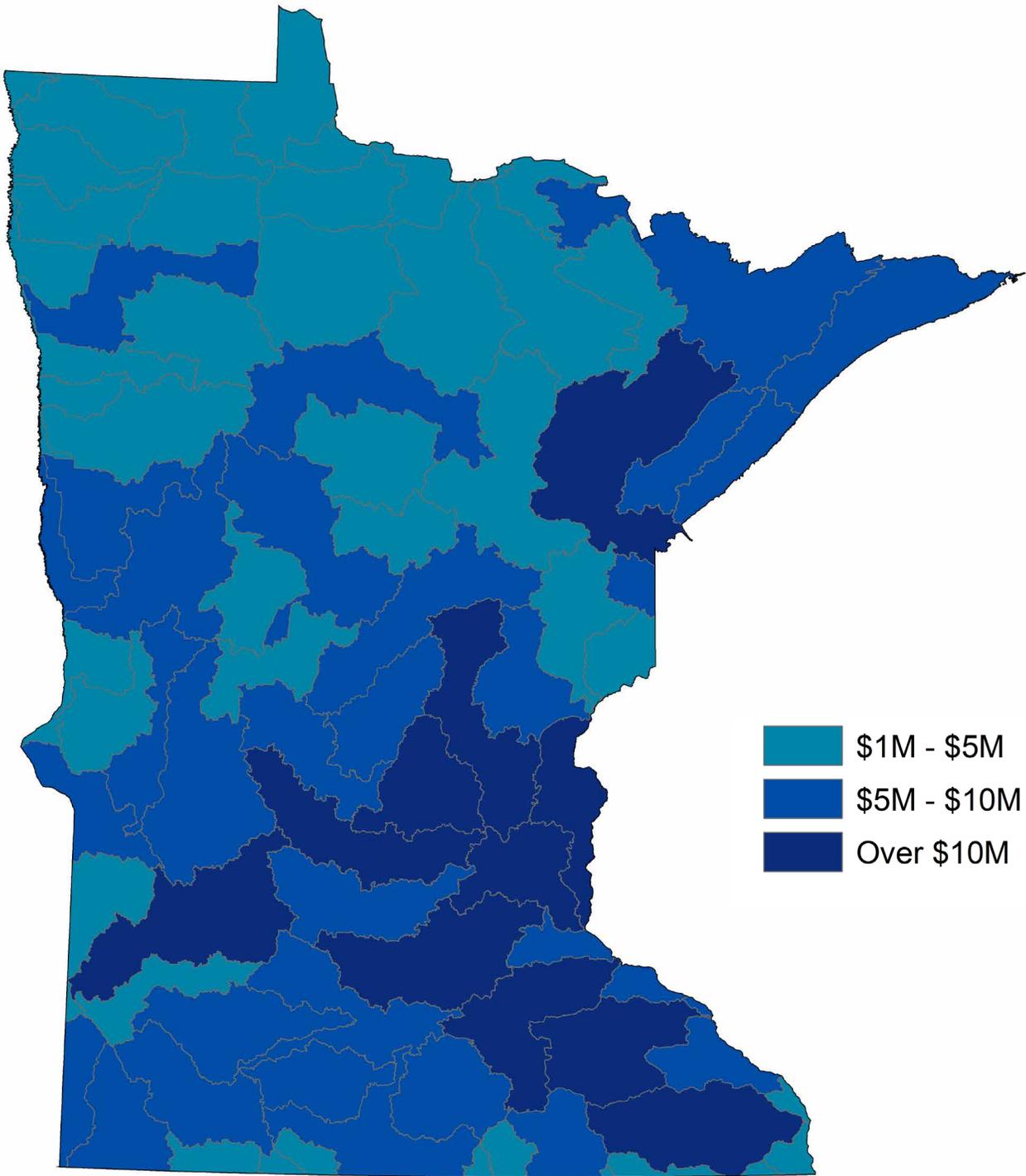
*For more information, see <https://www.eqb.state.mn.us/content/25-2025-overview>



Photo credit: Chandra Heinrich

CLEAN WATER COUNCIL ACTIVITIES SINCE THE 2016 REPORT

Clean Water Funding Expenditures by Watershed



FY 20-21 CLEAN WATER FUNDING RECOMMENDATIONS

The Clean Water Legacy Act mandates that CWF monies be appropriated for programs rather than projects. The public entities that implement the programs solicit grant proposals from Local Government Units (LGUs) and others. Therefore, the stakeholder engagement and support is crucial prior to making budget recommendations to ensure the programs funded by the CWF meet the needs of Minnesotans. The Council made every effort to include the stakeholders throughout the budget development process.

Budget Development Process

The Budget and Outcomes Committee (BOC) of the Council is responsible for examining all CWF budget requests by State agencies, Metropolitan Council, University of Minnesota and others. In early 2018, entities requesting funding submitted descriptions of each of their existing programs and information on any newly proposed programs to the BOC. The BOC conducted discussions with program proposers to learn more about the programs, with an emphasis on newly proposed programs. In April 2018, the Council hosted a meeting to solicit input from stakeholders; in addition, the Council invited the stakeholders to submit comments in writing. Council staff compiled all comments and input, and presented the information to Council members. In September 2018, the Council approved the proposed budget.

Budget and Outcomes Committee Members

The Council's 2017- 2018 Budget and Outcomes Committee members are Todd Renville (Committee Chair), Sharon Doucette (Committee Vice Chair), John Barten, Warren Formo, Robert Hoefert, Frank Jewell, Holly Kovarik and Patrick Shea. The Budget Committee met monthly to review budget proposals and solicited input from stakeholders and agencies during their budget development process.



Photo credit: Forrest Peterson

FY 20-21 Clean Water Fund Recommendations by Category

The Council's budget recommendations fall within six general categories and the implementation category is further divided into three subcategories. The categories listed below are based on the Watershed Framework the State adapted in 2014 (see Appendix C):

- Monitoring, Assessment and Characterization
- Watershed and Groundwater Restoration/Protection Strategies
- Comprehensive Local Watershed Management
- Implementation
 - Nonpoint Source Implementation
 - Point Source Implementation
 - Groundwater & Drinking Water Implementation
- Research, Evaluation and Tool Development
- Administration

Monitoring, Assessment and Characterization

\$37.783 million (14.4%)

The Watershed Framework (Appendix C) includes assessment of the State's ground and surface waters and provides information on water quality in the 81 major watersheds on a 10-year cycle. The State completed the first 10-year cycle in 2018; the second cycle of sampling has already started in some watersheds. The resultant data generated from this funding will help local partners and stakeholders understand the condition of the waters prior to implementing mitigation and protection actions.

Watershed and Groundwater Restoration/Protection Strategies

\$26.926 million (10.2%)

This funding will support local entities, with the help of State agencies to develop Watershed Restoration and Protection Strategies (WRAPS) and Groundwater Restoration and Protection Strategies (GRAPS) for each of the 81 major watersheds in Minnesota. As of November 2018, 37 of the 81 Minnesota watersheds have WRAPS and by end of FY 21, all but six watersheds are projected to have approved WRAPS.

Continued on next page

FY 20-21 CLEAN WATER FUNDING RECOMMENDATIONS

Comprehensive Local Watershed Management Plans (One Watershed, One Plan) Development

\$4.540 million (1.7%)

Local partners, using this funding, monitoring data, WRAPS, GRAPS and local knowledge, develop comprehensive watershed management plans. These plans prioritize projects necessary to restore and/or protect each watershed in the coming decade. Currently, five watersheds have approved plans and up to 60 watersheds outside the seven county TCMA completed by 2026. The entities within the TCMA are also eligible for this funding. In the Plans, local entities prioritize implementation activities to ensure that the most critical restoration and protection activities are completed. This approach optimizes the CWF support and prioritizes projects that have the greatest impact on water quality.

Local Implementation

\$180.889 million (68.9%)

The implantation category consists of the following sub-categories:

- Nonpoint source (\$136.473 million, 51.95%)
- Point source (\$21.100 million, 8.03%)
- Groundwater and Drinking water (\$23.316 million, 8.88%)

Examples of implementation activities include purchasing conservation easements, upgrading wastewater and stormwater infrastructure, and protecting community wellhead protection areas and other drinking water sources. Over \$29 million will be available for watersheds with Comprehensive Watershed Management Plans to implement priority projects. The Council is recommending another \$32.6 million to protect or restore surface and drinking water.

Research, Evaluation and Tool Development

\$11.836 million (4.5%)

In order to use CWF monies in the most effective and efficient manner, it is necessary to develop and evaluate new methods of restoration and protection. The University of Minnesota conducts much of this research with support from the State agencies and local entities. For example, in the area of stormwater management, the long-term

effectiveness and costs of many emerging best management practices are unknown. Research currently being conducted by cities, watershed districts and the University of Minnesota will help address this issue.

Administrative Expenses

\$0.729 million (0.3%)

This category includes funding the operations of the Council, and the Legislative Coordinating Commission's costs for maintaining the CWF portion of the Legacy website.

The Clean Water Legacy Act (Minn. Stat. § 114D.35) instructs the Council to “develop strategies for informing, educating, and encouraging the participation of citizens, stakeholders, and others” to restore and protect surface water and groundwater. The Council expects to take a leadership role in advancing public education and involvement. As noted earlier, Minnesotans throughout the State identified community education, communication, and engagement as an effective way to improve water quality. The Council is proposing a \$500,000 citizen information and engagement campaign to respond to the statutory requirement, and as a response to the citizens’ desire to learn more about their water and engage in water related decision making in their communities. Citizen engagement is critical to ensure the investment we are making in our waters is long lasting and would benefit future generations.

