DEPARTMENT OF NATURAL RESOURCES

Great Lakes- St. Lawrence River Basin Water Resources Compact

Water Conservation and Efficiency Program Annual Assessment

State of Minnesota, November 22, 2022

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Cover photo: Crimson skies over Lake Superior. Copyright Gary Alan Nelson.

Water Conservation and Efficiency Program Report Purpose

Each Party shall submit a report to the Council and the Regional Body detailing its Water Conservation and Efficiency Program, to satisfy obligations included in the Great Lakes-St. Lawrence River Basin Water Resources Compact.

This report includes new actions that were started or accomplished during calendar year 2022. For previous water management, water conservation and sustainability programs, please see earlier reports. Although the Minnesota Department of Natural Resources (DNR) submits this report, we have captured some of the highlights from our cooperating partners including other governmental and non-governmental groups involved in managing and conserving Lake Superior and other Minnesota water resources.

MINNESOTA HIGHLIGHTS:

- ***Spring Floods*** – 2022 saw relief from the 2020-2021 drought in the Lake Superior Basin in Minnesota. Much of the Lake Superior Basin saw 100-160 inches of snowfall over the winter. A cool spring resulted in two feet of snow lingering in the woods until late April. Lutsen Mountain stayed open for skiing until May 7, marking the longest season and the latest closing date in the resort's history. A combination of heavy rain and melting snow caused washouts, road closures and flash flood warnings for the basin in May. The entire Lake Superior basin was in High Flows or Flood Flows the week of May 15. Water levels for June 10 indicated that water levels on Lakes Superior rose by six inches since May. Lake Superior was four inches above its long-term average June levels.

Figure 1. Poplar River near Lutsen, May 13, 2022.

Late in the summer of 2022, Minnesota again experienced moderate to severe drought. This year, it impacted central and southern Minnesota. Most of the Lake Superior Basin had no drought through October, with the exception of a small pocket of moderate to severe drought south of Duluth.

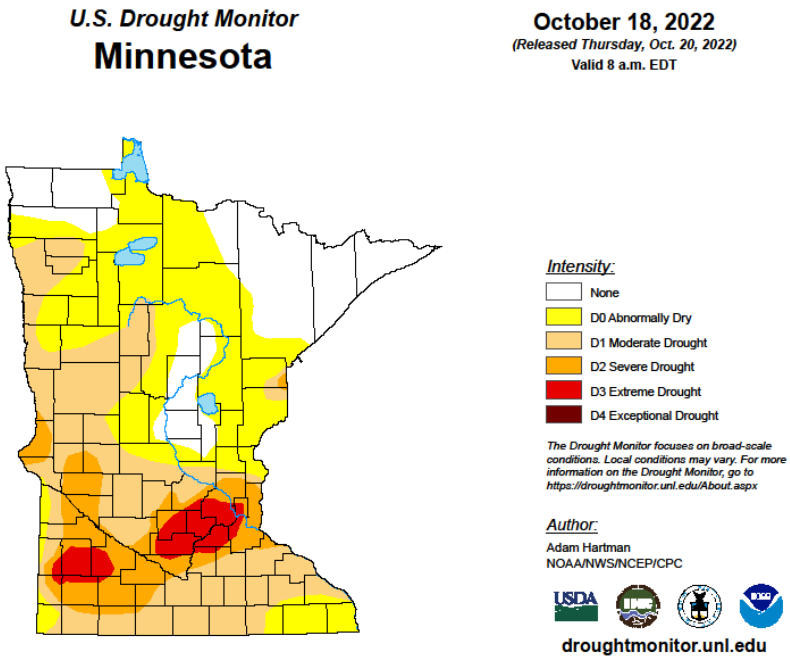

Figure 2. The 2022 drought came much later in the summer than the 2021 drought and mainly impacted central and southern Minnesota.

Water Conservation – In 2022, cities in the Lake Superior Basin were not issued drought notices. However, as required by the Statewide Drought Plan, all public water suppliers in eight other watersheds were asked to implement voluntary water conservation actions. Major water conservation accomplishment included the availability of all water use permittees to complete the DNR Water Conservation Reporting system reporting. Another was the University of Minnesota Turf Extension Office promotion of efficiency and water conservation solutions to reduce lawn watering.

Identify how the State/Provincial program is consistent with the regional objectives

Many efforts are underway in all levels of government, educational institutions, nonprofit organizations, business and industrial sectors, and at the grassroots level to guide Minnesota toward long-term sustainable water use. As shown below, Minnesota's program is consistent with the regional objectives in the promotion of environmentally sound and economically feasible water conservation measures.

Summary of Significant Water Conservation Accomplishments in the past year

Compact's Water Conservation and Efficiency Objectives	Summary of Minnesota's 2022 Efforts	Page
1. Guide programs toward long-term sustainable water use.	• Water use trends review, including a notable increase in water use for the thermoelectric power production. • Duluth/St. Louis River area receives Federal Infrastructure Funds. • MDH provides a status update for sustainability and water conservation efforts for communities within watershed including: source water protection plans, Groundwater Restoration and Protection Strategies (GRAPS), Drinking Water Revolving Fund and Water Reuse. • MPCA and DNR complete remediation and restoration efforts in the St. Louis AOC and estuary. • St. Louis River One Watershed, One Plan completes review period. • Funding sustainability remains strong. • Other sustainability and restoration projects are underway.	6
2. Adopt and implement supply and demand management to promote efficient use and conservation of water resources.	• Water conservation notices were sent during drought. • As of 2022, over 81% of the 16 cities in the Lake Superior watershed with populations over 1,000 have submitted their Water Supply Plan and had them approved. • The Metropolitan Council water efficiency grant program awarded $1,000,000 for residential assistance. The previous requirement of a homeowner contribution has been eliminated, to increase the equity of the program. • The 2022 MnTAP intern program sponsored 16 young professional to assist industries with water conservation and sustainability.	15
3. Improve monitoring and standardize data reporting within water conservation and efficiency programs.	• The statewide Water Conservation Reporting System now has five years of data for cities serving over 1,000 people and is able to collect data from all 10,000 water permit holders on their water conservation and efficiency improvements. • MN Permitting and Reporting System (MPARS) was updated. • Availability of accurate water resource maps continues improving, aiding in all program management. • Monitoring and Surveys Unit and Groundwater Unit provides robust monitoring reports that aided conservation efforts during the 2022 drought. • Lake levels fluctuated quite a lot in 2022 and Lake Superior is now above normal.	17
4. Develop science, technology and research.	• The Watershed Health Assessment Framework emphasizes ecosystem health. • The 2022 State of the Great Lakes report rates Lake Superior as fair to good in most categories.	18

	• The Lake Index of Biological Integrity Assessment Tool rates lakes to help managers target protection and restoration efforts. • Many Coastal Program Grants benefit the public and further research and technology efforts.	
5. Develop education programs and information-sharing for all water users.	• The Great Lakes Coastal Resilience Planning guide provides climate and environment resources. • Nature-Based Shoreline Protection demonstration sites help educate citizens on how to protect shorelines from coastal erosion. • The new Certified Coastal Practitioner program requires participants to complete 10 educational courses. • The "We Are Water" traveling exhibit continues touring the state. • A series of social media posts were created and released this summer focusing on outdoor water conservation. • The new Sustainable Damage Playbook for Local Officials helps them understand their responsibilities and available resource after a natural disaster. • A new learning toolkit has been developed for utility leaders on Water Equity and Climate Resilience.	19

OBJECTIVE One: Guide programs toward long-term sustainable water use

Sustainable water use involves ensuring there are adequate supplies of fresh, clean water for present and future generations and for the environment. It addresses all basin waters from stormwater - carried as surface water in rivers, creeks and held in reservoirs and dams - and underground water resources.

