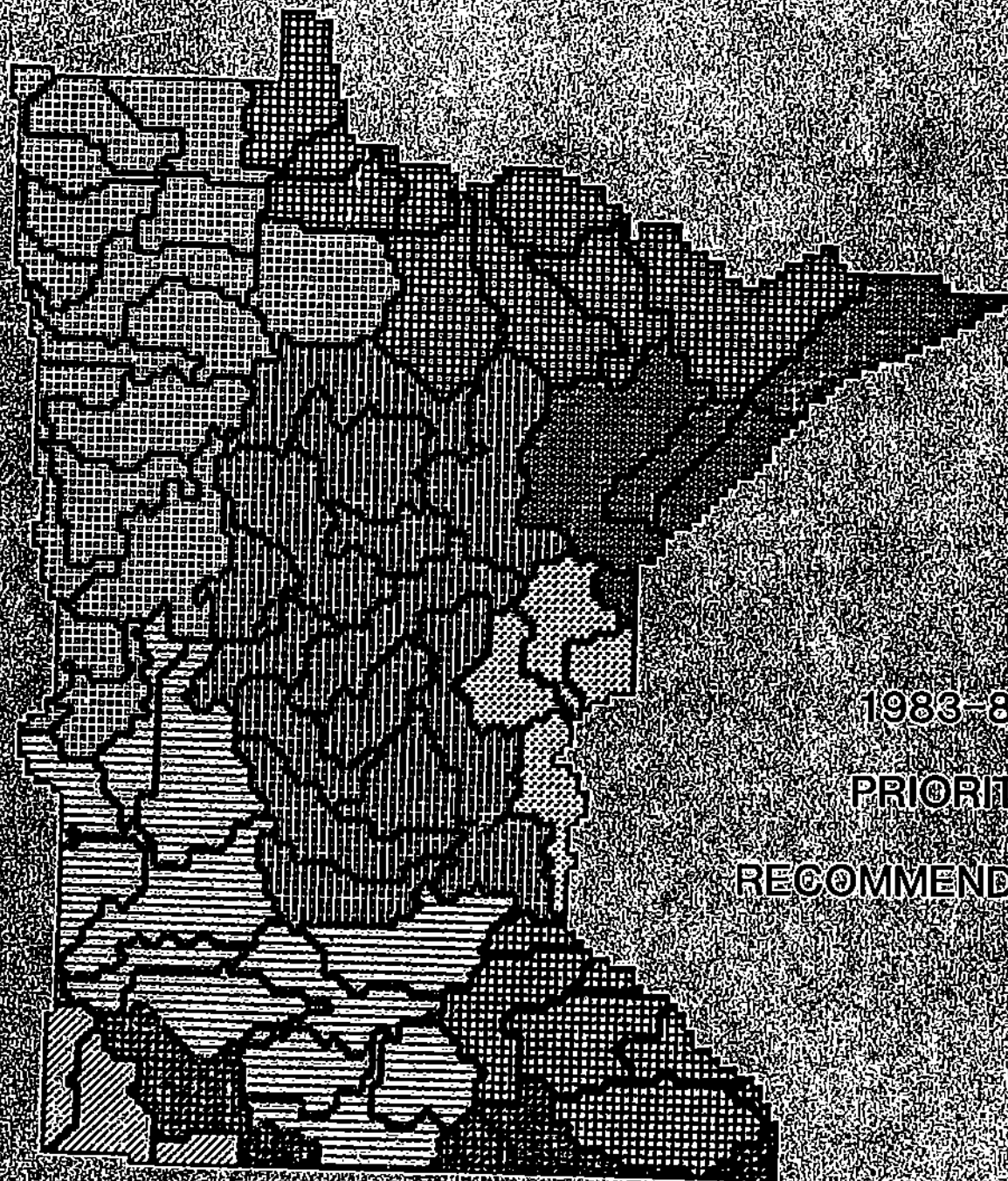


Toward Efficient Allocation and Management:



1983-85
PRIORITY
RECOMMENDATIONS

A REPORT OF THE MINNESOTA
WATER PLANNING BOARD

Minnesota Statutes, Section 105.401 charges the Minnesota Water Planning Board with the responsibility to evaluate and update the 1979 framework water and related land resources plan.

The nine-member Water Planning Board is composed of the Commissioners of the Departments of Agriculture, Health and Natural Resources; the Executive Director of the Pollution Control Agency; the Chairman of the Soil and Water Conservation Board; three citizen members with experience in and knowledge of water management issues, appointed by the Governor with the advice and consent of the Senate; and a Chairman appointed by the Governor with the advice and consent of the Senate. State agency members of the Board may designate alternate members to represent them on the Board.