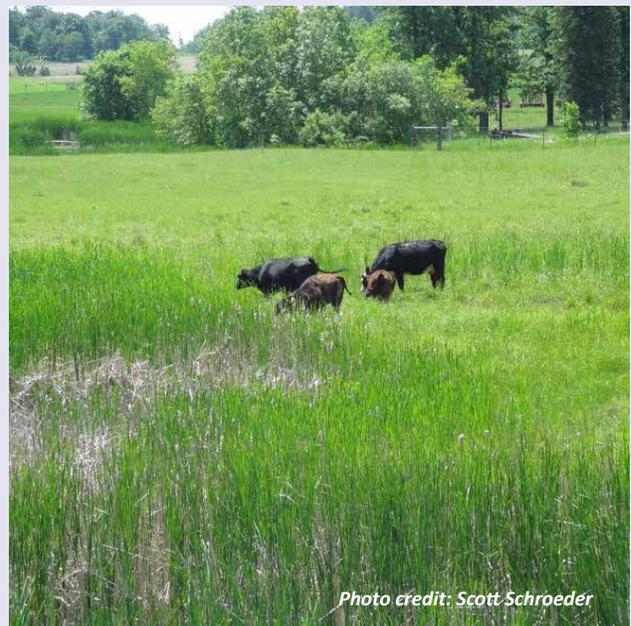
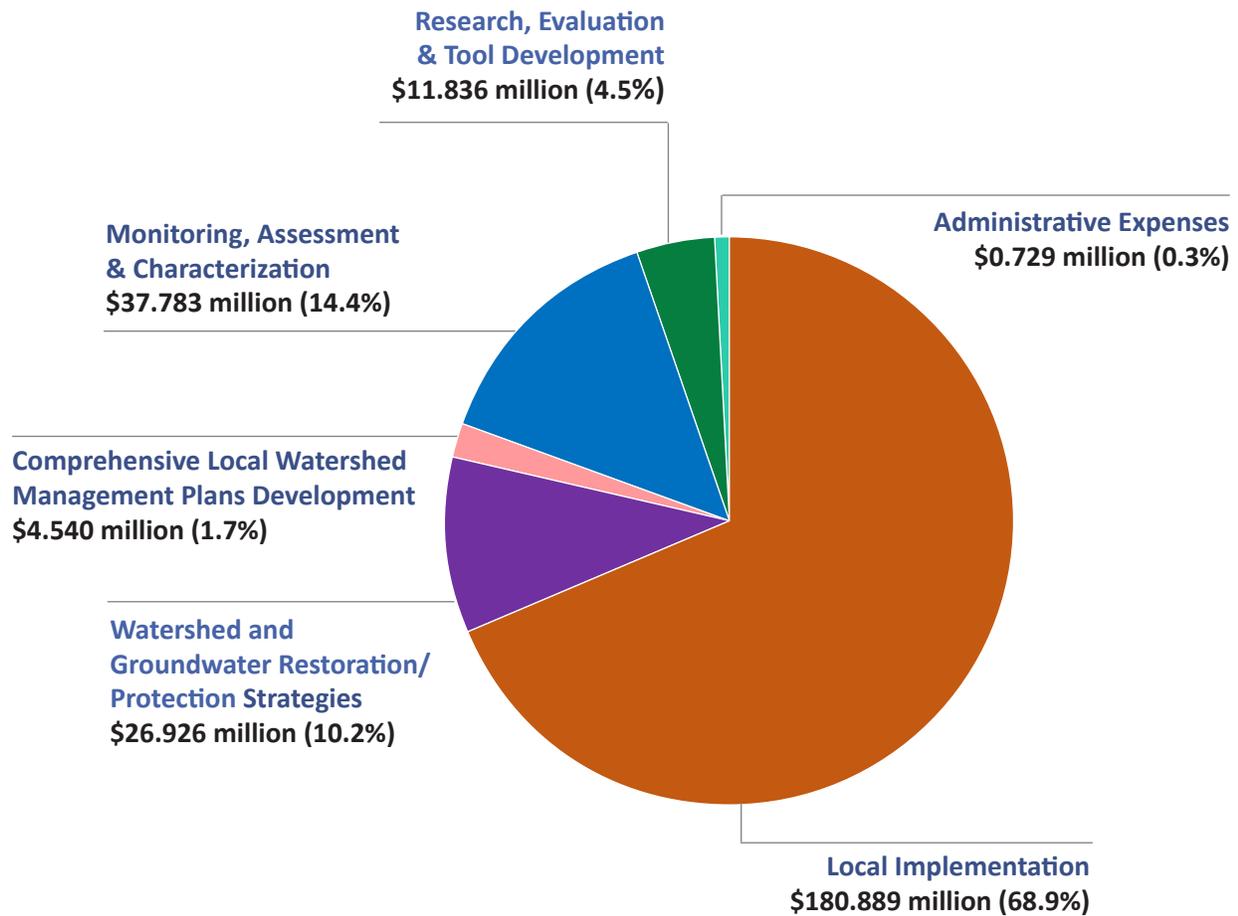


Photo credit: Scott Schroeder

FY 20-21 CLEAN WATER FUNDING RECOMMENDATIONS

FY 2020 and 2021 CWF Recommendations



FY 20-21 FUNDING RECOMMENDATIONS BY CATEGORY

The following tables present a synopsis of programs falling under the above categories as well as appropriation recommendations. More information on programs that receive CWF dollars can be found on the Council’s website: <https://www.pca.state.mn.us/clean-water-council/recommendations-plans>, and past recommendations and expenditure can be accessed at Minnesota’s Legacy website: www.legacy.leg.mn. A broad summary of the programmatic objectives of each category and proposed funding levels is provided below.

GOALS	 Surface water is swimmable and fishable	 Drinking water is safe for everyone, everywhere in Minnesota
	 Groundwater is clean and available	 Minnesotans value water and take actions to sustain and protect it

Monitoring, Assessment, and Characterization (\$37.783 million, 14.38%)

Activity	Recommendation	Goals met	Agency
Aquifer Monitoring for Water Supply Planning	\$4,650,000	 	DNR
Fish Contamination Assessment	\$270,000		DNR
Lake IBI Assessment	\$2,500,000		DNR
Buffer Map Maintenance	\$200,000		DNR
Stream Flow Monitoring	\$4,400,000		DNR
Monitoring for Pesticides in Surface Water & Groundwater	\$700,000	 	MDA
Pesticide Testing of Private Wells	\$2,000,000	  	MDA
Drinking Water Contaminants of Emerging Concern Program	\$3,000,000	 	MDH
Private Well Water Supply Protection	\$1,700,000	 	MDH

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FY 20-21 FUNDING RECOMMENDATIONS BY CATEGORY

Monitoring, Assessment, and Characterization (\$37.783 million, 14.38%)

Activity	Recommendation	Goals met	Agency
River and Lake Monitoring & Assessment	\$16,000,000		MPCA
Groundwater Assessment	\$2,363,000		MPCA

Watershed & Groundwater Restoration/Protection Strategies (\$26.926 million, 10.25%)

Activity	Recommendation	Goals met	Agency
Watershed Restoration and Protection Strategies	\$4,032,000		DNR
Groundwater Restoration and Protection Strategies	\$1,300,000		MDH
Source Water Protection	\$5,494,000		MDH
Watershed Restoration and Protection Strategies (includes TMDL development)	\$16,100,000		MPCA

Comprehensive Local Watershed Management (\$4.540 million, 1.73%)

Activity	Recommendation	Goals met	Agency
Water Management Transition (One Watershed One Plan)	\$4,540,000		BWSR

FY 20-21 FUNDING RECOMMENDATIONS BY CATEGORY

Nonpoint Source Implementation (\$136.473 million, 51.95%)

Activity	Recommendation	Goals met	Agency
Grants to Watersheds with Multiyear Plans/One Watershed, One Plan Implementation	\$29,422,000		BWSR
Accelerated Implementation	\$12,100,000		BWSR
Conservation Drainage Management and Assistance	\$3,000,000		BWSR
Conservation Reserve Enhancement Program (CREP)	\$20,000,000		BWSR
Critical Shoreland Protection-Permanent Conservation Easements	\$3,500,000		BWSR
Measures, Results and Accountability	\$2,000,000		BWSR
Shoreland Buffer Compliance Program	\$5,000,000		BWSR
Riparian Buffer-Permanent Conservation Easements	\$9,750,000		BWSR
Surface and Drinking Water Protection/Restoration Grants	\$32,601,000		BWSR
Community Partners Clean Water Program/Water Legacy Grants Program	\$2,000,000		BWSR
Enhancing Landowner Adoption of Cover Crops for Drinking Water & Groundwater Protection	\$500,000		BWSR
Nonpoint Source Restoration and Protection Activities	\$2,400,000		DNR
Color Infrared Imagery Analysis	\$650,000		DNR

Continued on next page

FY 20-21 FUNDING RECOMMENDATIONS BY CATEGORY

Nonpoint Source Implementation (\$136.473 million, 51.95%)

Activity	Recommendation	Goals met	Agency
Forests for the Future	\$1,500,000		DNR
AgBMP Loan Program	\$150,000		MDA
MN Agricultural Water Quality Certification Program	\$6,000,000		MDA
Technical Assistance	\$3,250,000		MDA
Vegetative Cover and Soil Health	\$150,000		MDA
Water Demand Reduction Grant Program	\$1,000,000		Met Council
Great Lakes Restoration Project	\$1,500,000		MPCA

Point Source Implementation (\$21.100 million, 8.03%)

Activity	Recommendation	Goals met	Agency
Accelerated Implementation of MS4 Permit Requirements	\$450,000		MPCA
Chloride Reduction Efforts	\$600,000		MPCA
NPDES Wastewater/Stormwater TMDL Implementation	\$1,800,000		MPCA
Point Source Implementation Grant (PSIG) Program	\$18,000,000		PFA
Small Community Wastewater Treatment Program	\$250,000		PFA

FY 20-21 FUNDING RECOMMENDATIONS BY CATEGORY

Groundwater/Drinking Water Implementation (\$23.316 million 8.88%)