Overview of Water Use Minnesota's Great Lakes Basin

- At the time of this report, there are 150 active water appropriation permits in the Minnesota Lake Superior Basin.
- Minnesota is one of five Great Lakes states that reported 100% compliance in 2021 water use data reporting.
- Most of Minnesota's water use in the Great Lakes Basin is for industrial uses, power generation and public water supply.
- Over the past year, water use (withdrawals) for industrial purposes is down slightly. Withdrawals for power generation purposes have increased markedly and public water supply withdrawals remained fairly constant.
- Minnesota's non-hydropower withdrawals totaled 263 million gallons per day.
- Minnesota's diversions outside the basin totaled nine million gallons per day. These were exempted since they were in place before the compact was signed. The water is withdrawn for mining tailings ponds at three facilities.
- Minnesota uses coefficients to calculate consumptive use for each reporting sector. For withdrawals and diversions, we use reported values from each water permit holder. For consumptive use, we take those measured values and estimate the consumptive portion using a calculation based on one coefficient for each reporting sector.

Notable changes from 2020 water use by Minnesota facilities include:

- A 162 percent (51 mgd or 193 mld) increase in water withdrawals for self-supply thermoelectric power production (once-through cooling) due to increased production at two facilities, consistent with standard fluctuations and market demand.
- A 38 percent (621 mgd or 2351 mld) decrease in withdrawal for off-stream hydroelectric power production, a change resulting from drought conditions in 2021.
- A 40 percent (6 mgd or 23 mld) decrease in the total diversions. Decreases in both the self-supply industrial and self-supply irrigation sector diversions are attributable to normal fluctuations in operations.

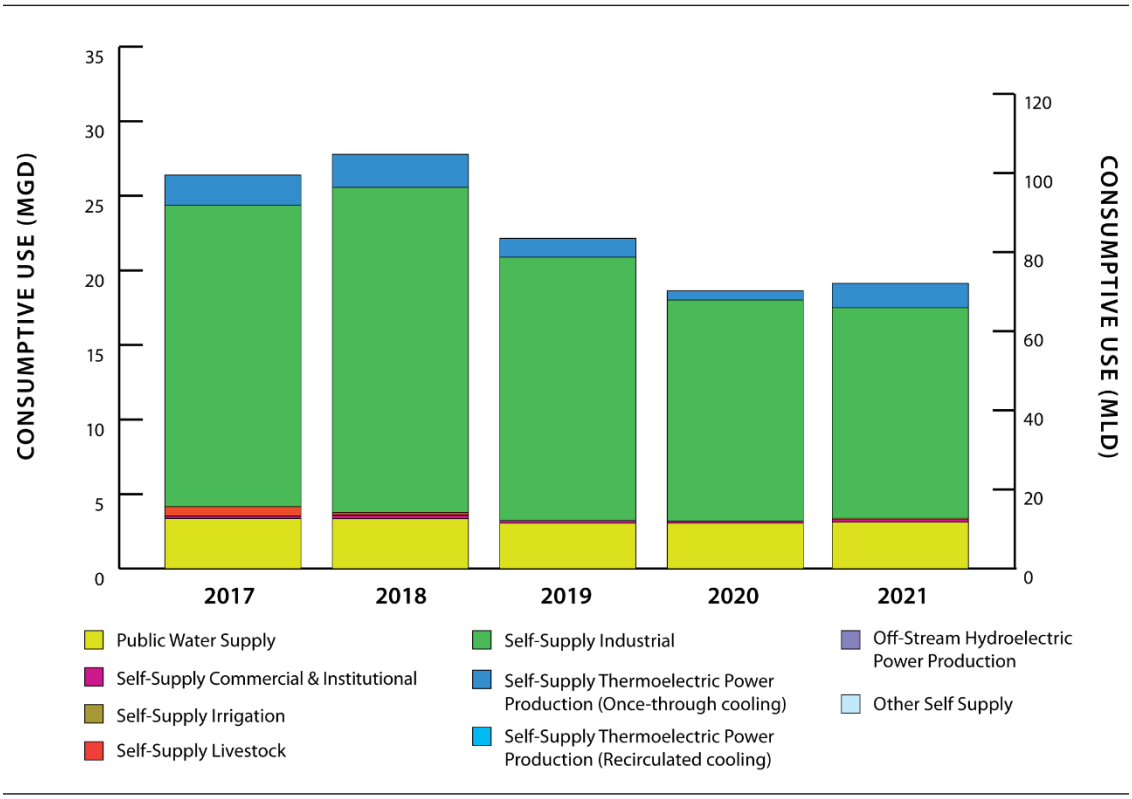

Figure 3. Water use trends in the basin show a slight decrease in public water use, a steady decrease in industrial water use and a general decline in total water use.

Duluth Basin Area Receives Federal Infrastructure Funds

President Biden visited the Duluth/St. Louis River area on March 2 to highlight infrastructure investments to clean up areas around the Great Lakes. The St. Louis River Estuary is the largest freshwater estuary in North America and is the headwaters of the Great Lakes. The U.S. Environmental Protection Agency (EPA) announced $113 million in funding for Great Lakes restoration in portions of the St. Louis River near Duluth. The money will help advance removal of the river's status as a polluted Great Lakes waterway. The EPA has pledged $81 million to complete restoration in Spirit Lake, an additional $25 million for restoration at Munger Landing, and $6.8 million for the restoration of Scanlon Reservoir, which are among the highest priority sites within the St. Louis

River Area of Concern for their cultural and historical significance. A large portion of these projects will be funded through President Biden's Bipartisan Infrastructure Law.

Source Water Protection Plan Completion Status Summary-by community

Source Water Assessments

Source water assessments include a variety of information about the water sources used by a public water system, including: the specific source, protection efforts, nearby potential risks, water treatment, water quality, and contact information. These assessments are used for consumer education, determining priorities and clean-up levels for remediation of contaminants, evaluating whether proposed land uses or permits could affect a public water system, and as a first step in developing source water protection plans. These are required by the EPA and were first completed for all community water systems in 2003.

Source Water Protection Plans

Source water protection plans are developed by public water systems in collaboration with the Minnesota Department of Health (MDH) to identify and manage risks to the source of their drinking water. MDH tailors source water protection requirements and recommendations so that source water protection is both doable and protective of public health for all communities. Considerations for preventing contamination include the population served, regulatory protections in place, nearby land uses, and natural protections offered by the geology and soils.

