

Supplemental Information to Appendix C (Minnesota’s Water Governance) of the Minnesota Ground Water Association’s White Paper Review of the 1989 Ground Water Protection Act.

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Supplemental Information to the White Paper’s Appendix C

- 1. Water Governance in Minnesota—A History, page 1**
- 2. Calls for Improving Water Governance, page 2**
- 3. Timeline of Water Resources Legislation and Governance, page 9**
- 4. Agencies, boards, and organizations involved with Minnesota’s Water Management, page 13**
- 5. Summary of past recommendations for improving water governance based on published governance reviews, described in this paper, page 19**
- 6. Water Governance in Minnesota: Selected References, page 23**
- 7. Acronyms, page 29**

1) Water Governance in Minnesota—A History

Water dominates the Minnesota’s landscape. Our state is at the head of four continental-scale river basins, so almost all the state's water falls on lands of the state. This also means that Minnesotans are solely responsible for the quality and quantity of the state's water (University of Minnesota, 2011). In Minnesota, 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 public waters and the lands beneath them in trust for the general public. Private rights to water are governed by a “riparian doctrine” where the traditional common law doctrine of riparian rights apply. This doctrine implies that owners of the adjacent land and the groundwater beneath it have use rights to the water bodies touching that land. However, the riparian doctrine has been modified through legislatively enacted regulations, and riparian rights to water are not absolute. Rather, they give adjacent landowners the right to reasonably use and can enjoy a water body as long as that use does not interfere with the public’s rights or the rights of other riparian owners. (University of Minnesota, 2015; MPCA, 2013)

To understand water governance in Minnesota, it is important to know how water policy, regulation, and management have evolved and changed. This evolution involved transition from the draining of excess water for agricultural improvement, to the protection and restoration of our waters; from farming practices that did not recognize adverse impacts on natural resources and natural systems to statewide adoption of soil and water conservation practices; and from discharge of raw sewage and pollutants into water bodies to implementation of water quality standards. Water policy changes also reflect decisions and actions made in other areas that include energy, land use, transportation, public health, and economic development. (University of Minnesota, 2011, 2015; MPCA, 2013). A history of the evolution of water governance in Minnesota is presented in the Supplemental Information Section of this paper.

Minnesota’s water policy was shaped by the state's early dependence on agriculture. When Minnesota achieved statehood in 1858, one of the first laws enacted allowed the formation of private corporations that specialized in draining lands for agricultural production. The first water initiative, when the state was settled, was to drain "swamplands" for agriculture. Under federal drainage laws,

Minnesota was given control of five million "poorly drained" acres, approximately half of the total wetlands in the state. 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. (University of Minnesota, 2011, 2015; MPCA, 2013)

As early as 1896, public waters were defined in 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. Despite the beneficial uses of water, drainage continued and reached a peak in the early 20th century. Over nine million acres of land were drained from 1900 to 1915. Activity slowed after that, due to floods, persistent drought during the 1930s, failing tiles, and increasing concerns regarding conservation. Minnesota's identity as a premier hunting and fishing destination was threatened by the loss of fish and wildlife habitat through drainage. The Minnesota Department of Conservation (the predecessor to the Minnesota Department of Natural Resources) was established in 1925 with a focus on management of the state's fisheries, wildlife, and waterfowl. Water management under this new department, served this goal: for example, establishing fishing limits and regulating dams and other obstructions in waterways that might interfere with passage of fish. (University of Minnesota, 2011, 2015; MPCA, 2013)

By the 1930s, the widespread droughts and the 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 United States Department of Agriculture (USDA). Subsequent legislation and public works programs resulted in the establishment of soil conservation districts and numerous land conservation demonstration programs, many of which continue under the auspices of the Natural Resources Conservation Services (NRCS), the successor to the SCS. (University of Minnesota, 2011, 2015; MPCA, 2013)

In 1931, the Minnesota Department of Conservation was created to develop practices to reduce adverse impacts of wide-scale drainage. The establishment of the Public Waters System, by the Minnesota Legislature in 1937 (Laws 1937 c 468), marked a growing awareness of water as a finite resource. The legislation authorized the department to establish permit programs for surface and groundwater appropriations and for construction of dams, reservoirs, and other waterway structures. The Minnesota Water Control Commission was created in 1947 within the Minnesota Department of Health (MDH). The focus during those years was to encourage upstream users to treat sewage well enough so that downstream users could disinfect the stream water for potable uses. In 1947, the Legislature amended the public waters laws to include the concept of public waters, thereby reducing drainage possibilities. (University of Minnesota, 2011, 2015; MPCA, 2013)

Conservation programs continued into the 1950s and 1960s. In the 1950s, Minnesota adopted the "Save the Wetlands" program, which used state and federal money to buy wetlands for state wildlife management areas. Minnesota adopted reporting requirements for large water users, and watershed districts were granted authority to levy taxes for water management. In the 1960's, the Minnesota Department of Conservation warned that some parts of the Twin Cities metropolitan area were approaching a limit between water supply and demand. In response, the legislature passed a law requiring state agencies to conserve precipitation where it falls. (University of Minnesota, 2011, 2015; MPCA, 2013)

During the late 1960s and 1970s, state responsibilities for managing water use and water quality expanded rapidly as the result of federal environmental legislation. The Federal Water Resources Planning Act of 1965 provided funding for states to create plans for water and related land use. The National Wild and Scenic Rivers Act of 1968, the National Environmental Policy Act 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. The Minnesota Pollution Control Agency (MPCA), established in 1967, maintained a primary focus on wastewater treatment through the 1970s and 1980s. In some instances, Minnesota laws preceded, or went beyond, Federal statutes, as in the enactment of shore land conservation requirements in 1969 (Laws 1969, c 777; University of Minnesota, 2011, 2015; MPCA, 2013)

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

In 1977, the Legislature created the Water Planning Board and during the 1980s the Legislature adopted recommendations from the Water Planning Board, calling for a new local role in statewide comprehensive water planning and establishment of a consolidated Board of Water and Soil Resources to administer local water planning and related programs. Policy programs were created to prevent pollution and to address nonpoint pollution. (University of Minnesota, 2011, 2015; MPCA, 2013)

The passage of the Federal Clean Water Act (CWA) in 1972 resulted in tremendous progress toward cleaning the nation's waters. 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 of certain pollutants. For example, the amount of phosphorus released annually into the Minnesota River declined by 52 percent between 2001 and 2011, falling below the 2015 water-quality standard 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 percent. In the 40 years since the passage of the CWA, tremendous progress has been made toward cleaning the nation's waters. Policies and programs have been particularly effective in treating sewage, industrial waste, and other pollutants. 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. (Helland, 1986; Brand and Finley, 1990; University of Minnesota, 2011, 2015; MPCA, 2013).