Activity	Recommendation	Goals met	Agency
Targeted Wellhead/Drinking Water Protection	\$4,750,000	  	BWSR
Irrigation Water Quality Protection	\$770,000	  	MDA
Nitrate in Groundwater	\$5,170,000	  	MDA
Drinking Water Protection	\$700,000	 	MDH
Well Sealing Cost Share	\$500,000		MDH
Metropolitan Area Water Supply Sustainability Support	\$2,000,000	  	Met Council
Enhanced County Inspections/SSTS Corrective Actions	\$7,876,000	 	MPCA
National Park Water Quality Protection Program	\$1,550,000	 	MPCA (pass through)

FY 20-21 FUNDING RECOMMENDATIONS BY CATEGORY

Research, Evaluation and Tool Development (\$11.836 million, 4.51%)

Activity	Recommendation	Goals met	Agency
Tillage and Erosion Transects	\$850,000	 	BWSR
Technical Evaluation	\$168,000		BWSR
Applied Research and Tools	\$1,400,000		DNR
County Geologic Atlases	\$300,000		DNR
Agricultural Research/Evaluation	\$1,325,000	 	MDA
Research Inventory Database	\$100,000		MDA
Forever Green Agricultural Initiative	\$3,300,000	  	MDA
Groundwater Virus Monitoring Plan	\$500,000	 	MDH
Water Reuse	\$550,000	 	MDH
Stormwater BMP Performance Evaluation & Technology Transfer	\$1,500,000		UMN
Clean Water Return on Investment Pilot	\$343,000		UMN
Geologic Atlas with Dept. of Natural Resources	\$1,000,000		UMN
Carp Management	\$500,000		UMN

FY 20-21 FUNDING RECOMMENDATIONS BY CATEGORY

Administration (\$0.729 million, 0.28%)

Activity	Recommendation	Goals met	Agency
Clean Water Council Budget	\$220,000		MPCA
Public Information Campaign	\$500,000		MPCA (pass through)
Legislative Coordinating Commission Website	\$9,000		LCC

FY 20-21 CLEAN WATER POLICY RECOMMENDATIONS

FY 20-21 Policy Recommendations

The Council recognizes that CWF dollars alone will not meet the expectations of Minnesota citizens for clean water. The Council's Policy Committee considered a range of policy issues in 2017 and 2018, and developed three policy recommendations that are sufficiently important to warrant the Council's support:

- Reducing de-icing chloride (road salt) pollution
- Preventing water pollution from improper disposal of pharmaceuticals
- Enhancing water quality by increasing continuous vegetative cover in the landscape

In addition to these policy recommendations, the Council's Policy Committee evaluated the progress made related to past policy recommendations. The results of the evaluation are summarized in Table 9.

The Policy Committee

The Council's 2017-2018 Policy Committee members are John Barten (Committee Chair), Victoria Reinhardt (Committee Vice Chair), Pam Blixt, Gary Burdorf, Sharon Day, Warren Formo, Robert Hoefert and Rylee Main. The Policy Committee members met monthly to evaluate policy recommendations and considered expert testimony from wide variety of stakeholders including State agency staff, UMN researchers, fortune 500 companies and small business owners.



Photo credit: Matt Moon

FY 20-21 CLEAN WATER POLICY RECOMMENDATIONS

DE-ICING CHLORIDE REDUCTION POLICY

Policy Statement

The Clean Water Council recommends that the State establish the following to reduce chloride in Minnesota surface and groundwater:

Winter de-icing:

- Fully fund the **Smart Salting** applicator training and certification program, and technical support aimed at reducing salt use.
- Provide liability protection for the **Smart Salting** program certified private winter de-icing applicators for reduced salt applications.
- Provide research funds to develop new technology and alternatives to chloride-containing de-icing chemicals, and best management practices.

Problem

Chloride is a naturally occurring ion found in low levels in Minnesota surface and groundwater. Salt used for winter de-icing and water softening contain chloride. Chloride is not toxic in small concentrations. However, above 230 mg per liter (about one teaspoon in 5 gallons of water), chloride becomes toxic to freshwater fish and other aquatic life under long-term exposure. Once chloride enters our surface water (lakes, streams, and wetlands) and groundwater, it is not feasible and extremely expensive to remove it.

Two primary sources of chloride in Minnesota waters are:

1. winter de-icing salts and
2. salt used for residential water softening systems.

Winter de-icing salts:

In the Twin Cities Metro Area (TCMA) winter maintenance activities use approximately 365,000 tons of road salt per year. The de-icing salts eventually wash into nearby lakes, streams and wetlands. Recent monitoring shows increasing chloride concentrations in surface water and shallow groundwater. Since it is very difficult and expensive to remove chloride from our surface and groundwater once it gets into water, reducing chloride at the source is necessary.



Solution

Reducing chloride use during winter de-icing:

1. Continue the Smart Salting applicator training and certification program:

The MPCA has a training program for private and public salt applicators, such as snow removal contractors and snowplow drivers. This has been a very successful program and has assisted winter maintenance programs in reducing salt application rates by 30% to 70%, without compromising public safety. The [TCMA Chloride Management Plan](#) includes the **Smart Salting** training program as the top implementation strategy to reduce salt use in the winter. In the past, MPCA conducted this training with federal funds, but those funds are temporary. The estimated operating cost for the training program is \$228,000/year. To qualify for the liability protection to private salt applicators, the applicator must complete **Smart Salting** training program to be certified.

2. Provide liability protection to certified private salt applicators against slip and fall lawsuits:

The notion here is that private applicators certified through the **Smart Salting** program would be able to apply for liability protection. The private applicator industry and local stakeholders strongly support this proposal. Various groups introduced bills to this effect in the last two legislative sessions; however, none was enacted into law.

3. Research funding. Make research funds available to develop new technology and alternatives to chloride-containing de-icing chemicals. Research on new technologies and alternative de-icing solutions may allow for a shift in snow and ice management that protect water resources while maintaining public safety. A full list of needed research areas can be found in Section 5 of the [TCMA Chloride Management Plan](#).

FY 20-21 CLEAN WATER POLICY RECOMMENDATIONS

WASTE PHARMACEUTICAL DISPOSAL POLICY

Policy Statement

The Clean Water Council recommends that the State establish the following to reduce the discharge of pharmaceuticals into the waters of Minnesota:

1. Require the words or symbols for “do not flush” be printed on all prescription pharmaceutical labels, and remove any existing instructions to flush unused portions.
2. Adopt a “Secure Drug Take-Back-Act” modeled after the legislation recently adopted by Washington State.

This legislation provides flexibility to utilize the current infrastructure for collection; and requires manufacturers to implement public education and outreach activities; and to cover all administrative and support costs including, but not limited to: collection, compensation to authorized collectors, transportation, secure receptacles, and environmentally sound disposal of covered pharmaceuticals.

Problem

Pharmaceuticals are used to treat, cure, diagnose, and prevent disease and ailments in humans, agricultural animals, and companion animals. The use of pharmaceuticals is expected to increase in response to increasing demand. These chemicals are designed to be biologically active and potent at low doses. Pharmaceuticals enter the environment through many pathways including:

- Improper disposal of unused medications (both in home and at care facilities)
- Runoff from manure on agricultural fields or feedlots
- Effluent from health care facilities, medication manufacturing and other industrial sources
- Excretion from normal use in humans (e.g., not all of the drug is fully metabolized in the body)

Pharmaceuticals are commonly detected in Minnesota surface water, groundwater and sediment. The concentrations detected are low relative to other contaminants, but they can have negative impacts on the environment, especially aquatic species. It is extremely difficult and costly to remove these chemicals from wastewater and drinking water. Preventing entry to the environment, such as through improving prescription practices and minimizing input from waste streams is the best way to avoid potential impacts of pharmaceuticals.

In addition to the environmental impact of waste pharmaceuticals being discharged into the waters of Minnesota, there is also a public safety benefit to environmentally sound disposal. Prescription drugs left unused by the intended recipient, which are not disposed of properly, can be misused by others and have serious or fatal consequences. Seven out of ten people who start abusing prescription drugs get them from the medicine cabinets of friends and family. Among children, the most common cause of accidental poisoning is from ingesting drugs. In addition, periodic cleaning of the medicine cabinet reduces the likelihood that adults, especially the elderly, will take the wrong medication, wrong dose or use expired medications.



Photo Credit: Scott Schroeder

FY 20-21 CLEAN WATER POLICY RECOMMENDATIONS

Current Efforts by State Agencies with Clean Water Fund (CWF)

With funding from CWF, the Minnesota Department of Health (MDH) and the Minnesota Pollution Control Agency (MPCA) conduct research, public education, monitoring and collecting waste pharmaceuticals throughout the State, and environmental surveillance. Both agencies work closely with other State agencies, local entities such as local law enforcement, county and city public health departments, and local pharmacies to keep unwanted pharmaceuticals from reaching our waters.

Minnesota Department of Health:

Pharmaceutical Rapid Assessments: using a novel method, MDH has established conservative screening values (above which the risk of negative human health effects increases) for 119 pharmaceuticals commonly prescribed in the U.S., and monitored for in the environment.

Provide outreach & education grants to local governments, non-profits, watersheds districts, and academic institutions to raise awareness of pharmaceuticals and other contaminants of emerging concern (CEC), expand outreach on pharmaceutical take-back opportunities, and reduce the presence of CECs in the environment through behavior change.

Create educational resources for local entities that facilitate outreach to communities and provide a consistent message throughout the State on the health and environmental risks of pharmaceuticals and other CECs.

One Health Antibiotic Collaborative: The MDH leads a team of experts from Minnesota Department of Agriculture, MPCA, Minnesota Department of Natural Resources, Board of Animal Health, Board of Veterinary Medicine, University of Minnesota, pharmacy and dentistry groups, physicians, agricultural representatives, and other experts to ensure that Minnesotans use antibiotics in a manner to reduce antibiotic resistance and protect the environment. <http://www.health.state.mn.us/onehealthabx/>.