- Wellhead Protection Plans
  Wellhead protection plans are required by Minnesota Rule for the public water systems that use groundwater as their source of drinking water. The land surface area corresponding to the subsurface area that flows to the well is outlined and visible landmarks are identified to determine the protection area, known as a Drinking Water Supply Management Area (DWSMA). Groundwater scientists also study the aquifers to learn about the water quantity, quality, residence time, flow, and interactions with surface water. The plan outlines the measures that the system will implement to prevent contamination by threats listed in the plan.

- Surface Water Intake Protection Plans
  Statewide, fewer than 25 community water systems use surface water (rivers, lakes or reservoirs) as a source, but they supply about 1.4 million Minnesotans with drinking water. A revised and updated Source Water Assessment (described above) is the first phase. That update is followed by a Surface Water Intake Protection Plan (SWIPP). These are voluntary and identify the protection area, potential contamination risks, and the actions the system will take to protect their source. No SWIPPs have been completed for the community water systems in the Lake Superior basin to date.

Groundwater Restoration and Protection Strategies (GRAPS)-by watershed

As part of Minnesota's Water Resources Management Framework, the Groundwater Restoration and Protection Strategies (GRAPS) draw on existing data to provide maps and information describing groundwater conditions in specific watersheds to use as a resource in developing priorities and implementation actions for One Watershed, One Plans (local comprehensive plans). Many state agencies work together to gather data and create the GRAPS

reports for each watershed in Minnesota, with the MDH coordinating. The reports identify key groundwater quantity and quality concerns and suggest targeted strategies to restore and protect groundwater.

Source Water Protection Plans Completion Summary			
Community Water System	**Approved Wellhead Protection Plan** **Y/N/NA**	**Approved Source Water Assessment** *(Completed in 2003)* **Y/N/NA**	**Approved GRAPS** *(See note below)* **Y/N/NA**
Aurora	NA, surface water	Y	NA
Babbitt	Y	Y	Y
Beaver Bay	NA, surface water	Y	NA
Biwabik	NA, surface water	Y	NA
Buhl	Y	Y	Y
Carlton	Y	Y	Y
Chisholm	NA, surface water	Y	NA
Cloquet	Y	Y	Y
Duluth	NA, surface water	Y	NA
Eveleth	NA, surface water	Y	NA
Floodwood	Y	Y	Y
Gilbert	Y	Y	Y
Grand Marais	NA, surface water	Y	NA
Hibbing	Y	Y	Y
Hoyt Lakes	NA, surface water	Y	NA
Iron Junction	Y	Y	Y
Kinney	Y	Y	Y
Meadowlands	Y	Y	Y
Mountain Iron	Y	Y	Y
Silver Bay	NA, surface water	Y	NA
Two Harbors	NA, surface water	Y	NA
Virginia	NA, surface water	Y	NA
Wrenshall	Y	Y	Y

GRAPS reports are focused on groundwater conditions and do not provide information on community water systems that use a surface water body (river, lake or reservoir) as their source. This is noted with "NA" in the table.

Drinking Water Revolving Fund

The Minnesota Department of Health administers the Drinking Water Revolving Fund (DWRF) projects. The DWRF provides below market rate loans for public water system improvements. Both watermain replacement projects and lead service line replacement projects can be considered conservation practices, since they eliminate water loss due to watermain breaks or service line leaks. Funding priority goes to projects that protect public health, provide adequate water supply and assist communities with financial needs. Loans are most often used to replace or upgrade wells, treatment plants, water towers or distribution systems. Projects have also included consolidating water systems, water meters, computerized monitoring and control systems, and extending public water services to properties with contaminated private wells. Over a dozen approved projects are located in the Great Lakes Basin and will help provide a more sustainable water supply or improve water conservation.

Potential DWRF Projects related to Sustainability and/or Water Conservation

Water System	Project	Need	Cost
Aurora	New Surface Water Intake (from a new source) & Treatment Plant to Serve Aurora & White Township	New source is more sustainable. It has improved water quality and will not be impacted by mining dewatering activities.	$24,400,000
Cloquet	Treatment Plant at Well No. 11	Needed to address manganese concerns and ensure capacity needs are met with safe water. Provides a more sustainable water supply.	$1,838,000
Duluth	Lead Service Line Replacement	Replacement of lead service lines improves drinking water quality and eliminates old service lines that tend to leak, thus eliminating water loss.	$10,000,000
Eveleth	Watermain Replacement	Watermain replacement reduces the likelihood of watermain breaks and the associated water loss.	$473,000
Gilbert	Watermain Replacement	Watermain replacement reduces the likelihood of watermain breaks and the associated water loss.	$889,000
Gilbert	Water Meter Replacement	Water meter replacement ensures water usage can be accurately tracked/recorded. Water meters can also help encourage water conservation.	$540,000
Hibbing	Lead Service Line Replacement	Replacement of lead service lines improves drinking water quality and eliminates old service lines that tend to leak, thus eliminating water loss.	$500,000
Hibbing	New Treatment Plant	New plant is needed to ensure a safe and sustainable water supply.	$10,800,000
Silver Bay	Treatment Plant Improvements	Upgrades to the plant are needed to ensure a safe and sustainable water supply.	$8,200,000
Two Harbors	Watermain Replacement	Watermain replacement reduces the likelihood of watermain breaks and the associated water loss.	$2,037,000
Two Harbors	Treatment Plant Upgrades	Upgrades to the plant are needed to ensure a safe and sustainable water supply.	$5,020,000
		Total Cost	**$64,697,000**

Water Reuse

Water reuse is a tool to promote water sustainability. Water reuse will be an increasingly important part of managing Minnesota's water resources, as demands on our water supplies continue to grow due to population increases, urbanization, climate change, increased irrigation and industry growth. In 2018, an interagency team

published a report on promoting safe and sustainable water reuse in Minnesota, including eight Minnesota-specific recommendations for consideration in future development of guidance and regulations (see Advancing Safe and Sustainable Water Reuse in Minnesota [PDF]). The MDH is currently facilitating a team charged with designing the process for the next phase of implementing those recommendations through an expanded workgroup comprising agency staff and stakeholders.

Minnesota Pollution Control Agency (MPCA) and DNR complete remediation and restoration projects in the St. Louis River Area of Concern and Estuary