Prepared February, 1983

EXECUTIVE SUMMARY:

1983-85 PRIORITIES FOR STRATEGY IMPLEMENTATION

The Minnesota Water Planning Board recommends an 11-point program to the Governor and the Legislature for the 1983-85 biennium to continue implementation of its strategy for preserving and protecting water and related land resources. This 11-point program includes recommendations for:

- ** The appointment by the Governor of a task force of state, local, legislative, and public interest and private sector representatives to study questions relating to further financing of water and related land resources development, management, research, and planning activities.
- ** The establishment of a permanent "water resources coordinating body" at the state level.
- ** The enactment of a statewide "Comprehensive Local Water Management Act" which establishes in law the basic principles contained in the Board's "Special Study on Local Water Management."
- ** The development of education and technical assistance programs for individuals, user groups, and local governments in the conservation of water, based on a state conservation plan prepared by the coordinating body.
- ** The continued coordinated development of automated systems for water information management, with specific appropriations for continuation of the SWIM clearinghouse concept within the Land Management Information Center.
- ** The further development of the ground-water strategy proposed to the Legislative Commission on Minnesota Resources, including support for LCMR appropriations to implement this strategy.
- ** The acceleration of surface water data analysis to develop an accurate picture of present and future water use and changes in total supply related to seasonal and climatic variations.
- ** The approval of a statewide program of cost-sharing assistance to implement both structural and non-structural components of approved comprehensive flood plain management plans.
- ** The expansion of the present state soil and water conservation cost-sharing program to provide incentives to a greater number of landowners to provide adequate protective measures on their lands.
- ** The support for continued study of the critical management questions related to threats from acid precipitation.
- ** The adoption of a state "superfund bill" to remedy problems created by past waste disposal practices which pose a threat to contaminate ground water supplies.

The focus on these 11 points in the 1983-85 biennium does not mean that the remaining recommendations of the Water Planning Board in its 1979 report, "Toward Efficient Allocation and Management: A Strategy to Preserve and Protect Water and Related Land Resources," are unimportant. It does reflect the Board's view that these major points should be addressed in the 1983-85 biennium as a continuing step toward full implementation of the Board's strategy for preserving and protecting water and related land resources.

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INTRODUCTION

Water has been called "the next resource crisis" by planners and a number of public officials including the last two Secretaries of the Interior. The Nation is learning that none of our resources is unlimited.

Water management has received attention in Minnesota since the turn of the century. Water planning has been mandated since the mid-1930's. Minnesota is fortunate to be advanced over many states in both its resource base and its resource protection programs.

But, Minnesota is not without its concerns. While average rainfall is adequate, parts of the state receive only about as much rainfall as the most arid western states. Two-thirds of the streams in the state have recorded low flows of zero; but in an average year, \$60 to \$70 million dollars in flood damages occur in Minnesota. Over a dozen municipal wells in the seven-county metropolitan area have been abandoned or deepened in the last three years because of organic chemical contamination, and ground-water contamination in southeastern Minnesota has been linked to human and animal health problems. Acid precipitation threatens lakes in much of northeastern and parts of central Minnesota. Over 100 million tons of soil erodes from land in the state each year, often carrying polluting chemicals to lakes and streams.

The responses to these concerns, and the course we choose for the use of our resources, are likely to significantly affect the future of the State of Minnesota. They may be the difference between new development or an erosion of our industrial base; between a vibrant tourism industry or lakes and rivers too polluted to continue to attract visitors.

In June 1979, the Minnesota Water Planning Board identified the major water issues which it believes the state should address and proposed actions to aid the state in attaining its potential for the future. In this first major evaluation of the Board's 1979 assessment, the Board recommends an agenda for action to meet the state's most pressing water and related land resources concerns in the 1983-85 biennium.


Thomas J. Kalitowski, Chairman
Water Planning Board

THE MINNESOTA LEGISLATURE HAS SAID:

"...to conserve the utilize the water resources of the state in the best interests of the people of the state, and for the purpose of promoting the public health, safety, and welfare, it is hereby declared to be the policy of the state...[to] control the appropriation and use of surface and underground waters of the state..." Minnesota Statutes, Section 105.38.

"The commissioner shall develop and manage water resources to assure a supply adequate to meet long-range seasonal requirements... from surface or ground water sources..." Minnesota Statutes, Section 105.405.

"Conservation of the state's water resources is a state function..." Minnesota Statutes, Section 110A.01.