Minnesota Pollution Control Agency:

The MPCA monitors pharmaceuticals and other CECs in surface water and groundwater to determine their presence and prevalence in the environment. Currently, the MPCA monitors about 140 chemicals comprised of pharmaceuticals, hormones, anti-corrosives, and other industrial or commercial chemicals in surface and groundwater. Among those, most frequently detected pharmaceuticals in surface water are: antidepressants (amitriptyline, fluoxetine, and sertraline), and iopamidol (an x-ray contrast agent).

Investigate sources of pharmaceuticals and other CECs to the environment and evaluate their potential effects on aquatic life: MPCA conducts focused investigations to determine sources of pharmaceuticals to the environment and understand potential actions to reduce them: pollution prevention, best management practices, rules. Often MPCA collaborates with university and federal researchers in these studies to use genomics and other new techniques to assess potential effects on fish and other aquatic life. MPCA has also developed a semi-automated approach for summarizing known information about the behavior and potential impacts of specific pharmaceuticals and CECs on aquatic life, resulting in an Aquatic Toxicity Profile (ATP). The ATPs provide a basis for comparing one chemical versus another.

Provide outreach & education materials to local governments, pharmacies, law enforcement and other agencies to raise awareness on the impacts of pharmaceuticals in the home and in the environment, and to support proper disposal of unneeded pharmaceuticals.

Register and track waste pharmaceutical collection locations in the state: The MPCA works with local law enforcement, pharmacies, Native American Tribes and other state and federal agencies to encourage the installment of secure bins to dispose of unwanted pharmaceuticals. The MPCA oversees over 350 collection sites and collects data from them annually. Since 2010, these programs have voluntarily collected over 550,000 pounds of waste pharmaceuticals. The MPCA is working with the Department of Human Services on a federal grant to place approximately 25 collection boxes in underserved areas of the state in 2018.



FY 20-21 CLEAN WATER POLICY RECOMMENDATIONS

ENHANCING CLEAN WATER BY INCREASING CONTINUOUS PRODUCTIVE VEGETATIVE COVER IN MINNESOTA AGRICULTURE

Policy Statement

The Clean Water Council recommends that the State of Minnesota enhance clean water by increasing continuous vegetative cover on cropland, with an initial focus on wellhead protection areas, through development of new agricultural production systems, markets, and supply chains in Minnesota agriculture by directing the University of Minnesota to:

- Establish a **Minnesota Agricultural Diversification Steering Council** with agriculture- focused representation from public agencies, the private sector, non-profit organizations, multicultural representatives, and research institutions, to create and direct a Minnesota Agricultural Diversification Network.
- Create a **Minnesota Agricultural Diversification Network** to accelerate the development and commercialization of new crops (e.g., perennial crops and winter-annual crops) that enhance continuous productive vegetative cover, defined as coverage of soil throughout the year, by crops that produce marketable commodities.



Camelina - Soybean Relay; Photo credit: Frank Forcella

Background

Achievement of Minnesota’s clean water goals is complicated by agricultural production systems that primarily utilize annual row crops that grow during the summer.

These crops cover soil only during the warm season; at other times of the year soil is exposed to wind and water erosion with documented losses of sediment and nutrients to surface and groundwater and alterations of the hydrologic system.



American Hazelnut

Recent analyses show that certain clean-water goals can be met by increasing vegetative cover in Minnesota’s agricultural regions, so that more land is covered by living plant cover for more months of each year. However, it is clear that this approach will be prohibitively expensive if it is based on taking farmland out of crop production. Instead, a new approach is needed, based on augmenting current crop production systems with economically viable perennial and winter-annual crops. Such crops enable agriculture to move toward continuous vegetative cover by growing plants that produce marketable agricultural commodities while also protecting against damage to water through soil erosion, nutrient losses, and precipitation runoff. However, to realize the potential of this new approach, viable markets and robust supply chains for these crops are critically needed; otherwise farmers cannot obtain adequate economic return on the production of these crops at the scales needed to realize their potential contributions to clean water goals.

The University of Minnesota’s Forever Green Initiative (FGI) is the national leader in this new approach to achieving clean water via enhancing continuous vegetative cover. The FGI links University resources to public, private and non-profit-sector partners. The FGI program focuses on development of new perennial and winter annual crops, new agricultural production systems that include these crops, and new supply and value chains that provide profitable markets for these crops. For example, FGI is taking this approach to advancing winter-hardy “cash cover crops” such as pennycress, camelina, and winter barley, and perennial crops such as intermediate wheatgrass (Kernza®), and hybrid hazelnuts.

FY 20-21 CLEAN WATER POLICY RECOMMENDATIONS



Kernza®; Photo credit: The Land Institute

The crops listed above, and others in the FGI portfolio, are now ready for a focused effort to accelerate their commercialization and wide adoption, through a concerted and strategic public-private effort. However, there are critical gaps in capacities and resources needed to support this effort, which the Steering Council and its Network will address. For example, at present, there is a major unmet need for coordination between end-users of new crops and growers of these crops. Without coordination, a major “chicken and egg” problem occurs, as farmers will not grow these crops without a market, and end-users will not invest in new products made from these crops without assurance of supply. Through linkage and coordination, producers and end-users can solve this problem by managing and sharing risks, and by efficient use of financial incentives and technical resources.



Pennycress Seed; Photo credit: Jim Ecklund

Creation and support of the **Minnesota Agricultural Diversification Steering Council and Network** will provide such linkage and coordination. Specifically, the Steering Council and Network will create and support new working relationships between public, private and non-profit sectors that are critical to timely development of new production systems that feature continuous productive vegetative cover. The Steering Council will also coordinate public and private investments necessary to operate the Network, advocate for supportive public policy, and link Minnesota’s efforts to developments at regional and national scales. The Diversification Network in turn will support and coordinate research activities, pilot-scale implementation projects, and experimentation with new programs and policies that will accelerate development of this market-driven strategy for clean water.



Pennycress Flower; Photo credit: Jim Ecklund

The expected outcome of this coordination is greater support for new markets and supply chains and extensive production of these crops in targeted areas where they will have the largest water quality benefit.

FY 20-21 CLEAN WATER POLICY RECOMMENDATIONS

Policy Progress since FY 13:

The CWC has made several policy recommendations in the past. The Council's first recommendation was to require installing buffers along public waters and private ditches. The Minnesota legislature passed the buffer law in 2015 and modified it in 2016. The progress of other policy recommendations are compiled in the following table.

Clean Water Council's Policy Recommendations from FY 2013 to FY 2019				
Policy	Adopted In	Key Policy Recommendations	Progress	Future Actions Needed
Riparian Buffers	FY 13-14	Require buffers along Public waters and ditches and private ditches that drains into Public waterways	Minnesota Buffer Law was signed into law in June 2015 and requires 50 foot buffer along Public waters and 16.5 foot buffer along Public drainage systems	All the policy goals are achieved. The State Agencies and local governmental units are responsible for ensuring the buffers are maintained.
		Fund local implementation & enforcement	CWF provides funding for technical support for local units of government	
		One State Agency oversee local activities	BWSR has overall implementation responsibility with technical support from other Agencies.	
Water Retention, Storage and Infiltration	FY 13-14	Require all major (HUC 8) watersheds outside 7-county metro area develop comprehensive watershed management plans.	All non-metro water planning and implementation are based on major watersheds. Water retention/ storage goals have been incorporated into 1W1P requirements via Statute (103B.801) and agency plan content requirements.	BWSR is currently working on white paper that analyzes technical issues, policy considerations, and potential costs necessary to scale up adoption of water storage and treatment.
Living Cover for Drinking Water Protection	FY 16-17	Require the establishment of living cover in vulnerable areas such as wellhead & upstream of surface water intakes	These areas are targeted, but voluntary; therefore, the progress is limited.	
		Property Transfers: Notify the buyers the potential existence of lead-pipes between the water main and taps, and provide informational material to mitigate risks.		Legislation may be necessary to ensure the seller discloses the existence of lead piping.

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Policy	Adopted In	Key Policy Recommendations	Progress	Future Actions Needed
Advancing Drinking Water Protection	FY 16-17	Renters: Notify the renters the potential existence of lead-pipes between the water main and taps and provide informational material to mitigate risks.		Legislation may be necessary to ensure the property owner discloses the existence of lead piping.
		Establish a panel of subject matter expert from around the country to advise MN lawmakers and Agencies ways to protect and improve drinking water quality.	MDH has a contract with UMN's Water Resources Center and Humphrey School of Public Affairs to convene an expert panel and their report is now in the review phase.	Policy Committee review the report and recommend policy actions
		State mandate Source Water Protection Plans (SWPP) for surface water systems.	Minneapolis, St. Paul and St. Cloud have SWPPs, but 21 others are yet to draft them.	Provide technical support needed to other 21 MN communities that use surface water as drinking water source to complete SWPPs.
De-icing Chloride Reduction	FY 18-19	Fully fund the Smart Salting applicator training and certification program, and technical support aimed at reducing salt use.	The MPCA's Strategic Plan includes chloride reduction efforts. The MPCA has requested and CWC recommended CWF monies to provide the training program Statewide.	Legislature to approve the CWC's recommendation.
		Provide liability protection for the Smart Salting program certified private winter de-icing applicators to reduce salt use.	During 2018 legislative session, bills were introduced in the both houses, but were not included in the Omnibus bills	Re-introduce, pass and sign into law the liability protection bill.
		Provide research funds to develop new technology, alternatives and BMPs		
Pharmaceutical Pollution Prevention	FY 18-19	Require the words or symbols for "do not flush" be printed on all prescription pharmaceutical labels, and remove any existing instructions to flush unused portions.	The Policy approved in mid-2018, hence CWC has not taken any action yet. The MPCA is working on a small card with collection information that can be stapled to prescription medicine bags.	
		Adopt a "Secure Drug Take-Back-Act" modeled after the legislation recently adopted by Washington State.		Establish a coalition of stakeholders to help draft legislation and adaptation of the Act during the 2019 legislative session.
Increasing Continuous Productive Vegetative Cover	FY 18-19	Establish a Minnesota Agricultural Diversification Steering Council	The Council recommended funding for establish the Minnesota Agricultural Diversification Steering Council at the University of Minnesota.	Legislature to approve the CWC's recommendation.
		Create a Minnesota Agricultural Diversification Network		

CONCLUSION

The Council recognizes that the level of government closest to the activities on the ground can best understand water resource management needs and implement the most effective strategies. As implementation activities progress, State agencies will continue to provide technical assistance to local governments in the form of modeling, mapping capabilities and creating uniform benchmarks. Although protecting water is a long term and complex issue that involves chemical, biological and physical sciences as well as the social sciences, Minnesota is well on its way to protect its water for generations to come.