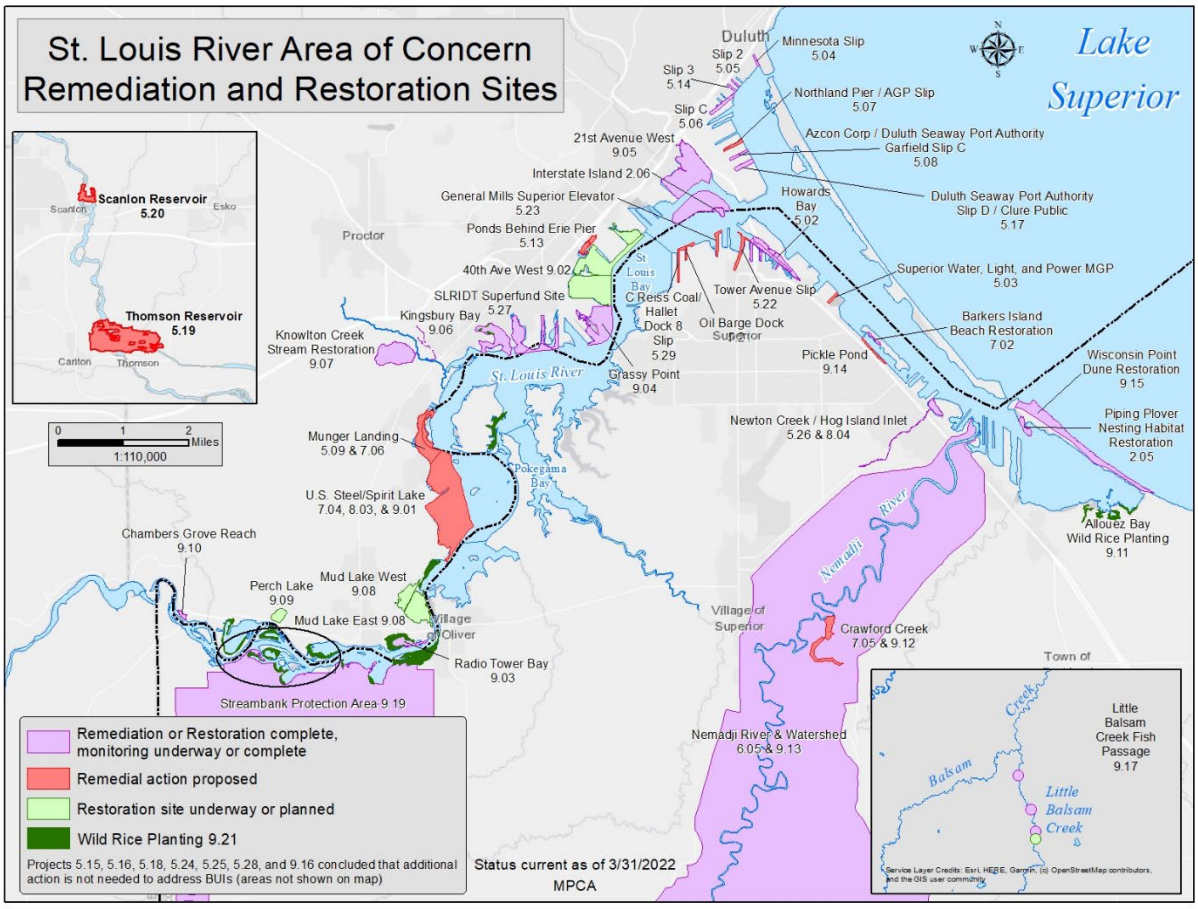

Figure 4. Map of the St. Louis River and estuary remediation and restoration sites as of 3/31/22.

Within the St. Louis River Area of Concern (SLRAOC) near Duluth, the **40th Avenue West** habitat restoration project was substantially completed by September 30, 2022. In 2017 and 2018, about 300,000 cyd of clean material dredged from the navigation channel in the harbor was used to construct six underwater shoals to restore shallow sheltered bay habitat. Then, in 2020, about 19,000 cyd of natural organic material from the Kingsbury Bay habitat restoration project was applied in a six-inch layer to two of the shoals, in order to help catalyze the recovery of benthic organisms. In 2022, about 18,000 cyd of "manufactured bio-medium" was applied to the remaining shoals. This was made by mixing clean and fine sediment dredged from the Superior Entry with seeds of eight aquatic plant species. It was also broadcast in a six-inch layer. With future post-construction sampling, the agencies will learn how the performance of these two types of bio-media compares.

Several other multi-year projects were under construction in 2022:

- Over 23,000 cyd of contaminated soil and sediment was removed from **Munger Landing**.
- At the **Perch Lake** site, about 80,000 cyd of clean sediment and vegetation have been removed to increase bathymetric diversity, to improve fish habitat and to create hemi-marsh, a 50:50 mix of open water and emergent vegetation that will attract coastal wetland birds and wildlife.
- At the **Ponds behind Erie Pier** project, nearly 43,000 cyd of contaminated sediment was removed for disposal in an off-site landfill, along with 275 cyd of contaminated upland soils. A 60-foot causeway opening was installed to improve hydrologic connectivity and fish habitat.
- Pelletized activated carbon was broadcast to remediate over 55,000 cyd of dioxin and furan contamination in the **Scanlon Reservoir**.
- At the **U.S. Steel-Spirit Lake project**, the following activities were completed this year: dredging of off-shore contaminated sediments, capping 33 acres of shallow-sheltered bay, grading and capping confined disposal facilities, and capping the Wire Mill Pond. Shoreline protection and trail construction along the shore were started.

More detail and pictures about each project can be found in their story maps at St. Louis River Area of Concern: Addressing the Loss of Fish and Wildlife Habitat and St. Louis River Area of Concern: Addressing Contaminated Sediments.

Figure 5. A volunteer seeds manoomin in Kingsbury Bay. (Photo credit: St. Louis River Alliance)

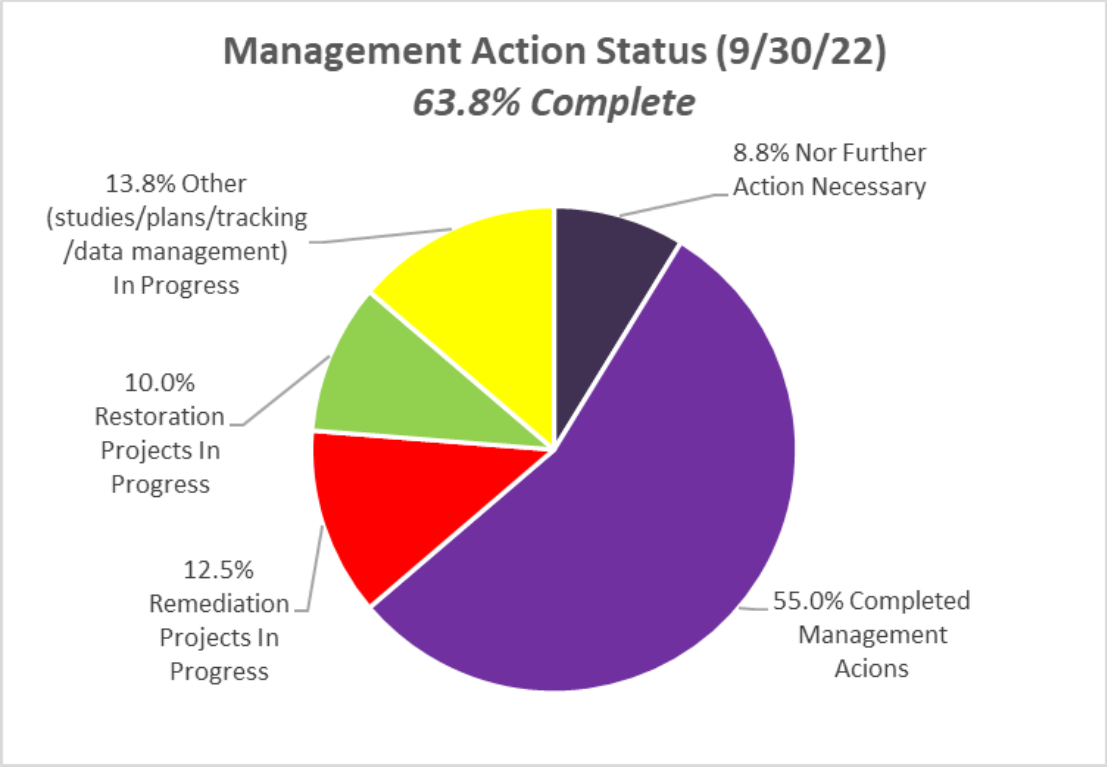

Figure 6. The multi-year, multi-agency efforts to clean up and restore the St. Louis River Area of Concern (SLRAOC) are showing tremendous progress.