"It is determined that state financial assistance for the construction of...municipal disposal systems is a public purpose and a proper function of state government, in that the state is a trustee of the waters of the state and such financial assistance is necessary to protect the purity of state waters, and to protect the health of the citizens of the state, which is endangered whenever pollution enters state waters..." Minnesota Statutes, Section 116.16.

"It is the legislative intent...to reduce and minimize the waste of ground water resources within the state...and to protect the health and general welfare by providing a means for the development and protection of the natural resource of underground water in an orderly, sanitary, and reasonable manner." Minnesota Statutes, Section 156A.01.

"It is the policy of the state to encourage land occupiers to conserve the soil and water resources through the implementation of practices that effectively reduce or prevent erosion, sedimentation, siltation, and agriculturally related pollution..." Minnesota Statutes, Section 40.02.

"The legislature...declares that each person is entitled by right to the protection, preservation, and enhancement of air, water, land, and other natural resources...and that each person has the responsibility to contribute to the protection, preservation, and enhancement thereof. The legislature further declares its policy to create and maintain conditions under which man and nature can exist in productive harmony in order that present and future generations may enjoy clean air and water, productive land, and other natural resources..." Minnesota Statutes, Section 116.01.

"The legislature...declares that...the public interest necessitates sound land use development as land is a limited and irreplaceable resource..." Minnesota Statutes, Section 87.01.

"It is the policy of this state, which is blessed with an abundance of water, to promote its full use and enjoyment by all people..." Minnesota Statutes, Section 361.01.

RESPONSIBILITIES

The State of Minnesota has an obligation to maintain and improve the health, safety, welfare, and quality of life for present and future generations of Minnesotans.

To meet its obligations, the state and its political subdivisions have six major responsibilities with respect to water and related land resources. These are:

1. To allow for continued growth and development, while adequately protecting and preserving the state's water resources to assure the maintenance of an adequate supply of safe and acceptable quality water from both surface and ground-water sources to meet seasonal and long-range requirements.
2. To establish a management structure which assures adequate communication and coordination among all levels of government, the private sector, and the public, avoiding duplication of effort and accomplishing management, development, and protection objectives at the lowest possible cost.
3. To provide an equitable distribution of opportunities to enjoy the benefits provided by Minnesota's water and related land resources.
4. To assure adequate public education regarding water and related land resources to allow informed public participation in water and related land resources decisions.
5. To attempt to develop adequate financing and/or incentives to assure the achievement of the management, development, and protection objectives of state and local programs.
6. To seek to improve understanding of water and related land resources by encouraging creative and applicable research contributions from the state's colleges and universities.

Progress toward fulfilling these responsibilities can be made only if the state and local institutional structure has (1) management authority; (2) coordinating capability; (3) financing ability; (4) a means of providing an effective voice for all parties; and (5) planning, analysis, and research capabilities so as to anticipate and be responsive to changing desires and technologies.

MINNESOTA'S WATER AND RELATED LAND RESOURCES FACTS

Minnesota Land Use (1973)

<u>Land</u>	<u>In (000) Acres</u>	<u>Percent</u>
Cropland	23,750	44.1
Irrigated (1978)	433	----
Pasture and Open	6,010	11.2
Forest Uses	16,975	31.6
Wildlife Management	1,450	2.7
Transportation	1,440	2.7
Urban Development	1,260	2.3
Extractive Uses	110	0.2
Energy Facilities	36	----
Subtotal	51,033	94.9
<u>Water</u>	2,770	5.1
<u>Total</u>	53,003	100.0

Minnesota ranks third among the 48 contiguous states in surface water area. Only Texas and Florida (among the contiguous states) have a larger share of the nation's surface water area.

Minnesota Lakes

<u>Lake Area (Acres)</u>	<u>Number of Lakes</u>	<u>Percent</u>
10-100	11,269	73.7
100-500	3,262	21.3
500-1000	400	2.6
1000-2500	225	1.5
2500-5000	63	0.4
Over 5000	62	0.4
<u>Total</u>	15,291	99.9

Ten counties have five or fewer lakes, two have only one lake and it is less than 100 acres in size. Seven counties have 500 or more lakes, led by Otter Tail with 1,048. Lake density is under one basin per township in much of southeastern, extreme southwestern, and parts of northwestern Minnesota.