"The Fight"

Photo credit: Karsten Klimek

APPENDIX A

Clean Water Progress



MINNESOTA BOARD OF WATER AND SOIL RESOURCES (BWSR)

BWSR's mission provides for effective and efficient use of Clean Water Fund (CWF) dollars with proven results. Working with local governments to achieve shared goals enables BWSR to be strategic in granting funds to meet local identified water quality goals within the larger scope of Minnesota's clean water efforts. BWSR's reporting and tracking requirements ensure measurable and specific results. For Minnesota, that means cleaner water that's fishable, swimmable, and drinkable.

Clean Water Fund Investments - Outcomes to Date

- To date, through 1,487 Clean Water Fund awards, more than 6,850 conservation practices have been installed to reduce critical erosion, stormwater runoff, and to keep water on the land. These awards include public and private projects.
- These conservation practices are estimated to reduce 121,000 tons of sediment per year and prevent 116,000 pounds of phosphorus per year from entering Minnesota waters.
- Minnesota's investment of nearly \$114 million leveraged \$62 million in partner contributions.
- In FY18, BWSR funded 30 competitive grant applications totaling nearly \$6.5 million. These projects are estimated to reduce over 19,200 tons of sediment per year and prevent over 16,400 pounds of phosphorus per year from entering Minnesota waters.
- *One Watershed, One Plan* has transitioned from five pilots to a statewide program where 27 watershed management plans are completed or underway.



Success Story

Nitrate treatment holds promise for water quality in Dakota County

A \$412,000 CWF grant provided the Vermillion Watershed Joint Powers Organization and Dakota County with funding needed to construct a 3-acre hybrid wetland to treat runoff from a portion of the watershed with the highest nitrate load. Nitrate contributes to water quality problems both in local rivers and in Hastings-area drinking water supplies. The innovative nitrate treatment project combines a wetland with a wood-chip bioreactor and is estimated to annually remove 13,600 pounds of nitrate.



Travis Thiel, senior environmental specialist with the Vermillion River Watershed Joint Powers Organization, explained how a constructed wetland and wood-chip bioreactor would treat nitrates on the Vermillion River. Photo credit: BWSR

APPENDIX A

Clean Water Progress



MINNESOTA DEPARTMENT OF NATURAL RESOURCES (DNR)

From Data to Implementation - Progress to Date

To date, the DNR has used Clean Water Fund dollars to [measure stream flow](#) (nearly 8,000 measurements), complete biological surveys in over 1,000 [lakes](#) across the state and test over 700 lake and stream sites for mercury in fish. We've brought expertise in watershed science to Watershed Restoration and Protection Strategies (WRAPS) development and assisted local implementation projects with data, information and technical assistance to help partners restore hydrology, stabilize and restore streams, and protect lakes and streams, including in forested landscapes. Our [Watershed Health Assessment Framework](#) makes it easy for anyone to explore watershed data and health scores at multiple scales. Our foundational LiDAR data and watershed models help predict the best locations for and potential benefits of conservation practices. We have also dramatically expanded the state's [aquifer level monitoring network](#) (adding over 600 observation wells) and established three [groundwater management areas](#) to address water sustainability concerns. Finally, we enhanced 10 [County Geologic Atlases](#) by filling in information gaps.

Restoring Natural Stream Functions at Cascade Creek

Flooding in southeastern Minnesota in September 2018 has put a stream restoration to the test, and it passed. (See photos below.) The restoration, completed in 2017, is the latest of several DNR partnerships with the Olmsted Soil & Water Conservation District and the City of Rochester to improve water quality and resilience to flooding in the South Branch of Cascade Creek watershed. DNR staff helped design the 1.5 mile restoration using natural channel design principles to reduce streambank erosion, add water storage and improve habitat. Key elements include reconnection of the stream to an active floodplain, five off-channel wetlands, and several in-stream habitat features. Reconnecting the floodplain has slowed floodwaters and lessened their erosive force on the streambanks. Other design elements provide habitat for a variety of plants, animals, fish and bugs. Extensive pre- and post-project monitoring will help document results and inform future projects. The project, funded mainly by the Clean Water Fund with a smaller Conservation Partners Legacy grant, shows we can achieve multiple objectives all at once—in this case water quality, flood capacity, habitat, and biological diversity—by addressing streams and their floodplains holistically. For more information see http://www.bwsr.state.mn.us/cleanwaterfund/stories/OlmstedSWCD_Cascade.pdf.



Figure 1. Restored stretch of Cascade Creek in Olmsted County. **Left:** During September 2018 flood; water spreading out across the floodplain and into constructed wetlands. **Right:** Waters receded after the flood. The main stream channel withstood the test and continues to perform well.

This is just one example of using data and science to target specific areas of land for conservation management that is making a long-term difference for Minnesota's water quality future.

APPENDIX A

Clean Water Progress



MINNESOTA DEPARTMENT OF AGRICULTURE (MDA)

Outcomes to Date

The MDA's Clean Water Fund activities help ensure that current and accurate scientific information is made available and used to address water quality concerns in agricultural areas of Minnesota. The MDA's major Clean Water Fund initiatives include:

The Minnesota Agricultural Water Quality Certification Program (MAWQCP), a unique partnership of federal-state government and private industry, has completed three years of statewide operations.

- At the end of November 2018, over 668 farms covering more than 428,900 acres have been certified.
- 1,250 new practices adopted by certified growers, prevent the loss of 24,000 tons of soil per year and reducing nitrogen and phosphorus losses.

The MDA is implementing a variety of work activities to prevent and respond to nitrate contamination of groundwater. Clean Water funding supports private well testing, on-farm demonstrations, local advisory teams, and the development of technical tools.

- 17 on-farm demonstrations to study the movement of nitrate-nitrogen in vulnerable areas and to develop and promote both nitrogen fertilizer and irrigation best management practices.
- Township Testing Program: 25,652 wells in 242 townships have been tested in 24 counties (2013 – 2017) and 10.1% (2,583) of the 25,652 wells tested in vulnerable areas exceeded the drinking water standard for nitrate.

The MDA provides technical assistance through research and demonstration projects and works directly with the agricultural community to promote best management practices.

- 35 edge-of-field monitoring stations to evaluate the effectiveness of on-farm conservation practices.
- Engaged 4,000+ participants, primarily farmers and agronomists, through 200 outreach events

Success Story

Root River Field to Stream Partnership

The Root River Field to Stream Partnership (RRFSP) is a unique water and field monitoring project located in southeast Minnesota. This partnership combines rigorous data collection, strong personal relationships, and real conservation action.

The RRFSP project uses both edge-of-field and in-stream monitoring to characterize water quality in three study areas within the Root River watershed. Through outreach activities and one-on-one meetings the results are discussed with farmers, landowners, fertilizer dealers, water managers and community leaders to promote an advanced level of conservation planning and delivery. Over the past two years, 98% of the farmers in the study area participated in on-farm walkovers to identify critical conservation needs and over 70% of those farmers began making improvements.

This project has helped install over 65,000 feet of grassed waterways, 13 new water and sediment control basins and catchment ponds, rehabilitation of an outdated flood control structure, and planting of 200 acres of cover crops. Feedlot improvements include an increase in manure storage to reduce manure applications on frozen soil, moving milk house wastewater systems, and abandonment of a feedlot in a high risk location. The highest runoff risk field in one of the study areas was enrolled into the Conservation Reserve Program and over 50% of the highest priority conservation practices were addressed by the end of 2017. The RRFSP has leveraged Clean Water Fund dollars with over \$4.5 million in private, state, and federal dollars to support conservation efforts.

WATCH our NEW VIDEO!

Root River Field to Stream Partnership: Lessons Learned (8 minutes)
www.youtube.com/watch?v=QTkMf9joXgA&feature=youtu.be



APPENDIX A

Clean Water Progress



MINNESOTA DEPARTMENT OF HEALTH (MDH)

Outcomes to Date

As Minnesota's lead public health agency, MDH protects, maintains, and improves the health of all Minnesotans and visitors. Healthy people in healthy communities depend on a safe and abundant supply of drinking water and clean water for recreation. Clean Water Fund initiatives at MDH have:

- protected swimmers and drinking water consumers from bacteria and/or viruses at beaches and in groundwater and provided health-based guidance for 41 water contaminants;
- advanced safe and sustainable water reuse;
- established a better understanding of the distribution of arsenic in Minnesota groundwater and what motivates private well users to test their well water and treat it when necessary;
- protected drinking water sources by providing technical and financial assistance for source water protection planning and implementation, and sealing over 800 unused wells.



Properly located and constructed wells prevent contaminants from moving down into the drinking water source.

Photo credit: Brianna Frisch

Success Stories

Improving Protections for Private Well Users

The Minnesota Well Code ensures that private wells are properly located and constructed, but Minnesota's 1.2 million private well users are responsible for maintaining and testing their well and treating their drinking water when necessary. MDH uses Clean Water Funds to understand the geological, chemical, behavioral, and social factors affecting private well users in Minnesota. A study of 264 new private wells showed how arsenic concentrations change over the first year in service. In addition, a survey of 798 households with high arsenic levels in their water helped identify barriers and motivators to well testing and installing water treatment. Information from both studies, as well as increased local partnerships, are helping expand outreach and education efforts to private well owners.