The discovery of pesticides in groundwater increased awareness of the importance of land use as well as surface water and groundwater interactions and heightened concern about shallow wells. The Groundwater Protection Act of 1989 established a state groundwater degradation prevention goal and enacted programs to achieve the goal. In 1990, the Legislature established the Legislative Water Commission, which called for no net loss of wetlands under the Wetland Conservation Act, and enacted measures to deal with emergency drought concerns, nutrient loading in water bodies, and nonpoint pollution issues. It also proposed the requirement for water-detention ponds for new developments and required public water supply planning and the elimination of wasteful water uses. Despite success cleaning up point source pollution, it was well documented that too many of Minnesota's water resources remained impaired or were trending toward impairment. Non-point source pollution, drainage, and overuse of groundwater supplies continued to present challenges (Helland, 1986; Brand and Finley, 1990; University of Minnesota, 2011, 2015; MPCA, 2013).

The recodification of the bulk of Minnesota's water-related statutes in 1990 represented an effort towards simplification and consolidation. Chapters 103A through 103I of the law encompass most water-related statutes. As part of the recodification, most statements of purpose for the individual components were grouped into Chapter 103A. However, it has been argued that these objectives

were “bundled” rather than integrated, resulting in multiple inconsistencies and gaps among them (Helland, 1986; Brand and Finley, 1990; University of Minnesota, 2011, 2015; MPCA, 2013).

During the first part of this century, there was renewed interest in policies for protecting water resources, stimulated in part by efforts to address impaired waters, water sustainability, climate change, and invasive species. The total maximum daily load (TMDL) process drove the passage of the 2006 Clean Water Legacy Act and the 2008 Clean Water, Land and Legacy Amendment and established the Clean Water Fund. These actions provided powerful incentives to increase systems science through collaboration and integration among state agencies. This collaboration resulted in improvements in flood retention and control, water retention, wetlands management, and groundwater assessment (Helland, 1986; Brand and Finley, 1990; University of Minnesota, 2011, 2015; MPCA, 2013).

The CWLLA helps ensure that state and local governmental units work well together. However, there remains a need for greater coordination across different scales of governance, from the local level to the statewide level. Water regulation and management in Minnesota is coordinated by many state, regional and local agencies. There are long-standing concerns that Minnesota’s water governance is inefficient and needs better coordination. Bills introduced in the 2020 legislature reflected that concern. Minnesota’s water governance structure includes six or more state agencies charged with distinct but interactive water management roles (Helland, 1986; Brand and Finley, 1990; University of Minnesota, 2011, 2015; MPCA, 2013). Each agency has its own responsibilities and strengths. Generally, agencies collaborate effectively. However, the complexity of laws, rules, programs, and permit requirements, some developed over 100 years ago, make the system difficult to navigate for landowners, developers, local units of government, and other organizations. State agency managers recognize the need to use resources efficiently and to establish a user-friendly governance structure. Each agency is concerned with its own duties and specific goals. Conflicts and trade-offs in this kind of system are usually conducted through political processes. (Helland, 1986; Brand and Finley, 1990; University of Minnesota, 2011, 2015; MPCA, 2013).

2) Calls for Improving Water Governance

The issue of reforming water governance is not new to Minnesota. The history of calls for reform is summarized at the end of this paper. This review is based on the following publications: (Helland, 1986; Brand and Finley, 1990; University of Minnesota, 2011, 2015; MPCA, 2013).

Water-related programs have evolved over time because they were created independently and assigned to individual agencies with little recognition of relationships to other policies and programs. Consequently, water regulation is complex. The resulting divergent responsibilities (public health, agriculture, natural resource conservation, and pollution prevention) are considered by some as governance strengths because of the diversity of responsibilities and professional skills they provide. Others 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 confusion and frustration. This 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 not.

As early as 1967, the State Planning Agency initiated an advisory Water Resources Coordinating Committee to prepare an interagency water plan because water management was thought to be fragmented among too many separate agencies, and because none of the agencies had the individual authority or responsibility to prepare or administer a statewide plan.

Several studies have stressed various aspects of Minnesota's water governance. One early study, prepared by the University of Minnesota, included this summary of water governance and law: "As questions of water use arose, 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 laws were developed in a similar manner. They now consist of a series of statutes dealing with specific areas. Differences in interpretations are common, and outright contradictions have been found. There is no comprehensive water law in Minnesota."

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, which created the Metropolitan Council. The Council was created with two missions: 1) to plan for the orderly and economic development of the seven-county metro area; and 2) to coordinate the delivery of certain services.

Efforts to streamline and reorganize water programs and statutes have been fairly continuous since the 1970s. In 1981, the Water Planning Board examined the multiple roles and functions of counties, watershed districts, and soil and water conservation districts. It recommended that counties be the fundamental decision-makers for local water plans, that plans, and management be based on hydrologic units, and that approval of local plans should trigger the delegation of state management responsibilities to these local government units. This study set the stage for the Comprehensive Local Water Management Act of 1981. This local water governance structure remains in place today, with counties, SWCDs, and watershed districts coordinating efforts to greater or lesser degrees, leaving cities to navigate multiple regulatory structures.

The Water Planning Board merged in 1983 with the Environmental Quality Board (EQB) and was placed within the State Planning Agency. The EQB became the lead state water coordinating body, responsible for developing biennial recommendations for legislative action and preparing a state water plan. Through the 1980s, there were several efforts to establish 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.

Water governance reform efforts continued through the 1980's. The report "A Water Agency Merger Study" by the State Planning Agency in 1984-85 suggested that governance changes were needed because there was no integrated state approach to local government planning. 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 presented 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 was described as promoting competition and increasing public representation of each goal or interest. Conflicts and tradeoffs in this kind of system were thought to best be resolved through this political process rather than by administrative processes.

A move toward streamlining occurred in 1987 with the creation of BWSR from the consolidation of three separate boards: the Water Resources Board, the Soil and Water Conservation Board, and the Southern Minnesota Rivers Basin Council. Having no original regulatory authority, BWSR was tasked with coordinating state and local soil and water management activities through the

establishment and oversight of watershed districts and by assisting local governments in developing water management plans. BWSR was empowered by statute to coordinate the work of water management agencies and to address state agency questions of water policy.

The increasing focus on groundwater supply, pollution, and governance culminated in the bipartisan effort to enact the Ground Water Protection Act of 1989, widely regarded as a comprehensive and forward-thinking accomplishment. Among the accomplishments stemming from the Act were 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; expanded monitoring of community water supplies; and additional support for local water management planning. In addition, MDA's statutes were comprehensively rewritten to greatly enhance the agency's role in pesticide and fertilizer regulation, promote the development of best- management practices, waste pesticide collection, site remediation, and water monitoring.

The recodification of the bulk of Minnesota's water-related statutes in 1990 represented another effort towards simplification and consolidation. Chapters 103A through 103I were created to encompass most water-related statutes. It has been argued that these objectives were "bundled" rather than integrated, leaving multiple inconsistencies and gaps among them.

