Where Land and Water Meet

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Minnesota's laws and programs governing planning for water quality and quantity developed separately from laws and programs governing land use planning. Local governments exercise land use planning and permitting authority with little state oversight, while water planning and permitting is spread broadly across multiple state agencies, many of which work with local government implementers. Because of the physical function of watersheds, integration of these distinct land use and water planning processes is necessary to achieve water sustainability. Integration to improve water sustainability does not require overhaul of either the land use or water planning statutes. This article presents targeted statutory interventions designed to produce improved water sustainability outcomes.

Despite the pervasive visual presence of surface water, land use planning practice in Minnesota most often gives water quality and water availability a perfunctory glance. Background studies underlying land use planning decisions provide inventories of water resources, but often these inventories fail to influence development pattern choices. Shoreland zoning, required by Minnesota law, is implemented most often by adopting zoning regulations modeled on the state's outdated sample ordinance, last updated in 1999.

The value of water resources in traditional land use planning issues is crystal clear. Access to clean, safe drinking water is necessary for development. Economic development is strongly related to water-based recreation in many Minnesota communities. Ecosystem services, such as wetland functions that filter polluted water, enable least-cost drinking water treatment. Shoreland home prices can fluctuate with the cleanliness of adjacent water bodies. Agricultural irrigation and energy production are dependent on available water supplies.

An excellent overview of Minnesota water law is set forth by Professor Bradley C. Karkkainen in chapter five of *Water Policy in Minnesota: Issues, Incentives, and Action*. The following section summarizes the multiplicity of state and local entities with authority over water use, water quality, and water planning; the legislative foundations for their authority; their responsibilities; and their relationships with other entities:

The **Minnesota Department of Natural Resources (DNR)** was Minnesota's first environmental agency, established in 1931 as the Department of Conservation. The DNR has primary responsibility for inventorying and managing the state's public waters, as defined, including public water wetlands, and for regulating any activities that obstruct or

alter these waters, including dams, reservoirs, and other structures. The DNR establishes permissible lake or stream levels (known as ordinary high water levels). The agency is also responsible for water allocation and use, including groundwater appropriations. Water use permits are considered on a case-by-case basis, based on a statutorily defined order of priorities that gives the highest priority to domestic water supplies, followed by uses such as irrigation, power production, and similar uses. The DNR may suspend withdrawals during periods of low water levels or other shortages.

The **Minnesota Pollution Control Agency (MPCA)** has primary responsibility for water quality protection, as the administrator of the federal National Pollutant Discharge Elimination System (NPDES) program under a cooperative agreement with the EPA. As such, the MPCA is responsible for assessing the quality of all waters in the state and identifying impaired waters that fail to meet state water quality standards. The agency is required to develop a total maximum daily load (TMDL)—essentially an allowable pollution budget—for each impaired water body segment and a plan for achieving the TMDL goals. The MPCA conducts extensive monitoring of lakes, streams, and watersheds; manages stormwater permits for municipal and industrial users; and monitors groundwater quality. The agency also regulates the collection, transportation, storage, processing, and disposal of animal manure and other livestock operation wastes.

The **Minnesota Department of Health (MDH)** is responsible for protecting drinking water. The MDH is responsible for protecting drinking water quality, especially groundwater, under the federal and state Safe Drinking Water Acts. The MDH regulates well drilling by examining and licensing well contractors and overseeing the modification, repair, and sealing of wells. The MDH performs source water assessments for public water supply systems and administers the state's Wellhead Protection Program. The agency also establishes health risk limits for groundwater contaminants, working with the MPCA and the Department of Agriculture.

The **Minnesota Department of Agriculture** works with agricultural producers to promote best management practices (BMP) that are protective of water resources. The agency is responsible for regulating pesticides, fertilizers, and other agricultural chemicals under the Minnesota Pesticide Control Act.

The **Board of Water and Soil Resources (BWSR)** functions as the state soil conservation agency and is authorized to direct private land soil and water conservation programs through the action of soil and water conservation districts (SWCD), counties, cities, townships, watershed districts, and water management organizations. The BWSR is the primary source of guidance for local government, private landowners, and other partners on local water plans, wetland protection efforts under the Wetland Conservation Act, and soil and water conservation programs. Counties are not required to produce water plans, but the plans are a prerequisite for eligibility for the BWSR's Natural Resources Block Grant program, and all of the state's eighty-seven counties have plans in place.