Rock County Rural Water District Wins National Award for Exemplary Source Water Protection

Unlike most of Minnesota, groundwater resources in Rock County are scarce and nutrients have impaired the surface waters. The Rock County Rural Water District (RCRW) serves drinking water to 3,000 Minnesotans from a series of 11 wells, all less than 40 feet deep. In 2001, RCRW obtained one of Minnesota's first wellhead protection plan approvals. Last year, the district submitted a revised second-generation wellhead protection plan. With technical assistance from MDH's source water protection planning and grants, RCRW's implementation work focuses on the agricultural land uses that dominate its wellhead protection area. RCRW actively engages the farming community by increasing the number of acres enrolled in long-term conservation easements, planted in perennial living cover, owned or controlled by the public water system, and subjected to advanced nutrient management practices. Trusted relationships and finding common ground on water quality issues form the strong foundation from which many of these activities can be successful. In recognition of these efforts, the American Water Works Association awarded RCRW the 2018 Exemplary Source Water Protection Award.

APPENDIX A

Clean Water Progress

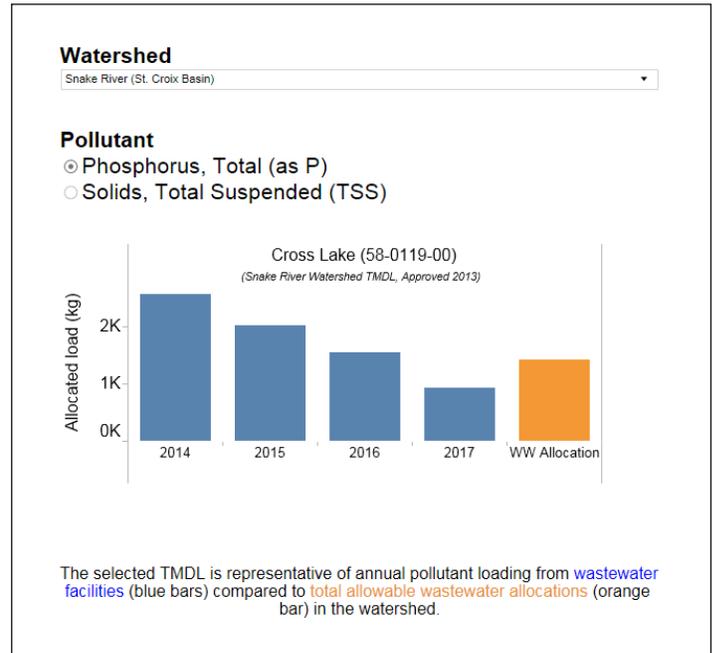


MINNESOTA POLLUTION CONTROL AGENCY (MPCA)

Outcomes to Date

The MPCA, together with local and state government partners, has:

- Monitored and assessed baseline water quality and health of aquatic fish and invertebrates in our rivers and lakes in all of our state’s watersheds. Now beginning a second round of monitoring to evaluate changes over time and fill in any high-priority data gaps.
- Monitored the quality of our state’s shallow groundwater via a network of over 250 wells to identify threats and track trends.
- Developed Watershed Restoration and Protection Strategies (WRAPS) for over half of our state’s watersheds, including clean-up studies known as “total maximum daily loads” (TMDLs) for over 1,100 waterbody impairments.
- Incorporated WRAPS and TMDL requirements into stormwater and wastewater permits, funded county programs for fixing septic systems; provided technical assistance to local governments implementing stormwater requirements, and continuously updated the state’s Stormwater Manual.
- Leveraged millions of federal dollars in the on-going clean-up the St. Louis River Area of Concern (Duluth Harbor and St. Louis River Estuary) to benefit water quality and habitat.

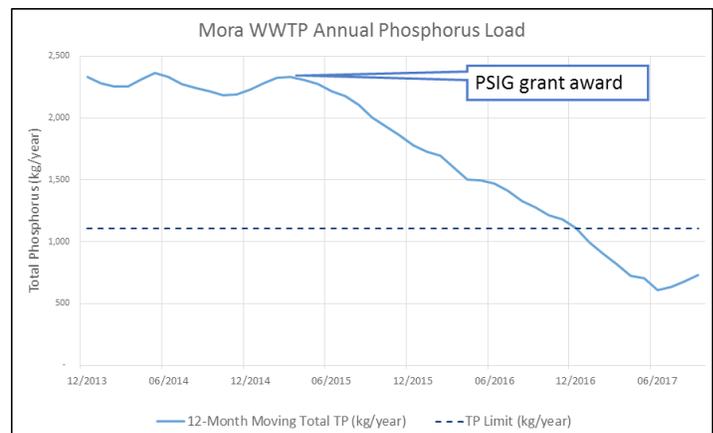


The screen-shot from the MPCA’s Healthier Watersheds webpage (<https://www.pca.state.mn.us/healthier-watersheds>) shows how as of 2017, the wastewater allocation for phosphorus in the TMDL is now being met.

Success Story

City of Mora Wastewater Improvements Benefit Cross Lake in the Snake River Watershed

Water quality monitoring and assessment in the Snake River Watershed identified high levels of phosphorus impacting the water quality of Cross Lake. The City of Mora was complying with their operating permit at the time. However with the new monitoring data, a TMDL study called for, among other actions, a reduction in the phosphorus discharge from the city to help address the problem. The city reduced its wastewater load of phosphorus by 75 percent, or over 3,740 pounds per year, to meet a new permit limit based on the TMDL, with the assistance of a Point Source Implementation Grant (PSIG) from the Minnesota Public Facilities Authority.



APPENDIX A

Clean Water Progress



PUBLIC FACILITIES AUTHORITY (PFA)

Outcomes to Date

Point Source Implementation Grant (PSIG) Program

The PSIG program provides grants to help cities upgrade water infrastructure treatment facilities to comply with TMDL waste-load requirements and more stringent water quality-based effluent limits for phosphorus, chloride, and other pollutants. From FY 2010-2018 the PFA awarded 85 PSIG grants totaling \$119 million, including 50 wastewater and stormwater projects to reduce phosphorus discharges by over 142,620 lbs/yr and 21 projects in previously unsewered areas to build new community collection and treatment systems or connect to existing municipal systems.

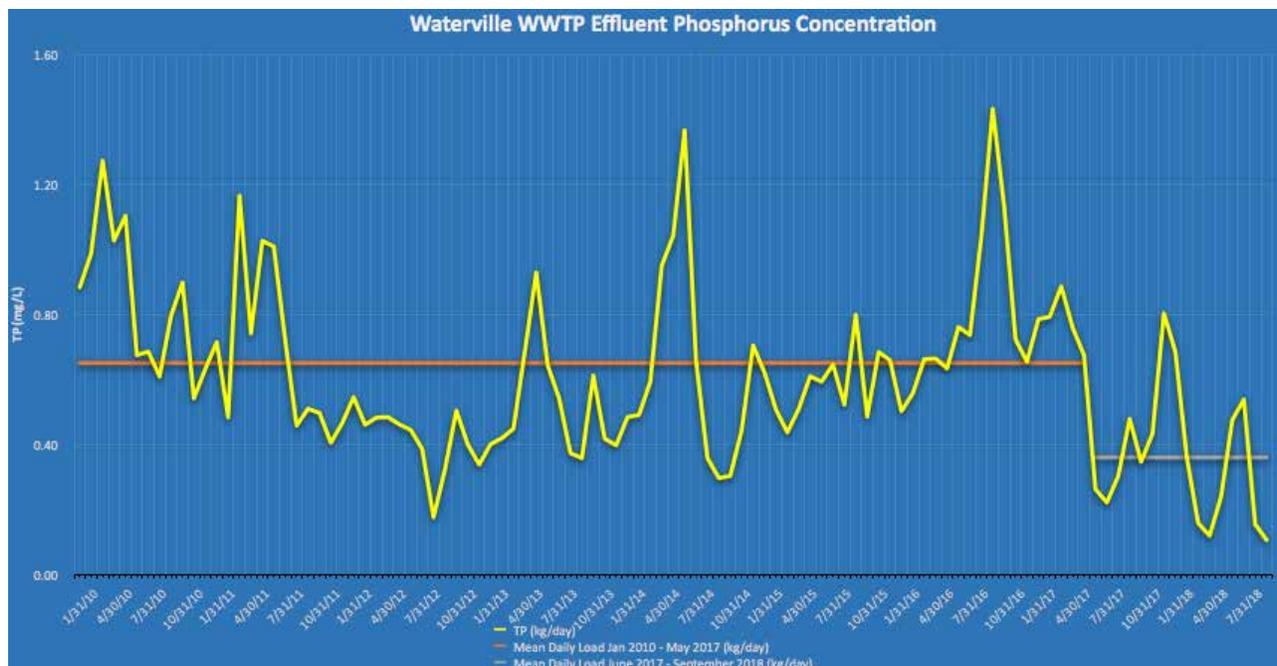


Small Community Wastewater Treatment Program (SCWTP)

The SCWTP provides grants and loans to help assist small unsewered communities with technical assistance and construction funding to replace non-complying septic systems with community subsurface sewage treatment systems. From 2010-2018 the PFA awarded 33 technical assistance grants totaling \$1.1 million to help communities conduct site evaluations and feasibility studies, and 12 construction loans and grants totaling \$7.5 million resulting in the removal of 745 non-complying individual systems.

Success Stories

The City of Waterville is a south central Minnesota community of under 2,000 population with a wastewater treatment facility that was well past it's design life. The system also lacked adequate operational reliability which limited the ability to accept flows from a large campground with an old, unreliable system. Additionally, the facility had just received a more stringent permit limit to reduce the discharge of phosphorus to Upper Sakatah Lake. With the help of a \$2.8 million PSIG grant, the city was able to cost-effectively incorporate the phosphorus upgrade as part of its \$13.4 million treatment plant improvement project.