Many waters 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 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, identified improvements and remaining challenges, and concluded that the existing management structure 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" suggesting that the current system provided local governments and citizens options for advancing their diverse interests in water management.

In spite of that assessment, the Ventura administration, in 1999, issued an executive order for a Water Management Unification Initiative. This process, led by EQB, developed specific water-related goals, objectives, and measurable outcomes. The study became the basis for the next state water plan: Watermarks, issued in 2000. The plan carried out the executive order's directive to focus on major river basins and outlined goals for each while placing emphasis on the diverse nature of Minnesota's water resources. Therefore, the focus was on water resources rather than on water management. The effort included an extensive stakeholder survey on water management issues. The survey 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 coordination among state water programs. Respondents identified many of the same issues as that had previously been identified.

The 1999 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 findings of "fragmentation" among state water programs, but also included specific recommendations for creating the Legislative Water Commission, establishing a cohesive policy on lakes, reforming drainage law, integrating comprehensive land use, and water planning. Although the effort did not

yield significant change, it did result in administrative penalty authority for BWSR, establishment of a Drainage Work Group, and increased focus on integrated water planning.

Several 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. These recommendations were substantially adopted by the legislature in 2007, including clarifications to enable wetland restorations and other impoundments on drainage systems. This resulted in a comprehensive analysis of drainage law for the Legislative-Citizen Commission on Minnesota Resources (LCCMR) in 2011. The analysis recommended major revisions to 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 BWSR in 2008 recommended integrating aspects of storm water permitting into watershed planning, as well as a five-year planning cycle for local water plan revisions.

The 2008 EQB/DNR report “Use of Minnesota’s Renewable Water Resources: Moving toward Sustainability” gave sustainable water use a definition: “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 used 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 2000-10 was 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 CWA. 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 citizen approval of the Clean Water, Land and Legacy Amendment, increasing the sales tax by three-eighths of one percent to create dedicated funds for conservation purposes. One-third of the sales tax revenues were dedicated to water quality improvements in 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 was 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” to streamline service to and obligations of local government.

Another study was the Citizens League’s 2009 report “To the Source: Moving Minnesota’s Water Governance Upstream”. While the study recognized Minnesota’s strong public commitment to water resources, it found that the state’s system of water governance was “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.

In 2010, the EQB, with the assistance of the DNR, MDA, MPCA, BWSR, Metropolitan Council, and MDH, developed the 2010 State Water Plan. 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 increased focus on building local capacity for water management, defined water management units (i.e., major watersheds and groundwater management units), a targeted approach for the protection and restoration of groundwater as well as a systematic approach to identifying and responding to emerging threats.

In 2011, the Minnesota Wetland Program Plan, prepared in response to an EPA request, identified four core elements of wetland protection: monitoring and assessment; regulatory activities, including 401 certifications; voluntary restoration and protection; and water quality standards for wetlands.

Also in 2011, the University of Minnesota published a report on water sustainability which involved many of the state's water experts and was conducted at the request of the Minnesota Legislature in response to passage of the Clean Water, Land and Legacy Amendment. The Legislature directed the University of Minnesota to construct a framework to describe what was needed to accomplish the goals that drove the passage of the amendment. The result was the publication of the Minnesota Water Sustainability Framework that laid out pressing issues needed to ensure sustainable water, and strategies and recommendations for how to meet these challenges. Many suggestions for revised water governance were included.

More recently, the Legislature asked the MPCA, together with other water-related agencies and the University of Minnesota, to evaluate water-related statutes, rules, and governing structures to streamline, strengthen, and improve sustainable water management. This evaluation was authorized by the Minnesota Legislature in 2011 (Laws 2011) (Session, Chapter 2, Article 4, and Section 33) 2013. The result was a set of recommendations. The group reviewed 40 years of studies, surveyed knowledgeable staff, and discussed strategies with local government organizations. They recognized the complexity of water governance. The report also described that the multi-faceted system, while effective in many aspects, often leaves citizens and local units of government confused and frustrated. The report offered many suggestions for improvement. It described the need for continuing cleanup of point-source pollution, improving lakes, streams, and wetlands, increasing water storage, addressing the overuse of groundwater supplies, and addressing the pollution from smaller, dispersed sources. The report expressed concern about the distinct and interactive agency roles in water management and that the complexity of programs and permit requirements can make the system difficult to navigate for landowners, developers, local units of government, and other organizations. Further, it suggested that state agencies needed to use resources (staff and money) efficiently and establish a user-friendly governance structure. Some of the report's recommendations required legislative action while others were able to be initiated by the agencies.

A summary of specific, collective recommendations for improving water governance, based on published governance reviews, as described in this paper is included at the end of this paper. Changed this text from bold, italic to italic to make consistent with earlier statement.

3--Timeline of Water Resources Legislation and Governance

Based on the following reports: Helland 1986; Brand and Finley, 1990; University of Minnesota, 2011, 2015; MPCA, 2013):

1883 County commissioners authorized the establishment of 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) prohibit discharge of solid refuse into navigable waters, regulates damming of streams and bridges, 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 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 Commission (Laws 1945, c395§§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 (PL83-566) provides planning and funding for flood control projects

1955 Minnesota Watershed Act (Laws 1955, c. 799) (§103D.201 } 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)

1961 Federal Water Pollution Control Act Amendments (PL87-88) increase federal support for water treatment; allows federal action against polluters with state governor's consent

1963 Land and Water Conservation Fund created

1965 Water Quality Act (PL89-234) requires states to issue water-quality standards; Water Resources Planning Act (PL 89-90) authorizes state framework plan, funds river basin studies and commissions

1967 Water Resources Coordinating Committee formed (Laws 1967, c. 882, §§1-11). State Soil Conservation Committee becomes Soil & Water Conservation Commission. (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 Shore land regulation authorized (Laws 1969, c.777; MS 103F) Floodplain Management Act (Laws 1969, c. 590, §1; 103F)

1970 National Environmental Policy Act (NEPA) (PL91-190}, Clean Air Act Amendments (PL91-604); US EPA established State Planning Agency, Water Resources Coordinating Committee. Minnesota Water and Related Land Resources: First Assessment.

1971 MN Environmental Rights Act (MERA) (Laws 1971, c. 952); surface water regulations to the DNR. Southern Minnesota Rivers Basin Council formed

1972 National Dam Inspection Act of 1972 (PL92-367); Coastal Zone Management Act; Lower St. Croix River designated National Wild & Scenic River (PL92-560) Federal Water Pollution Control Act Amendments (Clean Water Act) require states to develop list of impaired waters, sets TMDLs. EPA authority to regulate point sources. USACE permitting authority for dredging/filling waters of the US

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 SWCC (1967) becomes Soil and Water Conservation Board

1976 Resource Conservation and Recovery Act (PL94-580}, Toxic Substances Control Act (PL94-469). 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). 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 innovation: Report to the State Planning Agency.

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 (PL95-87); 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.

