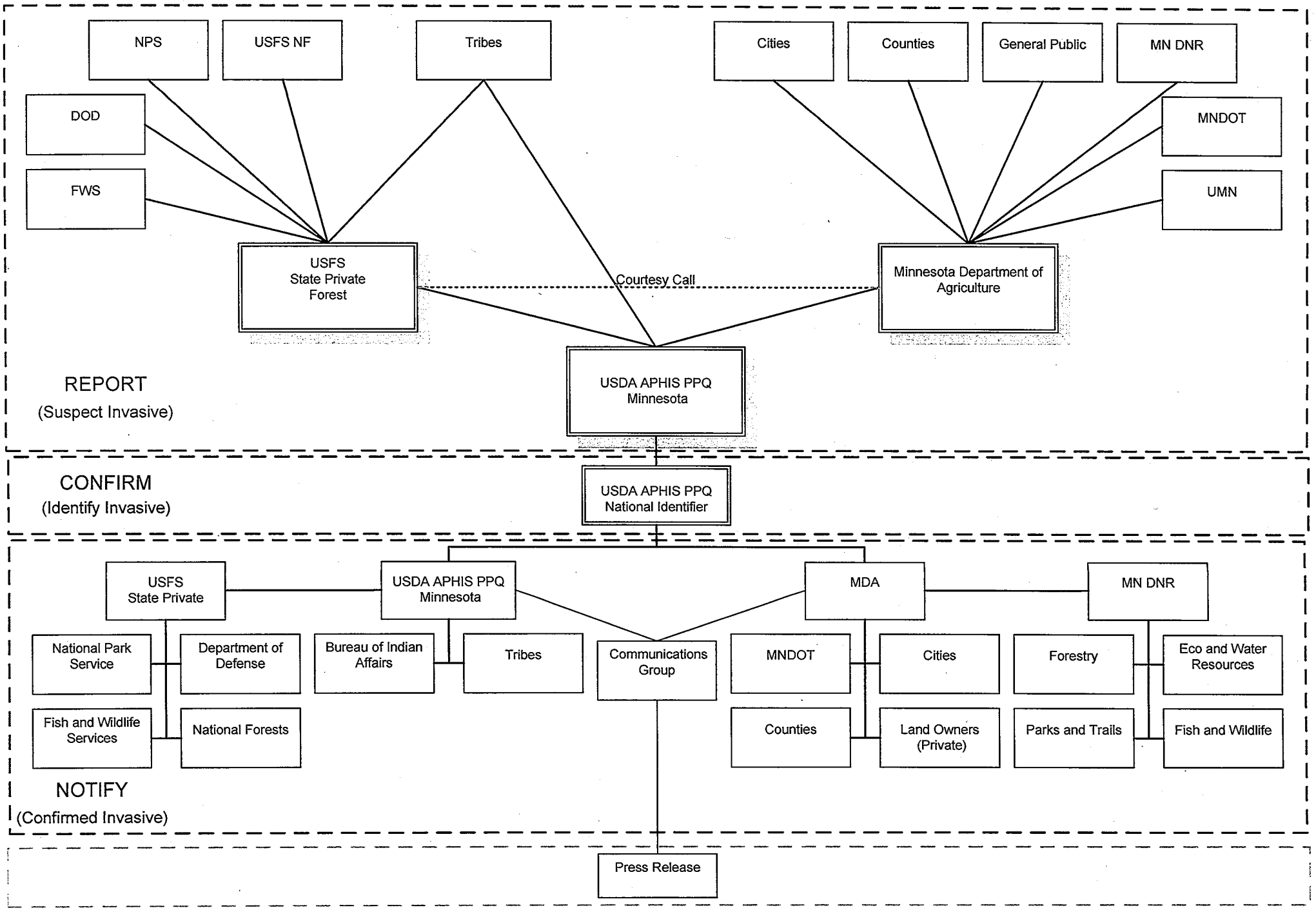
SUSPECT REPORTING, CONFIRMATION AND NOTIFICATION FLOW CHART



CHAPTER 114--H.F. No. 976; Sec. 105. RULES; SILICA SAND.

(d) The Environmental Quality Board shall amend its rules for environmental review, adopted under Minnesota Statutes, chapter 116D, for silica sand mining and processing to take into account the increased activity in the state and concerns over the size of specific operations. The Environmental Quality Board shall consider whether the requirements of Minnesota Statutes, section 116C.991, should remain part of the environmental review requirements for silica sand and whether the requirements should be different for different geographic areas of the state.

116C.991 ENVIRONMENTAL REVIEW; SILICA SAND PROJECTS.

(a) Until July 1, 2015, an environmental assessment worksheet must be prepared for any silica sand project that meets or exceeds the following thresholds, unless the project meets or exceeds the thresholds for an environmental impact statement under rules of the Environmental Quality Board and an environmental impact statement must be prepared:

(1) excavates 20 or more acres of land to a mean depth of ten feet or more during its existence. The local government is the responsible governmental unit; or

(2) is designed to store or is capable of storing more than 7,500 tons of silica sand or has an annual throughput of more than 200,000 tons of silica sand and is not required to receive a permit from the Pollution Control Agency. The Pollution Control Agency is the responsible governmental unit.

b) In addition to the contents required under statute and rule, an environmental assessment worksheet completed according to this section must include:

1. a hydrogeologic investigation assessing potential groundwater and surface water effects and geologic conditions that could create an increased risk of potentially significant effects on groundwater and surface water;
2. for a project with the potential to require a groundwater appropriation permit from the commissioner of natural resources, an assessment of the water resources available for appropriation;
3. an air quality impact assessment that includes an assessment of the potential effects from airborne particulates and dust;
4. a traffic impact analysis, including documentation of existing transportation systems, analysis of the potential effects of the project on transportation, and mitigation measures to eliminate or minimize adverse impacts;
5. an assessment of compatibility of the project with other existing uses; and
6. mitigation measures that could eliminate or minimize any adverse environmental effects for the project.

Minnesota Statutes, section 14.131, sets out eight factors for a regulatory analysis that must be included in the SONAR. Paragraphs (1) through (8) below quote these factors and then give the agency's response.

1. a description of the classes of persons who probably will be affected by the proposed rule, including classes that will bear the costs of the proposed rule and classes that will benefit from the proposed rule
2. the probable costs to the agency and to any other agency of the implementation and enforcement of the proposed rule and any anticipated effect on state revenues
    a) the probable costs to the agency of implementation and enforcement;
    b) the probable costs to any other agency of implementation and enforcement; and
    c) any anticipated effect on state revenues.
3. a determination of whether there are less costly methods or less intrusive methods for achieving the purpose of the proposed rule
4. a description of any alternative methods for achieving the purpose of the proposed rule that were seriously considered by the agency and the reasons why they were rejected in favor of the proposed rule
5. the probable costs of complying with the proposed rule, including the portion of the total costs that will be borne by identifiable categories of affected parties, such as separate classes of governmental units, businesses, or individuals
6. the probable costs or consequences of not adopting the proposed rule, including those costs or consequences borne by identifiable categories of affected parties, such as separate classes of government units, businesses, or individuals
7. an assessment of any differences between the proposed rule and existing federal regulations and a specific analysis of the need for and reasonableness of each difference
8. an assessment of the cumulative effect of the rule with other federal and state regulations related to the specific purpose of the rule. . . . '[C]umulative effect' means the impact that results from incremental impact of the proposed rule in addition to other rules, regardless of what state or federal agency has adopted the other rules. Cumulative effects can result from individually minor but collectively significant rules adopted over a period of time.

Minnesota's Clean Water Roadmap

CLEAN WATER LAND & LEGACY AMENDMENT

Setting long-range goals for Minnesota's water resources

2014

Additional data and information supporting the Clean Water Fund goals
can be found in the most recent copy of the Clean Water Fund Performance Report:
http://legacy.leg.mn/sites/default/files/resources/2014_CleanWaterFund_Performance_Report.pdf

Interagency Coordination Team:
Ali Elhassan (Metropolitan Council), Chris Elvrum (MDH), Rebecca Flood (ICT Chair - MPCA), Jeff Freeman (PFA), Denise Leezer (ICT Coordinator – MPCA), Barb Naramore (DNR), Sarah Strommen (BWSR), Judy Sventek (Metropolitan Council), Deb Swackhamer (University of Minnesota), Dave Weirens (BWSR), Matthew Wohlman (MDA)

Clean Water Council Liaisons:
Keith Hanson, Gene Merriam, Sandy Rummel

Editors:
Tannie Eshenaur (MDH), Margaret Wagner (MDA), Julie Westerlund (DNR)

Environmental Initiative Staff Team:
Emily Franklin, Mike Harley, Meleah Houseknecht, Andrea Robbins, Dani Schurter

Minnesota Pollution Control Agency

Minnesota Department of Natural Resources

Minnesota Department of Agriculture

Minnesota MDH Department of Health

Minnesota Board of Water & Soil Resources

PFA Minnesota Public Facilities Authority

Metropolitan Council

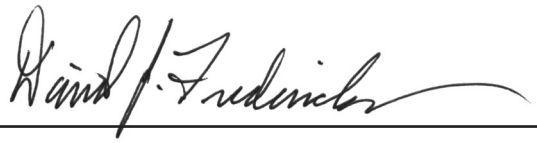
Water Resources Center University of Minnesota Driven to Discover

Photo credits: Minnesota Department of Health and Minnesota Department of Natural Resources

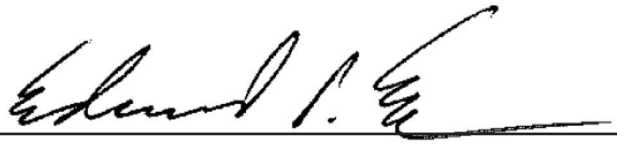
A message from Clean Water Fund agency leaders

This first edition of Minnesota's Clean Water Roadmap is a major advancement in the Clean Water, Land, and Legacy Amendment's promise to protect, enhance, and restore the state's water resources. We created the Roadmap to communicate our agencies' goals, inform our strategies and resource allocations, and assess our progress over time. The roadmap goals are ambitious, yet achievable. They capture the core areas of Legacy investment and address elements of water resource sustainability that directly affect Minnesotans' quality of life. As agency leaders, we are committed to working collaboratively across the Executive Branch, with the Legislature, and with local government and stakeholders to achieve these goals. The Roadmap is a living document, with a five-year schedule for comprehensive updates. In addition, agency leadership will meet annually to review progress and identify incremental adjustments.