APPENDIX A

Clean Water Progress



METROPOLITAN COUNCIL (Met Council)

Outcomes to Date

As the Twin Cities metropolitan area planning agency, Met Council works closely with local and state partners to support efforts for sustainable water supplies.

Clean Water Fund Initiatives at Met Council

- Address emerging drinking water supply threats
- Provide cost-effective regional solutions and tools
- Leverage inter-jurisdictional coordination
- Support local implementation of water supply reliability projects
- Prevent degradation of groundwater resources

Efforts so far have resulted in an estimated annual savings of about 135 million gallons.

Success Story

Working with community partners and other partners such as the University of Minnesota, Met Council has developed programs to promote water efficiency in communities and businesses in target areas.

- Sparked water efficiency rebate programs at 19 communities, estimated to save 52 million gallons of water every year.
- Identified over 195 million gallons/year of potential water savings at 20 industries and utilities in the metro area.
- Provided research-based guidance about turf grass management by conducting local research and providing educational resources.



Figure 1. Metropolitan Council and the University of Minnesota Extension service share information about turf grass and the benefits of water efficiency at the Minnesota State Fair.



Figure 2. CWF initiatives have supported communities like Woodbury, where water efficiency programs help the community meet their goals to support growth with no increase in water demand. Educational signage in parks is one example of their outreach campaign.

APPENDIX A

Clean Water Progress



UNIVERSITY OF MINNESOTA (UMN)

Outcomes to Date

UMN contributes to the Clean Water Council’s mission by providing science-based information and by developing new innovations to improve water quality. Most of the work at UMN supported by the Clean Water Fund has been part of programs managed by state agencies, which has deepened the connections between the University and state government. One of the first major activities at UMN supported by the Clean Water Fund was the [Water Sustainability Framework](#), a multi-stakeholder science-driven report to inform the state’s future investments in support of clean water. Other major activities have included the [County Geologic Atlas Program](#), the [Forever Green Initiative](#), and a recent [project](#) on urban stormwater research. UMN faculty have leveraged support from the Clean Water Fund to obtain additional funding, expanding the impact of the initial investments. The Forever Green Initiative, for example, has so far secured about three dollars of additional funding for every dollar invested from the Clean Water Fund.



Success Story

The Stormwater Best Management Practice (BMP) Evaluation and Technology Transfer program helps Minnesota communities manage stormwater and improve water quality. This program will assess existing stormwater BMPs for Minnesota conditions and develop new technologies to address evolving issues such as stormwater reuse and contaminants of emerging concern (CECs). With Clean Water Fund support through the Minnesota Pollution Control Agency, University of Minnesota scientists completed a [multidisciplinary project](#) that began to fill some of these gaps while also assessing future research needs. University scientists studied the fate of two types of contaminants entering stormwater retention ponds, phosphorous and polycyclic aromatic hydrocarbons (PAHs). Another team of scientists and educators developed a [Stormwater Research Roadmap](#), relying on structured input from a wide range of stormwater managers and practitioners throughout Minnesota. The Roadmap will be a guiding document to prioritize future research activities. Starting with the 2018-19 biennium, Clean Water Funds were appropriated directly to the University of Minnesota to make the next set of advances in stormwater science and management. These funds are being distributed to teams of researchers and educators through an open, competitive process.



APPENDIX B

2018 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.

The following report card highlights work done using Legacy amendment dollars for Minnesota’s many water resources. The Report Card tracks a suite of performance measures that are described in the full report. It provides a qualitative assessment of how well actions are being implemented and what outcomes are being achieved.

The legend shows the symbols used to describe how measures were scored. Measures are scored according to their status as of the end of fiscal year 2017 (FY17) and for their trend over time. Scores were developed using data-informed professional judgment of agency technical staff and managers.

Report Card Legend

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

Outcome Status Scores	
	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

Trend	
	Improving trend
	No change
	Declining trend



Water monitoring in the Flute Reed River near Hovland, MN

2018 Clean Water Fund Report Card

MEASURE	STATUS	TREND	DESCRIPTION	
INVESTMENT MEASURES				
INVESTMENTS	Total Clean Water Fund dollars appropriated by activity	FY10-11: \$152.2M FY12-13: \$179.4M	FY14-15: \$182.5M FY16-17: \$228.3M FY18-19: 201.4M	Appropriation levels will vary by biennium and the strength of the economy. FY10-17 funds have been allocated, while FY 18-19 allocations are in progress.
	Total Clean Water Fund dollars per watershed or statewide by activity	Most watersheds in the state are benefiting from local and statewide projects.		For FY10-17, all 80 watersheds benefited 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	\$361M was awarded in grants and contracts to non-state agency partners in FY10-17.		About 81 percent of grant and contract awards are for implementation activities; 48 percent of total FY10-17 appropriations were awarded to non-state agency partners.
	Total dollars leveraged by Clean Water Fund	\$199M was leveraged by Clean Water Funds in FY10-17, or 73 cents for every implementation dollar invested.		Required Clean Water match funds were met and exceeded.
SURFACE WATER MEASURES				
ACTION	Percent of major watersheds intensively monitored through the watershed approach			Steady progress is being made at the pace set in 2008.
	Local partner participation in monitoring efforts			As of 2017; all programs are meeting participatory goals.
	Number of nonpoint 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 and projects being implemented, the total request for projects has remained three times greater than available funds.
	Number of municipal point source construction projects implemented with Clean Water Funding and estimated pollutant load reductions			Total applications for eligible projects is twice the amount of funds available.
OUTCOME	Rate of impairment/unimpairment of surface water statewide and by watershed	Stream/lake swimming Stream aquatic life	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 whether long-term goals will be met.
	Changes over time in key water quality parameters for lakes and streams	Lake clarity	Not enough information for a trend determination at this time.	There are improving trends in lake water clarity in more lakes than not.
		Nutrients and sediment in large rivers		In general, concentrations in phosphorus and sediment are declining while nitrates are increasing in surface water.
		Pesticides in streams		Detections in streams vary greatly as a result of hydrologic and agronomic conditions; concentrations above water quality standards are rare.
		Pesticides in lakes		Detections in lakes vary by region; detections in lakes have been well below water quality standards.
	Number of previous impairments now meeting water quality standards due to corrective actions			Although many projects are making progress in improving water quality, more waterbodies are being listed as impaired relative to the slower rate of waterbodies being restored.
	Mercury in fish			Mercury in game fish is not yet responding to decreases in local mercury emissions, although these reductions likely have prevented a steeper upward trend. Global emissions have increased. The time lag between emission reductions and response is likely several decades. It is too soon to see a measurable response in fish mercury levels. Long-term and consistent monitoring is necessary to track changes in fish tissue.
	Mercury emissions			Significant progress has been made reducing mercury emissions from power plants and is expected from the mining sector. To meet Minnesota's 2025 emissions goal, further reduction of mercury use in various products will be necessary.
Municipal wastewater phosphorus discharge trend			Significant phosphorus load reductions have been achieved through regulatory policy, infrastructure investments and improved technology.	

Continued on next page

2018 Clean Water Fund Report Card

	MEASURE	STATUS	TREND	DESCRIPTION
ACTION	DRINKING AND GROUNDWATER MEASURES			
	Number of community water supplies assisted with developing source water protection plans			It will be difficult to meet the 2020 goal for vulnerable systems because of competing demands for plan development resources.
	Number of grants awarded for source water protection			Increasing funds accelerate implementation of proven strategies for source water protection.
	Number of local government partners participating in groundwater nitrate-nitrogen monitoring and reduction activities			New local partnerships continue to be established for nitrate-nitrogen monitoring and reduction activities.
	Number of new health-based guidance values for contaminants of emerging concern			Met target for FY 16-17. On track to meet goal of ten guidance values developed each biennium.
	Number of counties completing a county geologic atlas for groundwater sustainability			Significant progress has been made completing county geologic atlases and the rate of completion has increased. Counties continue to step up to participate. Substantial work remains before all counties in Minnesota are done.
	Number of long-term groundwater monitoring network wells			Many areas of the state still lack important groundwater information. Long-term ramp-up in monitoring accelerated by Clean Water Fund investments is filling gaps.
	Number of unused groundwater wells sealed			FY16 funding was awarded to seven public water-suppliers to assist in sealing nine unused wells. FY17 funding was awarded to six local government units to assist in sealing over 200 private unused wells.
OUTCOME	Changes over time in pesticides, nitrate-nitrogen and other key water quality parameters in groundwater	Pesticides 		Variable trends for five common pesticides indicate a mixed signal. Low levels are frequently detected in vulnerable groundwater
		Nitrate-Nitrogen statewide 	No trend information available.	In many agricultural areas, drinking water supplies are not vulnerable to surficial contamination and most wells have low levels of nitrate-nitrogen. However, in vulnerable groundwater areas, nitrate contamination is a significant concern.
		Nitrate-Nitrogen southwest region 		Most agricultural areas in southwest do not have vulnerable groundwater. In areas where groundwater is vulnerable, nitrate levels can be high. Of the 11 vulnerable townships tested in southwest Minnesota (2013-2016), 100% of them were determined to have 10% or more of the wells over the nitrate-N 10 PPM standard.
		Nitrate-Nitrogen Central Sands 		Trend data from the Central Sands Private Well Network shows no change. However, Township Testing data show a high level of nitrate in some vulnerable aquifers in the Central Sands. Of the 119 vulnerable townships tested (2013-2016), 29% of them were determined to have 10% or more of the wells over the nitrate-N 10 PPM standard.
		Nitrate-Nitrogen southeast region 		Trend data from the Southeast Minnesota Domestic Well Network shows no change. However, Township Testing data show a high level of nitrate in some vulnerable areas in southeast Minnesota. Of the 46 vulnerable townships tested (2013-2016), 54% of them were determined to have 10% or more of the wells over the nitrate-N 10 PPM standard.
	Changes over time in source water quality used for community water supplies		Not enough information for a trend determination at this time.	Identifying correlations between drinking water contaminants is a significant step in trend analysis of source water quality.
	Nitrate concentration in newly constructed wells			Since 1992, there has been a general increase in the percent of new wells that have nitrate levels above the drinking water standard. Since 2014, there has been a slight decrease in the percent of new wells with nitrate higher than the drinking water standard.
	Arsenic concentration in newly constructed wells			The percentage of wells with arsenic above the drinking water standard has remained steady over the past 10 years. Evaluation of ways to reduce this percentage is ongoing and may take years before significant progress is made.
	Changes over time in groundwater levels			Most observation wells show no significant change or an upward trend (up 24% since 2014), but many areas of the state lack important groundwater information while some areas experienced groundwater level declines.
	Changes over time in total and per capita water use			There has been a slight improvement in water efficiency in recent years, although continued tracking is needed to determine the amount of impact from annual difference in weather versus changes in management.
DRIVERS	SOCIAL MEASURES AND EXTERNAL DRIVERS			
	Social measures		Not enough information for a trend determination at this time.	In recent years, state agencies have developed and piloted the Social Measures Monitoring System. This work integrates social science into Clean Water Fund projects.
External drivers			The external drivers identified continue to alter land-water interactions across Minnesota, impacting how Clean Water Funds need to be invested.	

