Water Governance Evaluation

Recommendations to streamline, strengthen, and improve sustainable water management

2013 Report to the Legislature

Minnesota Pollution Control Agency

Legislative Charge

The statutory requirement for this report is found in Minnesota Session Laws, 1st Special Session, Chapter 2, Article 4, Section 33, which reads:

EVALUATION REQUIRED

(a) The Pollution Control Agency, in conjunction with other water agencies and the University of Minnesota, shall evaluate water-related statutes, rules, and governing structures to streamline, strengthen, and improve sustainable water management.

(b) The Pollution Control Agency must submit the study results and make recommendations to agencies listed under paragraph (a) and to the chairs and ranking minority party members of the senate and house of representatives committees having primary jurisdiction over environment and natural resources policy and finance no later than January 15, 2013.

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Contents

Acronyms and Abbreviations

AOC.....Area of Concern
BMP.....Best Management Practices
BWSR.....Minnesota Board of Water and Soil Resources
COE.....U.S. Army Corps of Engineers
CWA.....Clean Water Act
DNR.....Minnesota Department of Natural Resources
EPA.....U.S. Environmental Protection Agency
EQB.....Environmental Quality Board
FWS.....U.S. Fish and Wildlife Service
GLRI.....Great Lakes Restoration Initiative
ISTS.....Individual Sewage Treatment System
LID.....Lake Improvement District
LGU.....Local Government Unit
MAWQCP.....Minnesota Agricultural Water Quality Certification Program
MDA.....Minnesota Department of Agriculture
MDH.....Minnesota Department of Health
MGS.....Minnesota Geological Survey
MHB.....Mississippi Headwaters Board
MnDOT.....Minnesota Department of Transportation
MPCA.....Minnesota Pollution Control Agency
MRB.....Minnesota River Board
Minn. Stat......Minnesota Statutes
MS4.....Municipal Separate Storm Sewer System
NRCS.....Natural Resources Conservation Service
RDC.....Regional Development Commission
RRWMB.....Red River Watershed Management Board
SCS.....Soil Conservation Service
SWCD.....Soil and Water Conservation District
TMDL.....Total Maximum Daily Load
WCA.....Wetland Conservation Act
WMO.....Watershed Management Organization

Summary of Recommendations

The Minnesota Pollution Control Agency, in cooperation with other state water management agencies, the Metropolitan Council, and the University of Minnesota, has developed recommendations for improving Minnesota's system of water governance.

The Water Governance Evaluation project was authorized by the Minnesota Legislature in 2011 (Laws 2011, 1st Special Session, Chapter 2, Article 4, Section 33). The legislation specifies that the MPCA, along with other water-related agencies and the University of Minnesota, "shall evaluate water-related statutes, rules, and governing structures to streamline, strengthen, and improve sustainable water management."

Progress and Challenges

In the 40 years since passage of the 1972 Clean Water Act (CWA), it is unarguable that tremendous progress has been made toward cleaning the nation's waters, and Minnesota's policies and programs have been particularly effective in treating sewage, industrial waste, and other pollutants that damage water resources. The CWA's focus on – and funding for – cleanup of point source pollution has resulted in dramatic reductions in certain pollutants. For example, the amount of phosphorus released annually into the Minnesota River declined by 52% between 2001 and 2011, falling below the 2015 threshold established for phosphorus. It is estimated that water clarity is increasing in about a quarter of Minnesota's lakes, although it is declining in about 9%.

Despite success cleaning up point source pollution, it's well documented that too many of Minnesota's water resources remain impaired or are trending toward impairment. Non-point source pollution, drainage and overuse of groundwater supplies continue to continue to present challenges.

Minnesota's water governance structure includes six state agencies that are charged with distinct but interactive water management roles. These differing purposes (public health, natural resource conservation, pollution prevention, etc.) are considered an organizational strength within the system because of the diversity of responsibilities and professional skills that they provide. Some, however, view the system as uncoordinated, with multiple entry points and conflicting or overlapping policies and processes. The complexity of programs and permit requirements contributes to this confusion and frustration.

In recent years, the Clean Water Legacy Act of 2006, which established the Clean Water Fund and the Clean Water Council, and the 2008 Clean Water, Land and Legacy Amendment have served as powerful incentives for state agencies to collaborate and improve the integration of their programs. Collaboration is yielding results in areas as diverse as flood control and water retention, wetlands management, and groundwater assessment. However, aspects of Minnesota's water management system still confuse or frustrate many local units of government and citizens, resulting in continued calls for reform.

This study represents an effort by the state water management agencies to turn the spotlight on ourselves and seek opportunities to improve our policies, processes and requirements, in order to improve water quality and sustainable water supplies. Some of this report's recommendations will require legislative action to implement. Others are actions that can be initiated by state agencies themselves, including some reforms that are already underway.

Project Design

The project was organized and managed through the MPCA Commissioner's Office, with participation and assistance from the state agencies with primary responsibilities for water management. A work group composed of agency managers and senior staff held a series of meetings between June and October of 2012 to develop and test alternative governance models and problem-solving strategies. The University of Minnesota's Water Resources Center assisted with identification of relevant research and program models and with historical review. Project tasks included a literature review of the many previous water management and

policy studies, development of a timeline of water-related state and federal legislation, rules and programs, a survey of water program customers and agency staff, and a series of interviews with lead agency staff and other experts.

Presentations were also made to the Clean Water Council, Board of Water and Soil Resources, and the Local Government Roundtable, which includes representatives of local governments, watershed districts and soil and water conservation districts. Project staff coordinated their research and issue analysis with that of related projects (see Section 3 below).

It is important to note that this report focuses on three levels of water governance: state, regional and local. We do not focus on federal programs and policies, except in cases where jurisdictions overlap, such as wetland regulation. Federal programs provide a backdrop to state activities and are significant sources of legislative authorization and support, but are not the primary focus of this report.

Recommended Strategies

Recommendations are organized into two primary sections:

- Three strategies focusing on organization and delivery of water management services at the watershed, state and regional levels; and
- Four strategies organized around specific water resource topics.

A. Organizational Strategies

A.1. Implement Water Management at a Watershed Scale at All Levels of Governance

This strategy builds on the 2012 "one watershed – one plan" legislation to begin addressing the issues of multiple local units of government with overlapping and and "underlapping" responsibilities and differing levels of commitment to sustainable water management, as well as the scarcity of baseline funding for local water management.

Recommendations

- *Establish the 2012 "one watershed – one plan" legislation as the preferred option for local watershed management* outside the Metropolitan Area. The major watershed scale (Hydrologic Unit Code 8) will generally be the appropriate scale at which to align with other data collection, monitoring, protection and restoration programs. Establish incentives and explore transition models for conversion from existing local water planning authority/timeline to a "one watershed – one plan" within the next decade.
- *Outside the Metro area, complete the transition to a "one watershed" scale for future TMDLs as designed in Minn. Stat. 114D using the major watershed scale.* TMDLs going forward will address impairments more comprehensively rather than pollutant-by-pollutant, and will in most cases be incorporated into locally developed Watershed Restoration and Protection Strategies (WRAPS). This approach will more effectively bridge the gap between local watershed plans and state-led planning efforts.
- *Define essential watershed management services for defined watershed outcomes* and ensure that the resources necessary for local governments to cooperatively provide these services are available. This may include actions such as the following:
  - ~ *Create/modify limited local government authority to levy for water management purposes.* Local governments – potentially working together to share services across county boundaries – need the resources to take responsibility for water resources planning and implementation. Improving matching sources for state funding expands commitment to actions locally.
  - ~ *Expand delegation of some state regulatory authorities* to those local governments or aggregated local units of government/regional entities with demonstrated capacity and interest. Criteria would have to be established to ensure that an LGU had sufficient capacity, commitment and performance.

Programs or areas for potential delegation include wetland regulation (discussed under B.1 below) and construction-related erosion/sediment control regulation, an area where county, city, state, and watershed organizations may have overlapping and inconsistent roles for permitting.

~ *Explore the ways that existing clean water funding can be "packaged" at the watershed or regional scale*, as part of a shift from the "program" approach to the "systems" or "watershed" approach. Explore performance-based standards for funding.

~ *Assess how local water plan and watershed district advisory committees can further interact with NRCS Local Work Groups* to guide conservation efforts and implementation at both the county and watershed scale. There may be some opportunities to further coordinate water plans, watershed district plans and NRCS LWG planning efforts.

Funding will be a challenge associated with any further delegation of state authority. Absent additional funding, some existing programs that are implemented at the local level could benefit from exploring different models for delivery such as performance-based annual reporting by local government units rather than individual action reporting for shoreland, flood plain programs and wild and scenic rivers programs, for example.

A.2. State of Minnesota Responsibility: A Synchronized Approach to Water Management

This strategy addresses the long-standing issue of differences and inconsistencies among state water management agency rules, statutes and processes, dating back to the disparate origins and purposes of each agency. While the current system has its strong points, and while interagency collaboration and coordination have increased, a cooperative approach can't reconcile the underlying differences among agency authorities, missions and purposes.

Recommendations

Synchronize the state agencies' water management programs into a Water Management System, creating a more formal mechanism for lateral coordination among agencies and as a basis for continuing realignment and streamlining of water programs. This system would be designed to "virtually" organize and coordinate water programs, while retaining much of the current division of responsibilities among state agencies.

An effective Water Management System would be charged and empowered to:

- *Focus on and resolve conflicts, eliminate inconsistencies and set broad policy directives* for all state agencies engaged in water management.
- *Develop initiatives to streamline, integrate, transfer or delegate related processes, programs and activities.*
- *Develop a system for coordinated delivery of state water management services, using continuous improvement processes and models.*

Essential tasks for a Water Management System would include:

- Developing an *overarching set of principles* for water management.
- *Assessing state programs* as to whether they align with a watershed-based approach. Re-orienting state agency programs to a watershed focus, where feasible.
- *Reporting to the legislature on a regular basis* (at a minimum, every four years coinciding with gubernatorial terms) on the progress and next steps needed to further realign and streamline policies and programs, and on the initiatives that it intends to pursue.

Various organizational models for a Water Management System are feasible, but it will be critical to have a commitment from all state agencies, informed by the Governor's office.

Other responsibilities of a Water Management System could include:

- *Alignment of technical systems* such as water monitoring data and other databases (as in the current water portal initiative).

- *Interagency lateral teams that would work on priority issues as they emerge* – for example, wetlands and groundwater policy have already been identified as issues in need of attention.
- Analysis and recommendations for *resolving conflicting water statutes and rules* through legislative changes.
- *Assuming responsibility for the State Water Plan* (currently an EQB responsibility under Minn. Stat. ch. 103B.151).
- *Defining, managing and implementing process redesign and continuous improvement efforts*.

A.3. Improve Delivery of Water Management Services at the Regional Scale

This strategy addresses the service delivery gap that exists in exists in much of greater Minnesota between the state agencies dealing with water management and local governments. Some regional entities have filled this gap effectively, and state agencies can be more effective where regional structures exist. However, there is as yet no agreed upon model or vision for the most effective "scale" for delivering state water-related resources and services to local governments

Recommendations

- *Charge the Water Management System with exploring regional organizational models* for existing state agency programs and staff to deliver state water management services in Greater Minnesota, considering both major watershed and larger basin-level possibilities, based on the nature of the water resource and other factors such as population and economic base. The following directions should be pursued:
  - *Establish clear lateral points of contact between staff* within the water management agencies so that communication and issue resolution can occur at the lowest staff level. Clarify roles and provide training for staff.
  - *Explore co-location of state agencies in each region as a long-term goal.* Where financial and structural barriers to co-location exist, explore models for "virtual" co-location, including regular regional meetings, regular and inclusive communication, and work-sharing among agencies.
  - *Work with state agency staff to shift their focus toward watershed management*, in tandem with local government units.
  - *Assess the need for and work to develop new regional entities that can deliver water management services geared to regional needs.* Each region will have differing options and potential organizational models, depending on the nature of their resources, economic drivers, and management issues. Regional Development Commissions (RDCs) already exist and could be revitalized to play an increased role in water management.
- *Define and establish a coordinated cycle of monitoring, planning and implementation,* working with the MPCA's ten-year watershed water quality assessment cycle. The MPCA, DNR, BWSR and MDA are already working to develop this structure.

  This coordinated cycle/structure is still being refined, but as currently envisioned, the ten-year monitoring cycle would incorporate several phases, with the appropriate agency taking the lead, and each of the others contributing where appropriate. (Primary roles are shown below, but the other agencies participate as well):
  - *Surface water monitoring and assessment* (MPCA lead, DNR, MDA)
  - *Watershed characterization and problem investigation* (MPCA coordinates, LGUs as convener and contractor)
  - *Watershed restoration and protection strategies* (MPCA initiates, LGUs as convener and contractor , BWSR expectations/guidance, DNR technical assistance)
  - *Groundwater management* (multi-agency effort, DNR lead)
  - *Comprehensive watershed management plan* (LGUs lead and convene stakeholders; multi-agency participation; BWSR approves and coordinates)
  - *Ongoing implementation activities,* including state regulation, TMDLs,

technical and funding assistance from federal, state and local sources, and local land use controls

B. Resource-Based Strategies

B1. Public Waters and Wetlands: Improve Alignment of Statutes, Rules, and Regulatory Processes

Wetland regulation is widely recognized as one of Minnesota's most complex areas of water governance. The multiple and complex regulation of wetlands and other water bodies by federal, state, and local jurisdictions for varying authorities and purposes continues to baffle many local partners and applicants.

Recommendations

- *Clarify the boundary between Public Waters and WCA wetlands, and streamline the permitting process.* Explore the potential to modify public waters and wetland regulations to reduce complexity through realigning jurisdictional boundaries, establishing cooperative agreements or other strategies.

  This approach has been discussed in the past, however, finding an appropriate balance between streamlining wetland regulations without further weakening wetland protection has been elusive. Discussions of these issues going forward will need to involve local units of government and other partners.
- *Ensure consistent enforcement authority among state agencies* – the DNR currently lacks authority to issue administrative penalty orders (APO), but can issue stop-work orders, unlike MPCA. Consistent authorities across agency programs would reduce enforcement inconsistency and clarify permittees' expectations for compliance.
- Charge the Water Management System to work with U.S. Army Corps of Engineers (COE) to explore either *assuming the Clean Water Act, Section 404 permitting authority at the state level or broadening use of federal general permits.* COE has already developed a number of Minnesota General Permits that are essentially deferrals to the state – if one complies with state requirements, the federal permit is issued automatically. This approach warrants further study.
- Consider the findings and recommendations of an ongoing study of *Water Permitting Processes For Transportation Projects*, required by the 2012 legislative session and being developed by DNR, MPCA and MnDOT staff, as a pilot for a synthesized approach to wetland permitting.
- Build on the findings and recommendations of the BWSR report, "*Supporting and Strengthening Implementation of the State's Wetlands Policy,*" required under Executive Order 12-04.

B2. Groundwater Management: an Interagency Consensus and Usable Withdrawal Standards

Minnesota is perceived as a water-abundant state, but many areas rely on groundwater and lack for adequate water supply seasonally or episodically. Groundwater doesn't fit neatly into a watershed management framework, since defining its extent and availability requires extensive subsurface research. Current permitting and review of groundwater withdrawals are not based on cumulative effects. Groundwater management authorities and technical expertise are widely dispersed among state agencies.

Recommendations

- Complete and institutionalize an *interagency framework for groundwater management* that clearly articulates how groundwater resources are governed and managed to provide sustainable supplies of clean water, including mapping and defining groundwater provinces. (Work is already underway in this area.)
- Explore establishing *water use thresholds or quantity-based standards for groundwater* that are understandable and enforceable, and that also address the interchange between surface and groundwater. Manage groundwater withdrawals proactively at the system level (cumulatively) rather than the current approach of resolving "water use conflicts" reactively.
- *Integrate water appropriations and well construction approvals* and provide proactive approvals and assessments.

- Consider expanding MDH's Special Well Construction Areas program to *limit the drilling of wells in areas of groundwater scarcity or potential health risks.* A recent project by the Metropolitan Council assessing the vulnerability of regional aquifers suggests one possible approach.*
- *Facilitate integrated technical groundwater expertise among agencies*. The Water Management System could be charged with improving and optimizing the use and priority of this depth of technical expertise.
- *Examine alternatives for wastewater and stormwater conservation/reuse*, including:
  - ~ Consistent policies promoting the reuse of water for appropriate purposes, to reduce the use of drinking water-quality water for non-potable purposes: better match the water source to the use.
  - ~ Consistent policies promoting the infiltration of stormwater, particularly in drinking water supply management areas, to recharge aquifers while protecting groundwater quality for drinking water. Groundwater recharge should be considered a downstream use and should be considered when developing stormwater infiltration projects.
  - ~ Explore management of aquifer systems as underground reservoirs, with surface water infiltration, similar to California's "conjunctive use" programs.
  - ~ Explore options and implications of underground injection or infiltration of treated wastewater for recharge.
  - ~ Consider modifying statutory priority for groundwater use for industrial processes to promote use of available surface water or reused stormwater/ wastewater.
  - ~ Consider means of managing reuse costs versus groundwater appropriations so that reuse might be more economically viable.
- Develop recommendations for i*ncreasing the focus on groundwater considerations* as part of watershed management/assessment, restoration and protection plans.
- Work with the industry to *develop and implement additional guidance to municipalities* to better manage water used for residential lawn irrigation to reduce waste and to increase efficiency.

B3. Effective Linkage of Land Use and Water Management

While the one watershed – one plan legislation envisions a synthesis of comprehensive plans, which are typically focused on land use, and water plans, it's important to recognize the challenges inherent in bridging this gap. The statutory authority for comprehensive planning and land use controls will remain with counties, cities and towns, even as water plans move towards a watershed-wide approach. Bridging the gap between water and land use plans will call for increased communication and collaboration between local government units and technical experts working in each field.

Recommendations

- *Strengthen the relationship between water authorities and land use authorities.* Counties and cities will need to work together (or with watershed districts, where present) to synchronize water planning recommendations with the implementation activities that cities and counties are authorized to undertake, such as land use plans and ordinances.
- *Strengthen incentives for local government units to combine and integrate water plans and land use plans.* (Eligibility for funding has been used effectively to encourage water planning throughout the state through BWSR's Natural Resources Block Grant program.)
- With support from local units of government, *begin development of a comprehensive watershed management act* that streamlines and enhances planning, implementation, targeting and, where appropriate, regulatory efforts for the non-metropolitan area of greater Minnesota.
- *Reconcile the timing and sequencing of Metro-area watershed and land use plans.* Currently, Minnesota Rules 8410 requires local governments to update their water plans within two years of

*(See http://www.metrocouncil.org/environment/ WaterSupply/ CWFActivities/)

completion of any update to a Watershed District or Watershed Management Organization's water plan. Options that have been discussed include synchronizing local plan updates by major watershed (i.e., Minnesota or Mississippi) or dividing the Metro area into three planning /management areas for more effective management of local and watershed plan revisions and updates.

- *Refine state water and related land use regulatory efforts* (largely DNR's shoreland and floodplain programs) to increase the assessment of local government performance rather than focusing on individual land use applications.
- *Authorize DNR to complete the revised Shoreland rule adoption* and establish a timeline for local government implementation.

B4. Support and Strengthen Landowner and Land Occupier Efforts

While the quality of Minnesota's water resources has improved significantly over the decades since the federal Clean Water Act and related environmental legislation took effect, most of this improvement has come from control of point sources, while nonpoint sources largely go unregulated. (While the CWA exempts agricultural activities, other state and federal rules and regulations directly affect agriculture.)

Climate and land use changes are affecting water quality, quantity, and velocity. Additionally, loss of soil health through ongoing erosion is emerging as a significant issue.

Recommendations

- Some state agencies own and manage a significant amount of land. *Agencies should evaluate, monitor and benchmark their implementation of best management practices.* Examples include various agricultural practices on state-owned lands, and stormwater runoff/sediment control practices for construction activities for state-owned buildings, roads, trails, and similar facilities. Build on the results of the current study on streamlining water-related permitting for transportation projects (see under Section 3, Related Activities) and extend the findings to other state agencies.
- *Support implementation of the voluntary Minnesota Agricultural Water Quality Certification Program (MAWQCP)* under development by the MDA in consultation with the MPCA, DNR and BWSR. Monitor and audit the water quality results from the pilot areas that will be established under the program, ideally from a watershed perspective.
- *Revitalize and strengthen the implementation of the existing statutes for soil loss and soil health.* Updating the existing model ordinance, linking the existing statute to support incentives to encourage voluntary participation in the MAWQCP, and providing incentives and technical assistance for local governments that adopt soil loss ordinances are approaches to consider.

1. Introduction: Purpose and Need

The Water Governance Evaluation project was authorized by the Legislature during the 2011 special session. The statute specifies that the MPCA, along with other water-related agencies and the University of Minnesota, "shall evaluate water-related statutes, rules, and governing structures to streamline, strengthen, and improve sustainable water management."

In the 40 years since passage of the 1972 Clean Water Act (CWA), it is unarguable that tremendous progress has been made toward cleaning the nation's waters, and Minnesota's policies and programs have been particularly effective in treating sewage, industrial waste, and other pollutants that damage water resources. The CWA's focus on – and funding for – cleanup of point source pollution has resulted in dramatic reductions in certain pollutants. For example, the amount of phosphorus released annually into the Minnesota River declined by 52% between 2001 and 2011, falling below the 2015 minimum threshold established for phosphorus. Monitoring of the Minnesota River during the hot, dry summer of 2012 showed that dissolved oxygen levels were high enough to support fish and other aquatic life even during stressful environmental conditions like low flow and high temperatures. It is estimated that water clarity is increasing in about a quarter of Minnesota's lakes, although it is declining in about 9%.[1]

Despite success in cleaning up point source pollution, it's well documented that too many of Minnesota's water resources remain impaired or are trending toward impairment. Non-point source pollution, drainage and over-use of groundwater supplies continue to be major problems.

Minnesota's water governance structure includes six state agencies that are charged with distinct but interactive water management roles. These differing purposes (public health, natural resource conservation, pollution prevention, etc.) are considered an organizational strength within the system because of the diversity of responsibilities and professional skills that they provide. Some, however, view the system as uncoordinated, with multiple entry points and conflicting or overlapping policies and processes. The complexity of programs and permit requirements contributes to this confusion and frustration.

The system's complexity has resulted in numerous efforts to "streamline" water governance. Some of these efforts have resulted in consolidation or improved collaboration among state agencies and local units of government, while others have landed on the proverbial shelf.

In recent years, the 2006 Clean Water Legacy Act and the 2008 Clean Water, Land and Legacy Amendment, which established the Clean Water Fund, have served as powerful incentives for state agencies to collaborate and improve the integration of their programs. Collaboration is yielding results in areas as diverse as flood control and water retention, wetlands management, and groundwater assessment. However, aspects of Minnesota's water management system still confuse or frustrate many local units of government and citizens, resulting in continued calls for reform.

Despite these criticisms, it is important to recognize that many of Minnesota's environmental programs are well designed and managed, and some are considered among the best in the nation. It is not the intent of this report to suggest that all state water programs are failing or need to be restructured, but rather to seek opportunities for improvement while addressing identified issues.

This study represents an effort by the state water management agencies to turn the spotlight on ourselves and seek opportunities to improve our policies, processes and requirements, in order to improve water quality and sustainable water supplies. Some of this report's recommendations will require legislative action to implement. Others are actions that can be initiated by state agencies themselves, including some reforms that are already underway.

"The water management function in Minnesota state government is fragmented among a number of separate agencies. None of them have the authority and the responsibility individually to prepare or administer a statewide plan of water and related land resources development."

State Planning Agency, 1970

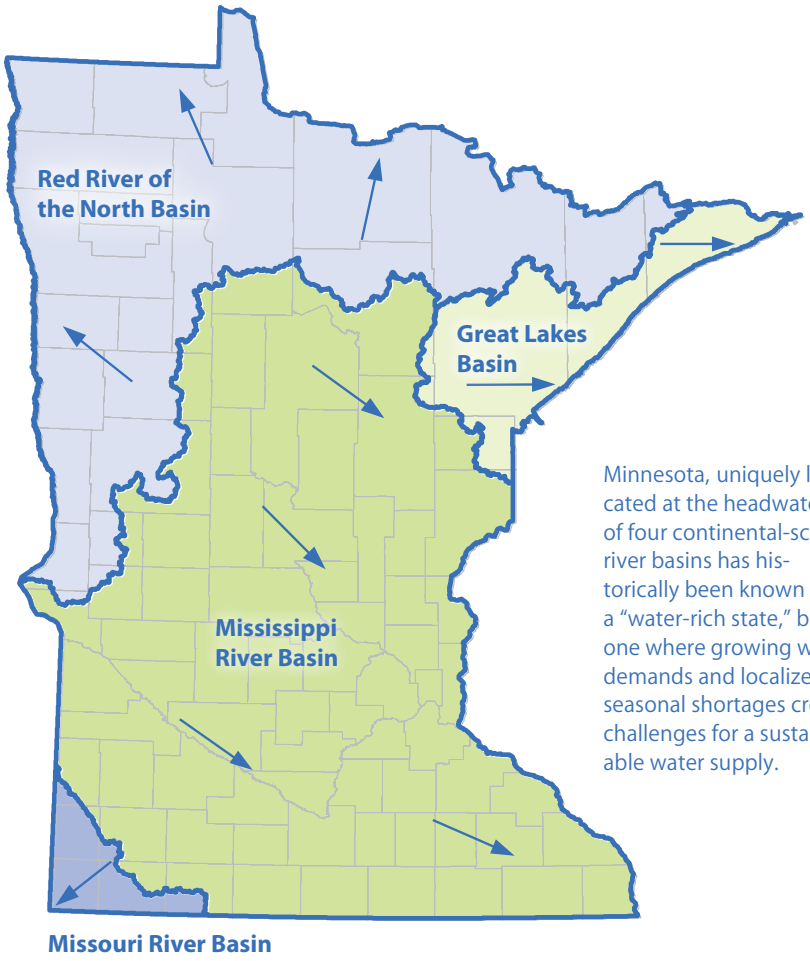
"The [water management] system meets the needs of various interest groups and gives them a voice in state government decision-making that they might not have with only one agency. Major decisions are made with full public scrutiny. Water resource issues are complex and far-reaching, and agencies dealing with agriculture, health, public safety, natural resource management and pollution control all have legitimate interests in them."

Minnesota Planning, Crosscurrents, 1996

Water in the Landscape

Minnesota's location at the head of four continental-scale river basins means that over 99% of the state's water comes from rainfall on our own land. Water in all its forms – lakes, rivers and streams, wetlands, drainage ditches, seeps, springs and fens, water in pipes and culverts, and groundwater resources in hidden aquifers – is a dominant presence in Minnesota's landscape. The management of water resources has a profound impact on the visible landscape. Likewise, land use practices are among the primary determinants of water quantity and quality.

Minnesota's landscapes and water resources are highly diverse, encompassing agricultural, forested, urban and suburban environments. Water management programs operate across these landscapes in a variety of ways. The profiles interspersed throughout the following pages illustrate successful water management collaborations that reach across watersheds and among various agencies, levels of government, and other partners, demonstrating some of the principles discussed in this report.



Minnesota, uniquely located at the headwaters of four continental-scale river basins has historically been known as a "water-rich state," but one where growing water demands and localized or seasonal shortages create challenges for a sustainable water supply.

Source: Minnesota Historical Society

Water and its many uses have long been critical to Minnesota's environment, economy, and sense of place.

Water in the Landscape: First and Second Fulda Lakes

The restoration of the First and Second Fulda Lakes in Murray County, Southwest Minnesota, exemplifies the multiple partnerships, funding sources, and actions needed to improve water quality and fish habitat in this intensively farmed region. In the early 2000s, the First and Second Fulda Lakes were suffering from severe algae blooms, loss of rooted aquatic vegetation, loss of migratory waterfowl, rough fish impacts, reduced water clarity, and flooding. Concerned citizens approached the Heron Lake Watershed District (HLWD) seeking both financial and technical assistance to restore the lakes. HLWD staff began to identify projects and seek funds for restoration efforts.

Multiple projects implemented over the past decade have solved many of the lakes' water quality and habitat problems.

A nine-acre corn and soybean field was located within the city limits. Runoff from the field, combined with stormwater from a fertilizer plant located across the highway, had flowed directly through open tile intakes into Second Fulda Lake. In August 2000, the HLWD purchased the property, replaced the open tile intakes with alternative rock inlets, and seeded the parcel into native grasses and forbs. In addition, the fertilizer plant placed a berm around its property to keep stormwater on site.

On the west side of the lakes are two 30-inch surface intakes that ran below ground to convey water from the surrounding area directly into the lakes. The area around these intakes was steep and highly erodible. The Fulda Fish and Game Club, Bondin Township, and the HLWD worked together to raise the intakes to provide some water storage and seed the sensitive area around the intakes into native grass through the Conservation Reserve Program (CRP).