John Jaschke, Director
Minnesota Board of Soil and Water Resources



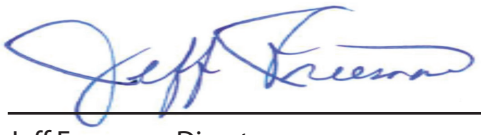
David Frederickson, Commissioner
Minnesota Department of Agriculture



Dr. Edward Ehlinger, Commissioner
Minnesota Department of Health

Tom Landwehr, Commissioner
Minnesota Department of Natural Resources

John Linc Stine, Commissioner
Minnesota Pollution Control Agency



Jeff Freeman, Director
Minnesota Public Facilities Authority

Susan Haigh, Chair
Metropolitan Council

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Executive summary

The Clean Water Roadmap is a set of goals for protecting and restoring Minnesota's water resources during the 25-year life of the Clean Water, Land and Legacy Amendment. Clean Water Roadmap goals are based on currently available data and are intended to be ambitious, yet achievable. Progress in meeting these goals will require significant investment from the Clean Water Fund established by the Amendment, combined with historical water resource funding from other sources.

Wise investment of Clean Water Fund dollars requires that partners in water resource management share common expectations and join together in creating a pathway to achieve meaningful improvements in Minnesota's water resources. To assist in the process of developing this future-oriented Clean Water Roadmap, state agencies involved with water resource management turned to Environmental Initiative, a nonprofit organization with expertise in facilitating environmental policy discussions.

The Clean Water Roadmap will help the seven agencies with Clean Water Fund responsibilities:

- Define aspirational, yet achievable goals for outcomes associated with 25 years of Clean Water Fund expenditures,
- Establish interim benchmarks, to assess progress towards the 25-year goals,
- Adjust program or funding priorities based on progress made towards the benchmarks and the 25-year goals,
- Create realistic expectations among interested stakeholders and citizens about the potential for progress with the addition of Clean Water Fund dollars.

This first edition of the Clean Water Roadmap lays out goals for four high-level indicators that describe surface water quality, groundwater quality, and groundwater quantity. These concrete measures mirror Minnesotans' desire for healthy lakes, rivers, streams, drinking water, and groundwater.

Lake water quality

Measure: Trophic State Index
2034 statewide goal: Increase the percentage of Minnesota lakes with good water quality, as measured by acceptable Trophic State Index, from 62% to 70%.

Trophic State Index (TSI) summarizes a lake's overall water quality. Lakes with lower TSI values have higher clarity and are better for swimming and other recreational uses. Clean Water Roadmap water quality goals for lakes are based on the percentage of lakes with acceptable TSI in each of Minnesota's 10 basins.

River and stream water quality

Measure: Fish-Based Index of Biotic Integrity
2034 statewide goal: Increase the percentage of Minnesota's rivers and streams with healthy fish communities, as measured by the Index of Biotic Integrity, from 60% to 67%.

An Index of Biological Integrity (IBI) measures the health of a river or stream based on the biological communities it supports. Clean Water Roadmap water quality goals for rivers and streams are based on fish IBI scores for rivers and streams in each of Minnesota's 10 basins.

Groundwater quality

Measure: Drinking water standards for arsenic and nitrate

2034 statewide goal: Reduce the percentage of new wells exceeding the drinking water standard for arsenic by 50%.

2034 statewide goal: Reduce nitrate levels in groundwater by 20%, which will decrease the percentage of wells exceeding the drinking water standard by 50% (in two vulnerable areas of the state).

Arsenic and nitrate are two contaminants found in Minnesota's groundwater over large areas of the state sometimes in concentrations exceeding the drinking water standard. The goal for arsenic is based on samples collected from all new potable wells. The nitrate goal is based on samples collected from private well networks in two vulnerable areas of the state.

Groundwater quantity

Measure: Changes over time in groundwater levels

2034 statewide goal: Ninety percent of groundwater monitoring sites affected by groundwater pumping will have either a steady or increasing water level trend.

This measure allows state agencies to track whether or not groundwater is being used sustainably. Groundwater availability, today and in the future, is crucial for people's health, natural ecosystems, and economic development.

The Clean Water Roadmap also acknowledges that other important factors such as climate, demographic shifts, and systemic changes in land use are largely beyond the influence of Clean Water Fund activities. These factors do impact water quality and quantity and will affect progress.

While many tools exist to assist in managing Minnesota's water resources, the Clean Water Roadmap is unique in articulating statewide, high-level goals for the 25 years of heightened activities supported by the Clean Water Fund. The Clean Water Roadmap does not replace local water plans, the Clean Water Performance Report, restoration and protection strategies, or any of the other planning, implementation, or evaluation activities currently underway. The Clean Water Roadmap seeks to answer questions raised by agency leadership and citizens alike about the pace of progress and water resource outcomes that can be expected after 25 years of investment from the Clean Water Fund.

Background

Minnesotans care deeply about the quality and availability of their water. In 2008, citizens chose to invest in water resources. Minnesotans voted to increase their sales tax by three-eighths of one percent and passed the Clean Water, Land and Legacy Amendment. Starting July 1, 2009 and continuing through June 30, 2034, about $90 million each year will be invested from the Clean Water Fund to protect drinking water sources and to protect, enhance, and restore lakes, rivers, streams, and groundwater. [1] With this significant investment comes a responsibility to ensure progress is being made and that funds are making a difference for the state's water resources and its citizens.

With more than 10,000 lakes, 100,000 river and stream miles, and extensive groundwater systems, water is a major part of Minnesota's culture, economy, and natural ecosystems. State agencies collect water quality data, including from local and federal agencies, as well as citizens, and use this information to evaluate waters for compliance with Minnesota's surface water quality standards. Today, about half of Minnesota's surface waters have been assessed; of those, about 40% do not meet basic water quality standards. The sheer volume of water resources means Minnesota has more to take care of compared to states in other parts of the country. This presents water protection, restoration, and resource management challenges as well as opportunities to make improvements and demonstrate leadership.

Seven state agencies are charged with specific responsibilities in managing Minnesota's water resources:

- Metropolitan Council
- Minnesota Board of Water and Soil Resources
- Minnesota Department of Agriculture
- Minnesota Department of Health
- Minnesota Department of Natural Resources
- Minnesota Pollution Control Agency
- Minnesota Public Facilities Authority

Following the initial passage of the Clean Water, Land and Legacy Amendment, decision makers and stakeholders alike have raised questions about the water resource outcomes Minnesotans can expect to achieve after 25 years of investment, as well as the pace of progress that will be required to achieve those outcomes over time.

The Clean Water Roadmap lays out a course for the future that includes long-term goals and interim benchmarks for statewide outcomes that can be achieved with Clean Water Fund investments statewide between now and 2034. It is also important to understand that achieving the Roadmap goals will require not only Legacy funding, but also continued investment from other traditional sources of water resource funding. Ultimately, the Roadmap

[1] **Clean Water, Land and Legacy Amendment:** In 2008, Minnesota voters passed the Clean Water, Land and Legacy Amendment (Legacy Amendment) to the Minnesota Constitution to: protect drinking water sources; to protect, enhance, and restore wetlands, prairies, forests, and fish, game, and wildlife habitat; to preserve arts and cultural heritage; to support parks and trails; and to protect, enhance, and restore lakes, rivers, streams, and groundwater. The Legacy Amendment increases state sales tax by three-eighths of one percent beginning on July 1, 2009 and continuing until June 30, 2034. The additional sales tax revenue is distributed into four funds as follows: 33 percent to the Clean Water Fund; 33 percent to the Outdoor Heritage Fund; 19.75 percent to the Arts and Cultural Heritage Fund; and 14.25 percent to the Parks and Trails Fund.

is a big picture guide for more detailed planning and policymaking and is not itself a specific plan or strategy. The Roadmap also provides a unified approach for the state's Executive branch. It is the only document that lays out shared expectations for what agencies hope to achieve with Clean Water Fund expenditures, and it is designed to work in tandem with the more specific strategies and plans developed at the state, watershed, and local levels. Clean Water Fund agency leadership and the Interagency Coordination Team will be responsible for updating and using the Clean Water Roadmap to guide policy and budget initiatives.

By affirming the Clean Water, Land and Legacy Amendment in 2008, the citizens issued a clear call for a change in course for managing Minnesota's water resources. Five years of experience has produced advances in planning, implementation, and measuring progress as well as the realization that difficult choices are ahead. The Clean Water Roadmap, intended to be dynamic and responsive, sets a course to measure and communicate progress in the protection and restoration of Minnesota's water resources for years to come.

Many leaders, staff, and stakeholders helped to develop the Clean Water Roadmap

During the summer of 2013, state agency leaders asked Environmental Initiative to convene a process with the seven state agencies to develop forward-looking, long-term goals for the Clean Water Fund. A variety of agency and citizen groups were convened on a regular basis between June 2013 and May 2014 to meet this charge and develop the Clean Water Roadmap:

Clean Water Fund Interagency Coordination Team
The Clean Water Fund Interagency Coordination Team (ICT) is a group of assistant commissioners and senior managers from state agencies that receive and administer appropriations from the Clean Water Fund. At the request of state agency commissioners and directors, Environmental Initiative facilitated Clean Water Roadmap meetings with this group. ICT members were responsible for drafting proposals and providing technical assistance as clean water goals were developed. The ICT received input and guidance from state agency leadership, the Clean Water Council, and other stakeholders throughout the process.

State agency leaders
Environmental Initiative formally convened state agency leaders (Commissioners and Directors) in conjunction with the ICT several times during the process of developing the Clean Water Roadmap. Agency leaders discussed the draft goals, raised important questions, and approved the goals with the ICT in January 2014. Leaders also actively participated in discussions held during external meetings with other interested stakeholders in October 2013 and April 2014. State agency leaders approved the final version of this document.

Clean Water Council
The Clean Water Council advises Minnesota's Executive and Legislative branches on the administration and implementation of the Clean Water Fund including how money from the Fund should be appropriated during each biennium.[2] Three Clean Water Council members were appointed as liaisons to the ICT and attended meetings when the Clean Water Roadmap was discussed. Liaisons provided advice and input as

[2]The Clean Water Council was created through the Clean Water Legacy Act, which was signed into law on June 2, 2006. The Council was charged with providing advice to the Executive and Legislative branches of government on the administration and implementation of the Clean Water Legacy Act. In 2011, following a Special Session law, the Council was also directed to provide advice to the Governor and the Legislature on the expenditure of Clean Water Funds. The Council consists of 28 members, including 19 appointed by the Governor, four non-voting representatives from the Legislature, and five non-voting representatives from state agencies.

the Roadmap was developed, as well as maintained lines of communication with other Clean Water Council members about the project. In addition to the three liaisons, ICT members and Environmental Initiative provided formal updates to the Clean Water Council throughout the project.

Other stakeholder input

Environmental Initiative and the ICT also shared information about the process and gathered input from other water stakeholders throughout the project. Environmental Initiative hosted two events with water resource stakeholders to provide updates and gather feedback about the Clean Water Roadmap.