1979 Certain wetlands defined as public waters, 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") (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:/Study on local water management

1982 Metropolitan Surface Water Management (Laws 1982, c. 509) established 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.

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), sod buster and swamp buster provisions. Comprehensive local Water Management Act (§103B.301to103B.355) Ground Water Management Strategy Issue Team Report.

1986 Nonpoint Source Pollution Issues Team Report

1987 Water Quality Act of 1987 (PL100-4) amends CWA, requires industrial stormwater dischargers and municipal separate storm sewer systems ("MS4") to 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). Protecting Minnesota's Waters: Priorities for the 1989-1991 Biennium. The Minnesota Ground Water Protection Act of 1989: A Summary.

1990 Recodification of Water law (Laws 1990, c. 391, codified as MS §§ 103A-103)

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 Shore land 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 MNRRRA 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.

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. Governor's Clean Water Initiative, Water Cabinet

2005 Office of Environmental Assistance was made an MPCA 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. Passage of the Clean Water Legacy Act of 2006 established the Clean Water Council. Subsequent efforts, by a coalition of conservation groups and state agency representatives, culminated in 2008 with citizen approval of the Clean Water, Land and Legacy Amendment, increasing the sales tax by three-eighths of one percent to create dedicated funds for conservation purposes. One-third of the sales tax revenues were dedicated to water quality improvements in the Clean Water Fund.

2007: The availability of Legacy Amendment funds led to further examination of water management programs. 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, 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. A report prepared by Smith Partners/EOR for the Board of Water and Soil Resources in 2008 recommended integrating aspects of storm water permitting into watershed planning, as well as a five-year planning cycle for local water plan revisions. Concept of water was explored in the 2008 EQB/DNR report "Use of Minnesota's Renewable Water Resources: Moving toward Sustainability".

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. 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 Citizens League's 2009 report "To the

Source: Moving Minnesota's Water Governance Upstream" While the study recognized Minnesota's strong public commitment to water resources. MN Session Laws 2009, c 37, § directs DNR groundwater study preparation. DNR, Long Term Protection of the State's Surface Water and Groundwater Resources. Water Governance Evaluation required (Laws 2011 1st Special Session, c2, art. 4, §33); Governor's executive Order #11-32 re EQB and environmental governance

2010, the EQB, with the assistance of the DNR, MDA, MPCA, BWSR, Metropolitan Council, and MDH, developed the 2010 State Water Plan.

2011 U of MN Water Resources Center. Minnesota Water Sustainability Framework.

The Minnesota Wetland Program Plan, prepared in response to an EPA request identified four core elements of wetland protection: monitoring and assessment; regulatory activities, including 401 certifications; voluntary restoration and protection; and water quality standards for wetlands. A comprehensive water-resource management studies completed in 2011. The Water Sustainability Framework was requested by the legislature and produced by the University of Minnesota. The framework report addressed many aspects of water sustainability, including drinking water, storm water, agricultural and industrial use, surface and groundwater interactions, infrastructure needs, climate change, demographics and land use. University of Minnesota published a report on water sustainability. That report, which involved many of the state's water experts, was conducted at the request of the Minnesota Legislature, in response to the passage of the Clean Water, Land and Legacy Amendment. The Legislature directed the University of Minnesota to construct a framework to describe what was needed to accomplish the goals and needs that drove the passage of the amendment. The result was the publication of the Minnesota Water Sustainability Framework that laid out pressing issues needed to ensure sustainable water, strategies, and recommendations for how to meet these challenges. Suggestions for revised water governance were included. MPCA, in cooperation with other state water management agencies, the Metropolitan Council, and the University of Minnesota, developed recommendations for improving Minnesota's system of water governance. This evaluation was authorized by the Minnesota Legislature in 2011 (Laws 2011) Session, Chapter 2, Article 4, and Section 33). The Legislature asked the MPCA, together with other water-related agencies and the University of Minnesota, evaluate water-related statutes, rules, and governing structures to streamline, strengthen, and improve sustainable water management

2012 Governor's Executive Order #12-04 re wetland policy; "One watershed, one plan" legislation

2013, several state agencies, following on direction from the Legislature, conducted another evaluation of Minnesota's water governance. Under the leadership of the Minnesota Pollution Control Agency, the study was completed with collaboration among five state agencies engaged in water management, along with the Metropolitan Council, and in consultation with the University of Minnesota Water Resource Center.

4--Agencies, boards, and organizations involved with Minnesota's Water Management:

The state agencies and Boards involved in water in Minnesota are as follows (MPCA, 2013):

Board of Water and Soil Resources (BWSR) functions as the state's soil and water conservation agency that follows guidance from the Wetland Conservation Act and soil and water conservation programs. BWSR is authorized to direct land, soil, and water conservation programs through the action of Soil and Water Conservation Districts, counties, cities, townships, watershed districts, and

water management organizations. The BWSR Board includes commissioners from 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 project funding for conservation and water resources projects.

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. EQB also prepares a consolidated report on groundwater policy and water assessments every five years, consolidating reports by the MPCA, MDA, and DNR on the 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.

Minnesota Department of Agriculture (MDA) is responsible for the management of pesticides and fertilizer that may affect waters of the state. MDA's programs include: the Agricultural Water Quality Certification Program; the Nitrogen Fertilizer Management Plan; Targeted Township Water Testing Programs; the Central Sands Private Well Monitoring Network; Irrigation Water Quality Protection Programs; Technical Assistance and On-Farm Demonstrations; Agricultural Research and Evaluation, the Forever Green Initiative; Pesticide Monitoring and Assessment Programs; Private Well Pesticide Sampling projects, the Agricultural Loan Program; and the Manure Applicator Education Program.

Minnesota Department of Health (MDH) is responsible for protecting drinking water quality under federal guidance. 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 Source Water Protection Program. MDH also establishes Health Based Values (HBVs) and Health Risk Limits (HRLs) for groundwater contaminants. Contaminants can be nominated by programs within MDH, by other state agencies such as MPCA and MDA, or mandated by the state legislature. Chemicals of Emerging Concern (CEC) s can be nominated by anyone, including citizens.

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, also known as high water levels, and is responsible for water allocation and use, including groundwater appropriations. Water appropriations permits are considered on a case-by-case basis and are established from 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 also oversees shore land and floodplain management, wild and scenic rivers, and lake and stream hydrology.

Minnesota Pollution Control Agency (MPCA) has primary responsibility for water quality protection and is 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, storm water 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:

Minnesota Department of Transportation (MN DOT) is involved with wetlands replacement, erosion and sedimentation control, and hydrologic studies as part of many of its road and transit projects. MN DOT is required to obtain permits from various other federal and state agencies and local governments, depending on the nature of its projects.

Minnesota Geological Survey (MGS), housed at the University of Minnesota, conducts research in partnership with DNR into groundwater geology, and prepares county geologic atlases and hydrogeological assessments. MGS partners with the Department of Health to maintain an index of county well data.