The **Minnesota Environmental Quality Board (EQB)** has statutory authority to coordinate a statewide comprehensive long-range water resources plan every ten years. The *Minnesota Water Plan* (*Water Plan*) assesses the current status of Minnesota water resources and charts a course for the future. While the *Water Plan* does not detail specific steps or numeric goals for water sustainability, it does provide directional guidance for state agency and local government program and policy choices. One of seven key principles identified as necessary to protect and improve water resources is comprehensive land and water management. On this principle, the *Water Plan* states that "[s]ustainable water resources can be achieved when land and water are managed as a holistic system. Land and water must be viewed and managed holistically using a systems approach that recognizes their complex interconnections." EQB is also mandated to produce a five year water policy report.

EQB 2020 State Water Plan: Water and Climate

2020 State Water Plan.pdf

The purpose of the 2020 State Water Plan is to establish a framework for aligning state agencies, legislative priorities, and local government policy, programs and actions for the coming decade. EQB developed this plan to set an agenda for tackling the stubborn and complex water problems that climate change will intensify for Minnesotans. In preparation for this report, EQB convened state agencies, met with over 250 people from 44 public and private organizations, and conducted two informal surveys to learn about concerns related to water and climate and thoughts on what actions local and state government should take. The plan defines goals, strategies and actions. It highlights key water issues related to climate, but it is not an exhaustive list of the challenges we face or the solutions to implement. Ideas set forth in this plan can help establish priorities and inform decision-making, and they underscore the need to take actions with multiple benefits across several goals to move beyond our current trajectory.

> *Goal 1: Ensure drinking water is safe and sufficient*
> *Goal 2: Manage landscapes to protect and improve water quality*
> *Goal 3: Manage built environment and infrastructure for greater resiliency*
> *Goal 4: Manage landscapes to hold water and reduce runoff*
> *Goal 5: Promote resiliency in quality of life*

Along with the focus on climate change impacts, this ten-year plan includes acknowledgement of environmental justice issues (disproportionate impacts), tribal sovereignty and indigenous values. There is also a helpful timeline of key state legislation that has driven agency actions and policies around water resource management and protection:

A Look Back: Water Policy and Planning Highlights

1982: Metropolitan Surface Water Management Act is enacted, requiring local governments in the 7-County metro region to form watershed management organizations to plan for surface water management across municipal boundaries.

1987: County Comprehensive Water Planning Program is established, funding county development of water management plans.

1989: The Groundwater Protection Act is enacted, creating new incentives and requirements for state and local groundwater management.

1991: EQB prepares first decennial Minnesota Water Plan: Directions for protecting and conserving Minnesota's waters.

2000: EQB completes Minnesota Watermarks: Gauging the flow of progress, 2000–2010.

2008: Minnesota voters demonstrate their commitment to working together on water issues by passing the Clean Water, Land and Legacy Amendment.

2010: EQB completes Minnesota Water Plan: Working together to ensure clean water and healthy ecosystems for future generations.

2011: The University of Minnesota releases Minnesota Water Sustainability Framework, a comprehensive report designed to protect and preserve Minnesota's lakes, rivers and groundwater for the 21st century and beyond.

2014: Minnesota Nutrient Reduction Strategy outlines how Minnesota will reduce nutrient pollution in its lakes and streams and reduce the impact downstream. The strategy specifies goals and provides a framework for reducing phosphorus and nitrogen by an interim target date of 2025 and final date of 2040.

2014: Minnesota's Clean Water Roadmap sets long-range goals for Minnesota's water resources over the 25-year life of the Clean Water, Land and Legacy Amendment (through 2034).

2015: The Minnesota Legislature passes a law to protect water quality by requiring buffers on more than 100,000 acres of land adjacent to public waters and public drainage systems. EQB prepares Beyond the Status Quo Water Policy Report. Legislation directs state and local governments to accomplish a ten-year transition to use a Comprehensive Watershed Approach to achieve accelerated and coordinated water management (aka One Watershed, One Plan).

2017: Governor Mark Dayton asks Minnesotans for their input on how to increase the pace of progress toward clean water, setting a goal of 25% improvement by 2025.

2019: Governor Walz signs EO 19-37 establishing the Climate Change Subcabinet and the Governor's Advisory Council on Climate Change to promote coordinated climate change mitigation and resilience strategies.

Water | Minnesota Environmental Quality Board

EQB 2015 Water Report (example of an EQB five-year water report)

This report is organized as a menu of options to move beyond the status quo on water challenges Minnesota faces. It was developed and written by state agencies with the intent of providing a framework to continue a broad conversation on water policy with local and state implementation partners. The layout acknowledges that water challenges and solutions are interrelated and that the solutions described here are only some of the possible approaches to meet the following goals:

- Manage water resources to meet increasing demands
- Manage our built environment to protect water
- Increase and maintain living cover across watersheds
- Ensure we are resilient to extreme rainfall

Describes four types of solutions to change the status quo: voluntary (tools and incentives), regulatory (rules, ordinances, compliance & enforcement), system change (market forces, cultural expectations, governance, models and management structures), and more study (research, pilot testing).