Beginning in 2002, landowners in the drainage area upstream of the lake system were involved in a project to improve Judicial Ditch #13. As a result of the improvement process, grass filter strips were installed along the entire system, open tile intakes were replaced with rock inlets, and a wetland restoration was completed at the outlet, with 50 percent of the cost funded by the US Fish and Wildlife Service (USFWS).

In March of 2006, the Minnesota Department of Natural Resources (DNR) began lay-

Sources:

Environmental Initiative 2012 Awards: http://environmental-initiative.org/projects/environmental-initiative-awards/2012-awards-finalists/a-grassroots-effort-to-bring-back-the-fulda-lakes

Heron Lake Watershed District: http://www.hlwdonline.org/hlwd/

Image: GoogleEarth

ing the groundwork for a lake reclamation project. The fixed-crest dam on the outlet of the lakes had begun to fail, presenting Murray County, lakeshore landowners, concerned citizens, and the DNR with a unique opportunity to identify replacement structures and management options to improve the lake. The result of the process was unanimous support for a temporary drawdown, construction of a variable-crest dam, and the installation of a fish barrier at the lake outlet. In addition, chemical treatment (rotenone) was done on the tributaries to the lakes, as well as the lake system to eliminate rough fish. In the spring of 2009, the lakes were stocked with walleye fry, bluegills, and largemouth bass.

In 2007, the HLWD was awarded an EPA 319 grant for the Fulda Lakes Best Management Practices (BMP) Project. Through this grant the HLWD and partners were able to install a critical area planting, shoreline restoration, and provide incentives to farmers who practice conservation tillage on their land.

The HLWD also partnered with lakeshore landowners, Heritage Society members, Murray County, the City of Fulda, and the Department of Natural Resources (DNR) to conduct three shoreline restoration projects. Projects ranged from a simple filter strip to a complex restoration that involved a complete bank stabilization using all bioengineered practices.

Stormwater from the east side of the City of Fulda dumped directly into the lake, with a considerable amount of shoreline erosion near the outlet structure. The HLWD and project partners faced several challenges with the steep slope, small area, and very large cottonwood trees along the lakeshore. In the summer of 2011, the outlet was modified, allowing water to drop into a manhole and then travel across rip rap and a zero-grade vegetated swale for treatment. Water is allowed to enter the lake over an area protected by rock to prevent erosion.

In 2011, the HLWD applied and received funding for a phosphorus reduction initiative in the City of Fulda. With these funds, the HLWD hopes to instill a sense of personal responsibility for the two lakes in the Fulda area by building awareness among students, 4-H members, Master Gardeners, landscapers, of effects of water pollution to the Fulda Lakes. The initiative involves classroom presentations, hands-on installation of five rain gardens, and a tour of the rain gardens at the end of the grant period. Work began on this effort in early 2012.

Shoreline restoration around Fulda Lakes

Photo: Heron Lake Watershed District

Water quality improved greatly as a result of the drawdown, fish kill and reclamation projects, and education. When the water quality monitoring data from 1997-2002 is compared to the 2010 data, improvements are noticeable.

First Fulda Lake:

- Total suspended solids (TSS) decreased by 72 percent
- Turbidity decreased by 51 percent
- Chlorophyll A decreased by 62 percent
- Ortho Phosphorus (OP) decreased by 70 percent
- Total phosphorus (TP) decreased by 45 percent

Second Fulda Lake:

- TSS decreased by 72 percent
- Turbidity decreased by 73 percent
- Chlorophyll A decreased by 70 percent
- OP decreased by 80 percent
- TP decreased by 56 percent

Fulda Lakes have a maximum depth of seven feet. Since 2008, water clarity readings from both lakes have been documented to the bottom of the lake throughout the year.

2. Project Design and Scope

The project was organized and managed through the MPCA Commissioner's Office, with participation and assistance from the state agencies with primary responsibilities for water management (see List of Contributors). A work group composed of agency managers and senior staff held a series of meetings between June and October of 2012 to develop and test alternative governance models and problem-solving strategies. The University of Minnesota's Water Resources Center assisted with identification of relevant research and program models and with historical review. Project tasks included a literature review of the many previous water management and policy studies, development of a timeline of water-related state and federal legislation, rules and programs, a survey of water program customers and agency staff, and a series of interviews with lead agency staff and other experts. Survey results are summarized in Appendix C.

Presentations were also made to the Clean Water Council, Board of Water and Soil Resources, and the Local Government Roundtable, which includes representatives of local governments, watershed districts and soil and water conservation districts. Project staff coordinated their research and issue analysis with that of related projects, described below.

It is important to note that this report focuses on three levels of water governance: state, regional and local. We do not focus on federal programs and policies, except in cases where jurisdictions overlap, such as wetland regulation. Federal programs provide a backdrop to state activities and are significant sources of legislative authorization and support, but are not the primary focus of this report.

3. Related Projects and Activities

Several parallel evaluations or pilot programs related to water governance are being developed within the Executive Branch while this project is underway.

- Under Executive Order 11-32, the *Environmental Quality Board (EQB)* is directed to evaluate and make recommendations on how to improve environmental review, environmental governance and coordination. In addition, the EQB is charged with preparing an environmental and energy report card for the State, and organizing and hosting an environmental congress focused on the current state of Minnesota's environment. A series of citizen forums around the state were held in late 2012, leading up to the environmental congress, scheduled for March 2013.
- Under Executive Order 12-04, the *Board of Water and Soil Resources (BWSR)* is directed to evaluate and develop recommendations to improve current wetland protection, restoration, and mitigation provisions, including opportunities to improve coordination of wetland regulatory efforts between state and federal agencies.
- The *Minnesota Agricultural Water Quality Certification Program* was initiated in 2012. The effort aims to accelerate voluntary adoption of on-farm conservation practices that enhance water quality. It is the product of a state-federal partnership that includes the Minnesota Department of Agriculture (MDA), the Minnesota Pollution Control Agency (MPCA), the Minnesota Board of Water and Soil Resources (BWSR), the Minnesota Department of Natural Resources (DNR), the U.S. Department of Agriculture's Natural Resource Conservation Service (NRCS), and the U.S. Environmental Protection Agency (EPA).

  Program details are being developed cooperatively, but the general concept is that farmers who implement and maintain approved conservation plans will be assured that their operations meet water quality goals and standards. So long as

the participating farmers meet program obligations, they will not be required to implement additional water-quality practices for the duration of their certification. Conservation plans for participating farms would be developed by a qualified team of experts with consideration given to the unique characteristics of the farm, the farming practices, the surrounding watershed, and the region in which the farm is located.

- A legislatively required report on *streamlining water-related permitting for transportation projects* (Laws 2012, Chapter 287, Sec. 63) is being prepared by an interagency team that includes BWSR, DNR, MPCA and Minnesota Department of Transportation (MnDOT). The agencies are charged with making recommendations for creation of a single point of issuance system for water-related permits for transportation projects.
- *A Legislative Rules Report* required by the legislature (Laws 2012, Chapter 238, Sec. 3) for BWSR, the EQB, DNR, MDA and MPCA will identify any rules recommended for repeal, describe the rationale for those rules the agency believes should remain in effect, and suggest changes that would improve the agency's ability to meet the regulatory objectives of the rules while reducing unnecessary burdens on regulated parties.

Streambank stabilization and shoreland restoration with native plants are among the best management practices being used to address non-point source pollution of Minnesota's lakes and streams.

Water in the Landscape: St. Louis River Estuary – From Area of Concern to Area of Recovery

St. Louis River Estuary viewed from a Duluth hillside

Photo: Diane Desotelle, MPCA

The St. Louis River Estuary is home to a diverse ecological system where people can fish, bird, paddle, and hike alongside the largest international port on the Great Lakes. Flowing 179 miles through a 3,634 square mile watershed within Wisconsin and Minnesota, the St. Louis River approaches the Twin Ports of Duluth and Superior and spreads into a 12,000-acre freshwater estuary characterized by numerous bays and islands. In this unique environment, near-wilderness lands transition rapidly to residential neighborhoods, parks, a downtown entertainment district, an industrial harbor and a major port. The area is like none other in the Great Lakes, but it has been greatly impacted by decades of industrial use prior to environmental regulation, when dumping waste on land and water was commonplace.

The river and harbor's legacy of industrial activity, such as steel mills, oil refining, coal tar and coking operations, paper mills and other wood products manufacturing, as well as the shipping of coal, grain, iron ore and taconite, left many contaminants behind. These "legacy" pollutants in sediment, filled wetlands and shallow bays, degraded habitat for fish and wildlife and contributed to human health risks. As a result of these and other concerns, the estuary has been designated as one of 43 Areas of Concern (AOC) in the Great Lakes region. The AOC includes the lower St. Louis River, the Nemadji River Watershed, and a portion of the southwest tip of Lake Superior. The Great Lakes Water Quality Agreement (GLWQA) as amended in 1987 called upon states, Canadian provinces, and the U.S. and Canadian federal governments to clean up these areas.

Nearly one-third of the estuary has been filled or dredged since the mid-1850s, and yet today it is one of the most biologically productive wetland complexes within the Great Lakes because much has already been done to help with its recovery, including:

- The establishment in 1978 of the Western Lake Superior Sanitary District (WLSSD) to treat sewage flowing into the lake;
- Controls in both Superior and Duluth to reduce wastewater overflows by separating combined storm and sanitary sewers,

Sources:

The St. Louis River Restoration Initiative (poster): http://www.lakesuperiorstreams.org/archives/slr/StLouisRiverBrochure_final.pdf

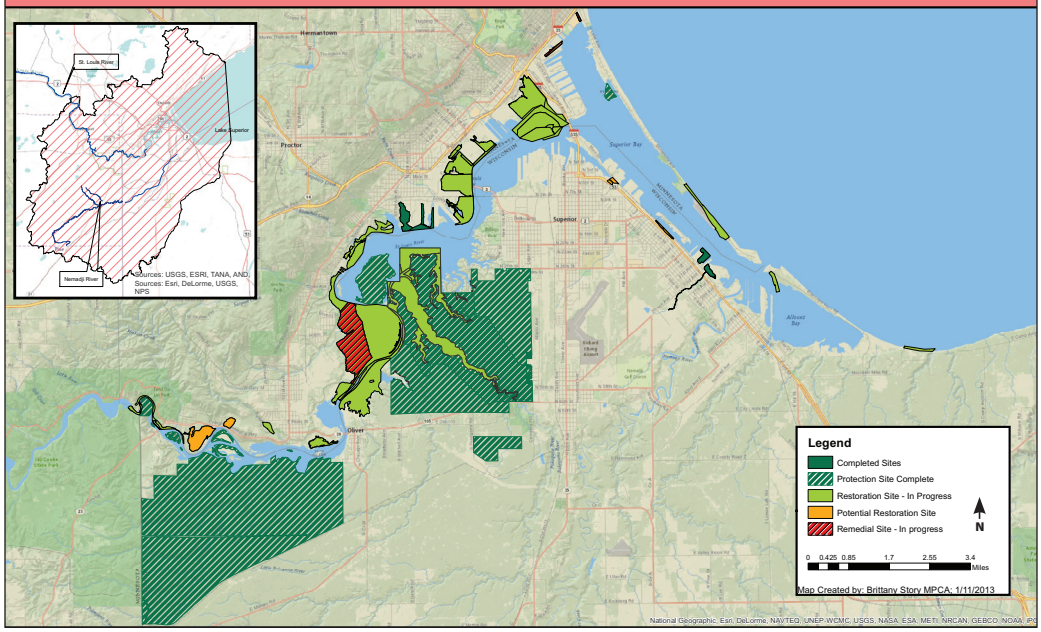
Sediment Contamination in the St. Louis River: http://www.stlouisriver.org/sed_committee.html

MPCA Sediment Studies: http://www.pca.state.mn.us/index.php?option=com_k2&Itemid=104&id=741&layout=item&view=item

EPA: Great Lakes Areas of Concern – St. Louis River: http://www.epa.gov/glnpo/aoc/stlouis.html#ci

St. Louis River Watershed: http://www.lakesuperiorstreams.org/streams/stlouis.html

From Area of Concern to Area of Recovery



building wastewater storage tanks, and educating landowners to help reduce stormwater inflows to the wastewater treatment system;

- Collaborative partnerships working together to review the AOC's history, collect and analyze data, and develop a remedial action plan; and
- The completion of several remediation and restoration projects to move the AOC toward recovery. Contaminated sediments and wood waste have been removed from sites such as Stryker Bay and Radio Tower Bay in Duluth and Hog Island in Superior. Wastewater collection system and storm sewer upgrades continue in the City of Duluth and sediments from navigation dredging are now processed for reuse in construction projects.

There is still much work to do, but well established bi-state and interagency partnerships, along with support from the citizens of Minnesota and Wisconsin, are helping to remove the nine beneficial use impairments (BUIs) identified by the GLWQA and delist the AOC. The BUIs include impairments related primarily to fish and wildlife habitat and health, contaminated sediments, and water quality and secondarily to beach closures and aesthetics.

An exciting effort known as the St. Louis River AOC Implementation Framework is now underway, with the goal of transforming the AOC to an "Area of Recovery" by 2025. Through a formal delisting roadmap, the Implementation Framework identifies specific actions and associated budgets necessary over the next 10 to 15 years to achieve this goal, including:

- project funding;
- collecting pre-construction baseline data;
- scoping project feasibility;
- developing engineering plans and construction specifications;
- performing construction;
- collecting post-construction data; and
- evaluating measurable indicators to document progress toward BUI removal and AOC delisting.

Minnesota is uniquely positioned to leverage federal Great Lakes Restoration Initiative (GLRI) funds along with the state's own Clean Water and Outdoor Heritage funds. Currently, the Implementation Framework and the data system development are being funded by GLRI and the Clean Water Fund. With federal support and collaboration among the coordinators and partners, the St. Louis River Estuary is on track toward recovery.

St. Louis River Restoration Initiative

ST. LOUIS RIVER ESTUARY
Area of Concern to Area of Recovery
A Framework for Delisting

AOC Coordinators

- Minnesota Pollution Control Agency
- Minnesota Department of Natural Resources
- Wisconsin Department of Natural Resources
- Fond du Lac Band of Lake Superior Chippewa

AOC Partners

- St. Louis River Alliance
- Minnesota Land Trust
- Lake Superior National Estuarine Research Reserve
- U.S. Environmental Protection Agency
- U.S. Fish and Wildlife Service
- U.S. Army Corps of Engineers
- Harbor Technical Advisory Committee

4. A Snapshot of Minnesota's Water Governance Structure

State Agencies

This section briefly summarizes the roles and responsibilities of the state agencies engaged in water management. Agency water-related statutory authorities and programs are also summarized in Appendix A.

The **Board of Water and Soil Resources (BWSR)** functions as the state soil and water conservation agency and is authorized to direct private land soil and water conservation programs through the action of SWCDs, counties, cities, townships, watershed districts, and water management organizations. The Board includes commissioners of the departments of Agriculture, Health, Natural Resources and the MPCA, local governments, and the University of Minnesota. BWSR is the primary source of guidance, oversight, and on-the-ground project funding for local governments, private landowners and other partners on local water plans, wetland protection efforts under the Wetland Conservation Act, and soil and water conservation programs.[2]

- The **Environmental Quality Board (EQB)** is charged with coordinating comprehensive long range water resources planning and policy through preparation of a Minnesota Water Plan every ten years (most recently in 2010). It also prepares a consolidated report on groundwater policy and water assessments every five years, consolidating reports by the MPCA, MDA, and DNR on assessment and analysis of: water quality and quantity; groundwater degradation trends; efforts to reduce, prevent, minimize and eliminate degradation of water; and surface and groundwater quantity. The EQB consists of nine state agency heads and five citizen members. Its structure and responsibilities are currently being studied as part of a larger environmental policy study under Executive Order 11-32 (see above under 3, Related Projects and Activities).
- The **Minnesota Department of Agriculture (MDA)** is statutorily responsible for the management of pesticides and fertilizer other than manure to protect water resources. The MDA implements a wide range of protection and regulatory activities to ensure that pesticides and fertilizer are stored, handled, applied and disposed of in a manner that will protect human health, water resources and the environment. The MDA works with the University of Minnesota to develop pesticide and fertilizer Best Management Practices (BMPs) to protect water resources, and with farmers, crop advisors, farm organizations, other agencies and many other groups to educate, promote, demonstrate and evaluate BMPs, to test and license applicators, and to enforce rules and statutes. The MDA has broad regulatory authority for pesticides and has authority to regulate the use of fertilizer to protect groundwater.
- The **Minnesota Department of Health (MDH)** is responsible for protecting drinking water quality under the federal Safe Drinking Water Act. The MDH regulates well-drilling by examining and licensing well contractors and overseeing the installation, modification, repair and sealing of wells. The MDH performs source water assessments for public water supply systems (facilities that serve more than 25 people on a regular basis) and administers the state's Wellhead / Source Water Protection Program. The agency also establishes health risk limits for groundwater contaminants, working with MPCA and MDA.
- The **Minnesota Department of Natural Resources (DNR)** was Minnesota's first environmental agency, established in 1925 as the Department of Conservation. The DNR has primary responsibility for inventorying and managing the state's public waters, 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 appro-

"Despite administrative complexity and the fragmentation and overlap that may occur among state water management agencies, Minnesota traditionally has supported a system of strong, competing agencies, each concerned with its own duties and specific goals. In political terms, an 'advocacy' system promotes competition and increases the public representation of each goal or interest and highlights political choices.

Conflicts and tradeoffs in such a system are meant to be solved through the political rather than the administrative process."

House Research Information Brief, 1986

"Minnesota's system of water governance is fragmented, incoherent, and poorly coordinated to the extent that it is failing Minnesota on all five principles by which the Citizens League evaluated the system" [Principles are transparency, effectiveness, equity, accountability and appropriate scale.]

Citizens League, 2009

priations. Water appropriations 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 industrial use. The DNR may suspend withdrawals during periods of low water levels or other shortages. The DNR also oversees shoreland and floodplain management, wild and scenic rivers, and lake and stream hydrology.

- The **Minnesota Pollution Control Agency (MPCA)** has primary responsibility for water quality protection, as the agency responsible for implementing much of the federal Clean Water Act in Minnesota. As such, the MPCA is responsible for establishing state water quality standards for lakes, rivers, streams, and wetlands, assessing the quality of all waters in the state, identifying waters that fail to meet state water quality standards, and administering the federal NPDES permitting program (under a cooperative agreement with the EPA). 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 monitors water quality in lakes, streams, watersheds, and groundwater. It issues and manages wastewater permits for municipal and industrial users, stormwater permits for municipal, construction and industrial activities, and works with local units of government to implement a statewide subsurface sewage treatment system (SSTS) program. The agency also regulates the collection, transportation, storage, processing and disposal of animal manure and other livestock operation wastes.

Several other state agencies are engaged in water management to a lesser but still significant degree.

- The **Minnesota Department of Transportation (MnDOT)** is involved with wetlands replacement, erosion and sedimentation control, and hydrology studies as part of many of its road and transit projects. MnDOT is required to obtain permits from various other federal and state agencies and local governments, depending on the nature of its projects.
- The **Minnesota Geological Survey (MGS)**, housed at the University of Minnesota, conducts research in partnership with DNR into groundwater in relation to geology, preparing county geologic atlases and hydrogeologic assessments. MGS partners with the Department of Health to maintain an index of county well data.
- The **Minnesota Public Facilities Authority (PFA)** is a multi-agency authority that provides municipal financing expertise and infrastructure financing programs. The PFA manages three revolving loan funds and several other financing programs to help local governments to upgrade and construct wastewater treatment and collection facilities, to upgrade and construct municipal stormwater infrastructure and drinking water treatment, distribution, and storage facilities, and to address transportation and other high-cost infrastructure needs.

Regional Agencies, Boards and Commissions

A variety of regional agencies and other entities exist in Minnesota, most established by state statute, with a variety of specific authorities. Their geographic coverage is also variable – some parts of the state have multiple agencies in place, while others have none.

- The **Metropolitan Council** is the regional planning agency serving the Twin Cities seven-county metropolitan area and providing essential services to the region. The Council works with local communities to provide critical services, including wastewater collection and treatment, operation of the region's largest transit system, and planning for future growth. The Council develops, in cooperation with local communities, the *Regional Development Framework*, a set of policies to guide the efficient growth of the region and help maintain the region's economic competitiveness. The Council carries out the Framework, in part, through its plans for "regional

systems" – transportation, regional parks and open space, and water resources.

The Council is authorized to conduct water supply planning as well as to oversee and coordinate watershed management plans. The Council's regional system plans also guide comprehensive planning efforts by local governments. Comprehensive plans are required to be consistent with local water plans, and must be updated following or in conjunction with water plan updates.[3]

- **Regional Development Commissions (RDCs)** were established by statute in 1969 to provide technical assistance to the local units of government in their region. Nine RDCs in Minnesota cover 63 counties.[4] Most RDCs focus on economic development, transportation, employment and housing, social services, recreation and the arts; relatively few focus on water management. However, RDCs often contract with local governments as service providers. In that capacity, a number of RDCs have assisted counties in preparing local water management plans and provided loans for subsurface sewage treatment system (SSTS) repair/replacement. The Arrowhead RDC provides staff capacity to the North Shore Management Board, a body that defines minimum shoreland zoning standards for the North Shore of Lake Superior, and assisted with development, updates, and administration of the North Shore Management Plan as mandated by Minnesota Statutes 103F.

A variety of **watershed or river basin-based boards and commissions** created in state or federal statute and funded in part with state resources, play a variety of roles in Minnesota and neighboring jurisdictions. They include, but are not limited to, the following boards and commissions:

- The **Mississippi Headwaters Board (MHB)** is a joint powers board of Clearwater, Beltrami, Cass, Hubbard, Itasca, Aitkin, Crow Wing and Morrison Counties. Formed in 1980 as an alternative to designation of the river into the National Wild and Scenic River System, the MHB is mandated by Minnesota Statutes 103F.361-377 to enhance and protect the natural, cultural, historic, scientific and recreational values of the headwaters region: the first 400 miles of the Mississippi River in Minnesota. The statute directs the MHB to "prepare, adopt, and implement a comprehensive land use plan designed to protect and enhance the Mississippi River and related shoreland areas situated within the counties." The plan, last updated in 2009, establishes management objectives and land use standards, which essentially function as a shoreland ordinance, within specified distances from river segments and headwaters lakes.

Signs at Lake Minnewawa in Aitkin County exemplify the efforts of local governments and voluntary associations to manage public water access and improve water quality, as well as the threat of invasive species.

- The **Red River Watershed Management Board (RRWMB)**, known locally as the "Red Board," was established in 1976 to provide a basin-wide perspective on flooding problems in the Red River Basin. The RRWMB consists of eight watershed districts within the basin, under a joint powers agreement authorized by law (Minn. Stat. § 471.59). As described in the profile in this section, the RRWMB has worked to reduce flood damages by establishing impoundments for water storage in the upper reaches of the basin, and restoring stream channels and wetlands. The watershed districts are authorized to impose a tax levy, a portion of which is assigned to the RRWMB for projects that benefit the basin as a whole.

Other boards and commissions, both international and interstate, have emerged in response to flooding in the Red River

Basin. These include the International Red River Board (IRRB), a board of the International Joint Commission, which works to prevent and resolve trans-boundary disputes regarding the waters and aquatic ecosystem of the Red River and tributaries. The Red River Basin Commission (RRBC), a grassroots watershed-based nonprofit organization of flood management professionals from the United States and Canada, is a research entity funded by North Dakota, Minnesota and Manitoba.

- The **Great Lakes Restoration Initiative (GLRI)** was established in 2009 as a partnership of the EPA and ten other federal agencies, in partnership with the states of the Great Lakes Basin, to provide funding and technical support to address five urgent issues:
  - ~ Cleaning up toxics and areas of concern;
  - ~ Combating invasive species;
  - ~ Promoting nearshore health by protecting watersheds from polluted run-off;
  - ~ Restoring wetlands and other habitats; and
  - ~ Tracking progress and working with strategic partners.

  In Minnesota, much of the GLRI effort has focused on the St. Louis River Estuary, identified as one of 43 Great Lakes Areas of Concern due to its legacy of industrial and shipping contaminants.
- The **Minnesota River Board (MRB)** is a joint powers board comprised of delegates from the 38 counties within the Minnesota River Basin. The MRB was established by the legislature in 1996 with the mission of providing leadership, building partnerships, and supporting efforts to improve and protect water quality in the Minnesota River Basin. The MRB works with the Water Resources Center of Minnesota State University – Mankato and other partners on a variety of research and advocacy efforts. Recent funding reductions and withdrawal by some member counties are prompting a reexamination of the MRB's organization and functions.
- **Area II Minnesota River Basin Projects, Inc.** Area II was authorized by the legislature in 1978 as a non-profit organization with the ability to levy a tax for flood control, erosion control and water quality improvement to address recurrent flooding problems in southwestern Minnesota. Area II primarily assists its nine member counties in the engineering design, hydrologic and hydraulic modeling, construction, and finance of flood control and flood retention projects.

Local Water Management Entities

Numerous local governmental units are engaged in water management, with multiple relationships among them, including counties, cities, watershed districts, watershed management organizations and lake improvement districts. The Board of Water and Soil Resources (BWSR) is the primary state agency that provides oversight and assists local government units (known as LGUs) on water planning and management. LGUs are responsible for making decisions on applications that request changes to protected wetlands under the Wetlands Conservation Act.

Outside the seven-county Metropolitan area, the LGU may be a city, county, or soil and water conservation district, or watershed district. Within the Metropolitan area, a city, town, watershed district, watershed management organization, or soil and water conservation district may be the LGU. In many cases, the LGU will designate a soil and water conservation district to assist in administration of the law.

- **Counties.** Counties have a wide variety of water management duties, including planning and zoning, including shoreland and floodplain zoning (with the exception of Hennepin and Ramsey counties in the metro area) and constructing and maintaining water and wastewater systems. Counties are authorized by Minnesota Statutes 103B.311 to develop water management plans to identify water problems and prioritize solutions.

Counties are not required to produce water plans, but the plans are a prerequisite for eligibility for BWSR's Natural Resources Block Grant program, and all of the state's 87 counties (including the seven metropolitan counties) have plans in place. Counties apply to BWSR for base grants and competitive challenge grants for implementation of local water plan initiatives. SWCDs are often tasked with or involved in water plan development and implementation.

- **Soil and Water Conservation Districts.** Minnesota Statutes 103C.331 establishes SWCDs as political subdivisions of the state of Minnesota with certain powers and duties. Ninety soil and water conservation districts (SWCDs) operate on a county basis throughout the state (several counties have more than one SWCD) and are administered by an elected board of supervisors. The districts do not have taxing authority and receive much of their money from their affiliated counties and the state. SWCDs focus their resources on encouraging private landowners to carry out best management practices, as well as development and implementation of water plans and related projects.
- **Cities.** As of the 2010 U.S. Census there were 853 cities in Minnesota. City roles in water management vary across the state, but many are defined as LGUs under the Wetland Conservation Act, and most are involved in local water management planning. Cities, counties, and townships with shoreland must submit ordinances, rules, or regulations to DNR for review if they affect shoreland development and use. Similar provisions apply to floodplain management ordinances.Starting in the mid-1990s, municipal separate storm sewer systems (known as MS4s) in about 235 of the largest cities, have been regulated by MPCA under the federal NPDES program. Community public water suppliers using groundwater are required to develop and implement wellhead protection plans.
- **Townships.** A number of Minnesota's 1,784 townships are engaged in water management. According to BWSR, 41 townships are listed as LGUs with Wetland Conservation Act authority. Townships that have adopted their own shoreland or floodplain regulations must also submit those regulations to the DNR for review.
- **Watershed Districts.** Watershed districts are special-purpose LGUs authorized to manage water resources within boundaries that follow those of a natural watershed. The Minnesota legislature authorized the creation of watershed districts through the Watershed Act in 1955. There are currently 46 watershed districts within the state, located mainly along the state's western boundary, the west central and southeast regions, and the metropolitan area, where 14 of the districts are located. Outside the metro area, most districts are organized within one or more of the 81 major watersheds, while within the metro area the scale is typically the subwatershed. Watershed districts have broad authorities, including the authority to adopt rules, regulate development, assess properties for benefits received, levy taxes to finance district administration, and acquire, construct and operate drainage systems and other water control structures. (See http://www.bwsr.state.mn.us/planning/WD-WMO_overview.html)

Photo: Heron Lake Watershed District

- **Watershed Management Organizations (WMOs)**. The Metropolitan Area Surface Water Management Act of 1982 required LGUs in the seven-county Metropolitan area to prepare and implement comprehensive surface water management plans through membership in a WMO. WMOs are based on watershed boundaries, and can be organized as in three ways: as a joint powers agreement between cities and townships in the watershed; as a watershed district (see above) or as a function of county government. Non-watershed district WMOs differ from watershed districts in several respects: they are mandatory, not voluntary, deal only with surface water, not groundwater, generally lack individual taxing authority, and are governed by a board appointed by the member municipalities. There are currently 19 non-watershed-district WMOs established through joint powers agreements or by counties in the Metro area.
- **Lake Improvement Districts (LIDs)**. Lake improvement districts were authorized by the Minnesota legislature in 1973, and are administered by DNR. LIDs may be established by resolution of local government or by petition to local government by a majority of affected property owners. Initially most LIDs were formed to manage water quality by improving sewage treatment around the lake, or to manage water levels through establishment and maintenance of some form of outlet control structure. Since 2004, LIDs have been formed primarily to manage invasive aquatic vegetation. There are currently 38 active LIDs in Minnesota.