Figure 7. The Fond du Lac Band of Lake Superior Chippewa, the Minnesota Department of Natural Resources, Minnesota Pollution Control Agency and the Wisconsin Department of Natural Resources are the four coordinating agencies leading the St. Louis River Area of Concern work. The St. Louis River Alliance is the designated citizens' action committee for the SLRAOC that works to protect, restore and enhance the St. Louis River.

St. Louis River One Watershed, One Plan

The St. Louis River One Watershed, One Plan was open for a 60-day review period, closing October 26, 2022. This plan was developed using existing local water management plans and priorities, Watershed Restoration and Protection Strategies (WRAPS), existing and new studies and data and other related plans from state agencies to help target protection and restoration work in the watershed.

Funding Sustainability

The Great Lakes and St. Lawrence Cities Initiative and the National Oceanic and Atmospheric Administration's Office for Coastal Management funded *An Assessment of Coastal Resilience in Great Lakes Communities* report

that was prepared by the University of Michigan, School for Environment and Sustainability. The report found that Minnesota has the most funding opportunities (27) of any of the states or provinces. This is due to Minnesota's additional state revenue through the Legacy Amendment, a publicly led and supported state sales tax of 0.38 percent that is appropriated into the Clean Water Fund, Outdoor Heritage Fund, Arts and Culture Fund, and the Parks and Trails Fund. This funding has totaled over $1232.8 million into the Clean Water Fund alone since the tax was enacted in 2009. Minnesota is the only Great Lakes state to have a tax with this structure that supports clean water projects.

Other Restoration and Sustainability Projects

- **The Coastal Nonpoint Source Restoration and Protection** program helps to restore and protect the water quality of Lake Superior and its tributaries, which are among Minnesota's most outstanding natural resources.
- **Forestry Best Management Practices for Clean Water** have been developed by the DNR and partners to minimize and prevent water quality problems associated with timber harvest and management. The project also monitors watersheds, harvest frequency and forest changes.
- **Manoomin Restoration** – Manoomin/Psiŋ (wild rice) is a sacred plant for Native peoples throughout the Great Lakes region. Manoomin has been declining due to multiple environmental stressors. Wild rice restoration continued this summer across the St. Louis Estuary. Project partners include the Fond du Lac Band of Lake Superior Chippewa, 1854 Treaty Authority, St. Louis River Alliance, Wisconsin DNR and Minnesota DNR. One of the challenges to wild rice restoration is depredation by geese. A Canada goose roundup was held for the Wisconsin side of the river near the Wild Rice bays. The City of Duluth now has a draft Goose Management Plan, which once revised and approved will allow partners to capture and dispatch geese within city limits. We are working to secure Minnesota DNR state permits to be able to work on the Minnesota side of the river but that will not happen this season.
- **Interstate Island -** The Interstate Island Wildlife Management Area restoration will be completed this year with the planting and protection of native dune vegetation.
- **Sea Lamprey** – Sea lamprey infestations cause recreational, economic and ecological damage—changing how residents and visitors use and enjoy Minnesota waters. Historically it was the most devastating invader in the Great Lakes. Before control efforts, lake trout populations were drastically reduced or extirpated. Current control efforts show the adult lamprey abundance index and wounding rate continue to be above targets.
    - Clarification is needed to determine if additional control efforts would be productive for achieving fishery objectives.
    - Based on current stock assessment modeling, sea lamprey kill more lake trout than humans.
- **Lake Superior Lakewide Action and Management Plan (LAMP)** - in association with the LAMP, MPCA staff are coordinating with the U.S. Geological Survey to monitor mercury in 21 U.S. tributaries to Lake Superior. Also, mercury isotopic analysis will be conducted in soil, leaf litter, and wet depositional areas across the U.S. portion of the basin. MDH secured funding to analyze fish for PFAS in water bodies within the Lake Superior Basin. USGS began monitoring PFAS and other contaminants in Lake Superior tributaries. Evaluation of contaminants in Lake Superior sediments was funded; the University of Minnesota Duluth's Natural Resources Research Institute will lead this effort. Sediment sampling is underway, with analysis to follow into 2022.

OBJECTIVE Two: Adopt and implement supply and demand management to promote efficient use and conservation of water resources.

Water Conservation During Severe Drought

Although the Lake Superior basin did not experience drought in 2022, by November 2022, nearly 80% of the state was experiencing persistent abnormally dry conditions to extreme drought. Public water suppliers implemented water use reduction actions with a goal of reducing water use to 50% above January levels.

- The weekly U.S. Drought Monitor map released Thursday, Oct. 27 shows:
  - 34% of Minnesota is experiencing abnormally dry conditions
  - 29% of the state is in moderate drought
  - 12% is in severe drought
  - 4% is in extreme drought
- Two watersheds remain in the Drought Warning Phase:
  - Minnesota River Watershed
  - Des Moines River Watershed
- One watershed has been placed in the Drought Warning Phase:
  - Missouri Little Sioux Watershed
- Seven watersheds remain in the Drought Watch Phase:
  - Missouri Big Sioux Watershed
  - Red River Watershed
  - Upper Mississippi Black Root Watershed
  - Upper Mississippi Iowa Skunk Wapsipinicon Watershed
  - St. Croix River Watershed
  - Mississippi River Headwaters Watershed
  - Upper Mississippi Maquoketa Plum Watershed

Municipal Water Supply Plans

The DNR works directly with cities and towns throughout greater Minnesota to ensure their water supply plans emphasize water conservation and efficient use. Minnesota has 16 water suppliers in the Lake Superior Watershed that are required to complete Water Supply Plans. In the Lake Superior basin, over 81% have been approved. Staff continue to work with cities to make final edits, since an approved Water Supply Plan is needed for MDH funding or prior to modifications to a DNR water appropriation permit. Thirteen cities have approved Water Supply Plans, including Duluth, the largest city. Only one community has not submitted a water supply plan yet. The remaining communities are in the final editing phase.