Minnesota Public Facilities Authority (PFA) 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, municipal storm water infrastructure and drinking water treatment, distribution, and storage facilities, and to address transportation and other high-cost infrastructure needs.

A number 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.

Metropolitan Council is the regional planning agency serving the Twin Cities seven-county metropolitan area that provides essential services to the region. The Council works with local communities to provide 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, 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.

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. 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 or replacement. For example, the Arrowhead RDC provides staff capacity to the North Shore Management Board, a body that defines minimum shore land zoning standards for the North Shore of Lake Superior, and assists with the development, updates, and administration of the North Shore Management Plan as mandated by Minnesota Statutes 103F.

A number of watershed or river basin-based boards and commissions and organizations have been 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:

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 the inclusion in 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 shore land areas situated within the counties.” The plan, last updated in 2009, establishes management objectives and land use standards, which essentially function as a shore land ordinance, within specified distances from river segments and headwaters lakes.

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). The RRWMB has worked to reduce flood damages by establishing impoundments (ponds) 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 entire basin.

Great Lakes Restoration Initiative (GLRI) was established in 2009 as a partnership of the EPA and ten other federal agencies, along with the states of the Great Lakes Basin, to provide funding and technical support to address urgent issues. These include 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 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.

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 its tributaries.

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 the Minnesota State University at Mankato and other partners on a variety of research and advocacy efforts.

Minnesota River Basin, 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.

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.

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. BWSR is the primary state agency that provides oversight and assists local government units (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, 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.

Cities. The roles of cities 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. According to the 2010 U.S. Census, there are 853 cities in Minnesota. Cities, counties, and townships with shore land must submit ordinances, rules, or regulations to the DNR for review if they affect shore land development and use. Similar provisions apply to floodplain management ordinances. Since the mid-1990s, municipal separate storm sewer systems (MS4s) in 35 of Minnesota's largest cities, have been regulated by MPCA, Community public water suppliers using groundwater are required to develop and implement wellhead protection plans.

Counties have a wide variety of water management duties. These include shore land and floodplain planning and zoning (except Hennepin and Ramsey counties) and constructing and maintaining water and wastewater systems. Counties are authorized by Minnesota Statute 103B.311 to develop water management plans that identify water problems and prioritize solutions. Counties are not required to produce water plans, but the plans are a prerequisite for eligibility to BWSR's Natural Resources Block Grant program. All 87 counties in Minnesota (including the seven metropolitan counties) have plans in place. The Natural Resources Block Grant program provides money to implement local water plan initiatives.

Lake Improvement Districts (LIDs). Lake improvement districts were authorized by the Minnesota Legislature in 1973 and are administered by the 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 an outlet control structure. Since 2004, LIDs have been formed primarily to manage invasive aquatic vegetation. There are currently 38 active LIDs in Minnesota.

Soil and water conservation districts (SWCDs) are established by Minnesota Statute 103C.331 as political subdivisions with certain powers and duties. Ninety SWCDs operate on a county basis throughout the state (more than one SWCD is present in some counties) 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 developing and implementing water plans and related projects.

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 shore land or floodplain regulations must also submit those regulations to the DNR for review.

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. They are located mainly along the state's western boundary, the west central and south-east regions, and the metropolitan area, where 14 of the districts are located. Outside the metropolitan area, most districts are organized within one or more of the 81 major watersheds, while within the metro area the scale is typically smaller at the sub watershed scale. Watershed districts have broad authorities, including the authority to adopt rules, improve water quality, 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)

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 in three ways: as a joint power's 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 ground-water, 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 Metropolitan area.

Certain federal agencies have 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.

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

United States Army Corps of Engineers (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.

United States Environmental Protection Agency (EPA) is the federal agency responsible for implementing the requirements of the Clean Water Act. The MPCA executes the CWA by setting standards, monitoring water quality, developing restoration and protection strategies, permitting implementation activities, and carrying out prevention and assistance activities. The EPA oversees the development of water quality standards that protect aquatic life and human health. They also accept and approve lists of impaired waters developed by the MPCA and required under Section 303(d) of the CWA. The EPA conducts national assessments of rivers, streams, lakes, and wetlands every five years, with a focus on obtaining statistically significant national results. The EPA also manages the GLRI.

The United States Fish and Wildlife Service (FWS) is the principle 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... FWS also manages national wildlife refuges and hundreds of federally owned Waterfowl Production Areas (WPAs) throughout Minnesota and the Upper Midwest.

United States Geological Survey (USGS) provides water data and information for national and local economic well-being, protection of life and property, and effective management of the Nation's water resources. The USGS works with partners to monitor, assess, conduct targeted research, and deliver information on a wide range of water resources and conditions including streamflow, groundwater, water quality, and water use and availability.

In addition to those organizations authorized by state statute and the federal government, there are numerous nonprofit lake and river-focused organizations devoted to improved fisheries and water quality, appropriate shore land 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.

5--Summary of past recommendations for improving water governance based on published governance reviews, described in this paper: (Helland 1986; Brand and Finley, 1990; University of Minnesota, 2011, 2015; MPCA, 2013).

Organizational efficiency. Synchronize water management programs into a Water Management System. This recommendation provides an alternative to the creation of a One Water Department. A formal mechanism would be needed for coordination among agencies, as well as a basis for continuing improvement, and streamlining and realignment of water programs and services. This alternative would require considerable planning and evaluation to be successful. This recommendation could address some of the long-standing differences and inconsistencies in water management rules, statutes, and processes that date back to the origins of each agency. A water management system would virtually organize and coordinate water programs, while retaining much of the current division of responsibilities among state agencies. It would focus and resolve conflicts, eliminate inconsistencies, and set broad policy directives for all state agencies engaged in water management. It would provide ways to streamline, integrate, transfer or delegate related processes, programs and activities, and develop a system for coordinated delivery of state water management services, such as permits.

Clarify the roles, responsibilities, and authority of LGUs. The number of state agencies having authority over water is problematic for LGUs because of the uncertainty around authority. LGUs are responsible for implementing many state water policies, but are sometimes given inadequate

resources, tools, and authority. LGUs perceive there are too many requirements, especially overlapping planning requirements (comprehensive plans, watershed plans, county water plans).

Improve the delivery of water-permitting services at the regional level, based on successful models such as the Red River Watershed Management Board and the St. Louis River Estuary recovery effort. Explore an organizational model for expediting water permits, based on regional intra-agency permit facilitators, representing all of the state agency programs. This recommendation involved regional permit and regulation facilitators to coordinate with the public at the local level. This model currently is being explored at spell out name (DEED). The recommendation addresses a service delivery gap that exists in Greater Minnesota among state agencies dealing with water management and local governments. Explore co-location of state agencies in each region as a long-term goal.