Detailed assessments for the last report (2020) can be found at:

Appendix A: Five-year Assessment of Water Quality Trends and Prevention Efforts
EQB Water Policy Report – Appendix A - Five-year Assessment of Water Quality Trends and Prevention Efforts
Appendix B: Groundwater Monitoring Status Report
Groundwater Monitoring Status Report - Appendix B
Appendix C: Water Availability and Assessment Report
Water Availability and Assessment Report
Appendix D: Water Supply Planning in the Twin Cities Metropolitan Area (2005-2020)
Water Supply Planning in the Twin Cities Metropolitan Area (2005-2020): Findings, recommendations and continuing planning activities

Minnesota has taken two additional steps toward integrating water planning on a watershed scale: (1) adopting a watershed-based data collection and assessment system; and (2) authorizing local governments to integrate multiple local water plans under the "one-watershed, one-plan" legislation.

One Watershed, One Plan

One Watershed, One Plan | MN Board of Water, Soil Resources

103B.801 COMPREHENSIVE WATERSHED MANAGEMENT PLANNING PROGRAM.

Subd. 2.**Program purposes.**

The purposes of the comprehensive watershed management plan program under section 103B.101, subdivision 14, paragraph (a), are to:

(1) align local water planning purposes and procedures under this chapter and chapters 103C and 103D on watershed boundaries to create a systematic, watershed-wide, science-based approach to watershed management;

(2) acknowledge and build off existing local government structure, water plan services, and local capacity;

(3) incorporate and make use of data and information, including watershed restoration and protection strategies under section 114D.26, which may serve to fulfill all or some of the requirements under chapter 114D;

(4) solicit input and engage experts from agencies, citizens, and stakeholder groups;

(5) focus on implementation of prioritized and targeted actions capable of achieving measurable progress; and

(6) serve as a substitute for a comprehensive plan, local water management plan, or watershed management plan developed or amended, approved, and adopted, according to this chapter or chapter 103C or 103D.

The **Minnesota Water Sustainability Framework (Framework)** details necessary steps that need to be taken to achieve water use sustainability in Minnesota: "***that which does not harm ecosystems, degrade water quality, or compromise the ability of future generations to meet their own needs***." The state Legislature directed the University of Minnesota Water Resources Center to construct a framework describing what needs to be accomplished and how to get it done. The 150-page report present the 10 most pressing issues that must be addressed to achieve sustainable water use, presents strategies for what should be done, and provides recommendations for how to meet those challenges. It is the nation's first state-level plan for ensuring that waters will be preserved, protected and available for use by all citizens for generations to come.

Minnesota Water Sustainability Framework

The knowledge, insights and perspectives of hundreds of scientists and water management professionals, and the input from a wide range of citizens and interest groups, was compiled and synthesized. The Framework offers a step-by-step road map towards water sustainability, identifying problems holistically and offering concrete solutions based on current science and best practices.

Summary of Desired Future, Issues, and Strategies:

1. The need for a Sustainable and Clean Water Supply
2. Excess Nutrients and Other Conventional Pollutants
3. Contaminants of Emerging Concern
4. Land, Air and Water Connection
5. Ecological and Hydrological Integrity
6. Water-Energy Nexus
7. Water Pricing and Valuation
8. Public Water Infrastructure Needs
9. Citizen Engagement and Education
10. Governance and Institutions

Additional background white paper: **Recreational, Spiritual, and Cultural Uses of Water Technical Work Team Report**

Minnesota Water Sustainability Framework: Recreational/Spiritual/Cultural Technical Work Team Report

Minnesota Nutrient Reduction Strategy (NRS)

In 2014, Minnesota introduced a NRS to address the excess nitrogen and phosphorus, collectively known as nutrients, found in the state's waterways. The strategy was developed from the work of state, federal, and regional partner agencies and the UMN. The strategy documented and quantified the sources of nitrogen and phosphorus and their levels in Minnesota's water, set measurable goals for reducing nitrogen and phosphorus loads in water bodies both within and leaving the state, and identified a series of strategic actions to help the state accomplish those goals. It also provided a unified resource and platform for the many programs, from the federal to the local level, seeking to reduce nutrient pollution around the state. The NRS was developed from the work of state, federal, and regional partner agencies and the University of Minnesota (UMN), along with broader input, and describes:

- Nutrient conditions in Minnesota waters
- Sources of excess nutrients
- Goals and milestones for addressing in-state and downstream water nutrient levels
- Science-based solutions to reduce nutrient loss
- The magnitude of changes needed on the land
- Specific strategies for increasing nutrient reduction efforts
- Ways of tracking progress