Status of review and approval of 10-Year Water Supply Plans for the Lake Superior Watershed

City	Approved Y/N	Date of last action or approval
Aurora, City Of	Y	3/22/21
Babbitt, City of	N	Edits sent back 10/15/2019
Carlton, City Of	Y	12/19/16
Chisholm, City Of	N	Nothing received yet. Reminder sent 8/8/19
Cloquet, City Of	Y	6/22/18
Duluth, City Of - Public Works Dept.	Y	1/30/17
Eveleth, City of	Y	03/06/20
Gilbert, City Of	Y	1/8/2020

Grand Marais, City Of	Y	6/14/17
Hibbing Public Utilities	Y	7/8/2020
Hoyt Lakes, City of	Y	8/20/19
Mountain Iron, City Of	Y	10/15/19
Silver Bay, City Of	N	2/28/20 second draft received
Superior Water Light & Power Co.	Y	12/31/2019
Two Harbors, City Of	Y	12/19/16
Virginia Public Utilities	Y	5/22/19

Water Efficiency Grant Program

The Metropolitan Council was awarded a third water efficiency grant of $1,000,000 for July 1, 2022-June 30, 2024. The Metropolitan Council was able to increase their match to 90% and cities now only need to match 10%. The previous requirement of a homeowner contribution has been eliminated, to increase the equity of the program.

The funding goes to communities to replace older, less efficient products with EPA WaterSense and DOE EnergyStar labeled products. Examples of qualifying products include irrigation controllers, toilets, spray sprinkler bodies, irrigation system audits, and EnergyStar clothing washers. Thirty-seven communities participated in the 2019-2022 program. It is projected that over 11,000 devices will be replaced, resulting in over 456 million gallons of water saved.

The Metropolitan Council's Water Efficiency Grants provides incentives to encourage efficient water use and conservation. Funding is provided by the Minnesota Clean Water, Land and Legacy Amendment funds. At this time, there is no water efficiency grant program available in Greater Minnesota.

Efficiency in the Commercial, Industrial and Institutional Sector

The Minnesota Technical Assistance Program (MnTAP) is an outreach program at the University of Minnesota that helps businesses develop and implement industry-tailored solutions that reduce water use, prevent pollution, and reduce energy use and cost to improve public health and the environment. The 2022 cohort of 16 young professionals composed students from University of Minnesota, Twin Cities; University of Minnesota, Duluth; Macalester College and St. Cloud State University. These interns bring expertise from the fields of Chemical Engineering, Environmental Chemistry, Mechanical Engineering, Bioproducts and Biosystems Engineering, Biomedical Engineering, and Sustainable Systems Management. By implementing the recommendations identified by the 2022 interns, host companies could realize 68,700,000 gallons of water, saving $627,000.

Figure 8. The 2022 cohort of MnTAP summer interns who worked on projects to reduce water use and save other resources.

OBJECTIVE Three: Improve monitoring and standardize data reporting among State and Provincial water conservation and efficiency programs

Water Conservation Reporting System Fully Developed

The DNR has significantly improved the measurement and evaluation of water conservation and water use efficiency through a contract with Energy Systems Platform (ESP) to develop a new Water Conservation Reporting System. To our knowledge, it is the first and only statewide water conservation reporting system in the nation. The system is cloud-based for easy data entry and record management. The Minnesota Water Conservation Reporting System's annual reports help various sectors to learn more efficient and cost-effective ways to conserve our water resources. The data will continue to guide water use decisions in the future. As our population grows and climate changes, we may experience increased use and seasonal intensity of use in some parts of the state. Our efforts to strive for water efficiency and conservation in all sectors will help protect Minnesota's water supplies, industry, economies and natural resources well into the future.

Minnesota Permitting And Reporting System (MPARS)

Minnesota tracks water use from the water use reports entered by water appropriation permit holders into the Minnesota DNR Permitting and Reporting System (MPARS). This information is used to compile the withdrawal, consumptive use and diversion information reported to the Great Lakes Regional Water Use Database. For the broader Minnesota extent, the water use information is used in aggregate and detail form for planning, trend and change analysis purposes by DNR staff and other state and federal agencies.

Water Monitoring and Surveys Data

- The DNR and partner agencies monitor more than 1,200 observation wells across the state. These water level data are critical for water supply planning, to ensure sustainability of water resources and help prevent well interferences and water use conflicts.
- The DNR maintains a stream flow monitoring network of 271 gauges and nearly 1,000 lake level gauges. The DNR and other agencies use these data to evaluate trends and determine the frequency and magnitude of floods and low flows. They also help with assessing changes in land use and watershed conditions and potential effects of climate change.

- All of the streamflow, groundwater and lake level data are publicly available on the DNR website.
- Several gaging stations in the Great Lakes Basin have been improved. Live readings from these gauging stations can be seen on the DNR's Cooperative Stream Gaging website.

Mapping our Water Resources

- In partnership with the Minnesota Geological Survey, the DNR develops County Geologic Atlases. These detailed maps provide essential information for sustainable groundwater resource management, water allocations, permitting and well constructions. They inform water users, local governments and others about local aquifers, to help them plan for economic growth and protect water supplies for the future.
- The DNR is the lead agency for maintaining the state's ground elevation data, watershed data and the MnTOPO online topographic map resource. Local governments use these hydrography-related data to prioritize implementation projects identified in their watershed management plans.
- The DNR maintains maps of public waters and public ditch systems that require permanent vegetation buffers. Perennial vegetation buffers along rivers, streams and ditches help filter out phosphorus, nitrogen and sediment.

Lake Superior is Above Average Lake Level

According to the US Army Corps of Engineers, January through April saw significantly lower water levels than 2021, but then experienced steadily increasing water levels from spring runoff and rainfall from May through August. From August to September, Lake Superior remained steady near a level of 602.53 feet. The September monthly mean level was four inches above the September long-term average (LTA) level, six inches above the 2021 September level and eight inches below the record high September level of 2019.

The latest six-month water level forecast shows Lake Superior beginning its seasonal decline and continuing to decline into March 2023. From October to March, the forecast shows water levels five to seven inches above the past year's levels, two to four inches above LTA levels, three to 16 inches above Chart Datum, and 11 to 13 inches below record high levels.

OBJECTIVE Four: Develop science, technology and research

Watershed Health Assessment Framework

The DNR's online, user-friendly Watershed Health Assessment Framework is a mapping application that supports natural resource management through a comprehensive approach, emphasizing ecosystem health.

State of the Great Lakes – 2022 Report

The report notes that Lake Superior's forested watershed and coastal wetlands help maintain water quality and a healthy aquatic ecosystem. Lake Superior's status is assessed as Good and Unchanging. Lake Superior's treated drinking water and beaches also received a Good assessment. Fish consumption in Lake Superior received a Fair assessment. Over the past ten years, mercury levels and PCB concentrations in fish have remained stable in Lake Superior. Toxic chemicals and habitat and species assessments in the Lake Superior range from Fair to Good and Unchanging to Improving conditions. Among the Great Lakes, only Lake Superior has relatively good nutrient conditions, which helps to maintain a healthy food web. Additional assessment are available in the State of the Great Lakes report.

Biological Integrity Assessment Tool

The Lake Index of Biological Integrity Assessment tool compares the types and numbers of fish, plants or other aquatic life observed in a lake to what is expected for a healthy lake. The resulting score helps watershed managers target efforts to protect and restore water quality.