ICT members gave presentations about the Clean Water Roadmap for the following groups or events:

- Lessard-Sams Outdoor Heritage Council (scheduled June 2014)
- Minnesota Board of Water and Soil Resources Board
- Minnesota Department of Natural Resources Roundtable
- Minnesota Pollution Control Agency Citizens' Board

The Roadmap establishes and measures progress toward goals

Identifying a set of indicators to measure outcomes and progress toward long-term goals over the length of the Clean Water Fund was a complex challenge. Minnesota has a long history of data collection and research on its lakes, rivers, streams, and groundwater resources. However, some significant gaps in understanding remain. Clean Water Fund investments are being used in part to accelerate data collection and research to address data and knowledge gaps.

Despite these challenges, the agencies with Clean Water Fund responsibilities worked to select measures for water quality and water quantity that:

- Reflect Minnesotans' concerns,
- Utilize existing data,
- Capture the effectiveness of protection and restoration activities throughout the life of the Amendment, and
- Communicate in easily understood terms.

The ICT also utilized the Clean Water Fund Performance Report as a resource to help inform and guide the selection of measures. This report is updated every two years and provides a summary of Clean Water Fund invested, actions taken to address water quality and water quantity issues, and outcomes achieved across the entire state of Minnesota.[3] The Performance Report is focused on ensuring accountability and measuring the effectiveness of past investments and activities. This document was used to help select the four broad measures of water quality and water quantity for the Clean Water Roadmap.

As opposed to measuring past performance, the Clean Water Roadmap looks to the future and establishes meaningful water resource goals to work toward. The Clean Water Roadmap sets goals for measurable outcomes that relate to the "quality of life" aspects of water resources that matter most to Minnesotans—drinkability, swimmability, and fishability.

[3] Clean Water Fund Performance Report: A report of Clean Water Funds Invested, Actions Taken, and Outcomes Achieved. February 2014. http://www.legacy.leg.mn/sites/default/files/resources/2014_CleanWaterFund_ReportCard.pdf.

Setting realistic goals also clarifies the pace of progress that can be expected over 25 years of the Amendment. Depending on the scale of the problem and forces beyond the influence of our protection and restoration efforts, there can be a delay between "on the ground" actions and measurable change in our water resources. Improved outcomes from some activities may take several years or even decades to measure. The Clean Water Roadmap is a tool to evaluate progress over time and communicate that progress at regular intervals to decision makers and interested stakeholders and citizens.

Clean water requires many funding sources

Managing water resources is an ongoing task. While the Clean Water Fund investment is significant, the Roadmap goal setting effort demonstrates that all of our water will not be clean or sustainably managed as a result of these dollars. The Clean Water Fund is but one of several essential sources of public funds available to advance our water resource goals. State agencies and local governments work to maximize the value of Clean Water Funds by matching (or leveraging) these funds with non-Clean Water Funds. By having different funding sources working together, the reach of all coordinated funding sources is extended, thereby increasing overall public benefits.

Funding sources that are used in a coordinated manner with Clean Water Fund investments include federal, other state, local, non-governmental, and private funds. Specifically, these funds include the Environmental Quality Incentives Program (EQIP), authorized under the Federal Farm Bill, where approximately $20 million is annually spent in Minnesota. The Outdoor Heritage Fund (OHF) is a sister fund to the Clean Water Fund that has approximately $90 million annually available for habitat protection and restoration projects. Projects that have habitat as a primary purpose can also provide important water resource benefits. Additionally, local governments and landowners are critical partners in financing water resource activities. These local sources annually provide millions of dollars to protect and restore our water resources.

No one source of public funds is large enough to achieve our water resource goals. But applying resources together in a prioritized, targeted, and measureable manner increases the likelihood of success. Protecting, restoring, and managing these precious natural resources will be a task that endures beyond the 25-year life of the Amendment.

Interim benchmarks and short term goals will be established

The path to effectively achieving clean and sustainable water resources is long, complex, and challenging; both to measure and to communicate. Designed to be a dynamic document, the Clean Water Roadmap will be reviewed and updated every five years based on assessments of progress toward goals as well as input and feedback received from stakeholders and citizens. As time progresses and additional data are collected, state agencies plan to establish interim benchmarks at five-year intervals, beginning in 2019, to track progress toward the overall goals. In addition, short-term goals for selected program or process measures will be set in future iterations of the Clean Water Fund Performance Report. The Clean Water Fund Performance Report, developed every two years, complements the Clean Water Roadmap by providing information about how the Clean Water Fund is invested, the actions taken, and outcomes achieved. The short-term goals that will be articulated in the 2016 Clean Water Fund Performance Report will help guide activities and measure progress toward meeting the long-term Clean Water Roadmap goals.

Changes in land use, demographics, and climate impact water resources

Minnesota's water resources are part of a complex ecosystem and are impacted by larger factors that change over time. Changes on the landscape, shifting demographics, and changing climate patterns will influence the quantity and quality of water in lakes, rivers, streams, and groundwater aquifers. These changes, routinely observed and updated at a statewide scale, were considered in the development of the Roadmap goals. However, the rate and scale of these changes are difficult to predict and their influence on progress to goals may change over time. More information and additional details about factors being monitored by state agencies can be reviewed in the 2014 Clean Water Fund Performance Report.[4]

Land use changes

Activities on the landscape affect water quality and quantity. For example, changes in farming, urban development, and wetland acreage influence where water goes and what pollutants it carries as it moves in the environment. Examples of land use changes include:

- Increases in surfaces like roads, driveways, and parking lots that prevent water from soaking into the ground,
- Shoreline development along lakes, rivers, and streams,
- Agricultural practices including tile drainage, intensity of land use, and changes in cropping systems, and
- Changes in natural systems of water flow, including loss of wetlands.

Demographic shifts

Changing demographics puts pressure on water resources through increased demands and land use changes. Minnesota's population has grown steadily since 1950. In addition to overall population growth, the percentage of people living in urban and suburban communities has increased. The addition of roads and pavement changes water quality and the amount of water that reaches and replenishes groundwater aquifers. At the same time, water demand has increased with population growth and rises in per capita water use. As the population continues to grow and more people choose to live in urban and suburban communities, the demands placed on our water resources also will change.

Changing climate patterns

Climate has a considerable influence on water quality and quantity. Historical data indicate Minnesota's climate patterns are changing. Precipitation and temperature are the most influential climatic factors on water resources. The amount and timing of rain or snowfall are critical in determining how much water soaks into soil to replenish groundwater aquifers and how much runs off directly into nearby lakes, rivers, and wetlands. Temperature changes affect the length of time lakes and streams are covered by ice, evaporation rates, the amount of water consumed by plants and water temperature. It is essential to consider Minnesota's changing temperature and precipitation patterns as protection and restoration strategies are developed and as projects are implemented across the state.

[4] Clean Water Fund Performance Report: A report of Clean Water Funds Invested, Actions Taken, and Outcomes Achieved. February 2014. http://www.legacy.leg.mn/sites/default/files/resources/2014_CleanWaterFund_ReportCard.pdf (58).

Lake water quality

Measure: Trophic State Index

2034 statewide goal:

Increase the percentage of Minnesota lakes with good water quality, as measured by acceptable Trophic State Index, from 62% to 70%.

Measuring water quality in lakes is important

Clean lakes are important to Minnesotans for recreation, tourism, and ecosystem health. Minnesotans want to know if they can eat local fish, andgo swimming, and if lakes are healthy. Water quality information is used to determine if lakes comply with water quality standards. Water quality standards tell how much pollution can be in the water and still allow the water to be used for swimming and fishing.[5] Monitoring and assessment data help the Minnesota Pollution Control Agency (MPCA), local units of government, and citizens understand lake health. The data also help identify sources of water pollution and strategies to:

- Clean up water that is poor in quality,
- Protect waters that are of good quality, and
- Prioritize implementation actions.

Starting in 2008, MPCA began a 10-year cycle to intensively monitor about eight of Minnesota's 81 watersheds each year. By the end of 2014, MPCA will have assessed 42 watersheds.

Trophic State Index is a useful measure of Clean Water Fund progress

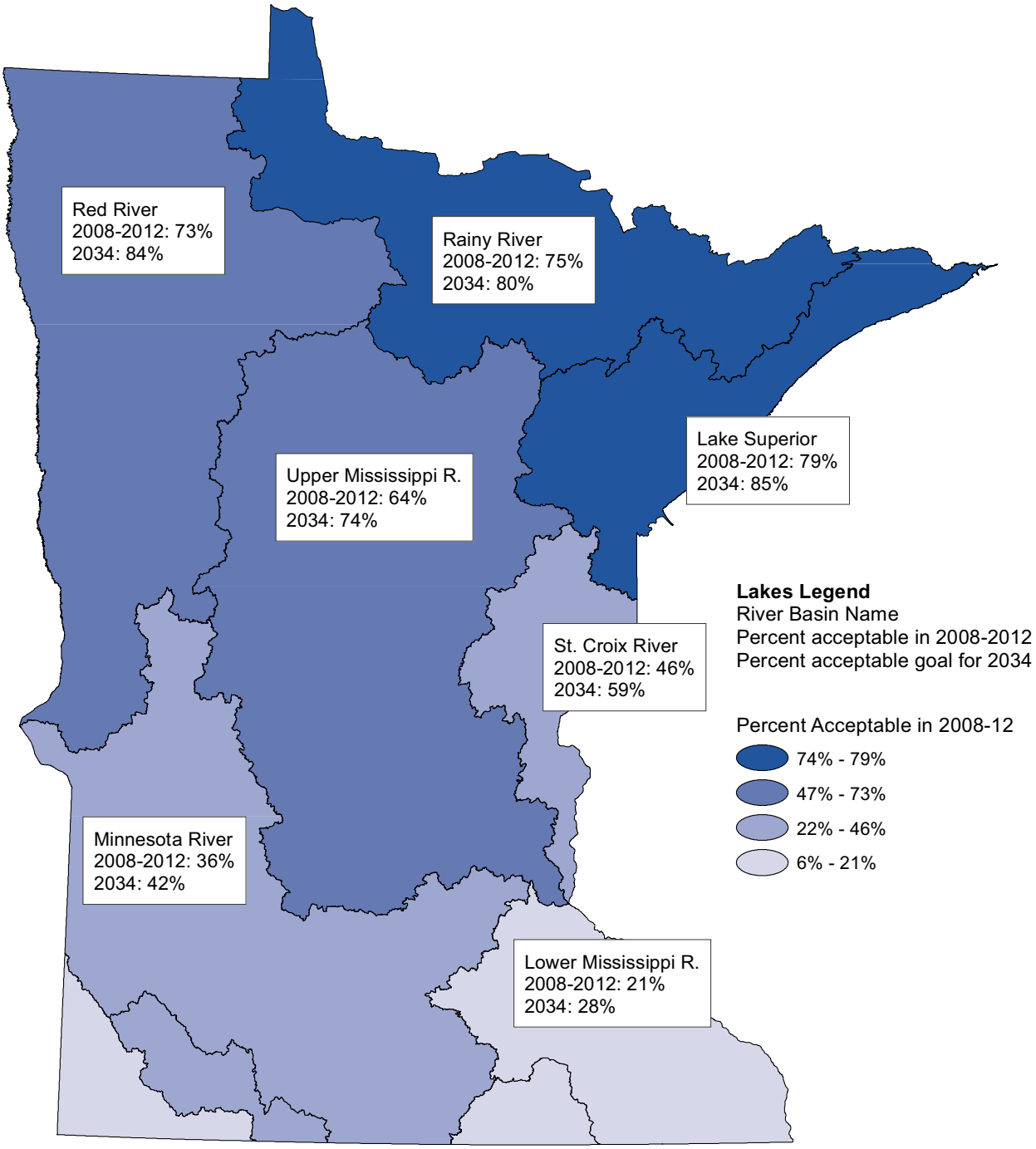
The Trophic State Index (TSI) summarizes a lake's overall water quality. TSI is made up of three individual measures: nutrients, algae, and water clarity. TSI allows for any combination of the three measures to be used, so that incomplete data can still provide an estimate of a lake's condition. Lakes with lower TSI values are clearer and are better for swimming and other recreational uses.