Currently, the scheduled 10-year update is available for public review and comment at: Minnesota Nutrient Reduction Strategy | Minnesota Pollution Control Agency

Southeast Minnesota Nitrate Strategies Collaborative Work Group

"…The importance of clean drinking water is a value we hold in common and a value that was core to the Southeast Minnesota Nitrate Strategies Collaborative Work Group. We came together as a work group in July of 2024 to learn together and develop recommendations that we hope will address the complex challenge of nitrate contamination in our groundwater. The karst geology of southeastern Minnesota is uniquely susceptible to leaching from land practices, which can result in problems for our private wells and community water supplies." Many important practices are needed to keep drinking water safe, but reducing the leaching of nitrate over the long-term – stopping the problem at the source – is a crucial part of the solution.
Report of Recommendations: Southeast Minnesota Nitrate Strategies Collaborative Work Group

Minnesota DNR Groundwater Management Program's Draft Strategic Plan:

While DNR's legal responsibility is the management of large users of water, the DNR is also leading all Minnesotans toward sustainable groundwater use through the Draft Groundwater Strategic Plan (GWSP) for DNR's Groundwater Management Programs. The plan proposes strategies to:

- Improve information about our groundwater resources,
- reinforce partnerships to provide better support for sustainable groundwater use,
- improve compliance with existing groundwater regulations
- assure that permits for large water appropriations provide sustainable supplies of groundwater for future generations
- concentrate action in areas of high groundwater use and /or limited groundwater supply

Draft Strategic Plan for Groundwater management program

Vanishing National Shorelines Report 2023

This report was formulated out of discussions with non-profit organizational leaders and government (state and local) natural resource professionals concerned about the continuing loss of shoreline vegetation, which helps protect clean water, habitat, lakeshore character, and recreation.

About half of Minnesota's natural shorelines have already been lost, and natural shoreline continues to vanish at an alarming rate. We are degrading our lake water quality. Mowed shorelines allow 7 to 9 times more pollutants to enter the lake than a more naturally vegetated shoreline. These pollutants accumulate in lakes, often creating serious water quality problems while also promoting algal blooms and excessive aquatic vegetation. In addition, we are losing valuable habitat for fish – and loons, frogs, butterflies and more. We are losing the beauty of diverse shorelines and the unique character of Minnesota. It is critical that we act, and act now, to protect our vanishing healthy shoreline and recover what has been lost.

We know that the loss of natural shorelines is a problem. We know what we've been doing to address this problem is inadequate. Top-down control through rules, education, and enforcement is not enough. The magnitude of natural shoreline loss is clear and troubling. We have talked to many people and listened to their stories. The messages are clear and consistent. Riparian owners need more support on shoreline restoration and protection. Community leadership development has proven effective in shifting social norms and values; however, we could better coordinate and invest more deliberately in these efforts.

There are organizations and partnerships from neighboring states that might serve as models to help guide work here in Minnesota.

Minnesota's Vanishing Natural Shorelines: A Loss that Contributes to Degraded Lake Quality

Ecosystem Service Valuation

None of the state agencies listed above has a specific website or program focus on the use of ecosystem services valuation (ESV), although there are numerous examples of agency reports, plans, and legislative testimony that references how it is used to communicate information and affect decision-making. ESV is a tool for identifying and quantifying the benefits provided by the natural world to ensure they are included in the decision-making process at all levels, so that communities can mitigate risk, increase resilience, and protect their natural capital wealth.

The University of Minnesota (specifically, the Center for Science, Technology and Environmental Policy at the Hubert. H. Humphrey School of Public Affairs) is a recognized leader in interdisciplinary and community-engaged research on energy and environmental policy, including a focus on more efficient and equitable water policies through improved cost analysis. An example of their recent work was in response to Legislative Request for a report that quantifies the multiple benefits of clean water investments, for a review of equity considerations in clean water fund spending, and for proposing climate considerations in comprehensive watershed management plans:

CWC Report Formatted (Valuing state investments in clean water)

Another example of ecosystem service valuation is a study commissioned by the Fond du Lac Band, working with Earth Economics to provide an analysis of ecosystem services of the St. Louis River Watershed:
Earth Economics St Louis River Project Report.pdf

And if this curated listing of statewide and regional efforts to address better protection of our waters seems incomplete, the University of Minnesota has another Legislatively directed effort "to create a Clean Water Plan for Minnesota to proactively protect, restore and conserve water in Minnesota for human and ecological values and uses for the next 50 years."

50-Year Clean Water Toolkit_re-organized