Minnesota Rivers and Streams

Total Length (including ditches) = 91,944 miles (147,930 kilometers)		
Mississippi River	682 miles	(1,097 kilometers)
Red River of the North	457 miles	(736 kilometers)
Minnesota River	371 miles	(597 kilometers)
Rainy River	292 miles	(470 kilometers)
Red Lake River	253 miles	(407 kilometers)
Big Fork River	197 miles	(317 kilometers)

Minnesota is at the head of four major watersheds: the Upper Mississippi River, the Missouri River, the Souris-Red-Rainy River, and the Great Lakes. This means nearly all flow is away from Minnesota.

MEETING OUR RESPONSIBILITIES: THE STRATEGY

In 1979, the Minnesota Water Planning Board made 88 recommendations for action in 11 major areas. More than 75 percent of these recommendations have either been carried out or have had some significant action taken on them. Twenty percent have been fully accomplished.

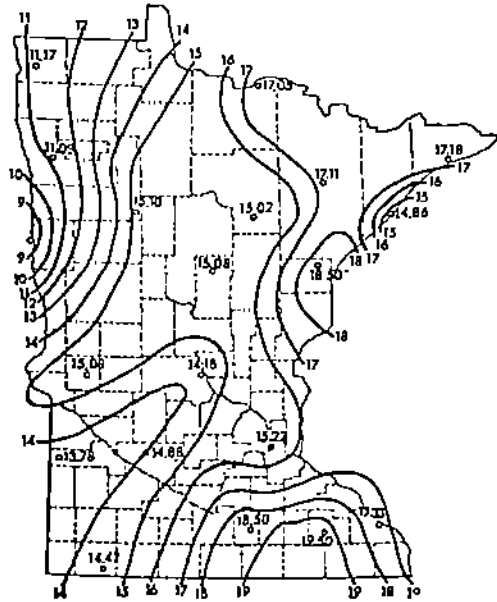
Action toward implementation of recommendations, continued study, and evaluation of progress have aided the Minnesota Water Planning Board in sharpening its focus on a strategy to preserve and protect the state's water and related land resources. This strategy--which provides direction for the future--is summarized below.

TO MEET THE RESPONSIBILITY FOR ATTAINING DESIRED GROWTH AND DEVELOPMENT WHILE PROVIDING ADEQUATE RESOURCE PROTECTION, THE WPB BELIEVES THE STATE OF MINNESOTA SHOULD:

- ** Discourage the interstate diversion of surface or ground water.
- ** Continue water quantity and quality planning and management programs, enhancing them with an expanded emphasis on protection of ground water, erosion and sediment control, acid precipitation abatement, flood damage reduction, preservation of waters and wetlands, and maintenance of commercial navigation channels (while preserving their significant environmental values).
- ** Accelerate data collection and analysis to develop a more accurate picture of present and future water use and changes in total supply related to seasonal and climatic variations in order to aid in targeting areas for continued growth and development in concert with their resources.
- ** Encourage water conservation through education and technical assistance to local governments and individuals.

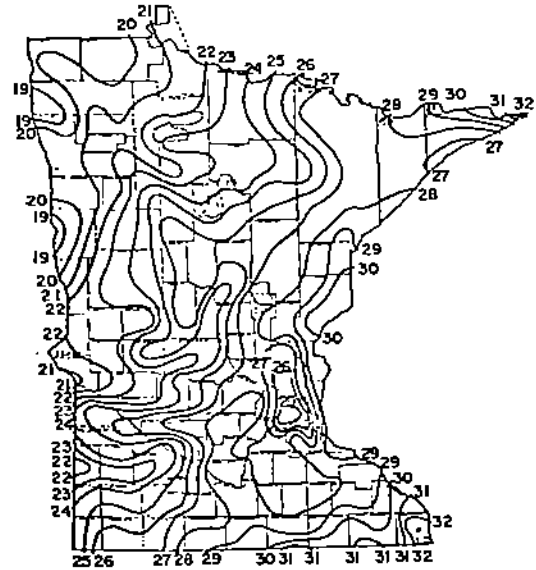
TO MEET THE RESPONSIBILITY FOR ESTABLISHING A MANAGEMENT STRUCTURE WHICH IS EFFICIENT, EFFECTIVE, AND ASSURES COMMUNICATION AND COORDINATION, THE WPB BELIEVES THE STATE OF MINNESOTA SHOULD:

- ** Continue the distribution of water and related land resources planning and management responsibilities among the major agencies created for specific purposes, but establish a permanent state coordinating body responsible for assuring communication and coordination relative to matters of inter-agency and interstate concern.
- ** Expand the role of local government in water and related land resources planning and management, establishing general purpose governments--particularly counties--as the fundamental decision-makers at the local level.
- ** Retain state management responsibility where there are threats to resources which local governments cannot effectively address, and transferring responsibility to the local level for decisions on matters on which the benefits and detriments of the solution to a problem will be felt within the boundaries of the decision-making unit and do not have a major impact on matters of state-wide concern.
- ** Continue special purpose districts at the local level in order to allow general purpose government decision-makers and citizens to "shop" for the best solution to a problem, but with increased accountability to general purpose governments.
- ** Develop a coordinated approach to working with local units of government, focusing on improved communication, technical assistance, and coordination of requests for information.
- ** Further develop and utilize automated systems for water information management to aid both state and local planning and management.
- ** Assure the opportunity of the public to participate in the preparation and implementation of water and related land resources planning and management decisions.