APPENDIX C

The Minnesota Water Management Framework



The Minnesota Water Management Framework

A high-level, multi-agency, collaborative perspective on managing Minnesota's water resources

(December 14, 2016)

The passage of the Clean Water, Land, and Legacy Amendment is a **game-changer** for water resource management in Minnesota. Increased funding and public expectations have driven the need **for more and better coordination** among the state's main water management agencies.

The **MN Water Quality Framework** and the companion **MN Groundwater Management Framework** were developed by the agencies to enhance collaboration and clarify roles in an integrated water governance structure, so that it's **clear to everyone who is responsible** at each stage in the process, making it **easier and more efficient** for state and local partners to work together.

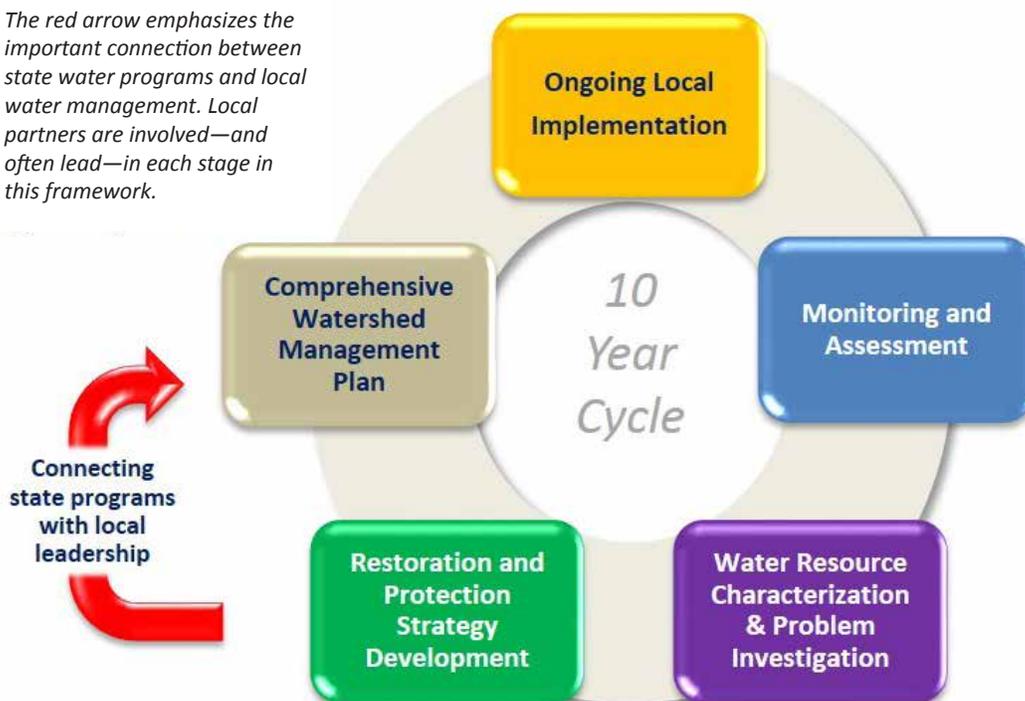
Goals: cleaner water via comprehensive watershed management; ensure that groundwater is protected and managed sustainably.

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Goals: cleaner water via comprehensive watershed management; ensure that groundwater is protected and managed sustainably.

The red arrow emphasizes the important connection between state water programs and local water management. Local partners are involved—and often lead—in each stage in this framework.



APPENDIX C

The Minnesota Water Management Framework



Building on a classic “plan-do-check” adaptive management approach, the framework uses 5 “boxes” to outline the steps Minnesota’s agencies are taking toward our goals of clean and sustainable water. The agencies aim to streamline water management by systematically and predictably delivering data, research, and analysis and empowering local action.

Ongoing Local Implementation is at the heart of the state’s overall strategy for clean water. Actions must be prioritized, targeted, and measurable in order to ensure limited resources are spent where they are needed most. The rest of the cycle supports effective implementation.

Monitoring and Assessment determines the condition of the state’s ground and surface waters and informs future implementation actions. The state’s “watershed approach” systematically assesses the condition of lakes and streams on a 10-year cycle. Groundwater monitoring and assessment is more varied in space and time.

Water Resource Characterization and Problem Investigation delves into the science to analyze and synthesize data so that key interactions, stressors, and threats are understood. In this step, watershed and groundwater models and maps are developed to help inform strategies.

Watershed Restoration and Protection Strategies (WRAPS) and Groundwater Restoration and Protection Strategies (GRAPS) include the development of strategies and high-level plans, “packaged” at the 8-digit HUC scale (81 major watersheds in Minnesota). These strategies identify priorities in each major watershed and inform local planning.

The **Comprehensive Watershed Management Plan** is where information comes together in a local commitment for prioritized, targeted, and measurable action. Local priorities and knowledge are used to refine the broad-scale WRAPS and other assessments into locally based strategies for clean and sustainable water.

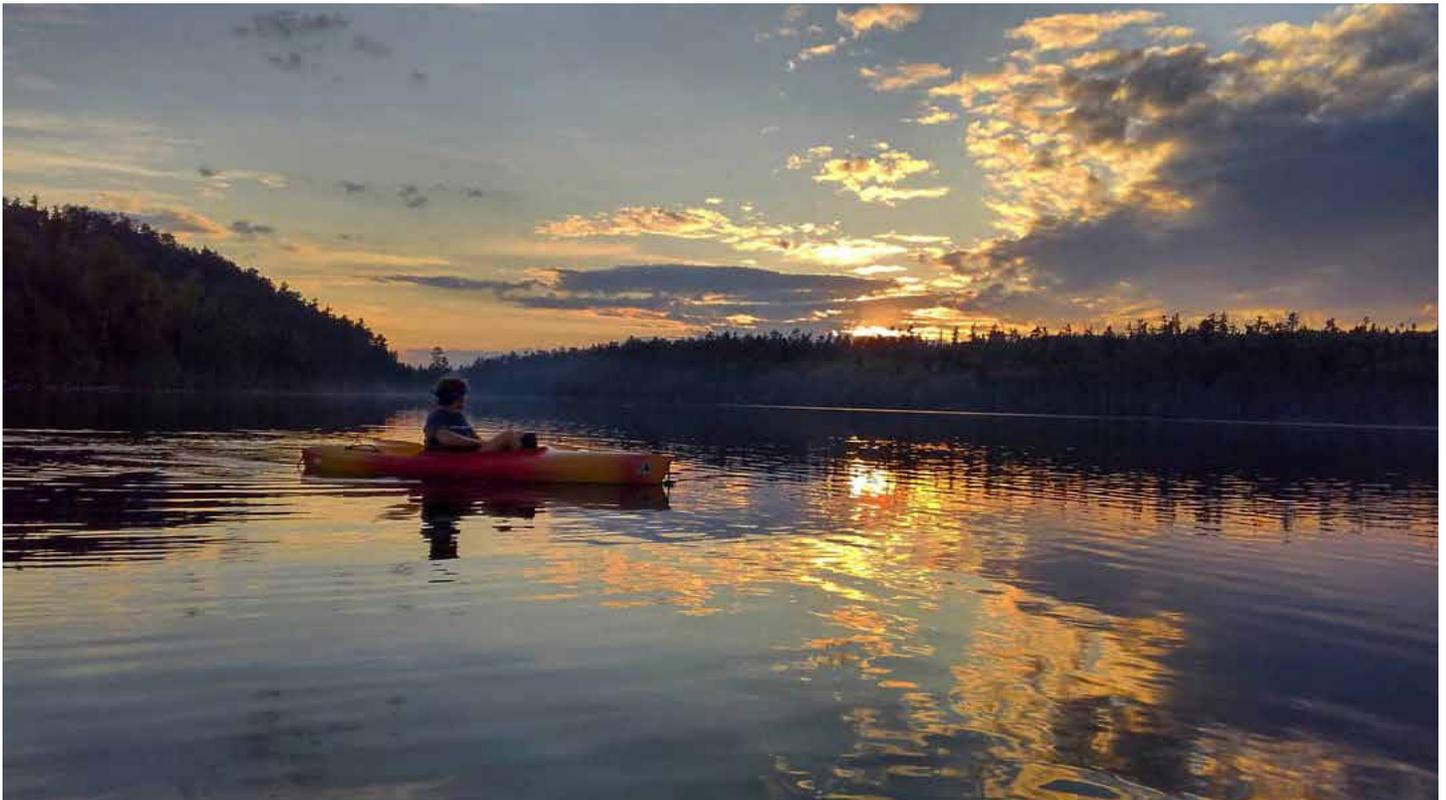


Photo credit: Matt Moon