Shoreline restoration at Fulda Lakes

Source: Heron Lake Watershed District

Federal Water Management Entities

The following agencies are those with the most direct involvement in state water governance. Many other federal agencies play more limited roles or work in related areas (for example, the Bureau of Indian Affairs, the National Park Service, the National Oceanic and Atmospheric Administration or the U.S. Geological Survey). The descriptions below focus only on the water management functions of each agency.

- **U.S. Environmental Protection Agency (EPA)**. The EPA is the federal agency responsible for implementing the requirements of the Clean Water Act (CWA), a charge that is assigned to the MPCA. The MPCA executes this charge by setting standards, monitoring water quality, developing restoration and protection strategies, and, finally, permitting implementation activities and carrying out prevention and assistance activities. The EPA oversees development of water quality standards that protect aquatic life and human health, and approves the list of impaired waters required under Section 303(d) of the CWA and developed by the MPCA.

  The EPA conducts national assessments of rivers and streams, lakes and wetlands every five years, with a focus on obtaining statistically significant national results; the MPCA assists in design and implementa-

tion of these surveys in Minnesota. The EPA also manages the Great Lakes Restoration Initiative, discussed above under "Regional Agencies, Boards and Commissions."

- **U.S. Army Corps of Engineers (COE)**. The COE is the principal federal regulator of wetlands and work in many types of water bodies, as authorized by Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act. Under Section 10, a COE permit is required to do any work in, over or under a Navigable Water of the U.S. (these are generally called the "Section 10 waters") or to do any work that affects the course, location or condition of the water body so as to impact its navigable capacity. Navigable waters include many of Minnesota's larger rivers and lakes, such as the Minnesota, St. Croix and Mississippi rivers.

  Under Section 404, a COE permit is required for the discharge of dredged or fill material into waters of the U.S., which include wetlands. Regulated discharges include filling wetlands for development, grading or pushing material around within a wetland, disturbing wetland soil during land clearing, etc. Some farming, forestry, maintenance and other projects are exempt, and other activities are covered by general permits. COE permits often overlap with the DNR and the Wetland Conservation Act (see discussion under "Wetlands" in Section 6).

- **U.S. Fish and Wildlife Service (FWS)**. The U. S. Fish and Wildlife Service is the principal federal agency that provides information on the extent and status of the nation's wetlands, through development of the National Wetlands Inventory and the more recent Wetland Database and mapping standards, reporting on status and extent of wetlands. FWS also manages National Wildlife Refuges and hundreds of federally owned Waterfowl Production Areas (WPAs) throughout Minnesota and the Upper Midwest.

- **Natural Resources Conservation Service (NRCS).** A division of the U.S. Department of Agriculture, the NRCS is the primary federal agency that provides financial and technical assistance to landowners, communities, and local governments for many soil and water conservation activities.

Advocacy Organizations

In addition to those organizations authorized by state statute, there are numerous nonprofit lake and river-focused organizations devoted to improved water quality, fisheries improvement, appropriate shoreland development, and protection of related land resources. Minnesota Waters (formerly the Minnesota Lakes Association and now a program of Conservation Minnesota) lists 435 such organizations, although this number is likely not definitive. Many statewide conservation organizations also focus on water resources in relation to their primary missions, including waterfowl hunting, fishing, forestry, agriculture, and environmental protection in general.

Water in the Landscape: The Red River Water Management Board

Flooding is a fact of life in the Red River Basin. The 550-mile Red River of the North drains an area of over 50,000 square miles, extending through much of western Minnesota and eastern North Dakota northward to Lake Winnipeg in Canada. The basin is formed by the broad, flat bottom of glacial Lake Agassiz, with only a mild northward slope. The river's northward flow increases its spring flood potential, because spring thaws generally begin in the southern reaches, sending water to a river restricted with ice in its northern reaches.

Documentation of major flooding began with journal entries by trappers, explorers, and early settlers recounting loss of lives, homes, and property beginning in 1824, 1825, and 1826 – this event likely the largest flood that has ever occurred in the Red River Basin. The floods of 1852, 1893, and 1897 were of nearly equal proportions, with the 1897 event the first to be officially recorded. Major events since that time occurred in 1914, 1919, 1950, 1974, 1975, 1978, 1979, 1985, 1989, 1993, 1996 and 1997. Since 2000, the basin has experienced damaging flooding in all but 2 years, including major floods in 2006, 2009, 2010 and 2011.Significant flooding events with documented damages have occurred on the tributary rivers in equal or greater frequency than those recorded on the main stem.

The Red River Watershed Management Board (RRWMB) was created by an act of the Minnesota legislature in 1976 to provide an organization with a basin-wide perspective concerning flooding. The Board is currently composed of eight watershed districts covering most of the river's main stem and tributaries in Minnesota.

Historically, the activities of the RRWMB have centered on flood control. Previous efforts in dealing with the flooding problem within the Red River Basin consisted of single projects within a localized area, planned with primary regard to local benefits. The RRWMB has expanded its efforts and now actively promotes a basin-wide perspective for water management. It undertakes or guides development of coordinated county water management plans, basin-wide assessment of flooding, basin-wide environmental assessments, coordination of data collection, the development of a functional basin-wide Geographic Information System (GIS), and wetland mitigation development strategy.

The flood control efforts of watershed districts tend to focus on prevention measures that reduce flood flows, such as water storage or retention and wetland restoration. Municipal projects, by contrast, tend to center on local flood protection measures such as dikes, levees and diversion channels.

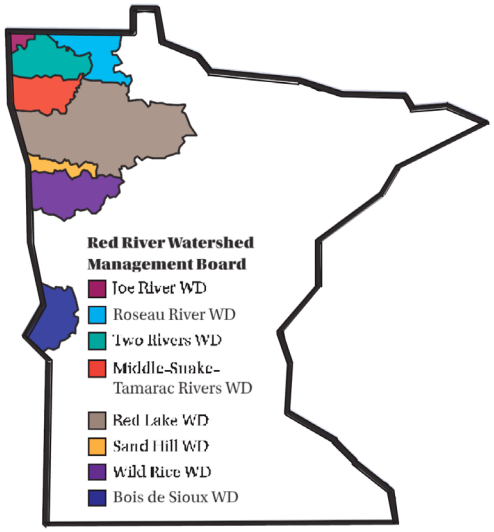
Sources:

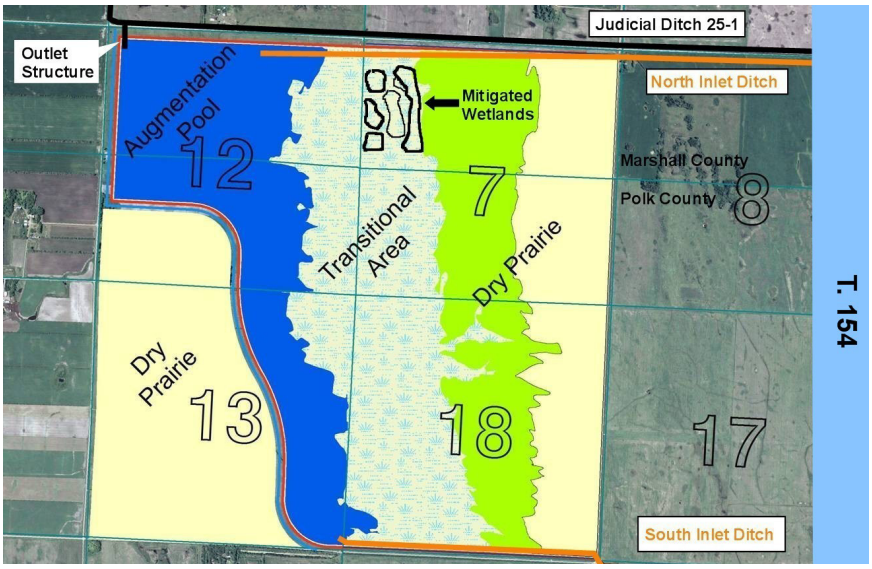
"Renewing Our Commitment to the Red River Valley" by John Jaschke, Executive Director, BWSR, et. al. *Crookston Times*, September 26, 2012. http://www.crookstontimes.com/article/20120926/OPINION/120929726

Red River Basin Flood Damage Reduction Work Group. 2004. Red River Basin Flood Damage Reduction Framework. Technical Paper No. 11. This and other documents at http://www.rrwmb.org/html/info.cfm?ID=10

Scoll, Jonathan P., 2012. Flood Control on the Red River as a Complex Environmental Decision System. *Natural Resources & Environment*, vol. 26, n3, Winter 2012.

Photo: Ann Arbor Miller





Concern about the potential cumulative environmental effects of proposed watershed districts' flood control projects led the United States Army Corps of Engineers and Minnesota Department of Natural Resources to initiate a joint Environmental Impact Statement in the early 1990s, and to put permit action on hold. In response, the RRWMB challenged the EIS in court. In May 1997, the Minnesota Legislature authorized funding for a mediation process to attempt resolution of the disputed issues in a positive manner and allow for the implementation of the most effective and environmentally friendly alternatives that would accomplish flood damage reduction. The mediated settlement, signed in 1998, calls for a basin-wide systems approach to manage the timing and volume of runoff in early, middle, or late runoff areas relative to the main stem.

Since then, the RRWMB has worked to reduce flood damages by establishing impoundments for water storage in the upper reaches of the basin and restoring stream channels and wetlands. The watershed districts are authorized to impose a tax levy, a portion of which is assigned to the RRWMB for projects that benefit the basin as a whole.

One of the projects funded under the mediation agreement is the Agassiz Valley Water Resources Project, in the Snake River Basin in Marshall and Polk counties. The project, completed in 2010, consists of an off-channel impoundment area of about 2,600 acres and associated channels, embankments, and inlet and outlet structures for temporary floodwater storage. In addition to flood control, the project will provide environmental benefits, including prairie habitat, woodland habitat, species diversification; educational and recreational opportunities, interpretative trails and overlooks; and a summer base flow augmentation on the Snake River.

On October 17, 2012, a group of state and federal agency leaders signed an opinion piece in local newspapers in the Basin, entitled "Renewing Our Commitment to the Red River Valley." The piece highlights the progress made since the 1998 mediation agreement, as demonstrated in a tour of the Agassiz Valley Water Resources Project in the Middle-Snake-Tamarac Rivers Watershed District. The letter concludes:

"We are renewing our commitment to the 1998 Mediation Agreement and pledge to:

- Continue coordination on additional projects to address flood damage reduction and ensure benefits for water quality and habitat are also included.
- Work together to more quickly identify and approve projects through our respective agencies.
- Grow our partnerships with the RRWMB, watershed districts and other local and regional organizations to carry out coordinated and comprehensive watershed planning based on the most relevant engineering and scientific information."

Agassiz Valley Water Resources Project

Left: RRWMB 2012 Calendar

Right: Middle-Snake-Tamarac Rivers Watershed District

5. A Brief History of Water Governance in Minnesota

The discussion in this section is supplemented by the legislative timeline in Appendix B, which summarizes federal and state water-related legislation and related actions.

Water is a public resource and the state has the right to regulate the use of water within its boundaries and to determine the scope of private water rights. The state holds title to its public waters and the lands beneath them in trust for the general public. In Minnesota, private rights to water are governed by a system known as a "regulated riparian" doctrine, where the traditional common law doctrine of riparian rights, in which the owner of the adjacent land and the groundwater beneath it has use rights over water bodies touching that land, has been modified through legislatively enacted regulations. Riparian rights to water are not absolute; rather they give the adjacent landowner the right to reasonable use and enjoyment of a water body, as long as that use does not interfere with the public's rights or the rights of other riparian owners.

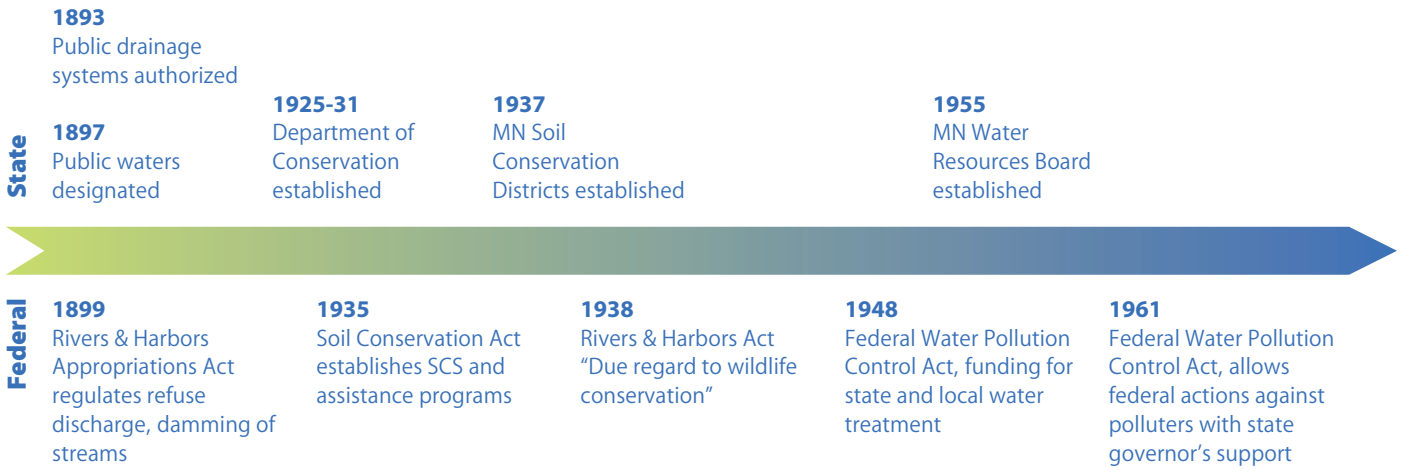
As early as 1897, public waters were defined in state statute to include meandered lakes (surveyed lakes with boundaries recorded on federal plat maps) larger than 160 acres as well as streams that could support beneficial public uses such as fishing, boating and water supply.[5]

Draining the Swamps

The first imperative as the state was settled was drainage of so-called "swamplands" for agricultural use. Under federal drainage laws, Minnesota was given control of five million "poorly drained" acres, approximately half of the total wetlands in the state.[6] State drainage laws were enacted to enable financing and construction of large-scale drainage systems, initially in the Red River Valley, using a system of petitions to establish drainage authorities and assessment of costs against the benefited properties.

Drainage reached a peak in the early 20th century, with over nine million acres of land being drained from 1900 to 1915."[7] Activity slowed after that, due to floods, persistent drought through the 1930s, tile failure, and increasing concerns regarding conservation, as Minnesota's identity as a premier hunting and fishing destination was threatened by the loss of fish and wildlife habitat through drainage. The Department of Conservation (the predecessor to the Department of Natural Resources) was established in 1925, with a focus on management of the state's fisheries, wildlife and waterfowl.[8] Any water management by the new department was in service of this goal, for example, establishing fishing limits and regulating dams and other obstructions in waterways that might interfere with passage of fish.

Water governance timeline (See detailed timeline in Appendix B)



Since that time, the ebb and flow of conservation programs, shifts in federal farm policy and demand for agricultural products have resulted in landscape changes. Wetland restoration via the state wetland banking program and other state and federal efforts have brought about positive change to offset some past wetland losses.

Drought and Loss of Water Supply

By the 1930s, the widespread droughts and massive soil erosion of the Dust Bowl provoked both federal and state responses. At the federal level, passage of the Soil Conservation Act (PL 74-46) in 1935 established the Soil Conservation Service (SCS) as a permanent agency of the U.S. Department of Agriculture. Subsequent legislation and public works programs resulted in the establishment of soil conservation districts and numerous demonstration programs, many of which continue under the auspices of the Natural Resources Conservation Services (NRCS), successor to the SCS.[9]

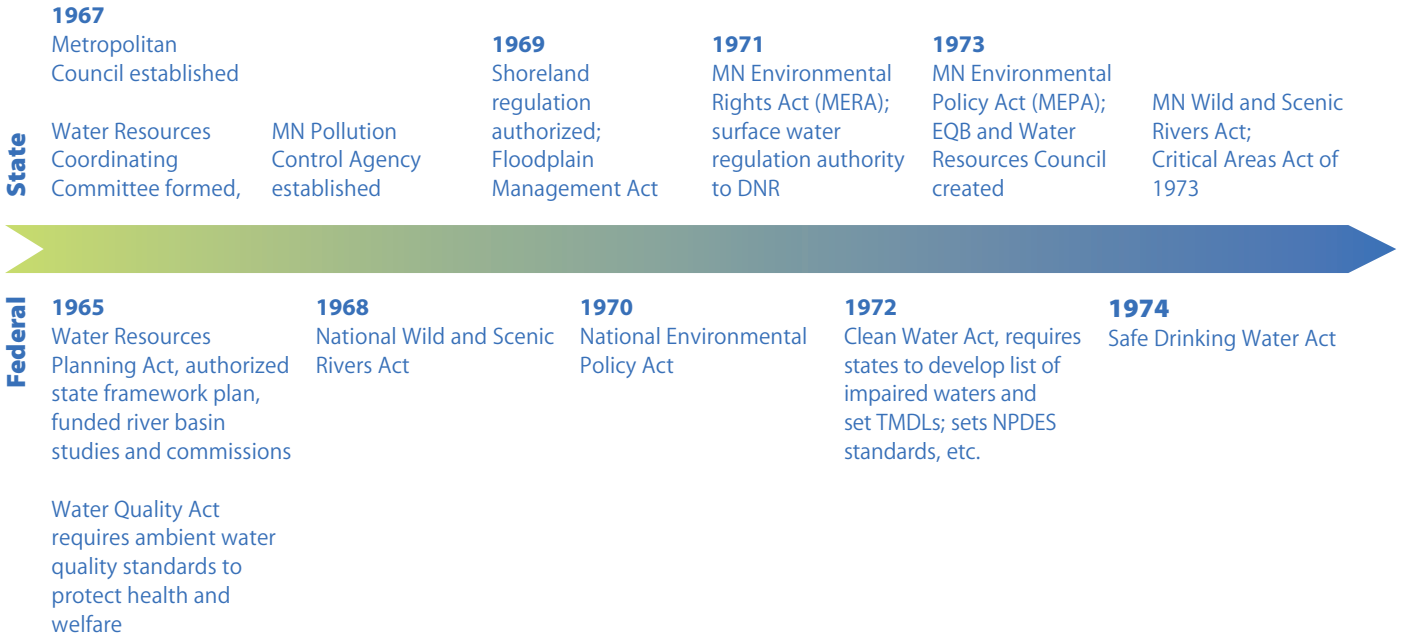
At the state level, establishment of the public waters system in 1937 (Laws 1937 c 468) marked a growing awareness of water as a finite resource. The legislation authorized the Department of Conservation to establish permit programs for surface and groundwater appropriations and for construction of dams, reservoirs and other waterway structures.

Cleaning the Waters: Federal Action, State Response

Pollution of surface waters, especially drinking water supplies, became an increasing concern throughout the early 20th century, leading to both state and federal actions. The Minnesota Water Pollution Control Commission was created in 1945 within the Department of Health. "The focus during those years was to encourage upstream users to treat sewage well enough that downstream users could disinfect the stream water for potable use."[10] The Minnesota Pollution Control Agency, established in 1967, grew out of this Commission and maintained a primary focus on wastewater treatment through the 1970s and 1980s.

During the late 1960s and 1970s, state responsibilities for managing water use and water quality expanded rapidly as a result of federal environmental legislation. The federal Water Resources Planning Act of 1965 provided funding for states to create framework plans for water and related land use. The National Wild and Scenic Rivers Act of 1968, the National Environmental Policy Act

Water governance timeline



of 1970, the Clean Water Act of 1972, and the Safe Drinking Water Act of 1974 all resulted in parallel statutes or programs in Minnesota. In some instances, Minnesota laws preceded or went beyond federal statutes, as in the enactment of shoreland conservation requirements in 1969 (Laws 1969, c 777).

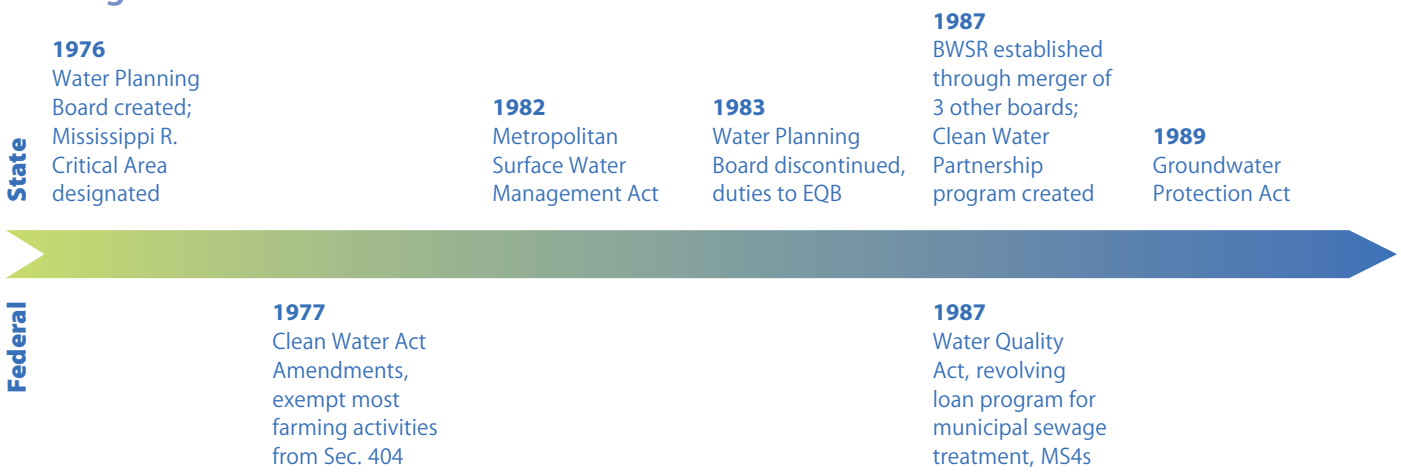
Each water-related statute or program was created independently and assigned to one of several state agencies, with little recognition of its relationship to other policies and programs. It soon became obvious that water regulation was becoming increasingly complex. As early as 1967, the State Planning Agency activated an advisory Water Resources Coordinating Committee to prepare a statewide water and related land resources plan. According to the planning agency, "the creation of this Committee was necessary because the water management function in Minnesota State government is fragmented among a number of separate agencies. None of them have the authority and the responsibility individually to prepare or administer a statewide plan of water and related land resources development."[11]

Subsequent research efforts assessed various aspects of Minnesota's water resources and current and projected demands. One of the early studies, prepared by the University of Minnesota for the planning agency, included this cogent summary of water governance and law – one that remains relevant today:

"As questions of water use arose over the years, agencies were created to deal with specific areas. Reorganizations tended to shift specific duties to new agencies, rather than develop a mechanism that would handle all present and future problems associated with use and management of water resources… Minnesota's water law was developed in a similar manner. It is now composed of a series of statutes dealing with specific areas. Decisions made in other areas are based upon interpretations of the introductions to these laws; differences in interpretations are common, and outright contradictions have been found. There is no comprehensive water law in Minnesota."[12]

The "water and related land resources plan" would not appear until 1979, after severe flooding and drought in the late 1970s prompted the legislature to create a Water Planning Board and charge it with developing the plan. The framework plan, titled *Toward Efficient Allocation and Management: A Strategy to Preserve and Protect Water and Related Land Resources*, examined water withdrawals and consumption, localized supply and demand, water quality, and related land use decisions. It recommended creation of a water resource coordinating body and called for regional development commissions (established by state statute in 1969) to provide a link between state policy and local plans. The plan also called for watershed districts, or local governments where none were present, to take the lead in local water management planning.

Water governance timeline



Continuing Governance Studies, Consolidation, and Groundwater Action

Efforts to streamline and reorganize water programs and statutes have been fairly continuous since the 1970s. The Water Planning Board's 1981 *Special Study on Local Water Management* examined the multiple roles and functions of counties, watershed districts, and soil and water conservation districts. It recommended that counties should be the fundamental decision-makers on local water plans, that plans and management should be based on hydrologic units, and that approval of local plans would trigger the delegation of state management responsibilities to these local government units.[13] The study and subsequent ones set the stage for the Comprehensive Local Water Management Act of 1985 and the local water governance structure that remains in place to this day, with counties, Soil and Water Conservation Districts, and watershed districts coordinating their efforts to greater or lesser degrees, and with cities often in the position of navigating multiple regulatory structures.

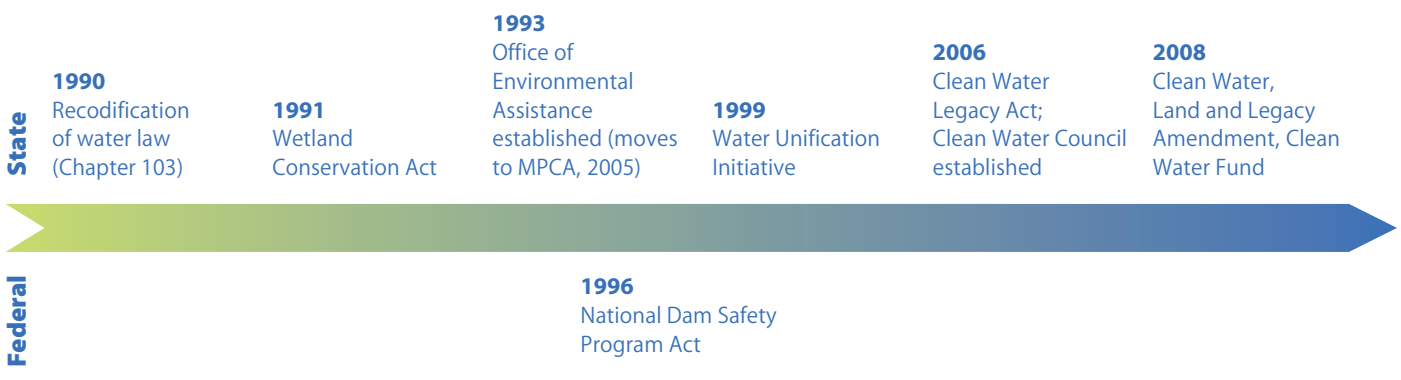
The functions of the Water Planning Board were merged in 1983 with those of the Environmental Quality Board (EQB), housed within the State Planning Agency. The EQB became the lead state water coordinating body, responsible for developing biennial recommendations for legislative action and preparing the state water plan.

Water governance reform efforts continued through the mid-1980s under the administration of Governor Rudy Perpich. A *Water Agency Merger Study* by the State Planning Agency in 1984 - 1985 stated that "the status quo is unacceptable," because "an integrated state approach to local government is lacking." The study recommended a single coordinating board for all state water programs and a single soil and water management agency (later created as BWSR).

A countervailing message was conveyed by a 1986 House Research Information Brief, *State Water Management: Reorganization and Consolidation*. The paper recapped the previous 15 years of water management studies and introduced the concept of an advocacy system: "strong, competing agencies, each concerned with its own duties and specific goals. In political terms, an 'advocacy' system promotes competition and increases the public representation of each goal or interest and highlights political choices. *Conflicts and tradeoffs in such a system are meant to be solved through the political rather than the administrative process*" (emphasis added).

One move towards streamlining was the creation of the Board of Water and Soil Resources (BWSR) in 1987, through consolidation of three separate boards, the Water Resources Board, the Soil and Water Conservation Board, and the Southern Minnesota Rivers Basin Council. With no direct regulatory authority at that time, BWSR was tasked with coordination of state and local soil and water management activities through establishment and oversight of watershed districts and by assisting local governments in developing water management plans. BWSR was also empowered by statute to coordinate the work of water management agencies and to address state agency questions of water policy.[14]

Water governance timeline



Through the 1980s the EQB worked to set priorities for water management, producing several plans and studies emphasizing the need for integrated water management, additional research and monitoring, and a focus on groundwater contamination and drinking water protection.