Minimum annual precipitation expected in 2 percent of years, in inches.

PRECIPITATION

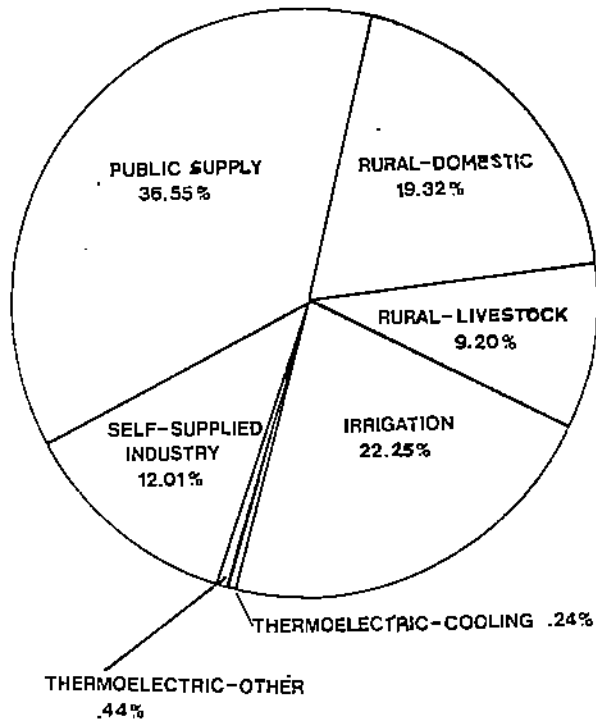


Annual normal precipitation in inches.

WATER USE

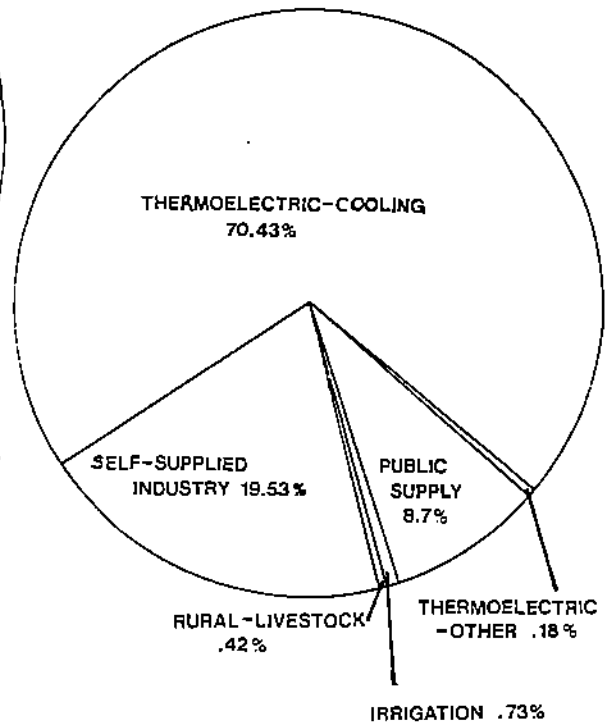
GROUND WATER WITHDRAWN-1980

Total= 228.4 Billion Gallons



SURFACE WATER WITHDRAWN-1980

Total= 661.2 Billion Gallons



TO MEET RESPONSIBILITY FOR PROVIDING AN EQUITABLE
DISTRIBUTION OF OPPORTUNITIES, THE WPB BELIEVES
THE STATE OF MINNESOTA SHOULD:

- ** Develop further a water supply/demand planning process which combines water use efficiency, growth management, and supply augmentation (where possible) considerations.
- ** Accelerate acquisition of public access to lakes and streams for recreational use, with emphasis on potential sites close to urban areas and on high-quality fishing lakes with limited or no public access in the prime lake areas of the state.
- ** Maintain an environment that offers a diversity of cultural experiences and preserves important aesthetic values, such as through preserving wild and scenic rivers.