The TSI rates individual lakes based on biological productivity. Nutrients, such as nitrogen and phosphorus, are naturally occurring elements that are the base of the food chain. However, excess phosphorus and nitrogen flowing into lakes can result in algae blooms, loss of water clarity, and associated problems including reduced dissolved oxygen and loss of fish habitat.

People widely recognize lakes for their economic, cultural, and aesthetic value, and the federal Clean Water Act mandates "swimmable" waters. TSI closely mirrors the impression that most people have of whether a lake is suitable for swimming.

[5] U.S. Environmental Protection Agency. Impaired Waters and Total Maximum Daily Loads. http://water.epa.gov/lawsregs/lawsguidance/cwa/tmdl/index.cfm. Last updated on Wednesday, December 11, 2013.

Lake water quality goals for 2034



Lake water quality table

Basin	Number of lakes in baseline population	Number of baseline lakes acceptable 2008-2012	2008-2012 baseline lakes % acceptable	2034 Goals % of lakes acceptable	Outcomes	% Change
Lake Superior	224	178	79%	85%	Improve	6%
Upper Mississippi	1,679	1,081	64%	74%	Improve	10%
Minnesota	472	172	36%	42%	Improve	6%
St. Croix	186	85	46%	59%	Improve	13%
Lower Mississippi	80	17	21%	28%	Improve	7%
Cedar	16	1	6%	6%	Progress	
Des Moines	61	15	25%	25%	Progress	
Red	443	322	73%	84%	Improve	11%
Rainy	643	483	75%	80%	Improve	5%
Missouri	13	1	8%	8%	Progress	
Totals	**3,817**	**2,355**				

Lake water quality goals for 2034

A statewide data set of TSI values for 3,818 lakes from 2003 to 2012 was used to develop goals for the percentage of lakes meeting the acceptable TSI in 2034 for each of Minnesota's 10 basins. Using an average of the percent increase in the 10 basins results in a statewide goal of increasing the percent of lakes meeting the acceptable TSI from 62% to 70%. "Acceptable" TSI values are based on U.S. Environmental Protection Agency-approved lake water quality (lake eutrophication) standards. These standards pertain to phosphorus, chlorophyll-a (algae), and clarity and establish the maximum levels of these pollutants at which a lake is deemed suitable for recreational use.

Lake eutrophication standards and associated TSI values vary with lake depth and ecoregion (geographic location). This is because not all lakes have the same "normal" or background level of biological productivity. Lakes are naturally more nutrient-rich in the southern and western portions of the state. Southwest Minnesota has more shallow lakes, which are more sensitive to excessive nutrients than deeper lakes. Lakes in this region also receive a greater amount of phosphorus pollution from agricultural sources than lakes in the northeast. As a result, generally the clearest, lowest-nutrient lakes in Minnesota are the deep lakes in the northeast, whereas the southwest is characterized by shallow, nutrient-rich lakes with poorer clarity.

Lake water quality

In some basins, the percentage of lakes reaching acceptable TSI is not expected to change. This does not mean Clean Water Fund investments will not be made, or that improvements will not occur. Rather, it reflects the fact that some regions of the state have more water quality challenges primarily due to the significant land use change that has occurred over the last 150 years as reflected in the Lake Water Quality Table. Progress can be made in these areas, however the improvements will not be sufficient to achieve acceptable TSI prior to 2034. Reaching acceptable TSI in lakes in these areas will likely take decades, just as the water quality degradation occurred over many decades.

Although lake water quality varies naturally from year to year, TSI trends in recent years are neither improving nor declining significantly. An analysis of the statewide data set showed that TSI in lakes with a minimum of eight years of data are generally holding steady.

The Clean Water Fund is being used to address lake water quality through a systematic, statewide, watershed-based approach. First, a baseline of water quality is established through monitoring and assessment. Next watershed protection and restoration strategies are developed based on the monitoring and assessment information. Then prioritized, targeted and measureable activities are implemented to protect, enhance, and restore water resources. Finally, monitoring is conducted to assess the effectiveness of implementation activities.

Learn more

- Find out when your watershed will be monitored: http://www.pca.state.mn.us/index.php/view-document.html?gid=10232
- Learn about other measures for lake health, water quality actions, and outcomes for lakes in the 2014 Clean Water Fund Performance Report: http://legacy.leg.mn/sites/default/files/resources/2014_CleanWaterFund_Performance_Report.pdf
- For more information on activities supported by the Clean Water Fund: http://www.legacy.leg.mn/funds/clean-water-fund

River and stream water quality

Measure: Fish Index of Biotic Integrity

2034 statewide goal:

Increase the percentage of Minnesota rivers and streams with healthy fish communities, as measured by the Index of Biotic Integrity, from 60% to 67%.

Measuring water quality in rivers and streams is important

As with lakes, Minnesotans want to know if they can swim or fish in their favorite river or stream. Water quality information is used to determine if rivers and streams meet water quality standards. Water quality standards tell how much pollution can be in the water and still allow the water body to be used for swimming and fishing. Monitoring and assessment helps state agencies, local governments, and citizens understand river and stream health. It also helps identify actions needed to protect and restore streams and rivers. Starting in 2008, MPCA began a 10-year cycle to intensively monitor about eight of Minnesota's 81 watersheds each year.

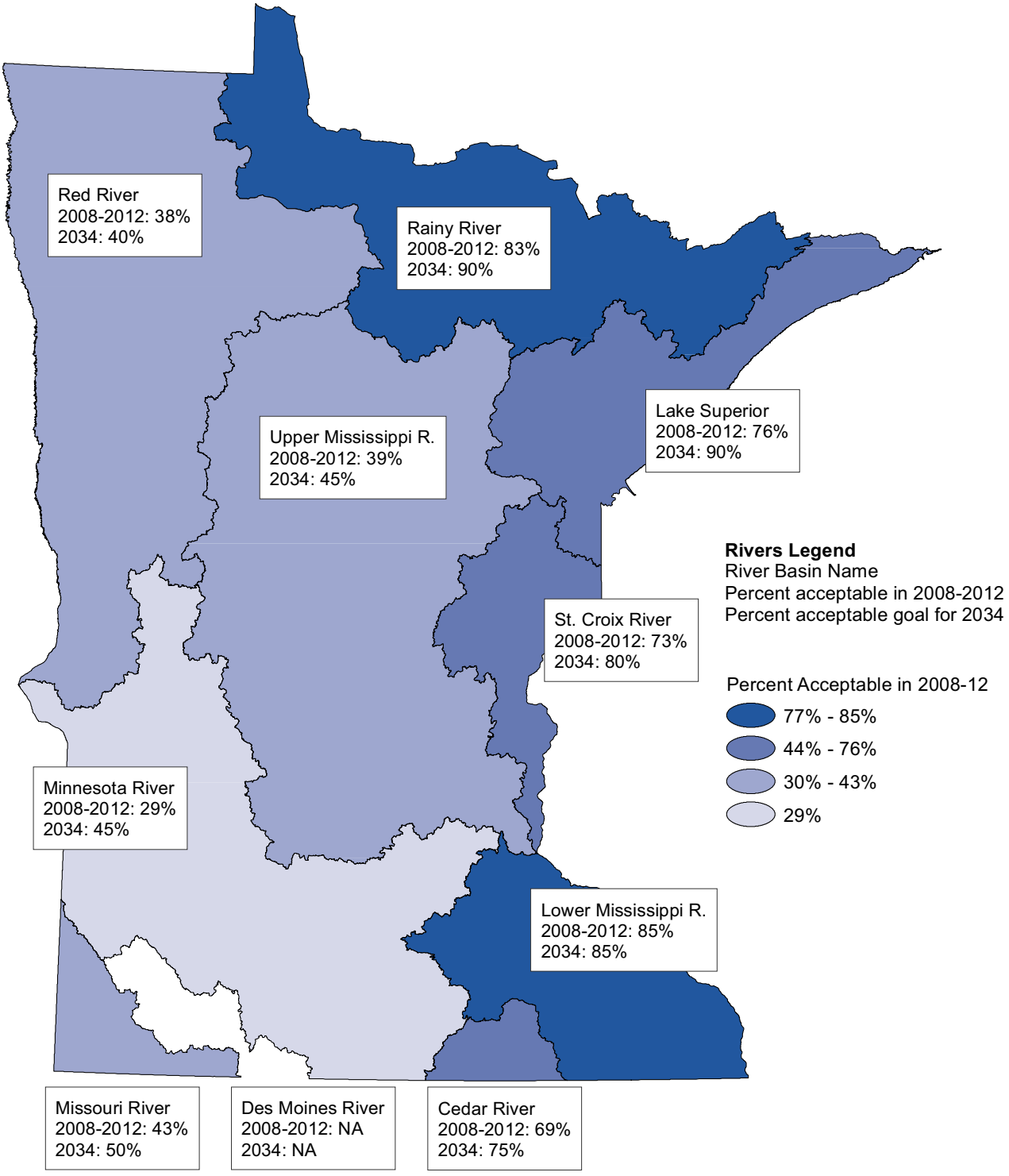
The Fish Index of Biotic Integrity is a useful measure of Clean Water Fund progress

The federal Clean Water Act calls for "fishable" waters. People widely recognize fish for their economic and aesthetic value. Healthy fish communities support Minnesota's recreation and tourism economies. Thus, fish are often used as a measure of water quality. Fish communities are typically present even in the smallest streams and are easily sampled and identified with the proper equipment and training.

An Index of Biotic Integrity (IBI) identifies water pollution problems based on the type and number of species found in a given location. Stressors such as low dissolved oxygen, excess sedimentation, nutrients, or toxics (pesticides, metals) result in more pollution-tolerant (and fewer sensitive) species. This makes IBI a good indicator of stream health.