The increasing focus on groundwater supply, pollution and governance culminated in the bipartisan effort to enact the Groundwater Protection Act of 1989, widely regarded as a comprehensive and forward looking accomplishment.[15] Among the accomplishments stemming from the Act are stronger water conservation measures; new or increased water use fees to reflect the cost of managing the resource; greater monitoring and testing of pollutants in groundwater; comprehensive waste pesticide collection and well-sealing programs; and expanded monitoring of community water supplies; and additional support for local water management planning.[16] In addition, MDA's statutes were comprehensively rewritten to greatly enhance the agency's role in pesticide and fertilizer regulation, BMP development and promotion, waste pesticide collection, site remediation and water resource monitoring.

The recodification of the bulk of Minnesota's water-related statutes in 1990 represents another effort towards simplification and consolidation. Chapters 103A through 103I now encompass most water-related statutes. As part of the recodification, most statements of purpose for the individual components were grouped in Chapter 103A. However, it can be argued that these objectives were "bundled" rather than integrated, leaving multiple inconsistencies and gaps among them.

Metropolitan Land and Water Management

Water governance in the Twin Cities metropolitan area diverged from that of greater Minnesota with the passage of the Metropolitan Land Planning Act in 1967 creating the Metropolitan Council. The Council was created with two missions: 1) to plan for the orderly and economical development of the seven-county metro area; and 2) to coordinate the delivery of certain services that could not be effectively provided by any one city or county. In addition to its land planning responsibilities (see Section 4 above), the Council and the Metropolitan Waste Control Commission moved forward with development of a modern regional system for collection and treatment of sewage, a system now considered one of the region's great successes in water quality improvement.[17] The Waste Control Commission was merged with the Council in 1994. Water supply and water quality planning in the metro area are managed from a regional perspective as well, as discussed in Section 4 above.

The EQB and Sustainability

Many water management plans and research efforts during the 1990s were authored by the EQB in partnership with the State Planning Agency, by this time known as Minnesota Planning. The *Minnesota Water Plan* of 1991 (the successor to the 1979 framework plan) called for a "focus on the resource" rather than on specific programs. The plan emphasized the importance of integrating water management through local water plans and regional water planning efforts.

The next major review of water governance took place mid-decade, with the 1995 legislature's mandate for a reorganization study, namely the 1996 *Crosscurrents* report by the State Planning Agency. The report reviewed previous water management studies (by now a 25-year history), identified improvements and remaining challenges, and essentially determined that the existing management structure, in all its complexity, was worth keeping. It reiterated the idea of an "advocacy system," echoing the 1986 House Research paper, stating that "agency missions demonstrate diversity and advocacy" – in other words, the current system gives local governments and citizens many options for advancing their diverse interests in water management.

In spite of this assessment, in 1999 the Ventura administration issued an executive order for a Water Management Unification Initiative: a planning process led by EQB that would develop "water-related goals, objectives, and measurable outcomes for the year 2010" for each major river basin in the state.

The study became the basis for the next state water plan, *Watermarks*, issued in 2000. The water plan carried out the executive order's directive to focus on major river basins, outlining issues and goals for each one, emphasizing the diverse nature of Minnesota's water resources. The focus was on the resource rather than its management.

The unification effort included a 2001 survey of state, county, local government employees, watershed districts, rural water providers, lake associations, consultants and others on water management issues. The questionnaire asked whether a clear and consistent vision for water resources management existed, whether a reorganization plan would improve on the existing "advocacy" approach, and whether there were areas of overlap, duplication, or good coordination among state water programs. Respondents identified many still-relevant issues.

The unification effort culminated in Minnesota Planning's 2002 report, *"Charting a Course for the Future: Report of the State Water Program Reorganization Project."* The study included the usual findings of "fragmentation" among state water programs, but also included specific recommendations: recreate the Legislative Water Commission, establish a cohesive policy on lakes, reform drainage law, integrate comprehensive land use and water planning, and consider authorizing penalty orders for all state agencies with regulatory programs. Although the reorganization effort did not yield sweeping changes, it resulted in administrative penalty authority for BWSR, establishment of a Drainage Work Group, and increased focus on integrated water planning.

Clean Water Funding and Accountability

The concept of sustainability as applied to water use was discussed in the EQB/DNR 2007 report, *"Use of Minnesota's Renewable Water Resources: Moving Toward Sustainability"*. Sustainable water use was defined as "the use of water to provide for the needs of society, now and in the future, without unacceptable social, economic or environmental consequences." The report examined current and future water demand and quantity of water that could be removed on a long-term renewable basis, at the county scale. A subsequent study by the EQB in 2008 recommended the development of "water appropriation and use management areas."

The overriding imperative during the 2000-2010 decade was the search for adequate, dedicated funding for clean water programs. A report by the Office of the Legislative Auditor in 2002 called attention to the lack of funding available to MPCA for water monitoring to complete the "total maximum daily load" (TMDL) studies required under the Clean Water Act.[18]

The efforts of the "G-16" coalition of stakeholders, along with supporters at the legislature, resulted in passage of the Clean Water Legacy Act of 2006, which established the Clean Water Council. Subsequent efforts by a coalition of conservation groups and state agency representatives culminated in 2008 with voter approval of the Clean Water, Land and Legacy Amendment, increasing the sales tax by three-eighths of 1% to create dedicated funds for conservation purposes. One-third of the sales tax revenues are dedicated to water quality improvements via the Clean Water Fund.

The availability of Legacy Amendment funds led to further examination of water management programs. Several environmental organizations weighed in with recommendations for water governance improvements. The Freshwater Society, in a 2008 report, pointed to a "startling lack of consensus" as to whether current groundwater use is sustainable, and called for the DNR to change its approach of issuing water withdrawal permits on a case-by-case basis.

In 2009, the Minnesota Environmental Initiative facilitated a study process, the "Land and Water Policy Project," with a work group of lead agency staff and local, federal and nonprofit participants. The group recommended creating a shared vision for land and water resources through a multi-year process, developing a coordinated planning cycle to integrate water and land use planning, and designing a three-tiered "integrated community assistance structure" in order to streamline service to and obligations of local government.

The third "outside" study was the Citizens League's 2009 report, *To the Source: Moving Minnesota's Water Governance Upstream*. While the study committee commended Minnesota's strong public commitment to water resources, it found that the state's system of water governance is *"fragmented, incoherent, and poorly coordinated to the extent that it is failing Minnesota"* on five evaluative principles: transparency, effectiveness, equity, accountability and appropriate scale. The study recommended building a collaborative model of governance that promotes public ownership and responsibility, redesigning government roles and responsibilities, and creating a single online water resource information hub.

Meanwhile, several in-agency studies pointed to some related streamlining options. A Drainage Work Group established to advise BWSR on improvements to drainage law developed a number of consensus recommendations that were substantially adopted by the legislature in 2007, including clarifications that would better enable wetland restorations and other impoundments on drainage systems. A comprehensive analysis of drainage law for the Legislative-Citizen Commission on Minnesota Resources LCCMR in 2011 recommended major revisions to these 19th-century-based laws that would provide tools and incentives for integrating drainage, flood control, conservation and water quality goals.

A report prepared by Smith Partners/EOR for the Board of Water and Soil Resources in 2008 recommended integrating aspects of stormwater permitting into watershed planning, as well as a five-year planning cycle for local water plan revisions.

EQB, with the assistance of DNR, MDA, MPCA, BWSR, Metropolitan Council, and MDH, developed the 2010 *State Water Plan*, as required every ten years. The plan assessed progress and emerging trends since the 2000 plan, including the Clean Water Act and the Legacy Amendment, population growth, climate change, and TMDL efforts. Recommendations included an increased focus on building local capacity for water management, definition of water management units (i.e., major watersheds and groundwater management units), a targeted approach to protection and restoration, and a systematic approach to identifying and responding to emerging threats.

The *Minnesota Wetland Program Plan*, prepared in response to an EPA request in 2012, draws on the contributions of an Interagency Wetland Group. The plan identifies the four core elements of wetland protection: monitoring and assessment; regulatory activities, including 401 certification; voluntary restoration and protection; and water quality standards for wetlands.

The most comprehensive recent water resource and management study is the 2011 *Water Sustainability Framework*, directed by the legislature and produced by the University of Minnesota's Water Resources Center. The framework report, developed with the input of multiple issue teams, addresses many aspects of water sustainability, including drinking water, stormwater, agricultural and industrial use, surface and groundwater interactions, infrastructure needs, climate change, demographics and land use. The report's recommendations on water governance include re-establishing the Legislative Water Commission; combining the functions of watershed planning entities and Soil and Water Conservation Districts; integrating water planning into land use plans, and convening a one-time Minnesota Water Congress to review all current state statutes and rules for alignment with water sustainability goals.

Water in the Landscape: North Central Lakes Collaborative

Beginning in the 1990s, increased development and new development trends in the North Central Lakes region of Minnesota raised concerns about impacts on water quality and lake use. The Brainerd Lakes area was among the country's fastest growing "micropolitan" areas, with population growth of almost 25% between 1990 and 2000. The five-county area encompassing Aitkin, Cass, Crow Wing, Hubbard, and Itasca counties remains a rapidly growing region of the state: each of the five counties grew between 5 and 15% between 2000 and 2010, and thirty-year growth projections continue to exceed statewide averages. Moreover, the region's abundant water resources make central Minnesota a popular location for seasonal housing (not reflected in population growth statistics) and recreation. This rapid pace of growth posed challenges to the long-term sustainability of the region's water resources, which include over a fifth of the state's lakes and 11% of the state's river miles (42% of Minnesota's Mississippi River miles). Local planners were faced with a dilemma: how to accommodate growth while still maintaining natural systems that contribute to a high quality of life for all residents, particularly in a tourism-driven economy.

Organized in 2003 as one of five pilot project areas under Governor Pawlenty's Clean Water Initiative, the North Central Lakes Collaborative (NCLC) worked to generate and test innovative strategies for lake conservation in the five-county region. According to Michael Duval, lakes management coordinator for DNR Fisheries, "We were set up as a kind of lakes conservation think tank." In addition to the DNR and the five counties, the collaborative included the lake associations, conservation groups and other state agencies.

NCLC's strength lies in the diversity of individuals, organizations, and government entities contributing their time and talents to seek balanced solutions for the complex challenges facing central Minnesota lakes. Among its contributions to sustaining healthy lakes in the region and statewide are:

- Development of Alternative Shoreland Development Standards, a suite of regulatory tools that are available for local governments to incorporate into their zoning ordinances;
- Information and technical assistance to landowners interested in conservation easements as a means of protecting their land and lakeshore for future generations;
- A regional wastewater treatment strategy to promote the regular maintenance and inspection of dispersed on-site

Sources:

"Lake Country Conservation," in Conservation Volunteer, July-August 2007, http://www.dnr.state.mn.us/volunteer/julaug07/wild_shore_saved.html

"The Alternative Shoreland Management Standards." http://www.dnr.state.mn.us/waters/watermgmt_section/shoreland/shoreland_rules_update.html

sewage treatment systems (septic tanks) common in rural Minnesota;

- "Lake Waves" radio spots and newspaper articles that encourage lake users and residents to engage in lake-friendly actions to protect lake water quality and aquatic habitats; and
- Collaboration with the Initiative Foundation's Development of the Healthy Lakes & Rivers Partnership program, which provides grant monies to implement projects that are defined by citizen-based lake management plans.

Many of the NCLC's strategies have been adapted and used by other counties and cities statewide. The alternative shoreland management standards have been particularly useful as guidance for local governments and as a template for ongoing statewide shoreland rule revisions. Counties may choose to use these alternatives instead of their current ordinances to provide better protection for lakes and water quality. For example, the alternative standards include increased setbacks from shorelines for houses and other buildings, clustered docks, and multiple shoreland classifications for a single lake, so that vegetation-rich bays may be protected as natural areas while other areas may be zoned for general development.

The alternative standards also include:

- The ability to designate certain lakeshore segments as sensitive area districts, with development standards that mirror the most restrictive (natural environment lake class) standards.
- A new special protection lake classification for lakes where there is considerable wetland fringe, shallow depth, and/or unique fish and wildlife habitat or endangered species.
- Improved planned unit development (PUD) standards, including maximum residential densities, increased setbacks, clustered or grouped docking.
- Special resort standards that allow for expansion and improvements while addressing water quality concerns, shoreland revegetation and compliance with stormwater and wastewater treatment standards. If converted to a residential development, the resort must then meet residential standards.
- Better water quality standards achieved by improved rainwater runoff management, increased drainfield setbacks, and higher shoreline vegetative buffer standards.
- Advanced subdivision controls, including promotion of conservation subdivisions over conventional (lot and block)subdivisions.
- Larger lot sizes for new lots on general development lakes, and no lot size bonuses for sewered areas in any classification.
- Many new definitions and concepts that add clarity or simplify administration of the ordinance, such as buildable area, common interest community, common open space, conservation subdivision, conventional subdivision, impervious surface, major and minor subdivisions, planned unit development, resort, and suitable area.

A small bay on Big Sandy Lake illustrates a "natural environment" lakeshore segment

To date, four counties in the collaborative have incorporated some alternative standards into their zoning ordinances and nine counties in western Minnesota have chosen to use some of the stricter alternatives in their planning and zoning.

Today, the collaborative is directed by a steering committee of government, private and non-governmental entities in the lakes region, and continues to focus on collaborative management, education, innovative planning and conservation, marketing and outreach.

6. Strategies and Recommendations

This section discusses the primary issues that this study has focused on, and identifies broad strategies and recommendations for addressing the issues. It is organized into two primary sections:

- Three strategies focusing on organization and delivery of water management services at the watershed, state and regional levels; and
- Four strategies organized around specific water resource topics.

A. Organizational Strategies

A.1. Implement Water Management at a Watershed Scale at All Levels of Governance

Background

Numerous local governmental units, including 87 counties, 90 SWCDs, 46 watershed districts, and 32 lake improvement districts, are currently engaged in water management. Within the Twin Cities Metropolitan Area, there are 19 water management organizations, as well as 14 of the state's watershed districts. In addition, numerous lake and river associations and other nonprofit entities work on various aspects of water management. Many of Minnesota's 853 cities and some of its 1,784 townships are engaged in water management as well. These over 2,700 local units of government intersect with 81 major watersheds, which are the basis for many state water management activities.

Local water plans, while optional, are a requirement for eligibility for the Natural Resource Block Grant program administered by BWSR for the 80 non-metropolitan area counties. This voluntary program requires counties to use local task forces to develop and implement water plans based on local priorities. Watershed districts also utilize citizen advisory committees and local project teams to guide implementation activities. The NRCS has implemented Local Workgroups (LWG) to guide conservation activities at the county level. The 2012 "one watershed – one plan" legislation may help reduce the number of required plans, but still leaves many government agencies and entities with overlapping responsibilities and authorities.

Different players have widely differing capacities, levels of dedicated resources, and historic levels of commitment to managing water resources, depending on factors such as population, tax base, and competing priorities. Population of many rural counties may be too small to effectively support their water planning needs, or deal with multiple watersheds. Likewise, some watershed districts may have too small a population base to fund their operations and manage their resources. Declining local government assistance, especially in baseline funding that is not grant-related, has generally further diminished the capacity of many local governments, creating a landscape of "haves" and "have-nots."

The lack of consistent baseline funding for water management functions means that local government units often rely on "soft money" designated for particular programs or activities, making it difficult to sustain ongoing planning and management for water. Even within the Twin Cities metropolitan area, with its dense population, significant disparities exist among watershed districts and watershed management organizations. Statutory responsibilities for planning and implementation rely on local capacity for water management. Metropolitan cities have been burdened by the requirement to update their local water management plans each time one of the watershed districts within their jurisdiction completes a plan or plan amendment.

The scale of some previous state water planning efforts has contributed to confusion; for example, the MPCA's TMDL plans for turbidity in the South Metro Mississippi River and the Minnesota River cover such large areas that it is difficult to "scale them down" to the watershed, county or city level. However, current and future TMDLs will generally be framed at a major watershed scale.

On the positive side, local governments are increasingly addressing problems of declining resources, increasing service demands, an evolving economy, and demographic changes with new initiatives to redesign

Issues

- Multiple local units of government with overlapping and "underlapping" responsibilities and differing levels of commitment to sustainable water management
- Declining local government funding diminishes local government capacity
- Inconsistent baseline funding for water management functions for local governments
- The "one-watershed – one plan" legislation may offer options to improve local water management.

local government services. In 2011, a series of innovation forums led by the Association of Minnesota Counties, League of Minnesota Cities, and Minnesota School Boards Association resulted in "redesign" recommendations in six areas of public service, including health and human services, education, transportation, public safety, administration and management, and government boundaries and structures.[19] Environmental services such as water management were not identified at that point, but could and likely will be ripe for such redesign efforts in the future. In addition, the group's recommendations for sharing services across government boundaries have great relevance for this study.

Recommendations

- *Establish the 2012 "one watershed – one plan" legislation as the preferred option for local watershed management* outside the Metropolitan Area. The major watershed scale (Hydrologic Unit Code 8) will generally be the appropriate scale at which to align with other data collection, monitoring, protection and restoration programs. Establish incentives and explore transition models for conversion from existing local water planning authority/timeline to a "one watershed – one plan" within the next decade. As discussed below under "Effective Linkage of Land Use and Water Management," this conversion will call for additional training and communication between water managers and land use planning and zoning managers, working across existing jurisdictional boundaries.
- *Outside the Metro area, complete the transition to a "one watershed" scale for future TMDLs as defined in M.S. 114D using the major watershed scale.* TMDLs going forward will address impairments more comprehensively rather than pollutant-by-pollutant, and will in most cases be incorporated into locally developed Watershed Restoration and Protection Strategies (WRAPS). This approach will more effectively bridge the gap between local watershed plans and state-led planning efforts.
- *Define essential watershed management services for defined watershed outcomes* and ensure that the resources necessary for local governments to provide these services are available. This may include actions such as the following:
  - ~ *Create/modify limited local government authority to levy for water management purposes.* Local governments – potentially working together to share services across county boundaries – need the resources to take responsibility for water resources planning and implementation. Improving matching sources for state funding expands commitment to actions locally.

    The scope of this levying authority would need to be determined. This base level of funding could be used to support watershed planning, not for permitting activities, for example. This approach would be most effective where the land base and population are large enough to produce the desired funding level. Where this is not the case, consolidation of management entities or programs may be an option.
  - ~ *Expand delegation of some state regulatory authorities* to those local governments or aggregated local units of government/regional entities with demonstrated capacity and interest. Criteria would have to be established to ensure that an LGU had sufficient capacity, commitment and continuing performance. (One analogy is the delegation of public health responsibilities to Community Health Boards (CHBs) that met certain requirements, a process that began in 1976 with legislation that streamlined a system of over 2,100 local boards of health. Today, 52 CHBs in Minnesota include 27 single-county boards, 21 multi-county boards encompassing 60 counties, and 4 metropolitan city boards).[20]

    Programs or areas for potential delegation include wetland regulation (discussed under B.1 below) and construction-related erosion/sediment control regulation, an area where county, city, state, and watershed organizations may have overlapping and inconsistent roles for permitting.
  - ~ *Explore the ways that existing clean water funding can be "packaged" at the watershed or regional scale*, as part of

a shift from the "program" approach to the "systems" or "watershed"-based approach. Explore performance-based standards for funding. (One example that should be investigated is the MPCA-delegated county feedlot program, which uses an incentive program to pay counties for additional work or inspections.)

~ *Assess how local water plan and watershed district advisory committees can further interact with NRCS Local Work Groups* to guide conservation efforts and implementation at both the county and watershed scale. There may be some opportunities to further coordinate water plans, watershed district plans and NRCS LWG planning efforts.

Funding will be a challenge associated with any further delegation of state authority. Absent additional funding, some existing programs that are implemented at the local level could benefit from exploring different models for delivery, such as performance-based annual reporting by local government units rather than individual action reporting for shoreland, flood plain programs and wild and scenic rivers programs, for example.

A.2. State of Minnesota Responsibility: A Synchronized Approach to Water Management

Background

Fragmentation among agency statutory purposes, missions, programs, and policies has been well-documented in a series of studies and reports beginning in the 1970s. Water management reorganization efforts have resulted in better coordination or consolidation of certain programs. However, underlying differences among agency missions remain, dating back to their disparate origins. Different water management problems, changing times and differing legislative mandates gave rise to inconsistent statutes, rules, and processes.

There are upsides and downsides to the current system. The upside is that state agencies can focus on their core missions and competencies, and build a closer relationship with stakeholders involved in particular aspects of water management. The downside is the confusion that can be created if enough attention isn't paid to coordination and communication, since the public understandably sees the state agencies as one entity – the State.

There is widespread agreement that the state agencies involved in water management collaborate and cooperate more effectively than they did in the past. Improved communications capability, strategic efforts at program coordination, and improved management theory and implementation have resulted in better state program coordination and less formal and more wide-ranging relationships among agency staff who work on similar issues. Another reason is the conscious crafting of laws such as the Clean Water Legacy Act (CWLA) that rely on interagency collaboration. The Clean Water, Land and Legacy Amendment sales tax provided additional resources through establishment of the Clean Water Fund and required greater accountability from the agencies as to how the funds were spent.

However, a cooperative approach can't reconcile the underlying differences among agency missions and purposes. Various alternatives have been discussed in the past, including combining water management functions into a single agency. However, the flaw in this approach lies in knowing where to stop. Water programs are so intertwined with other critical agency programs – for example, the DNR's habitat protection programs, the MPCA's cleanup programs, or MDA's pesticide and fertilizer monitoring program – that to remove water experts from these agencies would undermine broader agency structures and capabilities. In addition, recent research on water governance suggests that because of the complexity of these issues and the need for specialization, governance structures can tend to develop fragmentation between interests and that major changes in governance structures may result in disruptions of governance policy, structures and processes without any long term improvement of the underlying issue.[21] What is needed is a more formal mechanism for *lateral coordination* among agencies, as a basis for continuing realignment, possible consolidation, and streamlining of water programs.

Issues

- Varying agency statutory purposes, authorities, missions, programs, and policies.
- Different water management problems, changing times and differing legislative mandates gave rise to inconsistent statutes, rules, and processes.
- Water management reorganization and clarification efforts have resulted in better coordination or consolidation of certain programs.
- While availability of Legacy Amendment resources has improved interagency collaboration and accountability, a cooperative approach can't reconcile the underlying differences among agency authorities, missions and purposes.

Recommendations

Synchronize the state agencies' water management programs into a Water Management System, creating a more formal mechanism for lateral coordination among agencies and as a basis for continuing realignment and streamlining of water programs. This system would be designed to "virtually" organize and coordinate water programs, while retaining much of the current division of responsibilities among state agencies.

An effective Water Management System would be charged and empowered to:

- *Focus on and resolve conflicts, eliminate inconsistencies and set broad policy directives* for all state agencies engaged in water management.
- *Develop initiatives to streamline, integrate, transfer or delegate related processes, programs and activities*
- *Develop a system for coordinated delivery of state water management services, using continuous improvement processes and models.*

Essential tasks for a Water Management System would include:

- Developing an overarching set of principles for water management.
- Assessing state programs as to whether they align with a watershed-based approach. Re-orienting state agency programs to a watershed focus, where feasible.
- Reporting to the legislature on a regular basis (at a minimum, every four years coinciding with gubernatorial terms) on the progress and next steps needed to further realign and streamline policies and programs, and on the initiatives that it intends to pursue.

Various organizational models for a Water Management System are feasible, but it will be critical to have a commitment from all state agencies, informed by the Governor's office. Previous models have included a Legislative Water Commission, EQB oversight, and a state Water Planning Board. One option could involve commissioners of the five water management agencies using a board of directors model, placing the board in charge of resolving issues or conflicts regarding a specific process or program that cannot be resolved at the staff level. This model has the potential to be more efficient and provide for equal levels of agency commitment to the system.

Other responsibilities of a Water Management System could include:

- *Alignment of technical systems* such as water monitoring data and other databases (as in the current water portal initiative)
- *Interagency lateral teams that would work on priority issues as they emerge* – for example, wetlands and groundwater policy have already been identified as issues in need of attention. A "problem formulation team" could determine the range of issues that should be addressed.
- Analysis and recommendations for *resolving conflicting water statutes and rules* through legislative changes.
- *Assuming responsibility for the State Water Plan* (currently an EQB responsibility under Minn. Stat. ch. 103B.151) The EQB is currently studying various options for refocusing its responsibilities (see above under 3. Related Projects and Activities), but initial findings suggest that the EQB's limited staffing could more effectively be focused on environmental review and on emerging issues as they arise (i.e., silica sand mining), rather than being assigned specific resource topics such as water planning.
- *Defining, managing and implementing process redesign process redesign and continuous improvement efforts* in areas such as wetland regulation, water appropriations and well drilling authorizations, erosion and sediment control, or water planning.

A.3. Improve Delivery of Water Management Services at the Regional Scale

Background

State agencies continue to struggle to deliver water management support and services to local government at a scale and timeframe that is most effective for both the LGUs and the State. This challenge is understandable given that state agencies

need to develop approaches that work across multiple types of local government, while the needs of each LGU can be very individualized. Some regions, such as the Red River Valley, have made major progress with a basin-wide approach that is supported with taxing authority. This can be seen in the numerous flood damage reduction impoundments that have been constructed since 1998, with stakeholder and agency cooperation and agreement. These projects incorporate natural resources enhancements to meet not only local and regional multipurpose goals and objectives but those of the state. Other regions, including the Metro area, are organized at the subwatershed scale. In still others, state agencies are working effectively to respond to the needs of particular water bodies, i.e., Lake Superior and the Saint Louis River estuary. However, there is no agreed-upon model or vision for the most effective "scale" for delivering state resources and services to local governments in a coordinated and effective way.

A related issue is that watersheds are fairly easy to visualize, but groundwater management units are hard to define – aquifers are three-dimensional and defining them spatially for the sake of management and governance is complex. Agencies are discussing the need for an appropriate local or regional scale for managing groundwater.

Recommendations

- *Charge the Water Management System with exploring regional organizational models* for existing state agency programs and staff to deliver state water management services in Greater Minnesota, considering both major watershed and larger basin-level possibilities, based on the nature of the water resource and other factors such as population and economic base. The following directions should be pursued:
  - ~ *Establish clear lateral points of contact between staff* within the water management agencies so that communication and issue resolution can occur at the lowest staff level. Clarify roles and provide training for staff.
  - ~ *Explore co-location of state agencies in each region as a long-term goal.* Where financial and structural barriers to co-location exist, explore models for "virtual" co-location, including regular regional meetings, regular and inclusive communication, and work-sharing among agencies.
  - ~ *Work with state agency staff to shift their focus toward watershed management,* in tandem with local government units.
  - ~ *Assess the need for and work to develop new regional entities that can deliver water management services geared to regional needs.* Each region will have differing options and potential organizational models, depending on the nature of their resources, economic drivers, and management issues. Regional Development Commissions (RDCs) already exist and could be revitalized to play an increased role in water management.
- *Define and establish a coordinated cycle of monitoring, planning and implementation,* working with the MPCA's ten-year watershed water quality assessment cycle. The MPCA, DNR, BWSR and MDA are already working to develop this structure. Goals of this effort include meeting or exceeding federal (Clean Water Act) surface water requirements, using research, data, and analysis to better direct continuous implementation, integrating water quality efforts into comprehensive water management approaches, accelerating on-the-ground improvements, and empowering communities.