TO MEET THE RESPONSIBILITY FOR ASSURING ADEQUATE PUBLIC
EDUCATION WITH RESPECT TO WATER AND RELATED LAND RE-
SOURCES, THE WPB BELIEVES THAT THE STATE OF MINNESOTA
SHOULD:

- ** Expand public education efforts, particularly with respect to efficient use and conservation of water and related land resources, including greater use of the general education program of the Minnesota Department of Education in cooperation with the Minnesota Environmental Education Board and the Agricultural Extension Service.
- ** Institute a process of regular and extensive communication and interaction between state planners and managers and university leaders and researchers.
- ** Give special emphasis to assisting local decision-makers in understanding the importance and benefits of water and related land resources planning.

TO MEET THE RESPONSIBILITY TO DEVELOP ADEQUATE FINANCING
AND/OR INCENTIVES TO ACHIEVE PROGRAM OBJECTIVES, THE WPB
BELIEVES THAT THE STATE OF MINNESOTA SHOULD:

- ** Critically examine the future role of the state in financing water and related land resources development, management, research, and planning; how this involvement should be structured and paid for; and the uses to which state funds should be put.
- ** Establish added incentives for local water and related land resources planning and plan implementation; adoption of flood damage reduction measures; and soil erosion and sedimentation control.

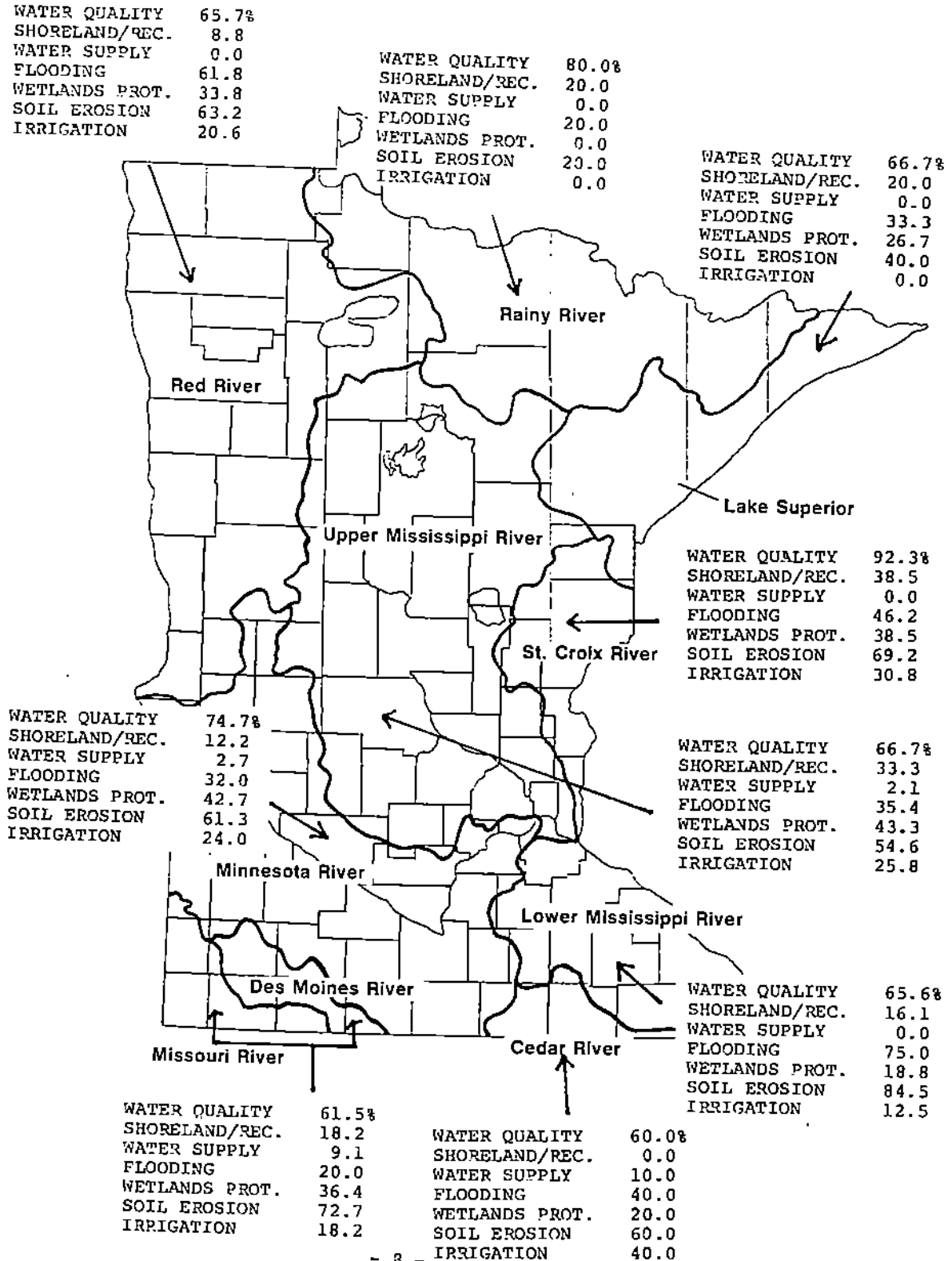
TO MEET THE RESPONSIBILITY FOR ENCOURAGING CREATIVE AND
APPLICABLE RESEARCH CONTRIBUTIONS FROM THE STATE'S COLLEGES
AND UNIVERSITIES, THE WPB BELIEVES THE STATE OF MINNESOTA
SHOULD:

- ** Continue to place primary reliance for research programs on the state's universities and colleges.
- ** Address questions of research responsibility, research information flow to state agencies, and financing of water and related land resources research through joint discussions and actions of state agencies, universities and colleges.
- ** Encourage university and college research in areas of priority concern to the state (e.g., acid precipitation and water conservation) and in areas which will assist the state in meeting water and related land resources management challenges, including partnerships with local units of government.

The Water Planning Board strategy does not prescribe a future for Minnesota. It does suggest a policy direction which will positively affect that future. The future the Board wishes to aid in attaining is one of continued growth and development within a framework which protects and preserves water and related land resources for the enjoyment of future generations.

WATER PROBLEMS, BY BASIN

IN AUGUST 1980, THE MINNESOTA WATER PLANNING BOARD ASKED LOCAL OFFICIALS AND LEADERS OF INTERESTED GROUPS WHETHER THEY BELIEVED CERTAIN WATER AND RELATED LAND RESOURCES CONCERNS WERE MAJOR PROBLEMS IN THEIR AREA. THEIR RESPONSES ARE SUMMARIZED BY MAJOR DRAINAGE BASIN BELOW, WITH THE PERCENT BEING THE PERCENTAGE OF RESPONDENTS WHO BELIEVED THE CONCERN WAS A MAJOR PROBLEM IN THEIR AREA. (THERE WERE 338 RESPONSES TO THE SURVEY.)



1983-85 PRIORITY RECOMMENDATIONS:
AGENDA FOR ACTION

The following pages provide a brief discussion of each item in the Water Planning Board's 11-point program of 1983-85 priority action items and specific recommendations relating to each. The order in which they are presented does not imply that the first item discussed is more important than the last. All are important.

The 1983-85 priority recommendations address both the state's overall water management activity and specific problems. Recommendations which deal with the overall water and related land resources management activity include the enactment of a statewide local water management act, the establishment of a permanent water resources coordinating body at the state level, ongoing development and maintenance of automated water data systems, and the investigation of future water program and project financing methodologies.

Recommendations which deal with specific resource problems include study and policy development with respect to ground-water protection, surface water availability and management, and acid precipitation; expanded state financial assistance for flood control, erosion control, and waste clean-up programs; and education and technical assistance in water conservation.

PROPOSED NON-FEDERAL COST-SHARING

IN A JUNE 15, 1982 MEMORANDUM TO PRESIDENT REAGAN, SECRETARY OF THE INTERIOR JAMES WATT RECOMMENDED A SERIES OF COST-SHARING ARRANGEMENTS FOR NINE CATEGORIES OF WATER PROJECT PURPOSES. THE PROPOSED RATES ARE BELOW.

PURPOSE	PRESENT NOMINAL NON-FEDERAL RATE	PROPOSED NON- FEDERAL SHARE
Urban Flood Damage Reduction	24 %	Variable, but not less than 35 %
Rural Flood Damage Reduction	8 %	Variable, but not less than 35 %
Recreation	20 %	50 %
Municipal and Industrial Supplies	99 %	100 %
Navigation	7 %	Subject to pending legislation
Fish and Wildlife	14 %	100 %
Hydropower	96 %	100 %

SOURCE : Water Information News Service, July 21, 1982, p. 4.
U.S. Water Resources Council.

RECOMMENDATION:

FINANCING WATER PROGRAMS AND PROJECTS

The State of Minnesota has relied heavily on federal assistance for implementing flood damage reduction measures, addressing soil erosion concerns, protecting valuable wetlands, constructing wastewater treatment facilities, developing recreational areas, and carrying on research. In F.Y. 1980, the state received about \$78 million from 24 water and related land resources programs.