A river or stream would have a low IBI score if only a few species were present or the population was made up of pollution-tolerant species. In contrast, a river or stream would score high if a diverse community of species were present. Where IBI scores are low, water quality sampling is used to help pinpoint the source and extent of the problem.

River and stream water quality goals for 2034



River and stream water quality table

Basin	Number of river/stream sites in baseline population	Number of river/stream sites acceptable 2008-2012	2008-2012 river/stream sites % acceptable	2034 Goals of river/stream sites % acceptable	Outcomes	% Change
Lake Superior	200	152	76%	90%	Improve	14%
Upper Mississippi	475	183	39%	45%	Improve	6%
Minnesota	339	98	29%	45%	Improve	16%
St. Croix	97	71	73%	80%	Improve	7%
Lower Mississippi	365	310	85%	85%	Progress	
Cedar	92	63	69%	75%	Improve	6%
Des Moines	0	N/A	N/A	N/A		N/A
Red	219	83	38%	40%	Improve	2%
Rainy	134	111	83%	90%	Improve	7%
Missouri	117	50	43%	50%	Improve	7%
Totals	**2,038**	**1,121**				

River and stream water quality goals for 2034

Goals were set for the percentage of rivers and streams meeting their potential fish IBI in 2034 for each of Minnesota's 10 basins. This results in the statewide goal of increasing the percentage of Minnesota's rivers and streams meeting their potential fish IBI from 60% to 67% by 2034.

Factors used in determining stream IBI potential include:

- Stream temperature (warm or cold),
- Geography (north region and south region), and
- Physical stream characteristics (stream size and gradient).

If the fish IBI score for a sampling site was greater (better) than the biological criteria for sites of the same stream type (i.e. stream class), the site is given an acceptable rating, indicating that it is supporting a healthy fish community.

Generally, more intact watersheds with low levels of artificial drainage or channel modification have healthier fish communities. In these areas there is typically less land disturbance and more natural plant cover near streams and riverbanks. As a result, fish IBI scores tend to decline from northeast to south and west across the state. Since the entire state has not been sampled, some basins have more data (i.e., assessed watersheds) than others. For example, the Des Moines River basin in southwestern Minnesota has not yet been assessed.

River and stream water quality

There is not enough biological data available to conduct a trend analysis for river and stream fish IBI. As more data are collected over time, it will be easier to determine whether or not river and stream water quality is trending upward, holding steady, or trending downward. After the first 10-year assessment cycle is completed and stations are sampled in the second cycle, more information on changes in condition will be available.

The Clean Water Fund is being used to address river and stream water quality through a systematic, statewide, watershed-based approach. First, a baseline of water quality is established through monitoring and assessment. Next protection and restoration strategies are developed based on the monitoring and assessment information. Then prioritized, targeted, and measureable activities are implemented to protect, enhance, and restore water resources. Finally monitoring is conducted to assess the effectiveness of implementation activities.

Learn more

- Find out when your watershed will be monitored: http://www.pca.state.mn.us/index.php/view-document.html?gid=10232
- Learn about other measures of river and stream health, actions and outcomes for rivers and streams in the 2014 Clean Water Fund Performance Report: http://legacy.leg.mn/sites/default/files/resources/2014_CleanWaterFund_Performance_Report.pdf
- For more information on activities supported by the Clean Water Fund: http://www.legacy.leg.mn/funds/clean-water-fund

Groundwater quality

Measure: Drinking water standards for arsenic and nitrate

2034 statewide goals:

- Reduce the percentage of new wells exceeding the drinking water standard for arsenic by 50%.
- Reduce nitrate levels in groundwater by 20%, which will result in reducing the percentage of wells exceeding the drinking water standard by 50% (in two vulnerable areas of the state).

Measuring groundwater quality is important

Groundwater is the main source of drinking water for three out of four Minnesotans. Water suppliers drill wells through soil and rock into underground aquifers to supply people with drinking water. Many homes also have their own private wells drilled on their property. In Minnesota, over one million residents rely on private wells for their drinking water.

Access to safe and reliable drinking water is essential to Minnesotans. Unfortunately, groundwater can become contaminated by both human activity and naturally occurring sources of pollution.

There are a variety of contaminants found in Minnesota's groundwater and most are found at low levels. Nitrate and arsenic are the two contaminants that most often exceed drinking water standards and are found over large areas of the state. Nitrate and arsenic can both pose serious health risks when found above certain levels in drinking water. Contaminants other than nitrate and arsenic rarely exceed drinking water standards.[6]

Arsenic is a useful measure of Clean Water Fund progress

Arsenic is a naturally occurring substance found in the earth's crust. Arsenic from soil and rock can dissolve into groundwater, the primary source of drinking water for much of Minnesota. Most of the arsenic found in Minnesota's groundwater naturally occurs when groundwater flows through rocks and soils that contain arsenic. There are some very limited areas where arsenic contamination in groundwater has resulted from human activities.

The location of wells that exceed the drinking water standard for arsenic are closely related to the distribution of a set of glacial deposits known as the Des Moines lobe glacial till. These glacial deposits are not uniformly distributed throughout the state. Therefore arsenic and arsenic contamination is not evenly distributed throughout Minnesota.

Long-term exposure to arsenic can cause a number of harmful human health effects including several types of cancer, diabetes, as well as skin, circulatory, and nervous system problems.

[6] There are some areas where a release of chemicals has caused groundwater contamination above drinking water standards (e.g., perfluorooctyl sulfonates (PFOS), trichloroethylene (TCE), and petroleum). In these cases, there are specifically designed programs to address and remediate pollution (Superfund, Petroleum Remediation Program, etc). These sites are not addressed in this report.

The U.S. Environmental Protection Agency (EPA) sets drinking water standards or 'maximum contaminant levels' (MCLs) for public water supplies. The drinking water standard for arsenic is 10 micrograms per liter (µg/L).

Nitrate is a useful measure of Clean Water Fund progress

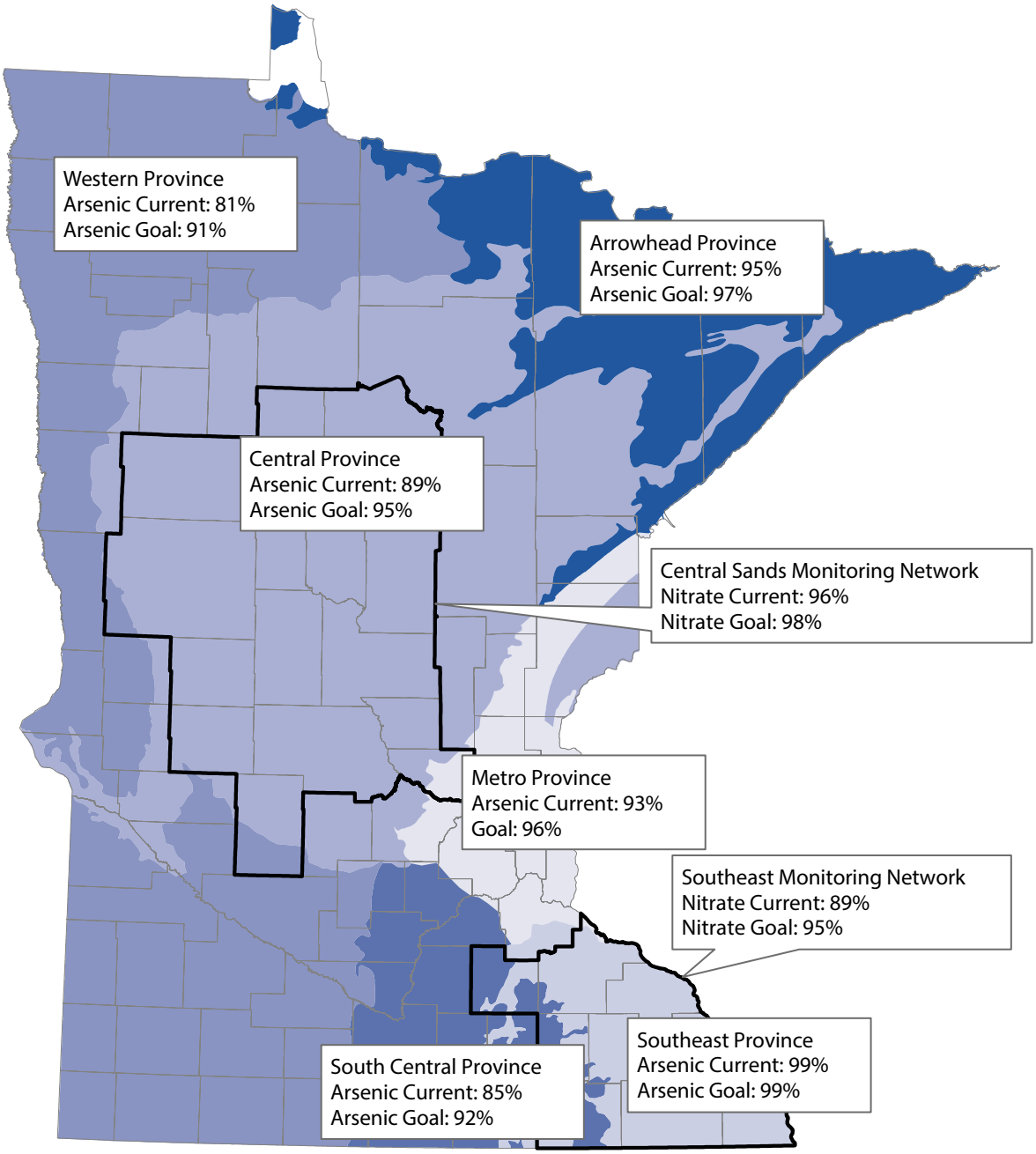
Nitrate comes from decomposing organic materials like plants, and animal or human wastes. Septic tanks, fertilizers, manure, and sanitary landfills are also sources of nitrate pollution. These pollutants can move from the land surface, seep down through the soil and rock, and cause elevated levels of nitrate in groundwater. Nitrate may also be found naturally in groundwater as nitrogen compounds break down in the soil. Naturally occurring levels of nitrate in groundwater, however, are usually quite low (0-3 milligrams per liter or mg/L). Nitrate contamination above the drinking water standard is most commonly found in aquifers that are vulnerable to contamination from the ground surface, such as shallow sandy and shallow bedrock aquifers.

Areas with heavy row crop agriculture and vulnerable groundwater are especially at risk. Very shallow wells and wells that do not comply with the Minnesota Well Construction Code have a significantly increased risk of high nitrate contamination. Aquifers that are covered by 50 feet or more of fine-grained clay soil are generally much less vulnerable to nitrate contamination because the clay serves as a barrier.

When an infant is fed water or formula made with water that is high in nitrate, a condition called "blue baby syndrome" (or methemoglobinemia) can develop. This condition interrupts oxygen flow in the blood. If nitrate levels in water are high enough and medical attention is not received, the condition can be fatal. The drinking water standard for nitrate is 10 mg/L.