Lake Superior Coastal Program

The Minnesota program had several accomplishments from the past year:

- Six culvert replacement or removal projects have design and engineering plans ready to go, thanks to funding and support from NOAA, CSO and our program through the Great Lakes Nearshore Habitat project. Once in the ground, these culverts will allow safe passage for both trout and stormwater.
- The Coastal Management Fellowship position conclude this year. Because of her hard work and effort, we made huge strides in addressing coastal hazards, in particular coastal erosion; hundreds of miles of shoreline were mapped, new high quality videos and fact sheets on erosion exist and a flourishing community of practice continues to meet regularly.
- The DNR intentionally incorporated subject matter experts from local tribes and tribal agencies into our Annual grant review process. This is just one of several advancements we made in incorporating diversity, equity and inclusion into our grant making.
- The DNR successfully launched a Great Lakes Restoration Initiative funded project to pilot the use of living shorelines on Lake Superior. A consulting firm is working on the designs, stakeholders are meeting and we are strategizing around future outreach products.

OBJECTIVE Five: Develop education programs and information sharing for all water users

There are numerous educational programs dedicated to water conservation education and outreach for all water users in Minnesota.

Great Lakes Coastal Resilience Planning Guide

The Great Lakes Coastal Resilience (GLCR) Planning Guide is a hub of ideas, advice and resources. The Guide aims to connect members of the Great Lakes Coastal Communities through the use of case studies, local stories, climate and environment information, and GLCR Resources. Whether you are a homeowner, community/government official, or simply have an interest in Coastal Resilience, the GLCR Planning Guide can offer data, advice and connections to help solve the problems associated with coastal hazards. Learn more here (https://wicoastalresilience.org/great-lakes-coastal-resilience-planning-guide/).

"We Are Water" MN Traveling Exhibit

The popular "We Are Water" MN traveling exhibit and community engagement project examines water issues statewide and in local communities through personal stories, histories and scientific information. It strengthens Minnesotans' relationship with water, exposes visitors to new perspectives and increases participation in water stewardship activities. The 1,000-square foot, hands-on exhibit was created by the Minnesota Humanities Center, MPCA, Minnesota Historical Society, and Departments of Health, Agriculture and Natural Resources. Demand and enthusiasm for the "We Are Water" traveling exhibit remains high and cities are willing to make accommodations to make the exhibit available. In 2022, the exhibit toured across Minnesota in six locations.

- Jan. 20 – Feb. 28, 2022 - St. Paul State Capitol
- March 3 – April 25, 2022 – Winona
- April 28 – June 20, 2022 --- Lake City

- June 23 – Aug. 15, 2022 – Alexandria
- Aug. 18 – Oct. 10, 2022 – Fergus Falls
- Oct. 13 – Dec. 5, 2022 – Hastings and Eagan

Figure 9. The We Are Water traveling exhibit continues to be popular in every city that it tours.

Five additional tour locations have been selected for 2023. More information is available at Minnesota Humanities.

Nature-based Shoreline Protection Demonstration

The DNR (Coastal Program) is demonstrating the use of nature-based shoreline protection on Minnesota's Lake Superior coast. At five DNR facilities, "living shorelines" will combine vegetation and other natural materials to help protect the shore and the species living there from changing water levels and coastal erosion. This is a collaborative project with NOAA, with funding from the Great Lakes Restoration Initiative.

Certified Coastal Practitioner Courses

The Certified Coastal Practitioner™ (CCP) program provides participants with multidisciplinary instruction on comprehensive coastal management, defines the body of knowledge which reflects best practices for coastal professionals, and complements existing coastal licenses and educational programs. Earning the CCP designation distinguishes the coastal practitioner as having a broad knowledge base and understanding of the interrelationships among the different elements of modern coastal practice. In order to achieve the CCP credential completion of 10 courses is required. Learn more here (https://coastalzonefoundation.org/ccp-training/ccp-course-information/).

Water Conservation Social Media Posts

A series of social media posts was created and released this summer focusing on outdoor water conservation.

Minnesota's New Substantial Damage Playbook for Local Officials

The DNR Floodplain Program recently posted the Minnesota Post-Disaster Substantial Damage Playbook for Local Officials, a useful resource to help local officials know their responsibilities post-disaster.
Read the playbook here (https://files.dnr.state.mn.us/publications/waters/2022-mn_substantial-damage-playbook.pdf).

Learning Module: Water Equity and Climate Resilience for Frontline Communities

This Toolkit module is for utility leaders nationwide facing the first, and worst, water challenges—from flooding to drought to basement backups to water contamination and more—all of which are exacerbated by climate change. The Water Equity and Climate Resilience for Frontline Communities module is designed to help leaders at all levels within drinking water, wastewater and stormwater utilities and public works departments navigate these challenges, building their knowledge, skills and abilities to be changemakers for these complex problems. Within this part of the Tap into Resilience Toolkit is a set of resources curated to address the pressing needs of communities at the forefront of the struggle for clean, safe, healthy and reliable water services for everyone.
Learn more here (https://tapin.waternow.org/toolkit/#frontline).

Description of Minnesota's conservation and efficiency program implementation timeline

Minnesota continues to explore opportunities to expand our water conservation efforts, empower and inspire people to save water, and seek new ways to conserve water in all sectors of society. Water conservation in Minnesota is built on a holistic foundation of knowledge about comprehensive water use. The DNR partners with other organizations to promote sustainable water use and provide clear information about how much water we have, how much water is used, and how to safeguard surface and groundwater availability.

The state has water conservation measures that are currently in place and integrated with the water appropriations permit program. Water supply plans, for public water suppliers serving over 1,000 people, have been updated and include new and improved water conservation, monitoring and management standards. State law requires water conservation rate structures for public water suppliers within the Basin or a water conservation plan.

Ecological and Water Resources Division Strategic Plan 2018-2028

The Division's 10-year plan has a **water resources goal** of "Minnesota water resources will be managed and used sustainably and the water quality will be improved and protected."

Relevant strategies to accomplish our water resources goal include:

- Collecting, analyzing and sharing important data on the status and trends of Minnesota's waters and their use to support decision-making, permitting and awareness.
- Engaging water users and other stakeholders to address challenges and opportunities in water use, watershed function and impaired waters.
- Using a systems-based approach for water management and conservation.
- Ensuring our permitting responsibilities are carried out efficiently, effectively and consistently with regulatory authority.

Minnesota Water Conservation and Efficiency Program Strategies

Timeline is until 2025 unless noted otherwise.

Strategies for Municipal Water Suppliers serving over 1,000 people

- Expand Water Loss Control education and outreach.
- Encourage improved metering and advanced metering infrastructure (AMI).
- Investigate time-based rates during peak demand periods.
- Support additional building codes and irrigation ordinances that promote demand reduction.
- Promote education and behavioral water efficiency strategies.
- Revise the Statewide Drought Plan to better align with the Water Supply Plan.

Strategies for Commercial, Industrial and Institutional Sector

- Advocate for advance metering and additional sub-metering.
- Encourage technology upgrades to most water efficient technology – greening the grey infrastructure.
- Support building and water management improvements to capture water efficiency opportunities.

- Encourage adoption of commercial building water BMPs and benchmarking.
- Work with partners to expand and improve water efficiency and water reuse options.
- Encourage CII to integrate water storage and demand response where practical.

Strategies for Smaller Public Water Suppliers

- Participate in the Water Conservation Reporting System.
- Expand Water Loss Control education and outreach.
- Provide water conservation educational resources.
- Revise the Statewide Drought Plan to better prepare and assist small communities.