Clarify the role of the Clean Water Council. The Clean Water Council was created by the Clean Water Legacy Act. However, the authority of the Council is not clear. The Council's primary mission is to advise the Legislature regarding spending from the Clean Water Legacy Account. Other lines of authority with respect to the Clean Water Fund as well as policy responsibilities are limited and unclear.

Increase emphasis on the responsibilities of local watershed authorities involved in the One-Watershed/One-Plan Process. Identify and correct overlap, gaps, conflicts in current statutes and rules, and align them with sustainability principles. Recommend specific and comprehensive statutory changes based on a review. Strengthen the link between land use and water management practices by creating incentives for local government units to combine and integrate their water and land use plans. Currently, the statutory authority for comprehensive planning and land use controls will remain with counties, cities, and towns, as watershed planning moves toward a watershed planning approach. Actions are needed that focus conservation efforts on priority areas. Local governmental authorities need the authority to levy for water management purposes; to expand the delegation of some state regulatory authorities to local governments; to explore mechanisms that allows the distribution of Clean Water Funds at the watershed or regional scale as part of a shift from a program approach to a systems or "watershed" approach using performance-based standards for funding.

Information delivery. Provide a Common Source of Water Data: Develop a comprehensive, accessible data portal (a single, entry point for accessing multiple databases) for all water quality and water quantity data, coordinated for each of the agencies. There is a critical need for an integrated, accessible information and data management system. This portal would provide a single entry, by way of the internet, to access all state water-related data bases.

Improved governance (the action or manner of governing).

Organizational efficiency": A formal mechanism is needed coordination among agencies, as well as a basis for continuing improvement, and streamlining and realignment of water programs and services. This would require considerable planning and evaluation. This recommendation could address some of the long-standing differences and inconsistencies in water management rules, statutes, and processes that date back to the origins of each agency. It would help to organize and coordinate water programs, while retaining much of the current division of responsibilities among state agencies.

Update the state water plan. Although Minnesota is recognized as a leader in water resources management, the state does not have a current comprehensive state water policy or plan. Water management is driven by short-term, specific issues, problems, and interests without long-term focus

on sustainable water policy. Policy has developed in an additive manner over time and tends to be fragmented and reactive rather than proactive without overarching goals. Current policy focuses on addressing basic human water needs, ensuring that water remains an important economic asset, and reversing destructive trends in water use. Emphasis on long-term changes and planning for sustainability are not well addressed. The plan should include and be more direct about issues that relate to and address environmental justice.

Implement a comprehensive statewide conservation priority process. Due to the shift of responsibility from state agencies to local implementation of water restoration, preservation and protection programs, steps need to be taken to assure that programs are coordinated and prioritized. The current focus on water-management delegation at local levels of government could have unintended consequences. Finite resources require good decisions about the best use of available funding. Priorities need to be made. Decision support tools are available to assist in making sound decisions to prioritize conservation efforts. Too often funding priorities result in “random acts of conservation” rather than prioritizing the greatest problems or the sites with the greatest potential impact. It is possible that the current model will not result in state-wide goals to improve the waters of the state.

Adopt a comprehensive systems approach to water management. Continue to place more emphasis on the interconnection of hydrologic systems that do not observe political boundaries. It is critical that efforts to manage and protect water take into account these connections and how impacts on one aspect of the system affect others. Increase one-watershed/one-plan activities as an integrated effort.

Strengthen land use planning focusing on water. Stress links between land use and water management practices by creating incentives and legislation that allows local government units to integrate water and land- planning. Support and strengthen landowner and land occupier efforts to stem nonpoint source pollution and soil loss, both through voluntary best management practices and strengthening existing statutes relating to soil loss and soil health. A comprehensive and integrated approach to land use, water quality, water quantity, and population growth should be developed.

Increase legislative support capacity for water issues. Because the state faces so many critical water issues and because these issues are so complex, there continues to be a need to increase bipartisan expertise to provide resources and information to the legislature.

Require that state-owned lands be examples of conservation. State agencies own and manage significant land area. Agencies should evaluate, monitor, and benchmark the implementation of best management practices on state lands. Examples include various agricultural practices on state-owned lands, and storm water runoff and sediment control practices for construction activities for state-owned buildings, roads, trails, and similar facilities.

Increase interagency water management on long-term sustainability. Minnesota is perceived as a water-abundant state. However, many areas of the state may lack adequate water supplies for the future. Prepare an interagency plan, as part of the state water plan, for water management. The plan needs to recognize that water availability varies across the state and that the withdrawal of groundwater should be managed proactively at the system level. Water appropriations permitting should be revised to incorporate cumulative effects. Establish water use thresholds or quantity-based standards for water that recognizes the interconnectedness between surface and groundwater. Prepare water budgets for aquifers and watersheds as part of the one watershed/one plan process. Create an interagency sustainability team with responsibility for coordinating and overseeing the implementation of water sustainability actions across agencies. The team should be charged with making recommendations for changes to statutes and rules.

Increase support for Minnesota Agricultural Water Quality Certification Program (MAWQCP) at 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 this voluntary program. Revitalize and strengthen the implementation of the existing statutes for soil loss and soil health. Update model ordinances, linking the existing statute to support incentives to encourage voluntary participation in the MAWQCP, and provide incentives and technical assistance for local governments that adopt soil loss ordinances.

Revise water policy to include the principle of equity. There is inequity between the requirements imposed on point sources as compared to non-point sources of pollution. An equitable principle would require that the costs of pollution would be allocated without regard to point sources or unregulated nonpoint sources.

Examine alternatives for wastewater and storm water conservation and reuse. Consistent policies are needed to promote the reuse of water for appropriate purposes... Consistent policies are needed to: promote the infiltration of storm water; to recharge aquifers; to explore management of aquifer systems as underground reservoirs; and to 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 storm water or wastewater.

Ensure that statutes regarding water policy are integrated across agencies and scales of governance and encourage integration. Much more could be accomplished if the requirements of the Clean Water Act and the Safe Drinking Water Act were better aligned and implemented to ensure that water policy considers the interconnected nature of surface waters and groundwater and their connections to other natural systems. Adaptive and flexible state water plans and policies are important as we address climate change. Future water policies need to connect water quantity and water quality, groundwater and surface water, human health and ecosystem health. Water policy should recognize the long-term health of the natural system and the ecological benefits it provides.

Ensure that state environmental and natural resource policies align with water sustainability goals that efficiently direct on-the-ground actions. Provide uniform state guidance for water sustainability policy and a governance delivery structure to ensure that Minnesota has a comprehensive, well-integrated, and effective water policy for the future.

Support and strengthen landowner and land occupier efforts to stem nonpoint source pollution and soil loss, using voluntary best management practices and strengthening existing statutes relating to soil loss and soil health. While the quality of Minnesota's water resources have improved significantly over the decades since the federal Clean Water Act, most of this improvement has come from control of point sources, while non-point sources largely go unregulated.