In Minnesota, there are six groundwater provinces. A province is an area where the characteristics of the groundwater system are similar. Each of the six provinces has slightly different geologic features, such as soil type and bedrock. For example, in some areas of Minnesota the bedrock layer is made up of sandstone and limestone (sedimentary rocks) while in other areas the bedrock is composed of igneous and metamorphic rocks. Additionally, there can be different soil types (clay, sand, silt) layered above the bedrock. The presence of different geological materials influences groundwater quality as well as groundwater quantity.

Groundwater quality goals for 2034



Groundwater quality goals for 2034

Arsenic

The goal is to reduce the percentage of new wells exceeding the drinking water standard for arsenic by 50% by 2034.

Information on arsenic levels comes from water samples taken from new wells. Since 2008, arsenic sampling has been required before a well can be used. About half of all new wells sampled in the state contain some arsenic, and about 10 percent of wells exceed the drinking water standard.

Because arsenic is naturally occurring, it is not a contaminant that can be removed or prevented from entering groundwater. To date, it has been very difficult to predict when a well will have elevated arsenic levels. Two seemingly similar wells in close proximity to one another can have very different arsenic concentrations. Also, in some areas there may not be any groundwater sources that are free of arsenic. Therefore, Clean Water Fund activities are targeted at characterizing the occurrence and distribution of arsenic and providing guidance for avoiding it when constructing new wells or guidance for treatment where it cannot be easily avoided.

Nitrate

The goal is to reduce nitrate levels in groundwater by 20%, which will result in reducing the percentage of wells exceeding the drinking water standard by 50% (in two private well networks located in vulnerable areas of the state). The Minnesota Department of Health and the Minnesota Department of Agriculture manage two regional private drinking water well networks, in partnership with Soil and Water Conservation Districts and volunteers. One is located in southeast Minnesota (9 counties) and the other is located in central Minnesota (14 counties). Due to their geologic materials both areas are considered vulnerable to nitrate contamination in groundwater. These networks will provide a better understanding of nitrate trends in these regions and will be used to educate private well owners about the quality of their drinking water.

This goal should result in approximately 95% of wells meeting the drinking water standard in the Southeast Minnesota Monitoring Network and 98% of wells meeting the standard in the Central Sand Private Well Network. While efforts to reduce nitrate in groundwater will occur statewide, these two areas were selected for goal setting due to data availability and documented nitrate issues

Groundwater quality

It is important to note that nitrate concentrations in shallow, vulnerable wells can be highly variable and the monitoring networks are relatively new. Given these factors, goals may be modified over time. Long-term trends and other statistical measures for nitrate concentrations (based on 90th percentile) will be used to track changes in nitrate levels. It is important to note that these measures are regional estimates of the nitrate concentration in groundwater across a large area and from wells drawing water from different aquifers. Local monitoring results in areas with vulnerable aquifers may be much higher.

Clean Water Funds are used for activities that help identify potential sources of nitrate contamination as well as to develop, evaluate, and implement management practices to reduce nitrate in groundwater. The Minnesota Department of Agriculture works with local partners to assess groundwater in agricultural areas and works with local government, farmers, agri-businesses, and others in the impacted or threatened areas. The Minnesota Department of Agriculture also works with University researchers, University of Minnesota Extension, and the agricultural community to develop, promote, and provide education on nitrogen fertilizer best management practices (BMPs).

Learn more

- Learn about other measures of groundwater quality, actions and outcomes in the 2014 Clean Water Fund Performance Report: http://legacy.leg.mn/sites/default/files/resources/2014_CleanWaterFund_Performance_Report.pdf
- For more information on activities supported by the Clean Water Fund: http://www.legacy.leg.mn/funds/clean-water-fund

Groundwater quantity

Measure: Changes over time in groundwater levels

2034 statewide goal:

Ninety percent of groundwater monitoring sites affected by groundwater pumping will have either a steady or increasing trend.

Measuring groundwater quantity is important

Currently, groundwater provides about 75% of Minnesota's drinking water. Groundwater also supports agriculture and a variety of industries, as well as natural resources.

As Minnesota's population and economy have grown, so has groundwater use. In some parts of the state, groundwater is at risk of being overused. Over the past 25 years, groundwater use increased by 75 billion gallons, an average of 3 billion gallons per year. Better information on aquifer water level trends is essential for making the best possible decisions about how to use and manage water wisely. The key is to know where groundwater is being used faster than it can be replenished. This requires tracking and analyzing water level changes over time in enough places to provide relevant and meaningful information to inform decisions about appropriation (groundwater use) permits and community water supply plans.

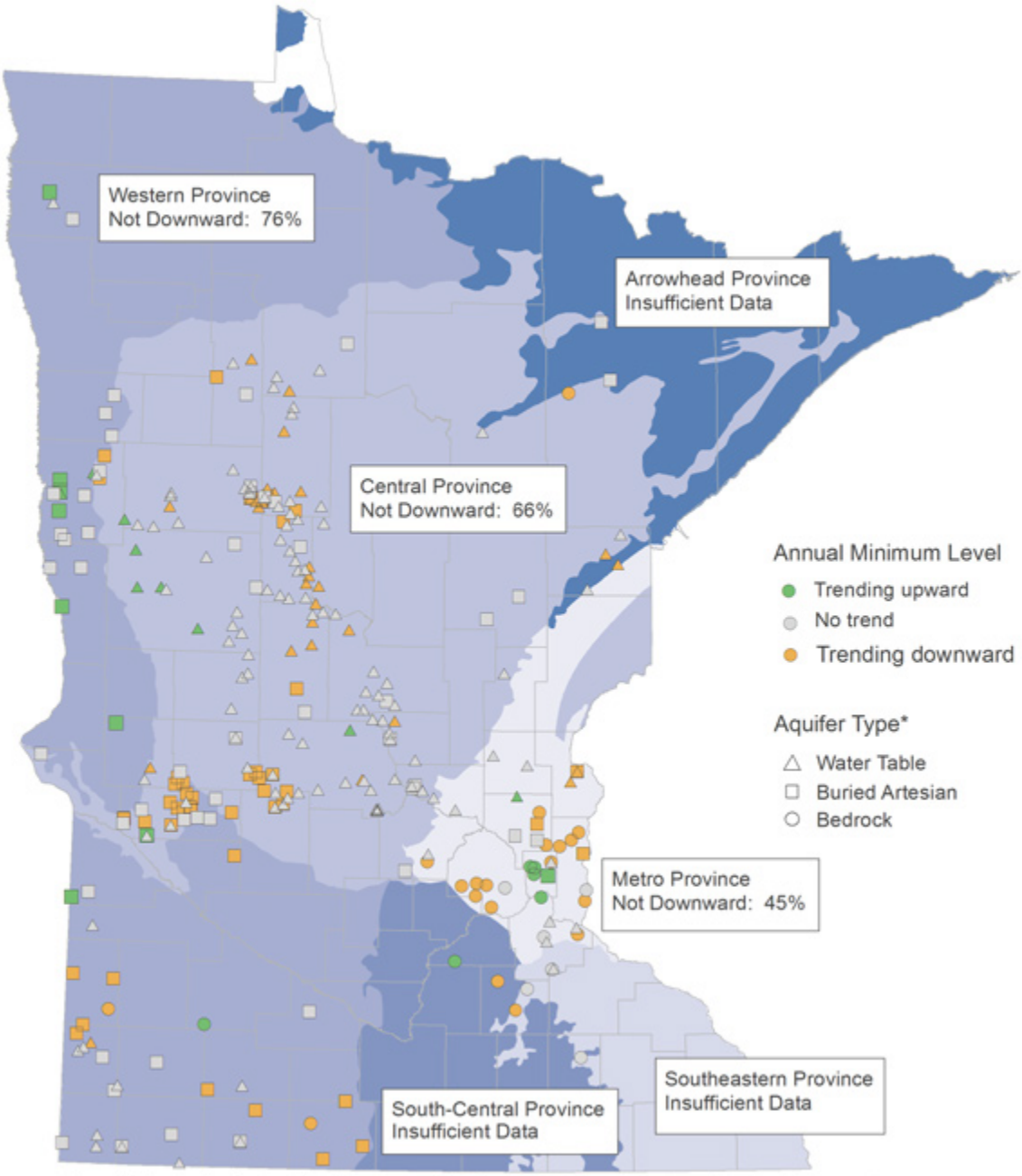
Long-term downward trends in water levels may signal unsustainable use of water, which can mean that alternative sources may be required. Water delivery infrastructure is costly and has a relatively long life span. Careful planning is needed to ensure timely, cost-effective investments will meet long-term water supply needs.

Annual minimum water-level trend is a useful measure of Clean Water Fund progress

The Minnesota Department of Natural Resources (DNR) manages a statewide network of groundwater-level observation (monitoring) wells, in partnership with Soil and Water Conservation Districts and volunteers. This network provides information about seasonal and long-term changes in groundwater levels for different aquifers across the state. This information is used to determine long-term trends, interpret impacts of pumping and climate, plan for efficient use of water, and manage the groundwater resource. Over the past four years, DNR has evaluated its monitoring network to identify gaps and prioritize future investments. DNR is now adding about 50 new monitoring sites to the network each year.

The annual minimum water-level is the lowest water level recorded for the year. Trends in annual minima were selected as a measure of groundwater sustainability because long- term declines can serve as a warning sign that there is an overuse of groundwater. When water is pumped from an aquifer, it is important to know how low the water goes in order to determine how that use may affect water availability and quality in nearby wells, rivers, lakes, and streams. Water level declines aren't always due to pumping. Declines can also result from changing trends in precipitation and recharging aquifers.

Groundwater quantity goals for 2034



* An aquifer is a body of saturated sediment or rock that is sufficiently permeable to supply reasonable amounts of water to wells. Water table aquifers include the water table, the upper surface of fully saturated soil, sediment, or rock below the unsaturated zone. Buried artesian aquifers are composed of sand and gravel overlain by confining (low permeability) clay or till. Bedrock aquifers are composed of one or more saturated bedrock units.

Groundwater quantity goals for 2034

Statewide, the Roadmap goal is for 90% of monitoring sites (with sufficient trend data) that are substantially affected by increases in groundwater pumping to have increasing trends in annual minima by 2034, as compared with the previous decade.

Goal setting for groundwater quantity was a challenge because Minnesota's monitoring network is still inadequate for understanding groundwater conditions in portions of the state. Of the 850 monitoring sites, only 295 had enough data to analyze for a meaningful trend. The map on page 23 gives a general picture of trends in water levels in each of the groundwater provinces based on available data. However, these sites were not selected to statistically represent water levels for these provinces.

Monitoring sites in the metro province indicate that 23 of 42 sites (55%) have a decreasing trend, while in the central province 63 of 185 sites (34%) show a decreasing trend. In the western province 14 of 58 sites (24%) show a decreasing trend.