Strategies for Agriculture, Irrigation and Other Sectors

- Participate in the Water Conservation Reporting System.
- Promote agricultural water efficiency best practices.
- Promote golf course, sod production, and other irrigation efficiency practices and reuse.
- Encourage technology upgrades to most water efficient technology.
- Revise the Statewide Drought Plan to better prepare and assist the agricultural sector.

Strategies for Local Planning, Collaboration and Action

- Coordinate and promote water efficiency – showcase best practices.
- Continue to define local thresholds for surface and groundwater resources.
- Leverage sources of funding for implementation.
- Resilience Planning, Adaptation Training, and increased understanding of the implications of the Water-Energy Nexus and climate change.
- Advance local water conservation planning and implementation.
- Pursue near-term actions at the local level – rebate programs, etc.

Note: All underlined items are linked to the referenced websites

Lead agency and contacts

Minnesota Department of Natural Resources, Ecological and Water Resources Division (EWR) is the lead agency responsible for Minnesota's water quantity management and water conservation and efficiency programs. Contacts are:

- Tim Walz, Governor of Minnesota
- Jess Richards, DNR Assistant Commissioner jess.richards@state.mn.us 651-259-5025
- Randall Doneen, Conservation Assistance and Regulations Section Manager randall.doneen@state.mn.us 651-259-5674
- Carmelita Nelson, Water Conservation Consultant carmelita.nelson@state.mn.us 651-259-5034

Status of Minnesota's water conservation and efficiency goals and objectives consistent with Basin-wide goals and objectives

Compact § 4.2.2 calls for each state to develop goals and objectives. Minnesota has adopted the Compact's goals and the Council's objectives and satisfies this aspect of Compact § 4.2.2.

Water conservation goals in Compact Section 4.2.1 have been adopted in Minnesota Statutes section 103G.801. These goals include:

1. Ensuring improvement of the waters and water-dependent natural resources.
2. Protecting and restoring the hydrologic and ecosystem integrity of the Basin.
3. Retaining the quantity of surface water and groundwater in the Basin.
4. Ensuring sustainable use of waters of the Basin.
5. Promoting the efficiency of use and reducing losses and waste of water.

Water conservation objectives in Compact Section 4.2.1 have been adopted in Minnesota policy. These objectives include:

1. Guiding programs toward long-term sustainable water use.
2. Adopting and implementing supply and demand management to promote efficient use and conservation of water resources.
3. Improving monitoring and standardizing data reporting among state and provincial water conservation and efficiency programs.
4. Developing science, technology and research.
5. Developing educational programs and information-sharing for all water users.

Minnesota is actively moving forward with an increased emphasis on water conservation, not only with current water law, rules, policies and their implementation, but also with improvement plans that further both state and Compact goals. The laws cited and programs described below provide a framework for sustainable water management that promotes efficient use of the state's water resources. Statewide programs that monitor and protect water resources are managed by several Minnesota agencies, including the DNR, the Pollution Control Agency, the Department of Health, the Department of Agriculture, and the Board of Water and Soil Resources.

The DNR applies an adaptive approach to its water management, so that expanding scientific knowledge and improvements in technology lead to improvements in natural resource use and protection.

Water Conservation and Efficiency Program Overview

A. Citations to implementing laws, regulations and policies.

The statutes and rules listed below are available at http://www.leg.state.mn.us

Primary

- *Minnesota Statutes*, chapter 103A. Water Policy and Information
- Minnesota Statutes, chapter 103G. Waters of the State (primary regulatory statute)
- Minnesota Statutes, chapter 103G.271 Appropriation and Use of Water
- *Minnesota Statutes*, section 103G.801, Great Lakes – St. Lawrence River Basin Water Resources Compact
- *Minnesota Rules*, parts 6115.0600 – parts 6115.0600 – 6115.0810. Water Appropriations and Use Permits and Use Management Plans

Related

- *Minnesota Statutes*, section 103B. Water Planning and Project Implementation
- *Minnesota Statutes*, section 103F. Protection of Water Resources
- *Minnesota Statutes*, chapter 103H. Groundwater Protection
- *Minnesota Statutes*, chapter 103I. Wells, Borings and Underground Uses
- *Minnesota Statutes*, section 116B.01 Environmental Rights
- *Minnesota Statutes*, chapter 116D. Environmental Policy

B. Summary of program elements, both mandatory and voluntary

Since 2015, the DNR has had a full-time Water Conservation Consultant developing and implementing the statewide water conservation program consistent with laws, the Great Lakes Compact, policies and management objectives. Minnesota's water conservation program is integrated with permitting and planning requirements.

Mandatory

- **Permits:** A water appropriation (use or withdrawal) permit is required for all users withdrawing more than 10,000 gallons of water per day or 1 million gallons per year. The efficient use of water is required through the permitting process (*Minnesota Rules,* part 6115.0770). Applicants may be required to provide alternatives to proposed actions, including conservation measures to improve water use efficiencies and reduce water demand [*Minnesota Statutes*, section 103G.301, subd. 1 (b)(3).
- **Accuracy:** Water users must measure water volumes appropriated within 10% accuracy. Flow meters are required but other methods, such as timers or electrical use meters, can be approved for smaller water users.
- **Demand reduction measures:** Public water suppliers serving more than 1,000 people are required to prepare a Water Supply Plan every ten years that is approved by the DNR. In these plans, suppliers identify water demand projections, development plans, water sources, and demand reduction and conservation measures. The 2016-2018 plan template has a stronger emphasis on water conservation

and efficiency. All Water Supply Plans for public water utilities along Lake Superior and from the inland communities within the basin were due October 15, 2018.

- **Low Flow Suspensions:** Surface water use can be and has been suspended during low flow periods in Minnesota, to protect downstream water needs and resources. Published procedures lay out when surface water users will be suspended. The DNR considers suspension of surface water appropriation permits within 81 watersheds when the average daily flow has been at or below Q90 in the respective major watershed Minnesota for 120 hours. Decisions about suspensions consider, but are not limited to, whether the use is consumptive, the priority of the use, and the extent to which the use is contributing to the flow in the watershed. Ecologically-based low flow or water level thresholds can be and have been developed for some surface waters.

Voluntary

- The Water Conservation Reporting system is voluntary, with all municipalities (large and small), commercial, industrial and institutional, and irrigators and agricultural users asked to report their conservation efforts.
- Most public water suppliers provide water conservation information to customers on their webpage, through newsletters and other outreach and educational materials.
- Cities are encouraged to become U.S. EPA WaterSense Partners.
- *Minnesota Statutes* require demand reduction measures for new public water supply wells or increased water volumes.
- Some local governments have collaborated with private industry to offer water-saving fixtures and other items such as soil moisture sensors.
- *Minnesota Statutes* encourage the reuse of non-consumptive water and the evaluation of reuse options as part of applications for water discharge permits.
- On the DNR webpage, public water suppliers and residents are referred to the water conservation toolbox developed by the Metropolitan Council, in cooperation with the DNR, which contains water conservation tips and resources for individual water users and program guidance for public water suppliers.