Create flexibility in water laws across landscapes. Minnesota water laws are not flexible or adaptive across landscapes. A "one size fits all" approach creates a challenge for LGUs because different parts of the state have different water issues. Resolve laws and rules to incorporate flexibility across landscapes. The approach to managing the state's water does not currently recognize that water is a system connected to other natural and human systems. Short term goals tend to be prioritized over long term needs. There is a need to identify deficiencies, overlaps, gaps, conflicts, inconsistencies, and opportunities within the implementation and enforcement of statutes and rules and evaluate how to gain efficiencies in compliance.

Analyze the efficiency and effectiveness of possible changes to wetland regulations. Wetland regulations are widely recognized as one of Minnesota's most complex areas of water governance. An appropriate balance between streamlining wetland regulations without weakening wetland protection is needed. Multiple and complex regulation of wetlands, by federal, state, and local jurisdictions confuses local partners and permit applicants. The alignment of statutes, rules, and regulatory processes for wetlands is needed. The boundary between wetlands managed as Public Waters and those managed locally under the Wetland Conservation Act, needs to be simplified and aligned. An evaluation of the costs and benefits of state assumption of the Corps of Engineers Clean Water Act, Section 404 permitting process or broadening use of federal general permits is a first step in this process.

Provide consistency of enforcement authority among state agencies. The DNR lacks authority to issue administrative penalty orders. Unlike the MPCA, it uses stop-work orders. Consistency across agency programs would reduce enforcement inconsistency and clarify permittees' expectations for compliance.

6--Water Governance in Minnesota: Selected References:

Amato, Anthony J., Janet Timmerman and Joseph A. Amato, eds., 2000. *Draining the Great Oasis: An Environmental History of Murray County, Minnesota*, Crossings Press, Marshall, MN.

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

Bush Foundation. *Focus on Outcomes: Redesigning Minnesota's Local Government Services*, 2011. [http://www.bushfoundation.org/solutions/engagement/redesigning Minnesota's local government services](http://www.bushfoundation.org/solutions/engagement/redesigning%20Minnesota's%20local%20government%20services)

Citizens League, 1985. *A Strategy for the Water belt*. A Citizens League Report. Approved November 22, 1985. Minneapolis.

Citizens League, 2009. *To the Source: Moving Minnesota's Water Governance Upstream*. Report of the Citizens League Water Policy Study Committee.

Clean Water Legacy Act (Laws 2006, c. 251, §§1-17). Clean Water Council established.

Clean Water, Land and Legacy Amendment (MN Constitution, Article XI, §15) Clean Water Fund established. Lessard-Sams Outdoor Heritage Council created

Commission on Reform and Efficiency (CORE), 1993. *Report on Reforming Minnesota's Environmental Services System*. (CORE – Department of Administration)

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

EQB , 1987. *Protecting Minnesota's Waters: An Agenda for Action in the 1987-1989 Biennium*. Minnesota State Planning Agency.

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

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

EQB, 1989. The 10-Year Agenda for Protecting Minnesota's Waters, a Working Paper 10

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

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

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

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

EQB, 1994. Water Policy Report: A Focus on Ground Water.

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

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

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

EQB, 1999. Preparing for Minnesota Water Plan 2000. Public Review Draft.

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

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

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

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

EQB and DNR, 2007. Use of Minnesota's Renewable Water Resources: Moving Toward Sustainability

EQB and DNR, 2007. Use of Minnesota's Renewable Water Resources: Moving Toward Sustainability

EQB. Managing for Water Sustainability: Report of the EQB Water

EQB. 2008. Managing for Water Sustainability: Report of the EQB Water Availability Project. St. Paul: Environmental Quality Board.

Environmental Protection Agency and Minnesota DNR, 1991. Minnesota Public Drainage Manual. Accessed April 26, 2021 at <http://archive.leg.state.mn.us/docs/NonMNpub/oclc25969484.pdf>

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.

Garvey, Edward, Philip Gersmehl and Dwight Brown, 1986. Minnesota Water Rights and Regulations. Public Report Series #5. The Water Resources Research Center, University of Minnesota, St. Paul.

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/cont/77/1/10179183>.

Gieseke, Timothy, 2002. Draft Water Unification Plan. Governor's Briefing on Water Issues, December 10, 1984. Various papers. Water Governance Evaluation required (Laws 2011 1st Special Session, c 2, art. 4, §33)

Governor's Executive Order #11-32 re Governor's Executive Order #12-04 re wetland policy; "One watershed - one plan" legislation (Laws 2012, c 272, §32) /wrc.umn.edu/watersustainabilityframework/

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

Water Governance Evaluation required (Laws 2011 1st Special Session, c 2, art. 4, §33); Governor's Executive Order #11-32 re

Governor's Executive Order #12-04 re wetland policy; "One watershed - one plan" legislation (Laws 2012, c 272, §32) /wrc.umn.edu/watersustainabilityframework/

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

Hansen, Mark J, 1987. Damming Agricultural Drainage: The Effect of Wetland Preservation and Federal Regulation on Agricultural Drainage in Minnesota, 13 Wm. Mitch. L. Rev. 135, 139-40.

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

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

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

League of Women Voters. 2007. Examining a state agency: Minnesota Pollution Control Agency. St. Paul: League of Women Voters Minnesota.

Legislative-Citizen Commission on Minnesota Resources. 2008. Minnesota statewide conservation and preservation plan. St. Paul. Minnesota DNR. 2010. Long-term protection of the state's surface water and groundwater resources. St. Paul: Minnesota Department of Natural Resources.

Food, Conservation, and Energy Act of 2008 (Farm Bill, PL 110-234) increases support for ethanol production

Metropolitan Council at 40. Agency website: <http://www.metrocouncil.org/about/metcouncilhistory.pdf>

Minnesota Environmental Initiative, 2009. Land and Water Policy Project Report, July 7, 2009

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

Minnesota House of Representatives, Land and Water Resources Committee Final Report, Interim 1969-1970. Accessed April 26, 2012 at <http://archive.leg.state.mn.us/docs/pre2003/other/I287.pdf>].

Minnesota Planning, 1996. Crosscurrents: Managing Water Resources.

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.

Minnesota DNR. Long-Term Protection of the State's Surface Water and Groundwater Resources.

Minnesota DNR. 2000. Minnesota's Water Supply: Natural Conditions and Human Impacts. St. Paul, MN: Waters Division, Minnesota Department of Natural Resources.

Minnesota DNR, 2010. Long-Term Protection of the State's Surface Water and Groundwater Resources.

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

Minnesota Environmental Initiative. 2009. Land and water policy project. Minneapolis: MEI.

Minnesota Water Resources Center. 2009. Water use in Minnesota. St. Paul: WRC.