While trends are valuable, equally important is an understanding of why there is a trend. As discussed previously, groundwater levels are affected by a variety of factors including: local and regional precipitation, changes in land use that affect recharge, and pumping by wells. The groundwater quantity map on page 23 is not intended to explain regional or local factors influencing any particular water level.

The Clean Water Fund is helping DNR implement a monitoring network that tracks groundwater levels over time. The DNR will continue to evaluate water level trends to determine if significant declines are due to groundwater pumping. In locations where pumping is contributing to significant declines, the DNR will review appropriation permits and work with affected parties to adjust water appropriations accordingly.

Learn more

- Learn about groundwater quantity, actions and outcomes in the 2014 Clean Water Fund Performance Report: http://legacy.leg.mn/sites/default/files/resources/2014_CleanWaterFund_Performance_Report.pdf
- For more information on activities supported by the Clean Water Fund: http://www.legacy.leg.mn/funds/clean-water-fund
- DNR groundwater level monitoring program: www.dnr.state.mn.us/waters/groundwater_section/obwell/ Metropolitan Council's water supply planning program: http://www.metrocouncil.org/Wastewater-Water/Planning/Water-Supply-Planning.aspx

Relationship to other water resource planning and implementation

The Clean Water Roadmap provides a high-level, long-term perspective on planning and implementation activities that protect and restore Minnesota's water resources, particularly those supported through the Clean Water Fund. The indicator measures, goals, and future benchmarks are intended to complement the many existing water planning tools, allowing for periodic evaluations to determine if activities are on track to achieve meaningful results. The magnitude of the Clean Water Fund efforts is unprecedented, and much of the first five years has focused on constructing an integrated system for water resource management, including:

- A holistic approach to managing surface water, groundwater, and drinking water,
- Comprehensive planning that supports local implementation,
- Transition to watersheds as the primary focus for organization, and
- Maximizing benefits through integration of local, regional, and state efforts

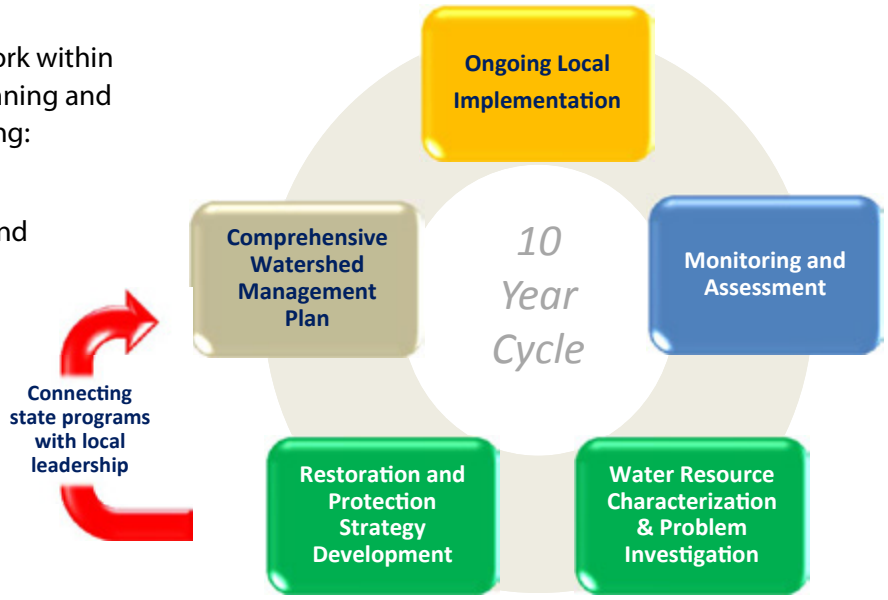
The Clean Water Roadmap is designed to work within this system, leveraging the full range of planning and implementation activities and tools, including:

Local Water Plans

Local units of government develop, adopt and implement local water management plans that are based on local and state priorities. These plans focus on water management concerns, goals, objectives, and measurable outcomes and outline implementation activities based on specific restoration challenges or protection opportunities. Clean Water Roadmap goals also can be measured at the local level so that progress toward the statewide goals can be evaluated at the local level.

Interagency Water Management Framework

By design, roles and responsibilities for managing Minnesota's water resources are shared by several state agencies. While this arrangement provides for depth and specialization in scientific expertise, alignment with other core agency missions, and comprehensive coverage of water concerns, careful coordination is necessary to avoid duplication and confusion as well as maximize benefits. The Interagency Water Management Framework lays out a planning cycle that coordinates water management efforts across agencies, with a focus on supporting local implementation. This Framework acknowledges that implementation activities on the ground are ongoing while providing a systematic, step-by-step process for improving implementation in the context of the 10-year watershed approach.



Relationship to other water resource planning and implementation

Watershed Restoration and Protection Strategies
Watershed Restoration and Protection Strategies (WRAPS) are being developed to provide information about scientific studies of each of Minnesota's 81 watersheds. These studies identify water bodies in need of protection, the stressors and sources of pollution, the reductions needed to meet water quality standards, and strategies and actions to make improvements or maintain water quality. In other words, WRAPS provide an assessment of the watershed and outline possible ways to protect and restore water resources.

Groundwater Restoration and Protection Strategies
A process for developing and integrating Groundwater Restoration and Protection Strategies (GRAPS) into the watershed approach is still under development, with a pilot project currently underway. While the science of groundwater systems does not fit neatly within the boundaries of a surface watershed, it is possible to address groundwater protection and restoration needs in watershed planning by local governments. Our knowledge about groundwater and relevant geology varies widely across the state. Where county geologic atlases and additional research exists, more detailed recommendations can be made. Broad protection measures can be utilized for areas where more detailed information is lacking.

Statewide Priorities
It is essential to ensure that state priorities are clearly articulated and used to help guide watershed planning and local implementation efforts. The July 2014 Clean Water Fund Nonpoint Priority Funding Plan (NPFP) is a process-based plan to support and provide direction to state agencies as they allocate implementation money from the Clean Water Fund to local partners. The NPFP aims to provide state agencies with a systematic, coordinated, and transparent process to provide assurance that nonpoint source investments from the Clean Water Fund are targeted to cost-effective actions that lead to measurable water quality results.

Similarly, Minnesota's Project Priority List guides investment in wastewater and stormwater infrastructure. The Roadmap's signatory agencies will also be articulating the state-level priorities for groundwater quality and quantity investments that help inform their approach to allocating Clean Water Fund resources. As with the NPFP, the focus will be on cost-effective actions that lead to measurable results.

Clean Water Fund Performance Report
The Clean Water Fund Performance Report provides a summary of Clean Water Fund investments, actions taken, and outcomes achieved. The report is published every other year and is based on a suite of about 30 performance measures that will be tracked over the lifetime of the Clean Water Fund. The focus of the

Performance Report is on monitoring the progress and effectiveness of past investments and their associated protection and restoration activities at a statewide scale.

These plans and strategies work together to address water resources

The Clean Water Roadmap is an important part of a comprehensive suite of tools for water resource planning and implementation. It is fundamentally a forward-looking document. By providing long-term, measurable goals at a statewide scale, the Roadmap fills a unique niche. These high level, statewide goals help inform state funding priorities, as articulated by the Nonpoint Priority Funding Plan and Project Priority List.

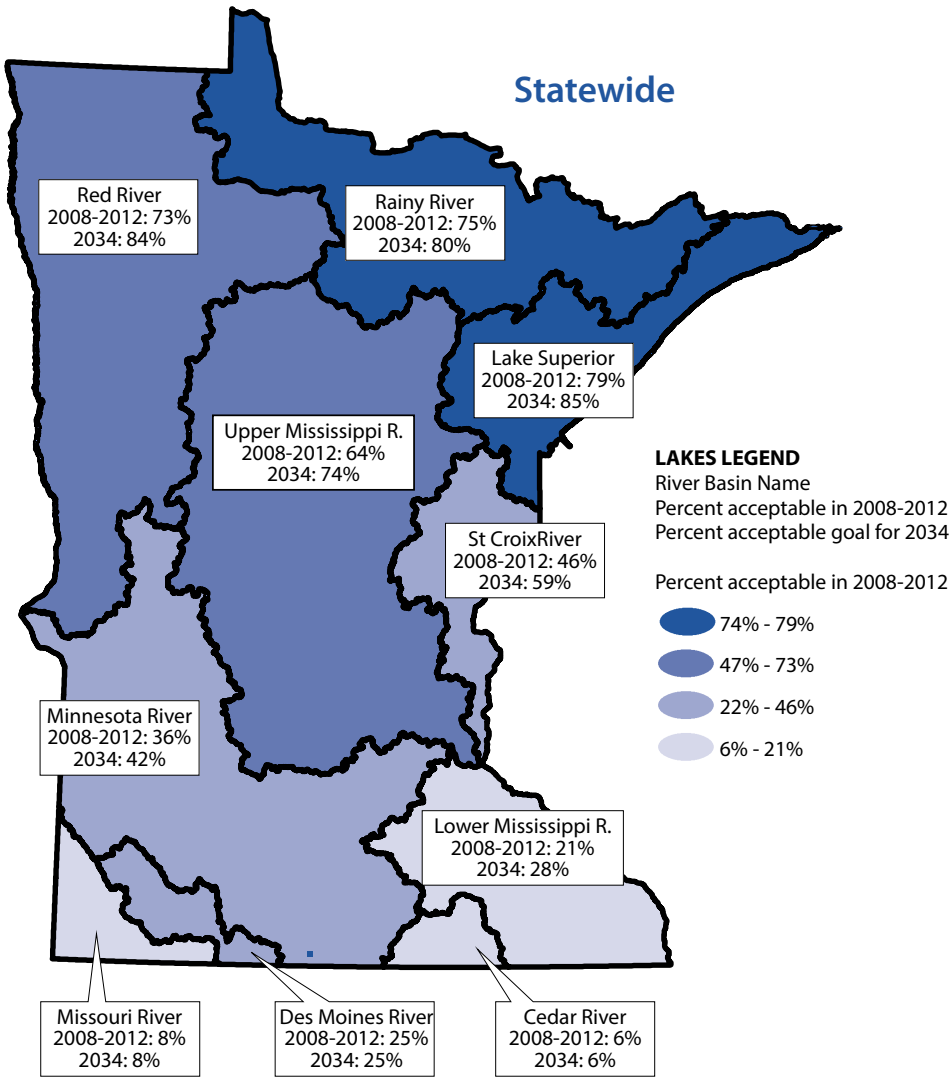
In turn, the WRAPS and GRAPS link these state-level priorities to watershed scale strategies to protect and restore water resources based on scientific analysis. These strategies identify water quality issues in each major watershed and will be used to inform local water planning.

Local Water 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 strategies identified in WRAPS and other assessments into locally based priorities and actions for clean and sustainable water.

Each of these tools will be informed and adjusted over time as progress is measured. The Clean Water Fund Performance Report is one key tool used to track performance at a statewide scale.