  This coordinated cycle/structure is still being refined, but as currently envisioned, the ten-year monitoring cycle would incorporate several phases, with the appropriate agency taking the lead, and each of the others contributing where appropriate. (Primary roles are shown below, but the other agencies participate as well):
  - ~ Surface water monitoring and assessment (MPCA lead, DNR, MDA)
  - ~ Watershed characterization and problem investigation (MPCA coordinates, LGUs as convener and contractor)
  - ~ Watershed restoration and protection strategies (MPCA initiates, LGUs

Issues

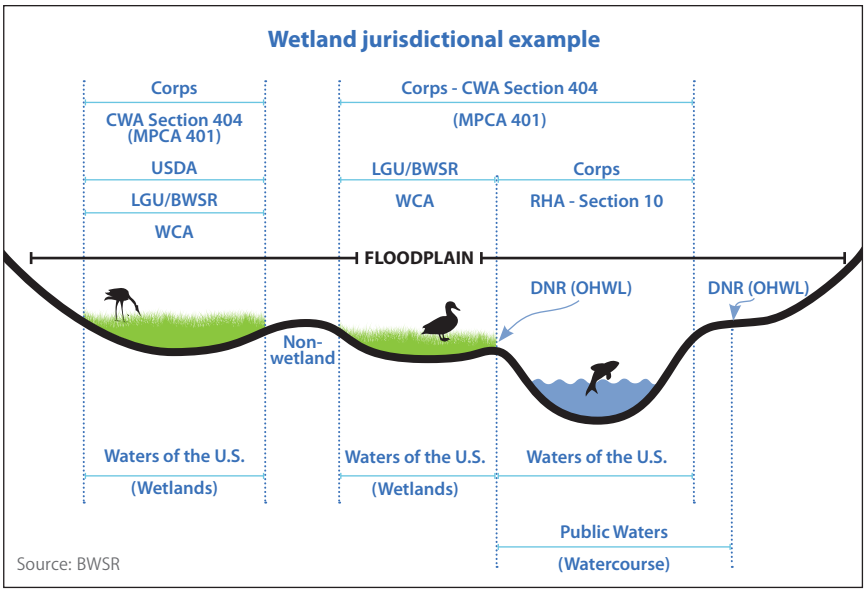
- A service delivery gap exists in much of greater Minnesota between the state agencies dealing with water management and local governments.
- Some regional entities have filled this gap effectively, and state agencies can be more effective where regional structures exist.
- There is as yet no agreed upon model or vision for the most effective "scale" for delivering state water-related resources and services to local governments.

as convener and contractor , BWSR expectations/guidance, DNR technical assistance)

~ Groundwater management (multi-agency effort, DNR lead)

~ Comprehensive watershed management plan (LGUs lead and convene stakeholders; multi-agency participation; BWSR approves and coordinates)

~ Ongoing implementation activities, including state regulation, TMDLs, technical and funding assistance from federal, state and local sources, and local land use controls



B. Resource-Based Strategies

B1. Public Waters and Wetlands: Improve Alignment of Statutes, Rules, and Regulatory Processes

Background

Wetland regulation is widely recognized as one of Minnesota's most complex areas of water governance. While the Wetland Conservation Act (WCA) has been effective in protecting most existing wetlands, permitting requirements are often cited as an example of regulatory overlap among multiple state and federal agencies. Overlapping jurisdictions for wetland regulation can be extremely difficult to determine, especially in areas also covered by shoreland regulations, as illustrated in the accompanying diagram. At its simplest, the system is divided into three parts. The DNR has authority over "public waters wetlands," as defined by state statute.* Local governments regulate all other wetlands under the authority of the WCA, with BWSR assistance. (DNR is authorized under Minnesota Statutes, section 103G.201 to reclassify public waters wetlands as public waters or as Wetland Conservation Act wetlands.) The third primary authority is that of the U.S. Army Corps of Engineers, which regulates most discharges of dredged or fill materials into "waters of the United States," including jurisdictional wetlands, under Section 404(a) of the Clean Water Act. In addition, the MPCA may certify (under Section 401 of the Clean Water Act) that Corps permits issued under Section 404 meet state water quality standards.**

While applicants are directed to a combined application, different programs within state agencies use different regulatory definitions of wetlands, and the overlaps and discontinuities between each permit program continue to baffle many local partners and applicants.

In addition to the system's multiple jurisdictional levels, state agency goals for wetland protection differ, and thus their policies and programs differ. For example, BWSR focuses on "no net loss" of wetlands, MPCA generally focuses on water quality and selective permit reviews under Section 401, and DNR on habitat protection, recreational use, and economic development. These differences impact what is required for mitigation when wetlands are developed.

The enactment of WCA has slowed the rate of wetland loss but not fully addressed water quality issues. Permitting systems do not fully consider wetlands' role in recharging groundwater and maintenance of biodiversity.

Recommendations

► *Clarify the boundary between Public Waters and WCA wetlands, and streamline the permitting process.* Explore the potential to modify public waters and wetland regulations to reduce complexity through realigning jurisdictional boundaries, establishing cooperative agreements or other strategies.

This approach has been discussed in the past, however, finding an appropriate

Issues

► Multiple and complex regulation of wetlands and other water bodies from federal, state, and local jurisdictions for varying authorities and purposes.

► Wetland permitting systems do not fully address water quality issues, including groundwater recharge and biodiversity.

*Public waters wetlands are defined in Minn. Stat. § 103G.005, subd. 15a as "all types 3, 4, and 5 wetlands, as defined in United States Fish and Wildlife Service Circular No. 39 (1971 edition), not included within the definition of public waters, that are ten or more acres in size in unincorporated areas or 2-1/2 or more acres in incorporated areas."

**The MPCA reviews certain Section 404 Corps Individual Permit applications for projects that would have significant impacts on wetlands or impaired waters, and waives other permit reviews. See http://www.pca.state.mn.us/index.php/water/water-permits-and-rules/water-permits-and-forms/clean-water-act-section-401-water-quality-certifications.html

balance between streamlining wetland regulations without further weakening wetland protection has been elusive. Discussions of these issues going forward will need to involve local units of government and other partners.

Local staff administering WCA may need additional resources to effectively administer wetland regulations. Current funding allocated to administer WCA at the local level varies widely, ranging from approximately $8,700 to $75,000 via the FY 2013 BWSR Natural Resources Block Grant (NRBG). Local staff currently obtain various types of wetland training through BWSR or other entities, including wetland delineation training. A "Certified Wetland Delineator" program is also available through the University of Minnesota. A "Certified Wetland Delineator" program is also available through the University of Minnesota.* This may be one area where additional certification(s) could be implemented.

- *Ensure consistent enforcement authority among state agencies* – the DNR currently lacks authority to issue administrative penalty orders (APO), but can issue stop-work orders, unlike MPCA. Consistent authorities across agency programs would reduce enforcement inconsistency and clarify permittees' expectations for compliance.
- Charge the Water Management System to work with U.S. Army Corps of Engineers (COE) to explore ***either assuming the Clean Water Act, Section 404 permitting authority at the state level or broadening use of federal general permits***. COE has already developed a number of Minnesota General Permits that are essentially deferrals to the state – if one complies with state requirements, the federal permit is issued automatically. This approach warrants further study.
- Consider the findings and recommendations of an ongoing study of *Water Permitting Processes For Transportation Projects*, required by the 2012 legislative session and being developed by DNR, MPCA and MnDOT staff, as a pilot for a synthesized approach to wetland permitting.

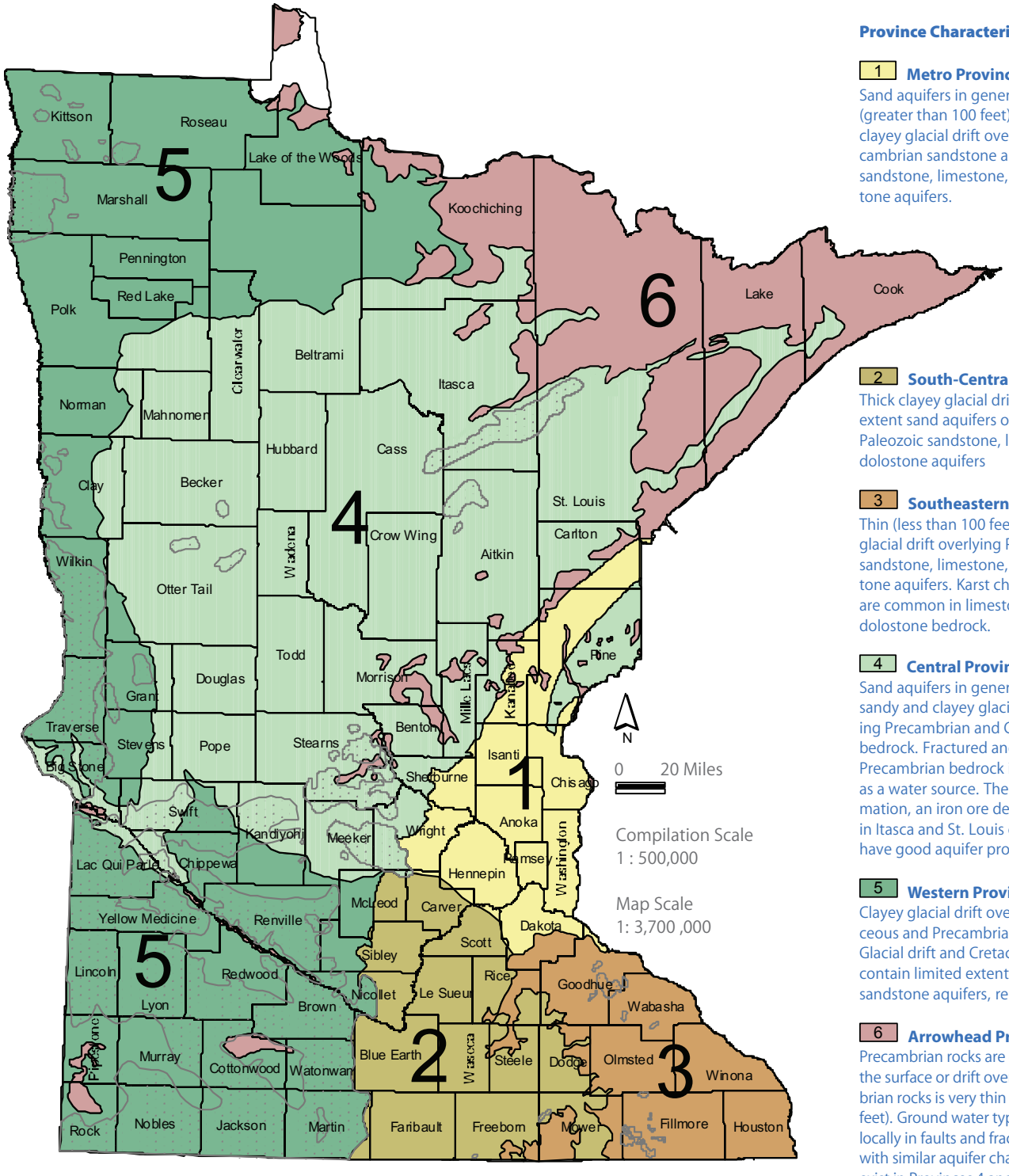
Wetlands serve multiple ecological functions and are subject to multiple layers of regulation.

Source: BWSR

- Build on the findings and recommendations of the BWSR report, *"Supporting and Strengthening Implementation of the State's Wetlands Policy,"* required under Executive Order 12-04. The report's preliminary recommendations include alignment and management of many wetland regulatory processes at a watershed or basin scale, reducing overlap and improving consistency between the Public Waters Work Permit program and the WCA, exploring new options for wetland mitigation in priority watersheds, and focusing wetland restoration efforts in areas of greatest need.

* http://www.mnwetlands.umn.edu/

Minnesota Ground Water Provinces



Province Characteristics

1 Metro Province
Sand aquifers in generally thick (greater than 100 feet) sandy and clayey glacial drift overlying Precambrian sandstone and Paleozoic sandstone, limestone, and dolostone aquifers.

2 South-Central Province
Thick clayey glacial drift with limited extent sand aquifers overlying Paleozoic sandstone, limestone, and dolostone aquifers

3 Southeastern Province
Thin (less than 100 feet) clayey glacial drift overlying Paleozoic sandstone, limestone, and dolostone aquifers. Karst characteristics are common in limestone and dolostone bedrock.

4 Central Province
Sand aquifers in generally thick sandy and clayey glacial drift overlying Precambrian and Cretaceous bedrock. Fractured and weathered Precambrian bedrock is used locally as a water source. The Biwabik Formation, an iron ore deposit found in Itasca and St. Louis counties, can have good aquifer properties.

5 Western Province
Clayey glacial drift overlying Cretaceous and Precambrian bedrock. Glacial drift and Cretaceous bedrock contain limited extent sand and sandstone aquifers, respectively.

6 Arrowhead Province
Precambrian rocks are exposed at the surface or drift overlying Precambrian rocks is very thin (less than 30 feet). Ground water typically found locally in faults and fractures. Areas with similar aquifer characteristics exist in Provinces 4 and 5.

Cretaceous Bedrock
Sandstone layers that are interbedded with thick layers of shale are used locally as water sources. Occurs beneath glacial drift but above older bedrock.

Sources:

Minnesota Geological Survey maps and databases:
- Hydrogeologic Map of Minnesota
- Bedrock Hydrogeology, 1978.
- Quaternary Hydrogeology, 1979.
- Geologic Map of Minnesota
- Bedrock Geology, 2000.
- Depth to Bedrock, 1982.
- Scott County Geologic Atlas, 1982.
- Dakota County Geologic Atlas, 1990.
- County Well Index.

Minnesota Department of Natural Resources:
- Minnesota Digital Elevation Model, 2000
- Water Resources of Minnesota, Bulletin 16, 1962.

B2. Groundwater Management: an Interagency Consensus and Usable Withdrawal Standards

Background

Groundwater doesn't fit neatly into a watershed management framework. Defining the extent and availability of groundwater requires extensive subsurface investigation to assess its flows, recharge rates, and quality. Aquifers are three-dimensional and are often multi-layered, making them challenging to map and model.

At a larger, more regional scale, previous mapping of aquifers and groundwater resources has documented that Minnesota groundwater resources can be mapped in regional "provinces" that generally align with the surface landscape in many parts of Minnesota (see http://www.dnr.state.mn.us/groundwater/provinces/index.html) Research efforts over time have defined and assessed groundwater, yet the ability to translate these data into policy has lagged. Laws requiring protection of groundwater resources and their conservation have long been on the books[22]; yet the determination of a means or approach to achieve sustainable use of groundwater has been elusive.

The 1989 Groundwater Protection Act created a system of groundwater governance that is distributed among numerous agencies: DNR handles issues related to supply, while well-drilling licensing and public drinking water supply protection are handled by the Minnesota Department of Health (MDH). Nonagricultural contamination and ambient groundwater quality are monitored by the MPCA, while impacts on groundwater related to agricultural practices are handled by MDA. Meanwhile, specific situations are emerging – accelerated groundwater use is negatively impacting streamflow and lake levels in some areas, and periodic droughts are straining groundwater supplies.

Minnesota is perceived as a water abundant state. There are areas of Minnesota that lack adequate water supply because of geologic conditions, climate, and seasonal fluctuations. Climate change will be a factor in this regard, and water reuse has been suggested as a means to improve water sustainability. State rules allow for wastewater and stormwater reuse but the cost of meeting public health, environmental and industry standards is high. As long as the price structure remains higher for necessary infrastructure and operation and maintenance to reuse water versus appropriation from groundwater aquifers to meet needs, we expect reuse of both wastewater and stormwater to be limited.

More frequent droughts may strain groundwater supplies. The Minnesota River in Mankato shows the effects of severe drought in September, 2012.

Source: MPR

Recommendations

- Complete and institutionalize an *interagency framework for groundwater management* that clearly articulates how groundwater resources are governed and managed to provide sustainable supplies of clean water, including mapping and defining groundwater provinces. (Work is already underway in this area.)
- Explore establishing *water use thresholds or quantity-based standards for groundwater that are understandable and enforceable, and that also address the interchange between surface and groundwater*. Manage groundwater withdrawals proactively at the system level (cumulatively) rather than the current approach of resolving "water use conflicts" reactively.
- *Integrate water appropriations and well construction approval*s and provide proactive approvals and assessments.
- Consider expanding MDH's Special Well Construction Areas program to include the authority to *limit the drilling of wells in areas of groundwater scarcity or potential health risks*. A recent project by

Issues:

- Groundwater doesn't fit neatly into a watershed management framework.
- Current permitting and review of groundwater withdrawals are not based on cumulative effects.
- Minnesota is perceived as a water abundant state, but areas lack for adequate water supply seasonally or episodically.
- Costs to re-use water are high.
- Management authorities and technical expertise on groundwater are widely dispersed among agencies.

the Metropolitan Council assessing the vulnerability of regional aquifers suggests one possible approach.*

- *Facilitate integrated technical groundwater expertise among agencies*. The Water Management System could be charged with improving and optimizing the use and priority of this depth of technical expertise.
- *Examine alternatives for wastewater and stormwater conservation/reuse,* including:
  - ~ Consistent policies promoting the reuse of water for appropriate purposes, to reduce the use of drinking water-quality water for non-potable purposes: better match the water source to the use.
  - ~ Consistent policies promoting the infiltration of stormwater, particularly in drinking water supply management areas, to recharge aquifers while protecting groundwater quality for drinking water. Groundwater recharge should be considered a downstream use and should be considered when developing stormwater infiltration projects.
  - ~ Explore management of aquifer systems as underground reservoirs, with surface water infiltration, similar to California's "conjunctive use" programs.[23]
  - ~ Explore options and implications of underground injection or infiltration of treated wastewater for recharge.
  - ~ Consider modifying statutory priority for groundwater use for industrial processes to promote use of available surface water or reused stormwater/ wastewater.
  - ~ Consider means of managing reuse costs versus groundwater appropriations so that reuse might be more economically viable.
- Develop recommendations for *increasing the focus on groundwater considerations* as part of watershed management/assessment, restoration and protection plans.

A well-vegetated shoreline protects water quality, consistent with DNR's shoreland guidelines.

B3. Effective Linkage of Land Use and Water Management

Background

The "one watershed – one plan" legislation of 2012 will encourage more coordinated planning for water management in Greater Minnesota, but the statutory requirements for both water plans and land use (comprehensive) plans do not address the sustainability of either set of resources, or the connections between them. State agencies have specific and limited authority over local land use; e.g. DNR shoreland (within 1,000 feet of lakeshore or 300 feet of rivers/ streams) and floodplains. However, water quality and quantity are affected by land use within an entire watershed, and land use is controlled only by local zoning (city, county or township).

Water management in Minnesota has been framed in the past as studies of "water and related land resources." Opportunities to address water-land use connections have waned in recent decades, with the loss of the State Planning Agency and de-emphasis of the state's role in advising on land use issues.

State land use statutes lack any explicit connection to water plans, and (outside the Metro area) include only general guidance for what should be included in a comprehensive plan or zoning ordinance. In fact, comprehensive planning and zoning are optional

Issues:

- Gaps exist between water planning and related land use plans.
- State land use statutes for Greater Minnesota lack any explicit connection to water plans.
- State agencies have specific and limited authority over local land use.
- Water quality and quantity are affected by land use within an entire watershed, which often crosses LGU boundaries, and land use is controlled largely by local zoning.

* See http://www.metrocouncil.org/environment/ WaterSupply/ CWFActivities/

activities for non-metro cities and counties. Despite this fact, the majority of Minnesota counties have adopted zoning ordinances and comprehensive land use plans, some of which recognize or are consistent with local water plans or watershed district plans.

However, it is clear that major goals of state water management statutory outcomes (water quality restoration or protection, lake improvement, flood damage reduction and drinking water protection, for example) can only succeed with strong links to land use management and control.

While the one watershed – one plan legislation envisions a synthesis of comprehensive plans, which are typically focused on land use, and water plans, it's important to recognize the challenges inherent in bridging this gap. The statutory authority for comprehensive planning and land use controls will remain with counties, cities and towns, even as water plans move towards a watershed-wide approach.

State agencies have different approaches and capabilities for conducting meaningful public participation or to influence local land use decisions related to water. DNR holds broad land use authority for shoreland areas, floodplains, wild and scenic rivers and the Mississippi River Critical Area. The ability of DNR staff to influence local land use decisions is limited, although many local governments rely on DNR's technical expertise in development of ordinances, policy and local water management plans. Certain shoreland ordinance provisions, such as buffer zones in agricultural areas, are inconsistently enforced among counties, which may have insufficient resources for this type of effort.

BWSR is considered by some to be among the most effective agencies in working with LGUs, but generally doesn't work with cities. MPCA is criticized by some for using an "academic" approach in outreach to the public, or failing to recognize local concerns. MDH's efforts to define and protect sensitive groundwater resources that are used for drinking water through wellhead protection plans are considered to be successful, but slow to be completed statewide.

Coordination between local governments, specifically cities and counties, sometimes falls short in protecting water resources. The differing capacities of large and small cities, counties, and some townships to plan for and manage both land use and water resources (discussed under A.1 above) also creates gaps and inconsistencies.

Some local water and watershed plans tend to focus on engineering solutions, rather than land use-driven issues or trends. For example, a community's current zoning or future land use plan is typically accepted as a given in its water plan – i.e., "this site is zoned commercial so these are the best management practices that apply." The alternative might be to plan and zone sensitive land areas for less intensive development, such as conservation design that concentrates development on the most suitable portions of the site. Design solutions such as narrower street widths or more compact development should be considered along with stormwater engineering solutions. Engineering solutions tend to be "restoration" strategies, while land use planning and controls tend to be longer-term "protection" strategies.

Recommendations

- *Strengthen the relationship between water authorities and land use authorities.* Counties and cities will need to work together (or with watershed districts, where present) to synchronize water planning recommendations with the implementation activities that cities and counties are authorized to undertake, such as land use plans and ordinances.
- *Strengthen incentives for local government units to combine and integrate water plans and land use plans.* (Eligibility for funding has been used effectively to encourage water planning throughout the state through BWSR's Natural Resources Block Grant program.)
- With support from local units of government, *begin development of a comprehensive watershed management act* that streamlines and enhances planning, implementation, targeting and, where appropriate, regulatory efforts for the non-metropolitan area of greater Minnesota. Select pilot watersheds and create the framework to accomplish comprehensive watershed management. Review and study current efforts in the

Red River Valley to synchronize watershed district plans and comprehensive water management planning efforts. Consider consolidating existing authorities such as shoreland and floodplain with standards for land use management and nonpoint source pollution. An act of this type could also encourage, incentivize or require combined water/land use plans and integrate funding, as discussed above.

- *Reconcile the timing and sequencing of Metro-area watershed and land use plans.* Currently, Minnesota Rules 8410 requires local governments to update their water plans within two years of completion of any update to a Watershed District or Watershed Management Organization's water plan. Options that have been discussed include synchronizing local plan updates by major watershed (i.e., Minnesota or Mississippi) or dividing the Metro area into three planning /management areas for more effective management of local and watershed plan revisions and updates.[24]
- *Refine state water and related land use regulatory efforts* (largely DNR's shoreland and floodplain programs) to increase the assessment of local government performance rather than focusing on individual land use applications.
- *Authorize DNR to complete the revised Shoreland rule adoption* and establish a timeline for local government implementation.

B4. Support and Strengthen Landowner and Land Occupier Efforts

Background

In many respects, the quality of Minnesota's water resources has improved significantly over the decades since the federal Clean Water Act and related environmental legislation took effect. However, much of this improvement has come from control of point sources, while nonpoint sources largely go unregulated. The Clean Water Act exempts agricultural and forestry runoff from regulation as pollutants. From this underlying fact, many issues flow.

At the same time, the Clean Water Fund has allowed local units of government to enhance their efforts to address these issues in close cooperation with Minnesota's farmers and landowners. Without these funds, BMPs and conservation adoption and implementation would remain at static levels.

Mulitple private docks and manicured lawns can degrade water quality.

Source: Metropolitan Design Center

Substantial progress in water quality monitoring is being achieved through MPCA's watershed approach, a 10-year cycle of monitoring for all of Minnesota's 81 major watersheds. The minimal impact design standards (MIDS) being developed represent the next generation of stormwater management – greater flexibility, streamlined permitting and encouragement of innovative approaches. However, progress towards clean water remains challenging. Because of increased global demand for food and domestic needs, commodity prices have significantly increased in recent years. As a result, there is an increase in drainage activity to make land more productive to meet these needs. The expiration of many Conservation Reserve Program contracts will also likely result in increased cultivation and drainage activity.

Similarly, water quantity and velocity are affected by land use alterations, including urbanization, drainage activities and other unregulated nonpoint source runoff. Changing climate conditions are expected to exacerbate these effects. Hydrologists are documenting increased flood peaks, reduced groundwater recharge and reduced base flows in streams.

These nonpoint impacts accelerate runoff and increase nutrient and sediment

Issues:

- Nonpoint source runoff from agricultural and development practices remains largely unregulated and will require focused efforts at a variety of scales.
- Climate and land use changes are affecting water quality, quantity and velocity.
- Loss of soil health through ongoing erosion is emerging as a significant issue.

loading to Minnesota's streams and lakes. Recognizing the need for focused efforts to address water quantity and quality impacts from agricultural practices, Governor Mark Dayton signed an agreement with the U.S. EPA Administrator and the U.S. Secretary of Agriculture to develop a Minnesota Agricultural Water Quality Certification Program (MAWQCP), a pilot project to accelerate voluntary adoption of on-farm conservation practices that enhance water quality (see above under 3, Related Projects and Activities).

Loss of soil health through ongoing erosion continues to threaten future agricultural production potential. The Natural Resources Conservation Service (NRCS) is launching a soil health awareness and education effort, with strong support from a diverse group of conservation and commodity groups.[25] According to the groups' letter, "achieving soil health is part of a systems approach to agriculture production that benefits the landscape, reduces nutrient loading and sediment runoff, increases efficiencies, and sustains wildlife habitat, while providing the potential for cost savings to producers."

In addition, Minnesota Statutes ch. 103F §§ 401-455 encourages local governments, with BWSR assistance and oversight, to adopt soil loss ordinances, based on soil loss tolerances for each soil series, as established by NRCS. A local ordinance can prohibit excessive soil loss, with the stipulation that no violation can be found if the land occupier is using the "best practicable conservation practices" for agricultural land. This section was enacted in 1990 and a model ordinance was developed, but these provisions have rarely if ever been used.

Algae blooms indicate high nutrient levels, while streambank erosion (here on the Chippewa River) can accelerate soil loss.

Recommendations

- Some state agencies own and manage a significant amount of land. *Agencies should evaluate, monitor and benchmark their implementation of best management practices.* Examples include various agricultural practices on state-owned lands, and stormwater runoff/sediment control practices for construction activities for state-owned buildings, roads, trails, and similar facilities. Build on the results of the current study on streamlining water-related permitting for transportation projects (see under Section 3, Related Activities) and extend the findings to other state agencies.
- Explore additional opportunities to *work with industries to voluntarily adopt best management practices, self-audits and performance criteria* to lessen the need for additional regulatory tools.
- *Support implementation of the voluntary Minnesota Agricultural Water Quality Certification Program (MAWQCP)* under development by the MDA in consultation with the MPCA, DNR and BWSR. Monitor and audit the water quality results from the pilot areas that will be established under the program, ideally from a watershed perspective.
- *Revitalize and strengthen the implementation of the existing statutes for soil loss and soil health.* Updating the existing model ordinance, linking the existing statute to support incentives to encourage voluntary participation in the MAWQCP, and providing incentives and technical assistance for local governments that adopt soil loss ordinances are approaches to consider.

Water in the Landscape:
The Ramsey-Washington Metro Watershed District

New Maplewood Mall entrance plaza features rain gardens, porous pavement and a rain-water cistern with interpretive displays.

Photo: Ramsey-Washington Metro Watershed District

The Ramsey-Washington Metro Watershed District (RWMWD) is one of 14 watershed districts within the Twin Cities Metropolitan area. It encompasses seven small watersheds that each drain to the Mississippi River, including the Phalen Chain of Lakes, Battle Creek, Fish Creek, Grass Lake, and the blufflands along the Mississippi just downstream of downtown St. Paul. There are 5 major creeks, 15 lakes and thousands of wetlands within the RWMWD, which also includes all or part of 12 cities in eastern Ramsey and western Washington Counties, including St. Paul, Woodbury, Oakdale, Landfall, North St. Paul, Maplewood, Little Canada, White Bear Lake, Vadnais Heights, Gem Lake, Shoreview and Roseville.

Since its establishment in 1975, the RWMWD has actively managed the water resources within its jurisdiction through permitting or review of floodplain construction, potential soil erosion, wetland development, plats and roads, drainage plans, and water-related ordinances. The District has adopted a series of comprehensive management plans and specific plans for smaller sub-watersheds, with an increasing focus on integrating the preservation and restoration of aquatic, wetland, and associated upland habitats into flood control and water quality protection efforts. Today the District's major programs include:

- Water quality protection
- Stormwater management
- Flood control
- Lake management
- Lakeshore restoration
- Wetland management
- Construction site permitting
- Exotic species control
- Native landscaping and habitat restoration
- Water quality and biological monitoring
- Watershed education

Through its extensive analysis of the watershed, the RWMWD has been able to effectively identify the root causes of water quality degradation and flooding. The RWMWD has used this knowledge to develop and implement solutions that address these causes. These solutions include both nonstructural solutions (e.g. regulation of land and water use and public information and education) and structural solutions (e.g. construction of wet detention basins/wetlands, outlet control structures, stream channel maintenance and other projects). The District continues to refine its water resource analysis to identify solutions for complex issues related to urban nonpoint source pollution.

The RWMWD funds its implementation program using three primary sources: 1) property tax levy; 2) grant funds; and 3) local cost-share funding. Approximately 95 percent of the RWMWD's funds for implementing capital projects, programs, and other operations are raised through its property tax levy – an ad valorem tax (a tax on all taxable parcels in the District that is based on

property value). Large projects are broken into multiple phases and may be financed through bonds or loans.

Two ongoing projects that exemplify the District's collaborative and proactive approach are the Lake Phalen shoreline restoration and the Maplewood Mall retrofit.

St. Paul's Lake Phalen, 220 acres in size, is the southernmost link in the Phalen Chain of Lakes and is the centerpiece of the Phalen Regional Park System. Lake use is extremely high, with over one-half million visitors a year using the park grounds and lakefront trails.