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

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

MPCA, 1980. Water Quality Management: Minnesota's 208 Plan

MPCA, 2002, Agency Funding. Accessed November 30, 2011 at <http://www.auditor.leg.state.mn.us/ped/pedrep/0202all.pdf>

MPCA, 2007. Minnesota's Groundwater Condition: A Statewide View. Accessed March 21, 2012 at <http://www.pca.state.mn.us/index.php/view-document.html?gid=6395>

MPCA, 2010. Continuing Planning Process: State of Minnesota's Water Quality Management Program. Accessed September 20, 2012 at <http://www.pca.state.mn.us/index.php/view-document.html?gid=15647>

MPCA, 2013, Water Governance Evaluation: available online at: www.pca.state.mn.us

MPCA (Minnesota Pollution Control Agency), 1980. Water Quality Management: Minnesota's 208 Plan.

MPCA, 2007. Minnesota's Groundwater Condition: A Statewide View. Accessed March 21, 2012 at <http://www.pca.state.mn.us/index.php/view-document.html?gid=6395>

MPCA, 2010. Continuing Planning Process: State of Minnesota's Water Quality Management Program. Accessed September 20, 2012 at <http://www.pca.state.mn.us/index.php/viewdocument.html?gid=15647>

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

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.

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

Minnesota Planning, 1996. Crosscurrents: Managing Water Resources.

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

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

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.

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

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

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

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

Office of the Legislative Auditor, State of Minnesota, 2007. Evaluation Report: Watershed Management. January 2007. Accessed September 21, 2012 at <http://www.auditor.leg.state.mn.us/ped/pedrep/watersheds.pdf> 12

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

State Planning Agency, 1985. Water Agency Merger Study, 1984-1985. Accessed April 18, 2012 at <http://archive.leg.state.mn.us/docs/2010/other/101000.pdf>

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

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

Smith, Louis and Charles B. Holtman, 2011. Minnesota Drainage Law Analysis and Evaluation. Legislative and Citizens Commission on Minnesota Resources.

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

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

State Planning Agency, 1985. Water Agency Merger Study, 1984-1985. Accessed April 18, 2021? at <http://archive.leg.state.mn.us/docs/2010/other/101000.pdf>

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

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

Teisman, Geert R. and Jurian Edelenbos, 2011. 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.

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.

University of Minnesota, Center for Science, Technology and Public Policy, 2011. Hennepin County Water Governance Project: An Application of Design Thinking to Governance.

University of Minnesota, Water Resources Center, 2011. Minnesota Water Sustainability Framework. Accessed April 18, 2012 at [http:// MN Session Laws 2009, c 37, § 4 directs DNR groundwater study preparation](http://MN Session Laws 2009, c 37, § 4 directs DNR groundwater study preparation)

Water Governance Evaluation required (Laws 2011 1st Special Session, c 2, art. 4, §33); Governor's Executive Order #11-32

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.

University of Minnesota, Center for Science, Technology and Public Policy, 2011. Hennepin County Water Governance Project: An Application of Design Thinking to Governance.

University of Minnesota, Water Resources Center, 2011. Minnesota Water Sustainability Framework:: final.pdf (43.46Mb application/pdf):Persistent link to this item:
<https://hdl.handle.net/11299/98976>: Suggested Citation Swackhamer, Deborah. (2011). Minnesota Water Sustainability Framework. Water Resources Center, University of Minnesota. Retrieved from the University of Minnesota Digital Conservancy, <https://hdl.handle.net/11299/98976>.

University of Minnesota, Water Resources Center, 2011. Minnesota Water Sustainability Framework:: final.pdf (43.46Mb application/pdf):Persistent link to this item:
<https://hdl.handle.net/11299/98976>: Suggested Citation Swackhamer, Deborah. (2011). Minnesota Water Sustainability Framework. Water Resources Center, University of Minnesota. Retrieved from the University of Minnesota Digital Conservancy, <https://hdl.handle.net/11299/98976>. The following white papers, associated with the Stainability Framework, are available at the University of Minnesota’s Water Resources Center as archived in the UMN digital library at the following link. (Search using the title shown below and include “Sustainability Framework”)

<https://conservancy.umn.edu/>

1. Water Use in Minnesota
2. Water Availability in Minnesota
3. Water Quality in Minnesota
4. Agricultural Water Use Technical Work Team Report
5. Domestic Water Use Technical Work Team Report
6. Manufacturing and Energy Water Use Technical Work Team Report
7. Recreational, Spiritual, and Cultural Uses of Water
8. Technical Work Team Report Ecosystem Services Technical Work Team Report
9. Policy Technical Work Team Report
10. Water Education Technical Work Team Report
11. Water Valuation Technical Work Team Report Public Water
12. Infrastructure Needs Report Citizen Stakeholder Outreach Efforts Report

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Water Governance Evaluation required (Laws 2011 1st Special Session, c 2, art. 4, §33); Governor’s Executive Order #11-32

7--Acronyms

BWSR - Board of Soil and Water Resources
CEC - Contaminants of Emerging Concern
COE-United States Army Corps of Engineers
CREP- Conservation Reserve Enhancement program

CRP -Conservation Reserve Program
CWA - Clean Water Act
CWLLA - Clean Water Land & Legacy Amendment
CWLA - Clean Water Legacy Act
DNR - Minnesota Department of Natural Resources
EPA- U. S. Environmental Protection Agency
EQB - Minnesota Environmental Quality Board
EQuIS - Environmental Quality Information System
FWS-United States Fish and Wildlife Service
GLRI- Great Lakes Restoration Initiative
HBV - Health Based Value
ICT - Interagency Coordination Team
IRRB-International Red River Board
LCCMR - Legislative and Citizens Commission on Minnesota Resources
LGUs- Local Government
LIDs-Lake Improvement Districts
MAWQCP- Minnesota Agricultural Water Quality Certification Program
MDA - Minnesota Department of Agriculture
MDH - Minnesota Department of Health
MEPA- Minnesota Environmental Policy Act
MERA-Minnesota Environmental Rights Act
MERLA - Minnesota Environmental Response and Liability Act
MGS - Minnesota Geological Survey
MGWA - Minnesota Ground Water Association
MHB-Minnesota Headwaters Board
MNDOT- Minnesota Department of Transportation
MNRA- Mississippi National River and Recreation Area
MPCA - Minnesota Pollution Control Agency
MRB- Minnesota River Board.
NEPA-National Environmental Protection Act
NPDES- National Pollution Discharge Elimination System
NRCS- Natural Resources Conservation Service
PFA- Minnesota Public Facilities Authority
RCDs-Regional development Commissions
RCRA - Resource Conservation and Recovery Act
RIM- Reinvest in Minnesota
RRBC-Red River Basin Commission
RRWMB-Red River Watershed Management Board
SCS- Soil Conservation Service
SSTS- Subservice Sewage Treatment Systems
SWCD-Soil and Water Conservation District
TMDL-Total Maximum Daily Load
USDA- United states Department of Agriculture
USEPA - United States Environmental Protection Agency
USGS - United State Geological Survey
WMOs- Metropolitan Area Surface Water Management Organizations
WRAPS - Water Restoration and Protection Strategy
WRC - University of Minnesota Water Resources Center