Finally, because goal-setting and prioritization for water resources occurs at multiple scales, these plans and strategies represent the various different geographic scales (statewide to watershed) and different strategic scales (goals to actions). An example of how they work together is found below.

Example of goal-setting and prioritization at multiple scales: From statewide goals to subwatershed-scale actions

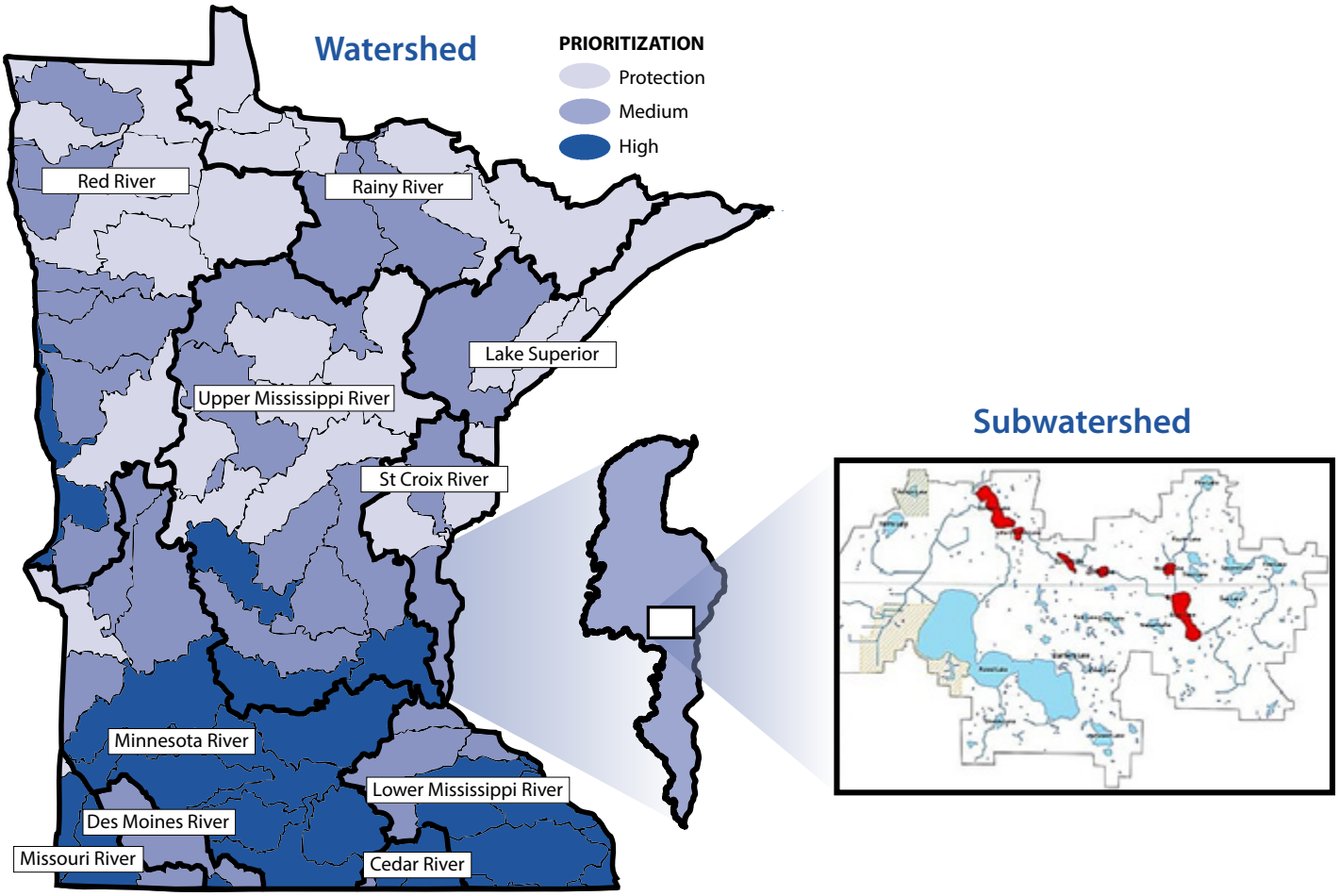


The Statewide Scale map shows Clean Water Roadmap goals for increasing the percentage of swimmable lakes in each of Minnesota's 10 major basins by 2034. To be "swimmable," a lake must meet state water quality standards for aquatic recreational use based on phosphorus levels, algae levels, and clarity. For the St. Croix River Basin in east central Minnesota, the goal is to increase the percentage of swimmable lakes from 46% in 2008 to 59% in 2034.

Relationship to other water resource planning and implementation

The Watershed Scale map shows a state-level perspective on priority major watersheds for the goal of reducing contributions to downstream phosphorus loads. Relative to that goal, reducing phosphorus contributed by the Lower St. Croix River Watershed (Figure 3c) is a medium priority compared to other major watersheds.

The Subwatershed Scale map depicts the Comfort Lake-Forest Lake Watershed District (CLFLWD) in the Lower St. Croix River Watershed, with Comfort Lake and other impaired lakes shown in red. Phosphorus levels in the lakes put them at high risk of eutrophication and reversing this trend is a local water quality priority. The CLFLWD Six Lakes TMDL Implementation Plan and the CLFLWD 2012-2021. Watershed Management Plan, Volume I identify and provide estimated costs and a schedule for implementing specific actions to meet TMDL load reductions and restore lake water quality throughout the subwatershed.



The path forward

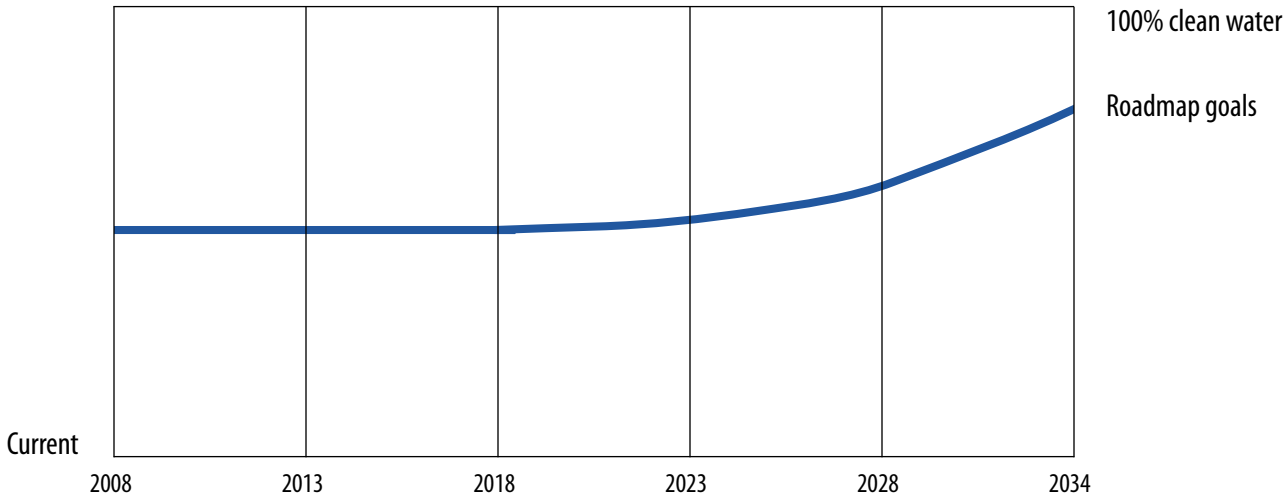
Measureable progress toward meeting the Roadmap goals will take time

The water quality and quantity issues facing Minnesota are the result of major changes to land use in the past 150 years. A significant portion of prairie and forest has been converted to agricultural and urban land uses. While progress can be made on a small scale over the short-term, moving the needle on the Roadmap goals will require significant effort. The following is a graphical representation of the anticipated pace of progress toward the Roadmap goals. It is not intended to convey specific interim objects. Rather, it illustrates that, because of the scale of our water resource challenges, number of external drivers, and complexity of our hydrologic systems, significant effort and investment will be required before the pace of progress toward the Roadmap goals accelerates.

Short-term measures, goals, and benchmarks along the pathway will be set

While progress toward the Roadmap goals will be difficult to demonstrate at first, short-term measures and goals will be developed to assess progress along the way. In future iterations of the Clean Water Fund Performance Report, short-term goals will be set for selected measures to guide activities toward meeting the long-term Clean Water Roadmap goals. In addition, as part of the next revision of the Clean Water Roadmap anticipated in 2019, interim benchmarks for the Roadmap goals will be set for the remaining five-year intervals. It is anticipated that efforts in the next five years will fill the gaps in data needed to establish trends and more effectively forecast progress toward meeting the goals at the five-year intervals.

Progress toward Roadmap goals



The Roadmap will guide agency implementation

The Roadmap, in combination with the interim benchmarks and progress indicators, will inform the state agencies' priorities and allocation decisions going forward. It will be an essential tool in helping the agencies determine which programs and projects, in which areas, will best advance the state's water resource goals. However, it is far from the only tool needed for this work. As described previously, the Roadmap sets the high level vision and is designed to be used in combination with more specific strategies and plans developed at the state, watershed, and local level. In essence, the Roadmap will serves as the agencies' guide in implementing the Clean Water Fund, letting us know whether the many individual investments and efforts are, collectively, moving us toward meaningful, state-level progress in improving the health and sustainability of our lakes, rivers and streams, drinking water, and groundwater.

A thorough review of the Roadmap will be conducted at five-year intervals

The Clean Water Roadmap will be revisited regularly and revised over time as new data and information are collected, including a thorough review at five-year intervals. During the five-year review periods, agencies will identify:

- Whether we are on-track or off-track towards meeting the 25-year goals,
- Whether or not any adjustments are needed to the indicators selected (Fish Index of Biotic Integrity, Trophic State Index, arsenic and nitrate in groundwater quality, and changes over time in groundwater levels), and
- Whether or not the outcomes of the analysis require us to make adjustments to management strategies, funding priorities, or the goals themselves.

Draft revisions to the Clean Water Roadmap will be presented to the Clean Water Council, as well as other interested stakeholders, for consideration and input. The five-year review periods also provide an opportunity to inform citizens about interim progress in meeting the Roadmap's water quality and quantity goals.

Partnerships are essential

The state agencies that developed this Roadmap recognize that the ultimate success of Minnesota's water resource protection and restoration efforts relies on the efforts of many partners will determine the ultimate success of Minnesota's water resource protection and restoration efforts. This Roadmap is the agency leaders' effort to articulate their 25-year goals for Clean Water Fund investments, setting a forward-looking course and inviting an ongoing dialog about that direction.

The 2014 Clean Water Fund Performance Report, future updates, and additional information about the Clean Water Fund can be found on the Minnesota's Legacy web site: **www.legacy.leg.mn/funds/clean-water-fund**