This important regional natural resource has a long history of shoreline alteration and erosion. In 1899, immediately after park acquisition, shore "improvements" were being made with the aid of a massive, steam-driven bucket dredge. In 1910, a city report stated that "dredge material is used for filling low, marshy land adjacent to the lakeshore, and these now unsightly places are being converted to lawn spaces." A flock of sheep was introduced to manicure the lake edge and riprap was placed along the shore to retard erosion.

By 2000, eighty percent of the shoreline was degraded and erosion was causing the banks of the lake to cave. Sheer drops were close to the walking path, creating safety concerns, and erosion was also degrading water quality. The RWMWD and the City of St. Paul developed a comprehensive ecological restoration plan to stabilize the shores, create habitat, and improve aesthetics.

The Lake Phalen shoreline restoration began in 2001. Over a period of five years and with the help of over 1,700 local students and numerous civic organizations, over 2 miles of shore have been restored to date. Erosion has been minimized and quality shoreland edge habitat is now common. Throughout the growing season, it is possible to view over 100 Minnesota native plant species in bloom. This project has provided a sense of community and ownership for local youth and adults who have contributed to the project.

Kohlman Lake, in Maplewood, was being polluted by phosphorus and sediment running off the large parking lots, roofs and roads of the nearby Maplewood Mall. Drawing on the Clean Water Fund and other sources, the RWMWD has worked with the mall management over five years on a comprehensive retrofit of the mall's parking areas, with the goal of infiltrating at least one inch of stormwater runoff, resulting in a large reduction in phosphorus to Kohlman Creek and the lake.

The $7 million project is one of the first shopping mall retrofits in the nation to use a full range of low impact development techniques to manage stormwater, improve aesthetics, and educate the public. It includes a chain of interconnected rain gardens and planters around the parking lots, tree trenches that capture runoff in a series of swales and catch basins, porous pavement, sand filters, and a rainwater cistern. Educational and interpretive elements include public art, signage, and exhibits.

Another recent development illustrates the difference in the capabilities of watershed districts, which have taxing authority, and watershed management organizations, which do not. In 2012 the RWMWD expanded its boundaries to include the eight square mile land area of the former Grass Lake Water Management Organization (GLWMO) which includes Snail Lake, Lake Owasso and many smaller lakes in eastern Roseville and western Shoreview.

The former GLWMO was organized as a joint powers agreement between the cities of Roseville and Shoreview and was funded through each city's general fund – enough funding to support planning activities, but not to implement projects and programs. To implement needed projects, city contributions to the WMO would have needed to increase dramatically, but the cities' levy limits make such increases difficult. The cities of Shoreview and Roseville petitioned BWSR to allow this change in order to provide a new source of project funding, along with a proven implementation program and experienced staff. The RWMWD levy generally averages approximately 2% of a property's total property tax. The additional funding will enable the RWMWD to define and implement programs and projects to solve flooding issues, preserve and enhance wetlands, and maintain or improve water quality in the Grass Lake Watershed.

Restored shoreline on Lake Phalen features a wide range of native plants.

Photo: Ramsey-Washington Metro Watershed District

7. Evaluation and Implementation Framework

The table below presents an initial evaluation of the strategies and actions recommended in this study. Each action is evaluated based upon a few basic parameters: relative cost to the implementing agencies, and relative impact on sustainable water management. Actions are also categorized based on anticipated time frames and lead and partner agencies are identified. Clearly, these are estimates at best. Some of the actions recommended in this study are already underway, others can be undertaken by state agencies on their own, while still others will require additional investments, realignment of current agency roles, new interagency initiatives, and, in some cases, legislative action.

Time Frame: Refers to the time estimated to implement the initial action by the responsible agencies, not to complete all work at other levels of government

ST Short-term = < 1 year
MT Medium-term = 1 – 3 years
LT Long-term = > 3 years

Cost: Refers to the estimated cost to the responsible state agencies, not to all government agencies and partners

L Low = < $100,000
M Medium = $100,000 - $1 million
H High = > $1 million

Impact: Low, Moderate, High – A preliminary assessment of how much each action contributes to meeting the primary goal of this study: to streamline, strengthen and improve sustainable water management.

A question mark in any of the columns indicates that we don't yet have enough information to assess these criteria.

Related Resource Benefits: The actions listed in the table are anticipated to produce related benefits for the natural resources identified in the 2008 *Minnesota Statewide Conservation and Preservation Plan*. The plan identified six primary natural resource areas: air, water, land, wildlife, fish and outdoor recreation. Clearly, this study focuses on water management, and the benefits are anticipated to be highest in this area. However, many of the other resource areas, particularly land, wildlife, fish, and outdoor recreation, are likely to benefit from implementation of these actions.

Action	Lead Agency/Partners	Time Frame	Cost	Impact
A.1. Implement Water Management at a Watershed Scale at All Levels of Governance				
Establish the 2012 "one watershed – one plan" legislation as the preferred option for local watershed management. Establish incentives and explore transition models for conversion within a decade.	BWSR	MT	M	High
Outside the Metro area, complete the transition to a "one watershed" scale for future TMDLs as designed in M.S. 114D using the major watershed scale	MPCA	MT	H	High
Define essential watershed management services for defined watershed outcomes	Legislature	MT	L	Moderate
Ensure that the resources necessary for local governments to provide these services are available. Includes following options:	Legislature/State water management agencies	MT	M-H	Moderate
• Create/modify limited local government authority to levy for water management purposes.	Legislature	MT	L	High
• Expand delegation of some state regulatory authorities to those local governments or aggregated local units of government/regional entities with demonstrated capacity and interest.	MPCA, DNR, BWSR	MT	L	?
• Explore the ways that existing clean water funding can be "packaged" at the watershed or regional scale	Clean Water Fund agencies: BWSR, DNR, MDA, MDH, MPCA	MT	L	Moderate

Action	Lead Agency/Partners	Time Frame	Cost	Impact
A.2. State of Minnesota Responsibility: A Synchronized Approach to Water Management				
Synchronize the state agencies' water management programs into a Water Management System. (For potential responsibilities and tasks, see Summary of Recommendations)	BWSR, DNR, MDA, MDH, MPCA	MT	L	High
A.3. Improve Delivery of Water Management Services at the Regional Scale				
Charge the Water Management System with exploring regional organizational models for existing state agency programs and staff to deliver state water management services in Greater Minnesota. Includes:	Water Management System and state agencies (for items listed below)			
• Establish clear lateral points of contact between staff within the water management agencies so that communication and issue resolution can occur at the lowest staff level. Clarify roles and provide training for staff.		ST	L	Low
• Explore co-location of state agencies in each region as a long-term goal. Where financial and structural barriers to co-location exist, explore models for "virtual" co-location, including regular regional meetings, regular and inclusive communication, and work-sharing among agencies.		LT	M	Moderate
• Work with state agency staff to shift their focus toward watershed management		ST	L	Moderate
• Assess the need for and work to develop new regional entities, as appropriate to the needs and resources of each region		LT	M	High
Define and establish a coordinated cycle of monitoring, planning and implementation, working with the MPCA's ten-year watershed water quality assessment cycle.		ST (in progress)	L	High
B1. Public Waters and Wetlands: Improve Alignment of Statutes, Rules, and Regulatory Processes				
Clarify the boundary between Public Waters and WCA wetlands, and streamline the permitting process.	DNR, BWSR, MPCA	ST	M	High
Ensure consistent enforcement authority among state agencies.	Legislature	ST	L	Moderate
Explore either assuming the Clean Water Act, Section 404 permitting authority at the state level or broadening use of federal general permits.	BWSR, DNR, MPCA with COE	LT	M	High
Consider findings and recommendations of "Water Permitting Processes for Transportation Projects" study.	MnDOT, BWSR, DNR, MPCA	ST	L	Low
Build on findings and recommendations of BWSR report, "Supporting and Strengthening Implementation of the State's Wetlands Policy"	BWSR, DNR, MPCA	ST	L	Low
B2. Groundwater Management: An Interagency Consensus and Usable Withdrawal Standards				
Complete and institutionalize an interagency framework for groundwater management	Water Management System, MPCA, DNR, MDH, MDA	LT	L	High
Explore establishing water use thresholds or quantity-based standards for groundwater that are understandable and enforceable, and that also address the interchange between surface and groundwater	DNR	MT	M	High

Action	Lead Agency/Partners	Time Frame	Cost	Impact
Integrate water appropriations and well construction approvals and provide proactive approvals and assessments.	DNR, MDH	ST	L	Moderate
Consider expanding MDH's Special Well Construction Areas program to identify areas of groundwater scarcity or potential health risks.	MDH, DNR	ST	L	Moderate
Facilitate integrated technical groundwater expertise among agencies.	Water Management System, MPCA, DNR, MDH, MDA	ST	L	Moderate
Examine alternatives for wastewater and stormwater conservation/reuse, including: • Consistent policies promoting reuse • Consistent policies promoting stormwater infiltration • Aquifer recharge techniques • Options and implications of injection or infiltration of treated wastewater for recharge • Modifying statutory priority for groundwater use for industrial processes • Managing reuse costs vs. groundwater appropriations	Water Management System, MPCA, DNR, MDH, MDA	LT	H	High
Develop recommendations for increasing the focus on groundwater considerations as part of watershed management/assessment, restoration and protection plans.	MPCA	?	?	?
B3. Efficient Linkage of Land Use and Water Management				
Strengthen the relationship between water authorities and land use authorities, to synchronize water planning recommendations with city and county plans and ordinances.	Water Management System, BWSR, DNR	LT	L	Moderate
Strengthen incentives for local government units to combine and integrate water plans and land use plans.	Water Management System, BWSR, DNR	LT	L	Moderate
With support from local units of government, begin development of a comprehensive watershed management act that streamlines and enhances planning, implementation, targeting and, where appropriate, regulatory efforts for greater Minnesota.	Water Management System, Legislature	LT	M	High
Reconcile the timing and sequencing of Metro-area watershed and land use plans.	Metropolitan Council, BWSR, DNR	LT	L	Low
Refine state water and related land use regulatory efforts (largely DNR's shoreland and floodplain programs) to increase the assessment of local government performance rather than focusing on individual land use applications.	DNR	MT	L	Moderate
Authorize DNR to complete the revised Shoreland rule adoption and establish a timeline for local government implementation.	Legislature, DNR	ST	L	Moderate
B4. Support and Strengthen Landowner and Land Occupier Efforts				
Some state agencies own and manage a significant amount of land. Agencies should evaluate and monitor their implementation of best management practices on that land.	Water Management System	?	?	?
Explore additional opportunities to work with industries to voluntarily adopt best management practices, self-audits and performance criteria to lessen the need for additional regulatory tools.	MPCA, MDA, DNR	?	?	?

Action	Lead Agency/Partners	Time Frame	Cost	Impact
Support implementation of the voluntary Minnesota Agricultural Water Quality Certification Program (MAWQCP) under development by the MDA in consultation with the MPCA, DNR and BWSR.	MDA/BWSR, DNR, MPCA	?	?	?
Revitalize and strengthen the implementation of the existing statutes for soil loss and soil health. Consider updating the existing model ordinance, linking the statute to the MAWQCP, and providing incentives and technical assistance to local governments.	Water Management System	?	?	?

Endnotes

[1] See http://www.pca.state.mn.us/index.php/about-mpca/mpca-overview/agency-strategy/dashboard-environment-and-performance-measures.html The 2015 TMDL limit for phosphorus in the Minnesota River is 44,211 kg/year.

[2] About the Board of Soil and Water Resources. Agency website: http://www.bwsr.state.mn.us/aboutbwsr/index.html

[3] Minn. Stats. 473.175 and 474.859 Subd. 2(a)

[4] Minnesota Regional Development Commissions (website), http://www.mrdo.org/

[5] Bradley C. Karkkainen, "Minnesota Water Law: A Unique Hybrid," in *Water Policy in Minnesota: Issues, Incentives and Action* (2011).

[6] Janet Timmerman, "Draining the Great Oasis," in *Draining the Great Oasis: An Environmental History of Murray County, Minnesota*, 125-141 (2001).

[7] Mark J. Hanson, *Damming Agricultural Drainage: The Effect of Wetland Preservation and Federal Regulation on Agricultural Drainage in Minnesota*, 13 Wm. Mitch. L. Rev. 135, 139-40 (1987).

[8] Minn. Stats. 1927, ch. 3A, § 53-1.

[9] 75 Years Helping People Help the Land: A Brief History of NRCS. USDA website, http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/about/history/?cid=nrcs143_021392

[10] Rob Johansson and Faye Sleeper, Implementing the Federal Water Pollution Control Act and Minnesota's Clean Water, Land, and Legacy Amendment, 53, *Water Policy in Minnesota: Issues, Incentives and Action* (2011).

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[13] Minnesota Water Planning Board, 1981. *Toward Efficient Allocation and Management: Special Study on Local Water Management*. A Report of the Minnesota Water Planning Board to the Legislative Commission on Minnesota Resources and Governor Albert H. Quie.

[14] Minn. Stats. 103A.301-341 and 103B.101, Subd. 9.

[15] Martha C. Brand and Joseph M. Finley, 1990. *Minnesota's Groundwater Protection Act: A Response to Federal Inaction*, 16 Wm. Mitch. L. Rev. 911-947.

[16] Minnesota House of Representatives Research Department. A Survey of the Groundwater Act of 1989. Prepared by John Helland, Legislative Analyst (2001).

[17] A Bold Experiment: The Metropolitan Council at 40. Agency website: http://www.metrocouncil.org/about/metcouncilhistory.pdf

[18] Office of the Legislative Auditor, State of Minnesota, 2002. Minnesota Pollution Control Agency Funding. January 24, 2002. http://www.auditor.leg.state.mn.us/ped/pedrep/0202all.pdf

[19] Bush Foundation. Focus on Outcomes: Redesigning Minnesota's Local Government Services, 2011. http://www.bushfoundation.org/solutions/engagement/redesigning-minnesotas-local-government-services

[20] See http://www.health.state.mn.us/divs/cfh/ophp/system/administration/history. html on the origins of this system in the Community Health Services Act of 1976.

[21] Geert R. Teisman and Jurian Edelenbos, Towards a Perspective of System Synchronization in Water Governance: A Synthesis of Empirical Lessons and Complexity Theories. International Review of Administrative Sciences, March 2011, vol. 77 no. 1, http://ras.sagepub.com/content/77/1/101

[22] Minn. Stats. 103H.001, Degradation prevention goal.

[23] During wet years, when more surface water is available, surface water is captured and stored underground by inducing recharge of aquifers with surplus surface water. "'Conjunctive use' means the temporary storage of water in a groundwater aquifer through intentional recharge and subsequent extraction for later use." California Water Code Section 79170-79183.

[24] Minnesota Environmental Initiative. *Land and Water Policy Project Report*, July 7, 2009.

[25] NRCS Soil Health information: http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/newsroom/?cid=STELPRDB1049251 and http://www.nrcs.usda.gov/wps/portal/nrcs/main/national/soils/health

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Appendix A: Water Programs by Agency

The following water-related programs were identified by each of the participating agencies and institutions, and are organized based on their primary areas of focus, such as education, planning, financial assistance or regulation. The scope of this study does not permit a detailed description of each program, nor can it indicate the relative size or scope of each one. Many programs also involve collaborative efforts among the participating agencies, which are not described here. However, the chart does provide a general overview of state agency roles and areas of concentration.

	Education, Outreach	Planning	Financial Assistance	Technical, Training	Oversight	Acquisition, Dev. & Maint.	Monitoring, Standards , Assessment	Regulation , Enforcement
Board of Water and Soil Resources (BWSR)								
Wetland Conservation Act			■	■	■			
Watershed District and Soil and Water Conservation District Creation, Dissolution, and Oversight			■	■	■			
Comprehensive Local Water Planning (Metro, Metro groundwater, WD, SWCD, County, WMO, and Comprehensive Watershed)			■	■	■			
Soil Conservation			■	■			■	
Erosion Control and Water Quality Cost-Share			■		■		■	
Education (NEMO, Envirothon, Conservation Corps Apprentices)	■		■	■				
Conservation Easements			■	■		■		
Nonpoint Engineering Assistance			■	■				
Area II Minnesota River Basin Projects, Inc.			■					
Performance Review and Assistance			■	■	■		■	
Department of Natural Resources (DNR)								
Water Use Permit Program (includes Supply Planning)	■	■		■	■		■	■
Public Waters Work Permit Program (includes Inventory)	■						■	■
Water-related Land Use Programs (Floodplain, Shoreland, Wild & Scenic River, other special River-related)	■	■		■	■		■	■
Aquatic Plant Management Program	■		■	■			■	■
Invasive Species Program	■	■	■	■			■	■
Dam Safety Program (includes permitting, inspections, grants)	■	■	■		■	■	■	■
Flood Hazard Mitigation Program (matching grants to LGUs)			■		■	■		
Lake Improvement District Oversight				■	■			
Surface Water Hydrology Programs (technical analysis, stream flows, lake levels, OHW levels, etc.)	■			■		■	■	
Groundwater Hydrology Programs (monitoring, ob. wells, technical analysis, mapping, etc.)	■	■	■	■	■		■	
Climate Monitoring Programs (State Climatology Office)	■	■		■			■	
Lake Superior Coastal Program (fed-state-local partnership)				■	■			
Mississippi River Management (long-term monitoring, UMRBA, navigation issues, etc.)				■		■	■	

Continued

	Education, Outreach	Planning	Financial Assistance	Technical, Training	Oversight	Acquisition, Dev. & Maint.	Monitoring, Standards , Assessment	Regulation , Enforcement
Fish Contaminant Monitoring Program (data to MDH & MPCA)							■	
Project WET (water education for teachers)	■			■				
Various Water Recreation-related Programs (fish mgmt., waterfowl mgmt., shallow Lakes, trout streams, water trails)	■	■	■	■		■		■
Aquatic Habitat Restoration Grant Program	■		■	■				
Environmental Quality Board (EQB)								
State Water Policy Coordination - includes:		■			■			
State Water Plan		■						
Groundwater Policy and Water Priority Reports		■						
MN Department of Agriculture (MDA								
Regulation of Fertilizers, Soil and Plant Amendments	■			■			■	■
MN Pesticide Control Act	■							
Agriculture BMP Loan Program			■	■				
MN Department of Health (MDH)								
MN Well Construction Code and Program					■			■
Public Water Supply Program						■	■	■
Wellhead / Source Water Protection Program		■		■				■
Contaminants of Emerging Concern		■		■				
Health Based Standard Setting				■			■	
MN Pollution Control Agency (MPCA)								
Surface Water Ambient Program – includes:								
Intensive Watershed Monitoring and Assessment				■			■	
Major Watershed Load Monitoring							■	
National and State Probabilistic Monitoring							■	
Fish Tissue Monitoring							■	
Project-Specific Monitoring							■	
Citizen Lake and Streams Monitoring	■			■			■	
Comprehensive Wetlands Monitoring							■	
Water Quality Standards Establishment							■	
Stormwater Program				■				■
Water Restoration and Protection Strategies (including TMDLs)			■	■	■			■
Feedlot Program				■	■			■
Subsurface Sewage Treatment Systems (SSTS, fka ISTS)				■	■			■
Wastewater Program (fka NPDES and SCS Permit Programs)				■				
Nonpoint Source Program (CWP and CWA §319 assistance)			■	■				
Groundwater Program				■			■	

Continued

	Education, Outreach	Planning	Financial Assistance	Technical, Training	Oversight	Acquisition, Dev. & Maint.	Monitoring, Standards , Assessment	Regulation , Enforcement
Public Facilities Authority (PFA) – DEED / MPCA								
Clean Water Revolving Fund			■					
Wastewater Infrastructure Fund			■					
Small Communities Wastewater Treatment Program			■					
TMDL Funds			■					
Phosphorus Reduction Grants			■					
Drinking Water Revolving Fund (PFA / MDH)			■			■		
MN Geological Survey								
County Geologic Atlas and Regional Hydrogeologic Assessments (DNR)				■				
County Well Index Database				■				
Borehole Geophysical Logging Program				■				
Hydrostratigraphic Framework Studies				■				
Geologic Mapping and Database Devel. Supporting Wellhead Protection (MDH)				■				
Karst Database Development				■				
Geologic Mapping to Support Lake Management				■				
Quantitative Mapping of Recharge, Metro and other areas				■				
University of MN Water Resources Center and Extension								
Manure Management and Utilization Education	■			■				
Environmental Quality Incentives Program Education	■			■				
On-Site Sewage Treatment Education Program	■			■				
Shoreland and Water Quality Education	■			■				
Volunteer Stream Monitoring Program	■			■			■	
University of MN Extension								
Water Resources Education (with BSWR)	■			■				
MinnAqua Program (with DNR)	■			■				
Metropolitan Council								
Lake Quality Assessment, Monitoring and Sampling							■	
Drainage Practices in the Minn. River Basin				■			■	
River and Stream Water Quality Monitoring Program				■			■	
Laboratory Analysis (wastewater, ambient & nonpoint sources)					■		■	
Water Supply Planning		■		■				
Technical Assistance (to communities, watershed orgs., etc.)				■				
River Corridor Planning (MNRRA and Critical Area plan review)		■			■			
Thrive MSP 2040 and Water Resources Management Policy Planning Program (regional plans, review of local water plans)		■			■			
Industrial Waste and Pollution Prevention (pretreatment)				■				■

Appendix B: Timeline of Water Resources Legislation and Governance in Minnesota

Year	Federal Legislation and Actions	Minnesota Legislation and Actions	Selected Water-Related Studies
1883		County commissioners authorized to establish **public drainage systems** (Laws 1883, c. 108)	
1897		**Public waters designated** - meandered lakes and streams supporting beneficial uses (Laws 1897, c. 257)	
1899	**River and Harbors Appropriation Act** (33 USC §407) prohibits discharge of solid refuse into navigable waters, regulates damming of streams and bridge, dock and pier construction		
1925		**Departments of Health, Drainage and Waters and Conservation** created (Minn. Stat. 1925 c. 426)	
1935	**Soil Conservation Act** (PL 74-46) establishes Soil Conservation Service		
1937		**MN Soil Conservation Districts Law** establishes process for creating soil conservation districts to control erosion; districts may enact land use regulations, State Soil Conservation Committee established (Laws 1937, c. 441 §1) **Public waters system** expanded; no obstruction without conservation commissioner's approval (Laws 1937, c. 468 §5)	
1945		**State Water Pollution Control Act** creates MN Water Pollution Control Commission (Laws 1945, c 395 §§1-12)	
1947		**Drainage of public waters restricted**, public waters definition includes some wetlands (1947 Laws, c. 142)	
1948	**Federal Water Pollution Control Act** (PL 80-845) provides funding for state and local water treatment		
1954	**Watershed Protection and Flood Prevention Act** (PL 83-566) provides planning and funding for flood control projects		
Gov. Orville Freeman Administration			
1955		**Minnesota Watershed Act** (Laws 1955, c. 799) (§103D.201). Drainage code amended to require consideration of conservation **MN Water Resources Board** established, authorized to create watershed districts	
1957		**State interest in public waters defined** (Laws 1957, c. 502)	

Continued

Year	Federal Legislation and Actions	Minnesota Legislation and Actions	Selected Water-Related Studies
Gov. Elmer Anderson Administration			
1961	**Federal Water Pollution Control Act Amendments** (PL 87-88) increase federal support for water treatment; allow federal action against polluters with state governor's consent		
Gov. Karl Rolvaag Administration			
1963	**Land and Water Conservation Fund** created		
1965	**Water Quality Act** (PL 89-234) requires states to issue water quality standards for interstate waters **Water Resources Planning Act** (PL 89-90) authorizesd state framework plan, funds river basin studies and commissions		
Gov. Harold LeVander Administration			
1967		**Water Resources Coordinating Committee** formed to carry out federal WRP Act. **MN Pollution Control Agency** established (Laws 1967, c. 882, §§1-11) State Soil Conservation Committee becomes **Soil & Water Conservation Commission** **Metropolitan Land Planning Act** (Laws 1967, c. 896, §§1-9) establishes Metropolitan Council	
1968	**National Wild and Scenic Rivers Act** (PL 90-542)	Upper St. Croix River designated National Wild & Scenic River	
1969		**Shoreland regulation** authorized (Laws 1969, c. 777; MS 103F) **Floodplain Management Act** (Laws 1969, c. 590, §1; 103F)	
1970	**National Environmental Policy Act (NEPA)** (PL 91-190), **Clean Air Act Amendments** (PL 91-604); US EPA established		State Planning Agency, Water Resources Coordinating Committee. *Minnesota Water and Related Land Resources: First Assessment.*
Gov. Wendell Anderson Administration			
1971		**MN Environmental Rights Act** (MERA) (Laws 1971, c. 952); surface water regulation authority to DNR (Laws 1971, c. 636 s 28); Southern Minnesota Rivers Basin Council formed	

Continued

Year	Federal Legislation and Actions	Minnesota Legislation and Actions	Selected Water-Related Studies
1972	**National Dam Inspection Act of 1972** (PL 92-367); Coastal Zone Management Act **Lower St. Croix River** designated National Wild & Scenic River (PL 92-560) **Federal Water Pollution Control Act Amendments (Clean Water Act)** require states to develop list of impaired waters, set TMDLs. EPA authority to regulate point sources. USACE permitting authority for dredging/filling in waters of the U.S.		
1973		**MN Environmental Policy Act** (MEPA) (Laws 1973, c. 412); waters of state redefined to include wetlands (c. 315 §§2-4) **Environmental Quality Board** created (Laws 1973, c. 342 §§1-9). **MN Water Resources Council** created by Executive Order **Minnesota Wild and Scenic Rivers Act** (Laws 1973, c. 271; 103F §§301-345); state program established **Lower St. Croix Wild and Scenic River Act** (Laws 1973, c. 246, §§1-2) **Critical Areas Act of 1973** (Laws 1973, c. 752 §1) establishes process for designating areas of critical concern (EQB & Governor). **Lake Improvement Districts** authorized (Laws 1973, c. 702 §§1-22)	
1974	**Safe Drinking Water Act** (PL 93-523)	**MPCA authorized to regulate NPDES**, SDS water quality permits SWCC (1967) becomes **Soil & Water Conservation Board**	
1976	**Resource Conservation and Recovery Act** (PL 94-580), **Toxic Substances Control Act** (PL 94-469)	DNR directed to inventory and designate water bodies serving a "beneficial purpose" as public waters (Laws 1976, c. 83, §7); DNR must offer to purchase drainage rights (c. 83, §8). **Water Planning Board** created. Mississippi River Critical Area designated by Executive Order.	University of Minnesota Center for Studies of the Physical Environment. *Environmental Decision-Making in Minnesota: An Overview, Applicability of Innovations in Other States to Minnesota, and Alternatives*. Report to the State Planning Agency.
		Gov. Rudy Perpich Administration	
1977	**Clean Water Act of 1977** (amendments to 1972 CWA). Section 208 of Clean Water Act requires water quality planning effort. **Surface Mining Control & Reclamation Act** (PL 95-87)	**Water Planning Board Framework planning process begins.** SWCD Cost-Share Program established.	
1978		**Dam safety programs and inspections authorized** (Laws 1978, c. 779). DNR establishes Dam Safety Grants program.	

Continued

Year	Federal Legislation and Actions	Minnesota Legislation and Actions	Selected Water-Related Studies
		Gov. Al Quie Administration	
1979		Certain wetlands defined as public waters (Laws 1979, c. 199, §3 and §103G.005) Executive Order 79-19, continues Critical Area designation for urban Mississippi River	Minnesota Water Planning Board. *Toward Efficient Allocation and Management: A Strategy to Preserve and Protect Water and Related Land Resources.*
1980	**Comprehensive Environmental Response, Compensation and Liability Act** ("Superfund" program) (PL 96-510)	WPB directed to study local management of water resources (Laws 1980, Chap 548)	
1981			Minnesota Water Planning Board. *Toward Efficient Allocation and Management: Special Study on Local Water Management*.
1982		**Metropolitan Surface Water Management Act** (Laws 1982, c. 509) - establishes watershed management organizations in Metro area	*Partnerships in Water Management: Minnesota's Challenge of the 1980s*. Summary of the Special Study on Local Water Management.
		Gov. Rudy Perpich Administration	
1983		**Water Planning Board discontinued**; duties to EQB	
1984			*State and Local Water Planning Issue Team Report*. Minnesota State Government Issues: Executive Branch Policy Development Program.
1985	**Food Security Act of 1985** (Farm Bill, PL 99-198) creates Conservation Reserve Program (CRP), sodbuster and swampbuster provisions	**Comprehensive Local Water Management Act** (§103B.301 to 103B.355)	*Ground Water Management Strategy Issue Team Report*.
1986			*Nonpoint Source Pollution Issues Team Report.*
1987	**Water Quality Act of 1987** (PL 100-4) amends CWA, requires industrial stormwater dischargers and municipal separate storm sewer systems ("MS4") obtain NPDES permits	**Board of Water and Soil Resources** created from Water Resources Board, Soil and Water Conservation Board, and So. Minn. Rivers Basin Council (Laws 1987, c. 358, §103). **Clean Water Partnership Act** (Laws 1987, c. 392, §§1-12), institutes funding program and requirements for nonpoint source management DNR need not offer compensation for public water wetland drainage rights (Laws 1987, c. 357, §20)	EQB. *Protecting Minnesota's Waters: An Agenda for Action in the 1987-1989 Biennium.*
1988	**Mississippi National River and Recreation Area** (MNRRA) designated	**Environmental & Natural Resources Trust Fund** created to receive proceeds from Minnesota Lottery	EQB. *A Strategy for the Wise Use of Pesticides and Nutrients*.
1989		**Groundwater Protection Act** (Laws 1989, c. 326, codified as MS §§103H.001-103H.280)	EQB. *Protecting Minnesota's Waters: Priorities for the 1989-1991 Biennium.* MN Planning. *The Minnesota Ground Water Protection Act of 1989: A Summary.*
1990		**Recodification of Water Law** (Laws 1990, c. 391, codified as MS §§ 103A-103)	

Continued

Year	Federal Legislation and Actions	Minnesota Legislation and Actions	Selected Water-Related Studies
		Gov. Arne Carlson Administration	
1991		**Wetland Conservation Act** (Laws 1991, c. 354). Draining and fill impacts to non-public waters wetlands regulated. No net loss in wetland public value.	EQB. *Minnesota Water Plan: Directions for Protecting and Conserving Minnesota's Waters.* EQB. *Water Quality Program Evaluation.* Overview Adopted by Minnesota EQB.
1992	**Pilot Wetland Reserve Program** established (1990 Farm Bill, PL 101-624)		EQB. *1991 Minnesota Water Research Needs Assessment.* EQB. *The Minnesota Water Monitoring Plan.*
1993		**Office of Environmental Assistance** established	
1994	MNRRA Plan completed, incorporates MN Critical Areas, Floodplain and Shoreland requirements by reference. Wetland Reserve Program goes national, Soil Conservation Service becomes NRCS.		EQB. *1995-97 Water Policy Report: A Focus on Ground Water.*
1995	MNRRA Plan approved	**Environmental reorganization bill** (Laws 1995, c. 248, art. 5) directs 1996 "Cross-currents" report. Mississippi Critical Area management shifted from EQB to DNR by administrative reorganization order.	EQB. *Meeting Minnesota's Water and Wastewater Needs: A Working Paper.*
1996	**Food Quality Protection Act** **National Dam Safety Program Act** of 1996, Public Law 104-303		EQB. *Saving Resources: Meeting Minnesota's Water and Wastewater Needs.* MN Planning. *Crosscurrents: Managing Water Resources.*
1998	Minnesota River is second Conservation Reserve Enhancement Program created	RIM matched with WRP and CREP, Red River Basin Flood Damage Reduction Work Group formed	EQB. *Soundings: A Minnesota Water Plan Assessment.*
		Gov. Jesse Ventura Administration	
1999		**Water Unification Initiative** - E.O. 99-15	EQB. *Preparing for Minnesota Water Plan 2000.* Public Review Draft.
2000			EQB. *Minnesota Watermarks: Gauging the Flow of Progress 2000 - 2010. (MN Water Plan)*
2002		Laws 2001, First Special Session, c. 10, Art 1, § 11 directs Urban Rivers study preparation	Minnesota Planning. *Connecting with Minnesota's Urban Rivers: Helping Cities Make Sustainable Choices for the Future.* EQB. *Charting a Course for the Future: Report of the State Water Program Reorganization Project.*

Continued

Year	Federal Legislation and Actions	Minnesota Legislation and Actions	Selected Water-Related Studies
		Gov. Tim Pawlenty Administration	
2003		Governor's Clean Water Initiative, Clean Water Cabinet	
2005		Office of Environmental Assistance becomes a PCA division	EQB. *Protecting Minnesota's Waters: Priorities for the 2005-2007 Biennium.* A Biennial Report of the Environmental Quality Board.
2006		**Clean Water Legacy Act** (Laws 2006, c. 251, §§1-17). Clean Water Council established.	
2007	CRP enrollment peaks in Midwest.		EQB. *Protecting Minnesota's Waters: Priorities for the 2008-2009 Biennium.* A Biennial Report of the Environmental Quality Board. EQB and DNR. *Use of Minnesota's Renewable Water Resources: Moving Toward Sustainability.*
2008	**Food, Conservation, and Energy Act of 2008** (Farm Bill, PL 110-234) increases support for ethanol production	**Clean Water, Land and Legacy Amendment** (MN Constitution, Article XI, §15) Clean Water Fund established. Lessard-Sams Outdoor Heritage Council created	EQB. *Managing for Water Sustainability: Report of the EQB Water Availability Project.* Freshwater Society. *Water is Life: Protecting a Critical Resource for Future Generations.*
2009		Laws 2009, c 172, art. 2, §33 directs U of MN to prepare **Water Sustainability Framework**	Citizens League. *To the Source: Moving Minnesota's Water Governance Upstream.*
2010		MN Session Laws 2009, c 37, § 4 directs DNR groundwater study preparation	DNR. *Long-Term Protection of the State's Surface Water and Groundwater Resources.*
		Gov. Mark Dayton Administration	
2011		**Water Governance Evaluation** required (Laws 2011 1st Special Session, c 2, art. 4, §33); Governor's Executive Order #11-32 re **EQB and environmental governance.**	U of MN Water Resources Center. *Minnesota Water Sustainability Framework.*
2012		Governor's Executive Order #12-04 re **wetland policy; "One watershed - one plan"** legislation (Laws 2012, c 272, §32)	

Appendix C: Summary of Responses to Water Governance Survey

A short on-line survey was distributed to state and local governmental water management staff and interested citizens through several of the MPCA's newsletters during July – September 2012. Fifty-two responses were received, about half of them from state agency staff and the remainder from local government staff, consultants, and others, as shown under Question 1 below. The intent of the survey was to seek input from those with direct involvement in water resource management, rather than the general public. Although the number of responses is small, the respondents are an experienced and knowledgeable group.

Several primary themes emerged from the open-ended survey responses, as discussed below. Respondents were divided into three groups for this analysis: state employees, local units of government/watershed districts, and interested citizens/consultants/other. Some direct quotes have been modified slightly for spelling, grammar, and minor clarification. All efforts were made to fully reflect the meaning of the original comment. The survey results were discussed among the agencies who worked on this water governance evaluation to inform the development of the recommendations contained in this report.

Question 1. "What is your role in water management?"

	Number	Percent
State employees	25	48%
Local government	13	25%
Watershed district staff/board	4	8%
Consultant	3	6%
Interested citizen	3	6%
Other (researchers, educators)	4	8%

Question 2. "Which, if any of the following have you personally experienced with state, local, or federal water management programs within the last 2 years? Please check all that apply."

	Number	Percent
Conflicting priorities among programs	34	65%
Burden of water management falls unfairly on local governments	9	17%
Resources wasted on low-priority waters; unachievable goals	18	35%
Duplication and overlap	27	52%
Confusing permit requirements	12	23%
Confusing program requirements	19	37%
Good or improved coordination	33	63%
Gaps in coverage, issues not addressed	20	38%
Other issues	11	21%

Question 2a. "Other issues you have experienced (related to question 2)."

A. Ten comments from *state employees* had three major themes:

1. *State agencies should involve citizens more.* "Lack of civic engagement… hinders progress." "Agencies need a role teaching citizens…"
2. *State agencies need to do a better job coordinating, communicating, and clarifying.* "Lack of coordination between agencies." Be more explicit, stop strategic planning separately for water programs." "Lack of strategic communication pathway among staff at different agencies."
3. *There appears to be a lack of enforcement/penalty tools.* "Well intended programs without the necessary enforcement tools, or lack of interest in enforcement" No great disincentive to business as usual (pumping without permits)" "highest fines are trivial"

B. Four comments from the *local units of government and watershed districts* had two major themes:

1. *There are more opportunities than dollars available.* "There are watershed projects that are not "districts" that have no stable source of funding" "Clean Water Fund has increased the amount of money available, yet it is harder to get." "There are more opportunities than tax levies can cover."
2. *Procedural complaints/observations.* "TMDL timeline taking too long;" "MPCA criteria for impaired waters does not consider local conditions."

C. There were no comments on this question from the interested citizens/consultants/ other group.

Question 3. "Please use the space below to give us any suggestions for addressing any of the issues identified above."

A. Twenty-two comments from *state employees* had three major themes:

1. *State agencies need to do a better job coordinating, communicating, and clarifying (and consolidating).* "Combine permits or programs to eliminate confusion or duplication." Communication seems to be at the heart of difficulties." "Better record-keeping at inter-agency meetings." "(Identify) one agency that deals with water." "Consolidate SWCD's and watershed districts."
2. *Agencies should involve citizens more (but with caution).* "Science alone cannot produce clean water." "Let go of top-down, expert-driven model of water governance and empower citizens to lead." "Agencies need a role in teaching citizens the importance… of supporting their local ecosystems." "Some regulations that fall to local entities are unenforced (due to local politics)."
3. *Procedural complaints/observations.* "Not enough time (4 years) given to major watershed projects." "Prioritize water bodies on impaired water list." "… public water rules need to emphasize protection of habitat for non-game species." "Water quantity (sustainability) needs to be explicitly stated as a management goal even where quality is the stated reason." "Why are we making MS4 requirements stricter?" "State agencies are allowing various chemical additions to lakes (vegetation control, fish control, water clarity, etc.) without knowing long-term effectiveness and impact on lake ecology."

B. Nineteen comments from the *local units of government and watershed districts* had three major themes:

1. *Centralize water management and governance.* "Water governance in Minnesota is quite fragmented." "I wish the MPCA and DNR would coordinate efforts." "Water management and governance at the state level needs to be unified under one agency." "Reduce federal authority unless a project exceeds a certain size." "One common agency should be established." "Focus monitoring, evaluation, and enforcement to simplify and eliminate confusion."
2. *Empower local units of government and watersheds.* "Include cities in the impaired waters listing process" "(Increase) local unit of government staff and (reduce) in St. Paul." "Consider allow-

ing watershed administration of certain programs." "(Return) a portion of fees collected back to the LGUs to enhance local capacity." "Local governments and special purpose districts need additional funding to adequately address water management issues." "It appears St. Paul is out of touch with how things work outside." "Emphasis should be on local staff implementing programs."

3. *Procedural complaints/observations.* "All of our waters are restoration waters and no longer considered a top priority by the MPCA for grant applications." "(Identify) accountability structures for agriculture." "The current impaired waters/TMDL/MS4 program needs additional attention to coordinate these activities with how local governments can actually implement improvements."

C. Six comments from the *interested citizens/consultants/other* group had one major theme:

1. *Procedural complaints/observations.* "Farmers tiling fields in our part of the state leads directly to run-off into streams and lakes." "A lot of money is wasted on resolving violations that should have never been if people had just asked a couple of questions first." "Expand the use of minor permit modifications so that staff can focus on new and expanded discharges as major modifications." "DNR… unwilling to focus on quantitative analyses and instead gets consumed in 'what if?' scenarios." "Zebra mussels new to our lakeshore, docks increasing to pier size without appropriate permits, lowered lake levels, increased weed growth, concern about water usage, gray water not used effectively."

Question 4. "Please use the space below to give us any further thoughts or suggestions regarding issues that the Water Governance Evaluation should address."

A. Fourteen comments from *state employees* had four major themes:

1. *Identify and support a vision for water quality.* "Emphasis needs to be placed on ground water sustainability." "I've worked in this field for a long time and yet to see a comprehensive goal" "The vision isn't clear and the philosophy pendulum seems to swing between jobs and water quality."
2. *Consider consolidating some functions.* "BWSR is too lenient with wetland protection…Give this authority to MPCA…" "Where is there overlap and where can things easily be condensed without sacrificing services?" "Read Elinor Ostrum's work on managing common pool resources." "Streamline programs and permits between agencies."
3. *Shared data management for water resources.* "Don't lose the goal of shared data management for water resources." "…educate local water planners to understand the data collection and assessment done by the agencies" "
4. *Procedural complaints/observations.* "A triage approach needs to be established (to help prioritize)" "The state should begin to enforce water quality rules, particularly in the agricultural community." "Increase simple purification strategies and collection of rainwater. DECREASE sending all clean water down the Mississippi after the first flush. Reroute the cities' systems."

B. Seven comments from the *local units of government and watershed districts* had two major themes:

1. *Minnesota has a good start at a water governance structure.* "It's getting better slowly." "One watershed – one plan approach is exciting." "Governmental watershed entities, like those that exist in the metro area (WMOs and Watershed districts) need to become standard statewide." "Minnesota has a good start at a governance structure with Watershed Districts, Water Management Organizations, Soil and Water Districts, etc., but authority given to each varies considerably."
2. *At the local level there is often a disconnect between land use planning and water resource planning.* "The processes are different and often managed by different staff groups and engage different stakeholder groups. The focus of most water planning work seems to be on structural

or engineered BMPs that attempt to fix a symptom rather than address the underlying problems (land use). Report should raise awareness of this issue and provide some insight on how these two practice areas (water and land use) can be better integrated."

C. Six comments from the *interested citizens/ consultants/other* group had two major themes:

1. *Push more authority, funding, and support to cities and localities.* "Establish joint powers organizations for the major watersheds." Heed the recommendations in the 1994 Minn. River Citizens Advisory Committee Report, 'Working Together: A Plan to Restore the Minnesota River'." "Increase technical assistance to local governments." "Fully fund the Water Resources Center at MN State Mankato and establish similar organizations in Minnesota's other major basins."
2. *Improved education and information for landowners:* "Increase education on dealing with current invasive species, rules about lake weed-cutting, lakescaping strategies for homeowners." "Reduce permits for extensive irrigation on recreational properties such as golf courses." "Increase water conservation information: decrease mowing and sprinkling, increase development of mulched yards, use of daily gray water from households to use on yards."

Water Governance Evaluation Appendix D: Literature Survey

Addendum to 2013 Report to the Legislature.

Minnesota Pollution Control Agency

January 2013

Legislative Charge

The statutory requirement for this report is found in Minnesota Session Laws, 1st Special Session, Chapter 2, Article 4, Section 33, which reads:

EVALUATION REQUIRED
(a) The Pollution Control Agency, in conjunction with other water agencies and the University of Minnesota, shall evaluate water-related statutes, rules, and governing structures to streamline, strengthen, and improve sustainable water management.
(b) The Pollution Control Agency must submit the study results and make recommendations to agencies listed under paragraph (a) and to the chairs and ranking minority party members of the senate and house of representatives committees having primary jurisdiction over environment and natural resources policy and finance no later than January 15, 2013.

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Literature Survey:
Water Governance Studies and Planning Documents, 1970-2011

This supplementary report is a survey and summary of over 50 water governance and water management studies and plans produced between 1970 and 2011. These documents contributed to the findings and recommendations of the full "Water Governance Evaluation" report. The reports are presented in chronological order, grouped by decade, in order to trace emerging trends and shifts in water policy over more than forty years.

1970s-1980s

1970

State Planning Agency, Water Resources Coordinating Committee. 1970. Minnesota Water and Related Land Resources: First Assessment.

"Stimulated by the passage of the Federal Water Resources Planning Act of 1965, the Minnesota State Planning Agency, in May 1967, activated an advisory Water Resources Coordinating Committee to prepare a statewide water and related land resources plan… The creation of this Committee was necessary because the water management function in Minnesota State government is fragmented among a number of separate agencies. None of them have the authority and the responsibility individually to prepare or administer a statewide plan of water and related land resources development."

Ten working papers were developed in 1969-70 on various aspects of water and related land resources, then condensed into this report. Assumptions and policy basis for the subsequent Framework Plan (WPB 1979) are outlined for each topic area – water supply, pollution control, recreation, drainage, power, etc. Information gaps are identified. Policy questions focus on roles and responsibilities. Options suggested include:

- No action
- WRCC given authority to plan and coordinate water management
- Transfer most functions to one agency

Minnesota House of Representatives Land and Water Resources Committee Final Report, Interim 1969-1970.

Prescribed by HF 32, joint effort of two subcommittees (Water Resources and Pollution; Minnesota River Flooding and Drainage).

- Identifies "uncoordinated, piece-meal and compartmentalized approach" to management of water and related land resources – 30 different state & federal agencies!
- Recommends development of an act that would establish a unified comprehensive state water policy; abolish the Soil and Water Conservation Commission and Water Resources Board; create a Water and Related Land Resources Board; and establish a joint Senate-House Standing Commission on water and related land resources.
- Other recommendations: grant-in-aid loan program for wastewater treatment plants, WWTP operator training and certification, improve MPCA capabilities. (Were policy statements incorporated in subsequent water law? (not obviously in MS 103). Did proposed Board prefigure the EQB?)

Office of Governor Levander. 1971. Natural Resources Organization for Minnesota. Briefing paper by Laurence Koll and David Durenberger.

Purpose: "draw on the recent experience at the State Executive level concerning the organizational effectiveness of government to respond to the natural resource needs of Minnesota." Examines roles of WRB, Soil & Water Conservation Commission and MPCA as they relate to DNR. Recommendations:

- A full-time "three-man" Natural Resources Council within Governor's office to improve inter-agency coordination. Could convene annual Minn. Environmental Quality Congress to assess progress.
- Transfer watershed district assistance from WRB to DNR; transfer Soil and Water Conservation Commission to DNR; consider merging WRB and SWCC.
- Retain PCA and DNR as separate agencies.

1973

University of Minnesota Center for Studies of the Physical Environment. 1973. Environmental Decision-Making in Minnesota: An Overview, Applicability of Innovations in Other States to Minnesota, and Alternatives. Report to the State Planning Agency. On-line: http://archive.leg.state.mn.us/docs/2012/other/120425.pdf

Minnesota's water agencies and water laws were created to deal with specific areas and issues. Problems include fragmentation of responsibilities, proliferation of special purpose districts, lack of effective methods of coordination or conflict resolution, lack of overall policy formulation, and inability to adequately enforce existing policy.

Recommendations:

- Establish a state water-use policy, a data-sharing system, and a conflict resolution mechanism (i.e. an environmental policy board)
- Reorganize water resource agencies: abolish the WRB, give watershed responsibilities to DNR.
  - PCA: regulatory
  - DNR: planning and management
  - SPA: policy decisions
- Allow greater citizen input into policy-making process

1979

Minnesota Water Planning Board. 1979. Toward Efficient Allocation and Management: A Strategy to Preserve and Protect Water and Related Land Resources.

This document is considered the first state water plan, followed by the EQB's plan of 1990, to be updated at 10-year intervals. Developed in response to drought of 1976 and LCMR concerns. Examines water withdrawals and consumption, localized supply and demand, water quality, and related land use decisions.

- Five topical areas:
  - Water resources planning and environmental review
  - Water quality management
  - Water quantity management
  - Related land resources management
  - Wildlife and recreation management
- Recommendations:
  - Create a water resource coordinating body
  - RDCs should provide link between state policy and local plans
  - Watershed districts (or if none, local governments) should be focal points for local water management planning

1980

Minnesota Pollution Control Agency. 1980. Water Quality Management: Minnesota's 208 Plan. Division of Water Quality, Planning Section On-line: http://archive.leg.state.mn.us/docs/pre2003/other/801228.pdf

"Initial Water Quality Management (WQM) Plan prepared by the State of Minnesota pursuant to federal regulations 40 CFR, Parts 130 & 131, and Sections 208 and 303 of the 1972 Federal Water Pollution Control Act (amended in 1977 as the Federal Clean Water Act)."

- Purpose is to examine non-point sources and urban runoff in 10 focus areas: 1) construction activities; 2) roadside erosion; 3) highway de-icing chemicals; 4) agriculture; 5) feedlots; 6) pesticides; 7) forestry; 8) mining; 9) urban runoff; and 10) residual wastes (industrial)
- Recommends various regulatory, educational and assistance programs in most focus areas
- Priority rankings by state task force gave highest priority to agriculture, followed by feedlots, pesticides, urban runoff and construction

1981

Minnesota Water Planning Board. 1981. Toward Efficient Allocation and Management: Special Study on Local Water Management. A Report of the Minnesota Water Planning Board to the Legislative Commission on Minnesota Resources and Governor Albert H. Quie.

Recaps previous water planning efforts and local role in water management. Recommendations to clarify and improve local authorities and relationships. These include:

- Counties and other "general-purpose governments" should be fundamental decision-makers
- County water planning /management should be based on hydrologic units
- SWCDs and watershed districts should be tied to and consistent with general-purpose government
- Joint powers agreements encouraged
- RCDs may act as planning advisors
- Approval of local plans triggers delegation of state management responsibilities to LGUs

Solutions must be: flexible, simplifications of current system, efficient, within fiscal/technical capabilities of local government, accountable to its supporters, and acceptable to the public.

Three alternatives were studied: 1) Extension of watershed districts across the state; 2) Realignment and strengthening of SWCDs and primary planning units; 3) Establishment of regional watershed management districts. Alternative 1 was selected.

1982

Minnesota Water Planning Board. 1982. Partnerships in Water Management: Minnesota's Challenge of the 1980s. Summary of the Special Study on Local Water Management.

Citizens' guide to the 1981 study: Minnesotans take water for granted, but that needs to change; new challenges at local level; local leaders believe change is necessary. Recaps recommendations of 1981 study.

1984

Governor's Briefing on Water Issues, December 10, 1984 (working document).

- Identifies priority environmental issues, based on EQB assessment:
  - State and local water planning and management
  - Soil conservation and water quality
  - Surface and ground water protection, including non-point source pollution
  - Toxic contamination – hazardous waste and pesticides
  - (remainder are not water-related)
- Water is next resource crisis – must act now
- Examines flood protection, water quality
- State level organization: coordination or consolidation?

- Supports a statewide comprehensive local water management act – similar to later BWSR establishment

State and Local Water Planning Issue Team Report. 1984. Minnesota State Government Issues: Executive Branch Policy Development Program.

Purpose: "Define process and recommend actions for improving the effectiveness of water and related land resources planning, research and management programs in Minnesota through more coordinated use of state, federal and local resources."

- Findings:
  - Fragmentation of programs leads to problems in public and legislative perception of water management, and to efficient and effective program operation
  - No reorganization options will eliminate the need for coordination among agencies, governments, etc.
  - No one local organization serves as a focus for water management decisions
  - Further study, analysis and research to implement framework plan
- Recommendations:
  - EQB should adopt an explicit process to negotiate priorities and resource assignments among participating public agencies
  - EQB should establish permanent water and related land resources subcommittee
  - Enact comprehensive local water management act for counties outside Metro; give them responsibility for developing water and related land use plans. (Became 103B.311)
  - Biennial preparation of water/related land resources recommendations to LCMR for project funding
  - EQB should develop updated state water management organizational options.
- Appendix includes outline for negotiated investment process, led by SPA. Participants are convened, asked to agree on priorities for action and policy reform. "Participants are asked to think of the commitment of time and resources as 'investments' which are expected to pay off in longer-term benefits to the state." Purpose is to establish consensus implementation plan.

1985

Citizens League. 1985. A Strategy for the Waterbelt. A Citizens League Report. Approved November 22, 1985. Minneapolis. [available online at http://www.citizensleague.org/publications/reports/402.Report.A%20Strategy%20for%20the%20Waterbelt%20(Groundwater%20contamination).PDF*]*

Report focuses on groundwater supply, pollution and structure (governance). Recommendations in each category include:

- Supply: state government should take a leading role in establishing interstate water transfer policy. Drought water allocation plan should be developed and priorities revised, giving household and municipal use top priority. DNR withdrawal fees should be increased and proceeds used for groundwater protection initiatives.
- Pollution: EQB, PCA, DNR and MDH should develop health risk standards, cleanup priorities and standards, a "report card" on agency performance.
- Structure: EQB should be reconstituted with majority of citizen members; greater coordinating powers. Ag chemical regulation should be transferred to PCA.

Ground Water Management Strategy Issue Team Report. 1985. Minnesota State Government Issues: Executive Branch Policy Development Program.

Findings/ Recommendations:

- Accurate baseline information on quality and quantity of ground water is lacking
- Present multi-agency governance structure is workable

- Interdisciplinary involvement among agencies is needed – a) a policy-level coordinating body; b) a mid-management technical group; c) interagency technical team; d) annual briefing of Governor
- Ground water should be managed at state rather than local level
- Recommendations on formal agreements for data-gathering and sharing

State Planning Agency. 1985. Water Agency Merger Study, 1984-1985. Compendium of study documents. [available online at http://archive.leg.state.mn.us/docs/2010/other/101000.pdf*]*

Compendium of study documents and recommendations of study, which included all water-related state agencies and selected interest groups.

- Goal of Perpich Administration is to make government more rational in structure and more cost efficient in operation. Expressions of concern from Citizens' League, League of Women Voters, etc. drive the effort.
- Status quo is unacceptable. Integrated state approach to local government is needed. Various restructuring options considered.
- Selected option led to creation of BWSR out of the SWCB, WRB and Southern Minn. Rivers Basin Council. BWSR designated as primary coordinator of state water management efforts with local governments.
- Recommended creation of EQB's "Water Subcommittee" (Water Resources Committee, Water Program)

1986

Helland, John, 1986. House Research Information Brief: State Water Management: Reorganization and Consolidation

Recaps the history of water management reorganization legislation and studies from 1955 through 1986, tracing organizational structures such as the Water Resources Board, Water Planning Board and EQB. Identifies pros and cons of consolidation of state agency water management functions, and introduces concept of an advocacy system:

> "…strong, competing agencies, each concerned with its own duties and specific goals. In political terms, an 'advocacy' system promotes competition and increases the public representation of each goal or interest and highlights political choices. Conflicts and tradeoffs in such a system are meant to be solved through the political rather than the administrative process."

Nonpoint Source Pollution Issues Team Report. 1986. Presented to Energy/Environment/Resources Subcabinet. Minnesota State Government Issues: Executive Branch Policy Development Program.

Identifies sources of NPS pollution and trends of declining water quality due to NPS. Recommends Clean Water Partnership Program with financial assistance, and water quality management improvements in several areas:

- Pesticides and fertilizers
- Agricultural runoff
- Animal feedlots
- Urban runoff/Infiltration and construction
- On-site sewage systems
- Hydrologic modifications (wetlands, drainage)
- Forestry runoff
- Mining runoff
- Highway de-icing chemicals
- Special erosion problems (streambank, lakeshore, roadside)

PCA to coordinate programs through EQB Water Resources Committee.

1987

EQB (Environmental Quality Board). 1987. Protecting Minnesota's Waters: An Agenda for Action in the 1987-1989 Biennium. Minnesota State Planning Agency.

We have much to learn about water distribution, quality, and related land use issues. EQB WRC has reviewed prior studies. "Make the current system work at its best" – dramatic changes are not required. Better integration and coordination is EQB's role.

Goals:

- Safeguarding public health – Ground water protection and management; toxic substances / health risk assessment
- Enhancing environmental quality – Nonpoint source pollution; drainage law reform; comprehensive lake management
- Fostering wise economic development – flood damage reduction; water quantity management
- Improving government support – communication, coordination, local water planning, water board reorganization (BWSR creation), water information system development, financing

1988

EQB. 1988. A Strategy for the Wise Use of Pesticides and Nutrients. Prepared by the EQB Water Resources Committee. Minnesota State Planning Agency.

Prepared as a follow-up to 1988 Ground Water Protection Strategy. Outlines actions to be taken to protect water resources from pesticide and nutrient contamination. Four agencies primarily responsible for water quality impacts: MDA, MDH, DNR and PCA.

Initiatives and Recommendations:

Information, education and incentives:

- Water resources education advisory committee
- Public information and training programs, demonstration projects and financial incentives

Resource evaluation and research

- Develop coordinated monitoring plan
- Establish interagency and academic technical committee;
- Identify BMPs; ongoing research

Preventive planning and regulatory efforts

- Adopt nondegradation goal and numerical limits
- Expand drinking water protection efforts, including enforcement of water well construction code
- MDA develop state pesticide management plan (per EPA suggestions)
- Integrate pest and nutrient management into existing efforts, including SWCD plans
- Enhance control efforts in areas such as fertilizer application through irrigation systems, waste disposal

1989

EQB. 1989. Protecting Minnesota's Waters: Priorities for the 1989-1991 Biennium. Minnesota State Planning Agency.

Under the same state goals as the 1987 EQB agenda, priorities include:

- Protect ground water – Sensitive areas, research into minor aquifers, recharge areas, local government regulatory role
- Local water management and comprehensive water planning with BWSR assistance

Accomplishments from 1987-89 recommendations include:

- BWSR established
- Pilot comprehensive local water planning program

- Water-related legislation – Clean Water Partnership, Flood Mitigation Act, Metro ground water planning

EQB. 1989. The 10-Year Agenda for Protecting Minnesota's Waters. Working Paper. EQB Water Resources Committee, November, 1989.

The Committee identified six priority areas for water resource protection in the 1990s: 1) water supply protection; 2) infrastructure; 3) information, monitoring and assessment; 4) reduction of environmental pollutants; 5) managing the use of land and water; 6) communication and education. Recommendations include:

- Groundwater models, geologic atlas studies and hydrogeologic assessments
- Evaluating pollutant sources; management of agricultural chemicals, phosphorous
- Research into long-term carrying capacity of specific water bodies, aquifers, etc.
- Convene biennial environmental congresses to establish priority environmental issues

Minnesota State Planning Agency. 1989. The Minnesota Ground Water Protection Act of 1989: A Summary.

Guide to new law: state agency groundwater responsibilities and management actions. Highlights include:

- MDH will adopt health risks limits for groundwater pollutants, notification, permits and fees for wells; well-sealing program is strengthened
- New Legislative Water Commission will review state water policy and programs
- EQB will prepare new state water plan every five years; will remain focus for state water policy/priorities
- MDA: various programs for pesticide education, IPM, training; will monitor pesticide use
- MDA has authority to order corrective action, remedies and penalties
- EQB / PCA to develop water monitoring plan, information system and database
- Water conservation: limits on once-through heating and cooling systems, fee structures changed, water allocation priorities during shortages are changed
- Grants to develop local water plans available to counties through BWSR
- Funding from fees for well construction, water use, fertilizer and pesticide use.

1990s

1991

EQB. 1991. Water Quality Program Evaluation Survey.

Survey of all state water management programs at PCA, DNR, MDA, MDH, BWSR, Office of Waste Management and Mn/DOT, with information collected from program managers, to inform subsequent study.

EQB. 1991. Water Quality Program Evaluation. Overview Adopted by Minnesota EQB.

Summarizes survey results, trends, recent efforts, impediments and opportunities. State has a "robust array of program to protect water quality." Trends include:

- Gaining ground on point sources; changing emphasis to nonpoint sources
- Heightened focus on prevention
- Continuing need for cleanup
- Shift from construction of wastewater treatment facilities to maintenance
- Increasing role for local government

EQB. 1991. Minnesota Water Plan: Directions for Protecting and Conserving Minnesota's Waters. Minnesota State Planning Agency.

Authorized by MS 103B.151, "develop a new plan and strategy" by 11-15-90

First Minnesota Water Plan since 1979 – signals state's commitment to local water planning, understanding water's interconnections and integrating government efforts to address them. "Focus on the resource" rather than specific programs. Establishes principles, objectives and recommendations:

- Integrating Water Management: Establish "Minnesota Coordination Strategy" that "makes water management more understandable, efficient and directed toward meeting state goals." Emphasizes role of local water plans and of joint water planning efforts at regional levels (i.e., Mississippi Headwaters, Redwood-Cottonwood)
  - Communication and Education: Develop information and education plan, using Office of Environmental Education and regional clearinghouses, curriculum development.
  - Information and Research – GIS, LMIC Ground Water Clearinghouse, etc.
  - Liability and Enforcement – consistent state approach, enhance compliance strategy
  - Infrastructure – water and wastewater treatment – effective operation and maintenance
  - Financing
- Focusing on the Resource:
  - Integrated lake management strategy
  - A state-local "no net loss" program for wetlands, including agricultural drainage reforms
  - Watershed and basin focus on rivers, including river basin coordinating teams
  - Groundwater research and priority aquifer management
- Protecting and Conserving Water Resources: Build degradation prevention goals into all state programs and practices affecting water – including pollutant discharges, agricultural activities, well management, water conservation
- Managing Water's Interconnections: Build water protection needs into land use decisions, identify barriers and program changes

1992

EQB. 1992. 1991 Minnesota Water Research Needs Assessment. EQB Water Research Advisory Committee. Minnesota State Planning Agency.

Authorized by MS 103A.43: EQB required to evaluate and report to Legislative Water Commission and LCMR on statewide water research needs and recommended priorities

Establishes priorities for water research using principles of 1991 MWP. Priority areas include 1) ground water; 2) surface water; 3) fate and reduction of environmental pollutants; and 4) integrated water management. Project-level priorities include: a) delineate and quantify factors that determine wetland functions; b) effects of climate change on surface and ground water availability; c) investigate contaminant movement through the unsaturated zone.

EQB. 1992. The Minnesota Water Monitoring Plan. Minnesota State Planning Agency.

Authorized by MS 103B.151: EQB required to develop a plan for monitoring the state's water resources

Identifies state agencies responsible for water monitoring and legislative authorities:

- PCA: broadest authorities re surface and groundwater
- MDH: public drinking water supplies; well data
- MDA: impact of pesticides; groundwater monitoring for ag chemicals, water quality testing for dairy wells
- DNR: habitat management; supply management; identify sensitive areas

Discusses data compatibility, monitoring system components, information system characteristics and integration. Recommendations include:

- Break down barriers to integrated data management
- Build comprehensive system of leading environmental indicators
- Support comprehensive system of monitoring ambient groundwater quality
- Revamp surface water monitoring network – away from chemical analysis toward integrated assessments
- Intensify groundwater assessments
- Expand Safe Drinking Water Act monitoring efforts

1995

EQB. 1995. Meeting Minnesota's Water and Wastewater Needs: A Working Paper. Minnesota State Planning Agency and EQB Water Resources Committee.

Water: The existing water system is complex, with nearly 10,000 public water systems (both public and privately-held systems supplying the public). Water supply needs are increasing, while treatment requirements are variable. Information on fiscal needs is limited, as is funding, while new federal requirements could be costly.

Wastewater: Treatment facilities are regulated by the state (PCA) and managed by individual municipalities and special districts (sanitary districts and subordinate service districts). Minnesota has over 480,000 individual sewage treatment systems, and regulation of these systems varies – by PCA, counties, cities, etc. Both ISTS and public system needs are extensive.

Funding: Available through 12 programs, generally supplied to local governments. State Revolving Fund role is expanding. Wastewater Infrastructure Fund inadequate to meet needs. Local capacity to pay varies greatly.

Land Use: Most land use regulation is local in nature, with a few state and federal regulation covering reas such as wetlands, shoreland and wellhead protection areas. Land use requirements outside Twin Cities metro vary widely and comprehensive planning is generally optional. Local water plans could address water supply and wastewater needs. RDCs could do the same. (Metropolitan area planning has a unifying framework, but some conflicts exist.)

1996

EQB. 1996. Saving Resources: Meeting Minnesota's Water and Wastewater Needs.

Summary of findings from 1995 working paper, with recommendations:

- Focus on a unifying mission to guide water supply and wastewater treatment issues: effective land use management, water demand reduction, reclamation of water, etc.
- Develop sustainable guidelines on water; include water in local sustainable development plans
- Include water supply and wastewater management in local water plans
- Define local communities' role; expand educational efforts
- Expand state's ability to correct problems; target state grant and loan funding based on needs identified in sustainable development plans

Minnesota Planning. 1996. Crosscurrents: Managing Water Resources.

Authorized by 1995 Laws c 248, art. 5

The major water governance assessment of the 1990s. Required by 1995 legislature, which "presented 5 goals and 11 outcomes and authorized a study of how services could be better delivered by reorganizing related functions." Report highlights past accomplishments, barriers to integration, and options for change. Also includes summary of state and local structures; inventory of recent improvements.

- "Agency missions demonstrate diversity and advocacy" – i.e., the current system works well within this advocacy framework; gives local governments and citizens many choices for actions
- History of water management reorganization studies
- Improvements:
  - Cooperative planning efforts on local water plans; improvements still needed
  - Agency coordination initiatives on financial assistance, permits, data-sharing

- Permitting simplified by DNR (general permits for multiple projects by one LGU) and PCA (general permits for similar operations)
- Focus on sustainable development (Roundtable, etc.)

· Barriers:
- Agency funding restrictions can restrict change and cooperation (funding "by program" sets expectations)
- Changing statutes and rules is a lengthy process, hindered by competing interests and advocates
- Planning is often disconnected among agencies – EQB's 1991 Mn Water Plan has not been tracked, other EQB plans lack follow-through. Most agencies lack resources for coordinated planning.
- Authorities sometimes unclear and overlapping – programs evolved under different mandates, but have begun to 'blend at the edges'
- Data uncoordinated; decision-making in central offices cumbersome for locals; lack of resources hampers local efforts
- Special purpose districts (SWCDs, etc.) difficult to modify

· Options:
- Continue to build on current management structure (citizen input: prefer existing structure)
- Develop plan to merge regional offices
- Simplify procedures for modifying special purpose districts
- Build on local water planning
- Integrate financial assistance programs
- Identify additional general permit options
- Seek waivers from federal mandates
- Invest in technology
- Continue to integrate sustainable development into state efforts

1998 *EQB. 1998. Soundings: A Minnesota Water Plan Assessment.*

A status report on progress in carrying out the objectives of the 1991 state water plan. Finds progress in key areas:

- More efforts are focused on big-picture management, including sustainable development and ecosystem management
- Local water planning is progressing
- Interagency coordination is increasing
- Electronic communication is changing methods of educating, information-sharing and accessing data
- More monitoring is providing better information
- New efforts are preventing and correcting problems, i.e., sealing unused wells, leaking tank removal

Other areas need more work:

- Priority setting (i.e., for state assistance) is variable and not systematic
- Coordination needs more emphasis
- Funding assistance may not relate to priorities
- Coordination needs more emphasis – more systematic, inclusive and long-term
- More systematic program evaluation is needed

2000 - 2011

2000

EQB. 2000. Watermarks: Gauging the Flow of Progress 2000-2010. Minnesota Planning.

This document is the 10-year update of the State Water Management Plan. Summarizes an 18-month interagency process to "set a new direction for water management in Minnesota" (Ventura administration's Water Management Unification Inititative). Defines goals and initiatives for seven major water basins. Common goals focus on improving water quality in rivers, streams, lakes and groundwater; maintaining adequate groundwater supplies; restoring and maintaining healthy aquatic ecosystems; and providing water-based recreation opportunities. Good basin-by-basin overview of issues.

2001

Minnesota House of Representatives Research Department. 2001. A Survey of the Groundwater Act of 1989. Prepared by John Helland, Legislative Analyst.

Survey of accomplishments stemming from the act, unfulfilled goals, and future groundwater concerns, based on a survey of agency staff. Accomplishments include stronger water conservation measures; new or increased water use fees to reflect the cost of the resource; greater monitoring and testing of pollutants in groundwater; comprehensive waste pesticide collection and well-sealing programs; and expanded monitoring of community water supplies; and additional support for local water management planning. Shortcomings include lack of information on nitrate in groundwater, disconnect between surface water, groundwater and land use in the current water management system, a failure to tie water use to particular aquifers, and unmet data needs on water quality trends.

Minnesota Planning. 2001. Water Program Reorganization Study: Results of the September, 2001, Survey. October 19, 2001. (working papers).

Background study for reorganization project, surveyed state, county, local government employees, watershed districts, rural water providers, lake associations, consultants, etc. Interesting set of perspectives on current programs and reorganization options.

2002

Gieseke, Timothy. 2002. Draft Water Unification Plan.

Per its subtitle, this independently prepared study calls for "coordinating state agencies through an activity-based structure that utilizes the spectrum of state, local and federal agencies' resources to effectively manage Minnesota's water resources." Contrasts the current agency-based structure with an activity-based structure. Activities and roles include: 1) monitoring; 2) regulation and enforcement; 3) implementation; 4) data collection and storage; 5) research and emerging issue; and 6) education and public outreach. Each agency would participate in some or all of these activities. This approach seems to prefigure the PCA's current structure compared to the previous media-based one.

Minnesota Planning. 2002. Charting a Course for the Future: Report of the State Water Program Reorganization Project.

Findings / Recommendations:

- Legislative committee structure is fragmented in regard to water policy and programs, which may result in fragmented policy direction. Recommend recreation of Legislative Water Commission or similar coordinative body.
- Executive Coordination. Operational level coordination is effective between agencies; policy level coordination is often thorny, especially with emerging issues. EQB coordination of water issues has varied in effectiveness. Recommend EQB examining current coordinative structures.

- Greater support to local governmental units, which are taking increasing roles in water management and protection, through local water plans and other programs. Recommend integration of comprehensive and water planning.
- Water monitoring is increasingly well-coordinated but common strategy and methodologies are still needed. Develop a strategic plan for water monitoring as well as for each of Minnesota's water basins. Conduct independent study of water monitoring and whether structural change is necessary to improve the situation. Integrate data using GIS.
- Examine use of administrative penalty orders. Consider authorizing penalty orders for all state agencies with regulatory programs (i.e., lacking for DNR waters permits).

Appendix includes examples of water management initiatives from other states. See also "Chart of state agency programs" prepared in 2001.

Minnesota Planning. 2002. Connecting with Minnesota's Urban Rivers: Helping Cities Make Sustainable Choices for the Future.

Authorized by 2001 Laws, Special Session, c 10, a 1, s 11

Legislature's intent: to evaluate need for DNR rules implementing Mississippi River critical area order (EO 79-19) and examine other legislation and guidance for urban rivers. Findings include:

- Critical area plan review process should be simplified and shortened;
- Decisions about river management should be made before the need for a Mississippi River critical area rule can be determined.
- Identifies range of options to improve river corridor management: give DNR clear authority to do critical area rules; change lead from DNR to Metropolitan Council; split responsibility between plan oversight (Metro Council) and enforcement (DNR) etc.

Also includes principles for sustainable development of urban rivers: 1) enlightened community interest; 2) asset management; 3) endowment protection; 4) implications analysis; 5) results management. Includes discussion of urban river issues and examples of design guidelines.

2005

EQB. 2005. Protecting Minnesota's Waters: Priorities for the 2005-2007 Biennium. A Biennial Report of the Environmental Quality Board.

Identifies "core state water activities" – research, monitoring, data management and assessment, regulation and enforcement, implementation, and education and outreach. Other priorities include restoring impaired waters and Metro area water supply sustainability.

Recommendations:

- Find long-term funding for core functions; overhaul Environment and Natural Resources Trust Fund process and replace with independent citizen-led panel; evaluate wetland conservation efforts; increase selected water-related fees. Discusses Governor's Clean Water Initiative pilot projects and milestones.
- New funding for clean water initiatives through increased sewer fees (Impaired Waters Initiative).
- Twin Cities regional water supply development fund and advisory committee to monitor water supply; water supply master plan.

2006

EQB and Clean Water Cabinet. 2006-2008. Preliminary Water Supply Vision and Strategies. (working papers)

Preliminary water supply vision and strategies by Clean Water Cabinet (EQB subcommittee). Strategies: targeted research to improve understanding of water; assess water availability; simplify regulation; ensure planning; reserve supplies to meet future needs. Recaps progress made through Clean Water Legacy Act, priorities and pilot projects. Lessons learned: power of focus – "better to do a few things well;" advantages of collaboration and teamwork.

2007

EQB. 2007. Protecting Minnesota's Waters: Priorities for the 2008-2009 Biennium. A Biennial Report of the Environmental Quality Board.

Recaps Clean Water Cabinet vision of 2005 report. Priorities are:

1) Water quality and the CWLA – completion of TMDLs;
2) Water supply – Metro Council planning activities, Minneapolis-St. Paul water interconnect, assess water sustainability statewide;
3) Wetlands – can "no net loss" be verified?

EQB and DNR. 2007. Use of Minnesota's Renewable Water Resources: Moving Toward Sustainability. directed by MS 103A.43

DNR's definition of sustainable water use: "the use of water to provide for the needs of society, now and in the future, without unacceptable social, economic or environmental consequences." Report examines current and future water demand and quantity of water that could be removed on long-term renewable basis, at the county scale. Comparisons made for reported use in 2005 and estimated use in 2030.

Conclusions:

- "Water rich" label no longer as applicable to Minnesota, especially in growth corridor
- All estimates of availability and sustainable use have elements of uncertainty
- Monitoring and research are needed to aid future management
- Next assessment should focus on geographic areas with supply & demand issues, etc. – should use both science- and citizen-based advisory committees

MPCA. 2007. Minnesota's Groundwater Condition: A Statewide View.

MPCA and MDH report focusing on groundwater quality, monitoring status and primary human-caused impacts, mainly associated with land use. Focus is on chloride, nitrate, VOCs, pesticides and other emerging contaminants. Identifies "growing need to better incorporate ground water and surface water interaction into water resource management activities."

Office of the Legislative Auditor. 2007. Evaluation Report: Watershed Management.

Findings:

- Minnesota's watershed management structure is a complex network: at least 14 federal and state agencies provide services; 11 different types of local entities carry out "on-the-ground" watershed management activities.
- Performance of local water management entities has been mixed.
- State oversight of local entities is inadequate – BWSR has not established standards, systematically monitored their performance, or adequately held them accountable for their performance. BWSR has limited authority but is also reluctant to fully use authority.

Recommendations: Legislature should:

- Require BWSR to provide greater oversight; i.e. establish performance and operational standards, monitor and assess local watershed management entities.
- Give BWSR a wider range of enforcement tools to manage and improve performance of low-performing local entities.
- Change the governing structure of BWSR – director appointed by Governor, confirmed by Senate; BWSR Board should change from a governing board to an advisory commission.
- Ensure BWSR has adequate resources to perform new oversight responsibilities.

·

2008

EQB. 2008. Managing for Water Sustainability: Report of the EQB Water Availability Project.

Report prepared in response to request from MPCA; EQB convened interagency stakeholder group. Recommendations in three general areas:

- Achieve protective standards: generate and manage information, enhance water quality monitoring network, refine aquifer protection threshold concept, including thresholds for regional systems. Identify defensible criteria for assessing critical water level or flow conditions required to support ecosystems.
- Plan for water sustainability: Manage water area-wide through water appropriation and use management areas. Develop system of incentives to encourage local governments to incorporate water sustainability considerations into their plans and actions. Encourage consideration of alternative water supplies, gray water reuse, etc.
- Define water information needs. Areas needing accelerated study include changes in groundwater recharge and water availability.

Freshwater Society. 2008. Water is Life: Protecting a Critical Resource for Future Generations. Report to the Freshwater Society Board by the Freshwater Society Guardianship Council.

Society's Guardianship Council analyzed ground and surface waters and the threats they face. Consensus was that the biggest freshwater challenges involve sustainability of groundwater and the nonpoint source pollution of surface waters. Findings and recommendations include:

- Groundwater:
  - "Startling lack of consensus" as to whether current use is sustainable – need scientifically rigorous study
  - DNR issues permits on case-by-case basis, not anticipated cumulative impact; lacks authority to restrict development; practices should be changed.
- Surface water:
  - Great strides in managing point source pollution, but not nonpoint – 40% of water bodies tested fail to meet standards
  - Agricultural runoff and urban/suburban development are biggest sources – adopted BMPs in both settings
  - Endocrine disruptors and emerging threat – more research needed
- Other recommendations: change water pricing structure to encourage conservation; emphasize environmental education; prepare for climate change.
- Further study: agricultural practices, stewardship and water allocation

Smith Partners and Emmons & Olivier Resources, 2008. Integrating Stormwater Permitting and Watershed Management. A Report to the Minnesota Board of Water and Soil Resources and the Minnesota Stormwater Steering Committee.

Explores feasibility of a watershed-based approach to stormwater and watershed planning; to streamline planning and permitting. Conclusions presented to Stormwater Steering Committee:

- No significant legal barriers to integrated permitting by MS4s and watershed organizations. Increased liability exposure from collaboration is manageable, with further MPCA guidance. Cost savings are likely.

- Continue and expand local collaboration among MS4s and watershed organizations, especially in inspections and BMP maintenance.
- BWSR, MPCA, MDH and Metro Council should collaborate to improve alignment of water planning processes.
  - Adopt WMO plans 2-3 years prior to comp land revision deadlines
  - BWSR should place all WMO plan revisions in same cycle, or scheduled by regions
  - BWSR should supplement 10-year WMO plan review cycle with 5-year reviews to incorporate SWPPP changes
  - MPCA adjust 5-year municipal stormwater permit to align with WMO planning cycle for metro watersheds
  - MDH should explore how wellhead protection plans could best be coordinated with local water plan updates
- MPCA should evaluate potential changes to the General Permit to allow SWPPPs to be integrated into local water plans.
- MPCA and BWSR should convene a work group to implement recommendations, through an interagency MOU.

(According to agency participants, recommendations were not adopted due to concern regarding legal exposure and the feasibility of 'delegation).

*University of Minnesota, Institute on the Environment, 2008. Statewide Conservation and Preservation Plan. Final Plan – June 30, 2008. [*http://www.lccmr.leg.mn/statewideconservationplan/SCPP_FinalPlan.html*]*

Habitat recommendations of plan include water-related recommendations:

- Protect critical shorelands, acquire high-priority shorelands (economic incentives, etc.)
- Restore and protect shallow lakes, targeting prairie and forest-prairie transition zones, focus on conservation easements
- Restore wetlands, protect critical in-water habitat of lakes and streams
- Keep water on the landscape
- Review and analyze drainage policy
- Research near-shore habitat vulnerability

Land Use recommendations include recommendations for reduction of streambank, upland and gully erosion, and storm water management in urban areas.

2009

*BWSR, 2009. Wetlands Restoration Strategy: A Framework for Prioritizing Efforts in Minnesota. (DNR, Mn/DOT, MPCA, MDA) [*http://www.bwsr.state.mn.us/wetlands/Restoration_Strategy.pdf*]*

Builds on recommendations of Statewide Conservation and Preservation Plan to recommend prioritizing wetland restoration based on desired outcomes: water quality improvements, habitat gains, flood damage reduction, etc. Principles include:

- Restoration of depressional wetlands with long retention times
- Riverine wetlands restoration to improve floodwater retention, wildlife habitat, and water quality
- Restorations in the upper reaches of tributaries provide greatest benefits
- Restorations for groundwater recharge can be a priority anywhere in the state.

*Minnesota Environmental Initiative, 2009. Land and Water Policy Project Report, July 7, 2009. Compendium of project recommendations. [*http://www.environmental-initiative.org/images/files/LWPPStakeholderRecommendations.pdf*]*

"Land and water policies in Minnesota are remarkably compartmentalized, falling under separate bodies or regulation and various agency jurisdictions at all levels." Draws on recommendations from six major reports, reviewed and prioritized through stakeholder work group.

Three major action steps:

- Create a shared vision, building on existing state and regional agency mission statements. Recommends multi-year process to build support.
- Develop a coordinated planning cycle based on geographic areas, with a five-year planning sequence. (See BWSR-Smith Partners 2008 study for details.)
  - Improve alignment of planning requirement dates
  - Integrate major watershed monitoring and assessment findings into local government plans
  - BWSR, MPCA, MDH and Met Council should collaborate to provide improved alignment of water planning processes; MPCA should evaluate the MS4 permit to allow stormwater pollution prevention programs to be integrated into local water plans; MPCA and BWSR should convene a work group to implement the recommendations.
  - Don't use MPCA's major watershed approach – instead, state agencies should adjust timelines to match local planning cycles.
- Design a three-tiered integrated community assistance structure primarily to streamline service to and obligations of local government. ("Community Assistance Pyramid)

Citizens League, 2009. To the Source: Moving Minnesota's Water Governance Upstream. Report of the Citizens League Water Policy Study Committee.
*[*http://www.citizensleague.org/publications/reports/482.RPT.To%20the%20Source.pdf*]*

Report developed to address use of Legacy Amendment funding. Findings and conclusions:

- Strong public commitment to water resources in MN is a great asset in addressing water challenges
- Minnesota's waters face serious and new challenges – notable nonpoint source pollution
- Insufficient data available to demonstrate water quality trends
- MN system of water governance is "fragmented, incoherent, and poorly coordinated to the extent that it is failing Minnesota" on five evaluative principles: transparency, effectiveness, equity, accountability and appropriate scale.
- Citizens and local organizations must play a stronger role
- Recommendations:
  - Build collaborative model of governance that promotes public ownership and responsibility, incentives, etc. (Models include Wisconsin Buffer Initiative and Independent Certification in forestry.)
  - Redesign government roles and responsibilities
  - Create single online water resource information hub

2010

MPCA, 2010. Continuing Planning Process: State of Minnesota's Water Quality Management Program.
[http://www.pca.state.mn.us/index.php/view-document.html?gid=15647*]*

Report required by Section 303(e) Clean Water Act, to establish management program and framework for programmatic commitments and goals for plans prepared under CWA. Summarizes MPCAs and interagency

water management programs and water quality standards, federal legislation and state rules authorizing water quality programs.

*DNR (Department of Natural Resources), 2010. Long-Term Protection of the State's Surface Water and Groundwater Resources. [*http://files.dnr.state.mn.us/publications/waters/long-term_protection_surface_ground_water_201001.pdf*]* directed by 2009 Laws c 37 s4 subd 3

Responds to legislative directive to evaluate protection strategies and required funding. Recommendations include:

- Three categories of BMPs: retain enhance watershed storage to replicate natural runoff rates and volumes; manage nutrients and potential pollutants; create buffers or easements between land-disturbing activities and water resources.
- Enhance data collection and sharing and simplify public access to data
- Systems approach to integrated groundwater and surface water management protection

DNR. 2010. Evaluation of Models and Tools for Assessing Groundwater Availability and Sustainability. Groundwater Technical Workgroup.

Consensus approach of Groundwater Technical Workgroup recommending focus on three broad categories: mapping, monitoring and managing. Compares existing programs and studies.

2011

Smith, Louis and Charles B. Holtman, 2011. Minnesota Drainage Law Analysis and Evaluation. Report to the Legislative-Citizen Commission on Minnesota Resources (LCCMR).

Comprehensive review of drainage law and management. Legal and policy recommendations center on updating MN drainage laws to embrace a multipurpose watershed-based approach. Recommendations include:

- Give drainage authorities more tools and resources for:
  - watershed-based planning, including cost-sharing with watershed districts and counties
  - integrated drainage, flood control, conservation and water quality benefits
- Integrate effects on wetlands and water quality into drainage authority decisions
- Integrate drainage and wetlands management through CWPMP process

Includes draft legislation to implement recommendations.

University of Minnesota, Water Resources Center. 2011. Minnesota Water Sustainability Framework. [http://wrc.umn.edu/watersustainabilityframework/] directed by Laws 2009, c 172, a 2, s 33

Addresses many aspects of water sustainability, including drinking water, stormwater, agricultural and industrial use, surface and groundwater interactions, infrastructure needs, climate change, demographics and land use. Governance recommendations include

- Convene Minnesota Water Congress
- Enact Water Sustainability Act
- Re-establish Legislative Water Commission
- Create a Water Sustainability Board to replace current Clean Water Council and water responsibilities of EQB
- Create watershed-scale Watershed and Soil Conservation Authorities combining functions of current SWCDs and watershed planning entities. Integrate water planning into land use plans.
- Create comprehensive, accessible interagency water data portal (action currently underway)

University of Minnesota, Center for Science, Technology and Public Policy. 2011. Hennepin County Water Governance Project: An Application of Design Thinking to Governance. *[*http://www.hennepin.us/files/HennepinUS/Commissioners/Jeff%20Johnson,%20District%207/Henn%20Co%20Water%20Governance%20Report.pdf]

Project identified ways in which Hennepin County surface water governance system could be updated and strengthened to address new water management issues. Explores geographic challenges of water governance. Four desired outcomes for the system are: 1) supply, quantity and sustainability; 2) ecosystem quality; 3) systematic and science-based governance; 4) effectively mobilizing resources. Recommendations:

- Consolidate number of watershed districts and WMOs from 11 to four based on existing hydrological boundaries
- All water organizations need taxing authority
- Improve water management planning coordination between WDs/WMOs and cities
- Some level of coordination, oversight or enforcement between watershed organizations and the state is needed – i.e., county or regional scale

Easter, K. Willian and Jim Perry, eds., 2011. Water Policy in Minnesota: Issues, Incentives, and Action. RFF Press, New York – London.

See specific chapters below.

Johansson, Rob and Fay Sleeper, 2011. Implementing the Federal Water Pollution Control Act and Minnesota's Clean Water, Land, and Legacy Amendment. In Water Policy in Minnesota, 46-70.

History of early water pollution control efforts in Minnesota, the state's response to federal Clean Water Act, implementation successes and challenges, and the development and enactment of the Legacy Amendment partially in response to clean water concerns. Includes timeline of federal water pollution legislation and Minnesota actions.

Karkkainen, Bradley C., 2011. Minnesota Water Law: A Unique Hybrid. In Water Policy in Minnesota, 71-88.

Overview of Minnesota water law from its common-law origins to multiple subsequent legislative enactments. Notes both the effectiveness and complexity of the body of law. Topics covered include water ownership, definition of public waters, water use permits, rights of access to surface water, wetlands, drainage authorities, watershed districts and management organizations, protected lakes and streams, shoreland management and floodplain regulation, specific river and river basin programs, water quality regulation, and well permits and regulations.

Conclusions: complexity of system may make compliance more difficult, may deter investment; may produce costly inefficiencies and redundancies, and may include large gaps in the "jerry-built" structure.