The outlook for continuing federal financial assistance is bleak. It is estimated that federal aid to state and local governments may shrink by \$10 billion in the next three years. The Corps of Engineers is currently implementing cost-sharing policies which will increase the local share of urban flood damage reduction project costs from an average of 14 percent to a minimum of 35 percent, for example. Beginning in F.Y. 1985, the federal share of the costs of a wastewater treatment facility will fall from 75 percent to 55 percent, and this program was tentatively identified by the Reagan Administration as a program to be "turned-back" to the states.

Minnesota must examine whether or not it will be able to initiate actions in pursuit of its water and related land resources objectives without a revision in its approach to financing the methods of achieving these objectives.

THE MINNESOTA WATER PLANNING BOARD RECOMMENDS THAT:

- ** The Governor immediately appoint a task force of state, local, legislative, and public interest and private sector representatives to study the following questions and make recommendations to the Governor and the Legislature by January 1, 1984:
 - A. What should be the role of the state in financing water and related land resources development (e.g., wastewater treatment and water supply projects), research (e.g., acid precipitation or ground-water contamination studies) and protection (e.g., wetlands preservation or soil conservation projects vis a vis local governments)?
 - B. If additional state involvement is called for, how should this involvement be accomplished (e.g., through revolving funds, loan guarantees, or grants) and how should it be paid for (e.g., by fees, general obligation or revenue bonds, or special taxes)?
 - C. What uses should an expanded state financing mechanism, if any, be targeted on (e.g., include all construction and protection projects or be limited to flood damage reduction projects)?
- ** The state coordinating body be assigned responsibility for staffing the task force appointed by the Governor and for providing necessary background information, including information on current financing and need, activities in other states, and possible options for consideration by the task force.
- ** The task force be cognizant of and attempt to achieve consistency with the findings of an interagency task group led by the MPCA which is considering options related to wastewater treatment facility financing.

LEVELS OF GOVERNMENT IN WATER MANAGEMENT

THE FEDERAL LEVEL

A. Executive Agencies

1. Department of Agriculture
2. Department of Commerce
3. Department of Defense, Department of the Army
4. Department of Energy
5. Department of Health and Human Services
6. Department of HUD
7. Department of the Interior
8. Department of Transportation
- C. Executive Office of the President (e.g., Office of Management and Budget)

B. Independent Agencies

1. Environmental Protection Agency
2. Federal Emergency Management Agency
3. Water Resources Council
4. Interstate Commerce Commission
5. National Science Foundation
- D. Special Boards, Committees, Councils (e.g., International Joint Commission)

THE INTERSTATE LEVEL

1. Upper Mississippi River Basin Association
2. Missouri Basin States Association
3. Great Lakes Commission
4. Red River Water Resources Council
5. Minnesota Wisconsin Boundary Area Commission
6. South Dakota-Minnesota Boundary Waters Commission
7. Upper Great Lakes Regional Commission 1/

THE INTRASTATE LEVEL

1. Regional Development Commissions (11)
2. Metropolitan Council
3. Lower Red River Watershed Management Board
4. Resource Conservation and Development Areas (2)
5. Mississippi Headwaters Board
6. Project Riverbend Board
7. Metropolitan Waste Control Commission

THE STATE LEVEL

1. Department of Agriculture
2. Department of Energy, Planning, and Development
3. Department of Natural Resources
4. Department of Transportation
5. Department of Public Safety, Division of Emergency Services
6. Environmental Quality Board
7. Department of Health

8. Iron Range Resources and Rehabilitation Board
9. Minnesota Historical Society
10. Minnesota Pollution Control Agency
11. Soil and Water Conservation Board
12. Southern Minnesota Rivers Basin Board
13. University of Minnesota
14. Waste Management Board
15. Water Planning Board
16. Water Resources Board

THE LOCAL LEVEL

1. Counties (87)
2. Municipalities (855)
3. Townships (1,795)
4. Watershed Districts (37)
5. Soil and Water Conservation Districts (92)
6. Drainage and Conservancy Districts (3)
7. Lake Improvement Districts (3)

8. Lake Conservation Districts (2)
9. Rural Water User Districts (5)
10. Sanitary Districts (7)
11. Port Authorities (5)
12. ASCS County Committees (90)
13. Farmers Home Administration County Committees (63)

() = Number of districts

1/ Discontinued at federal level, to be continued by states

RECOMMENDATION:

ESTABLISHMENT OF A STATE COORDINATING BODY

More than 80 water and related land resources management programs are administered at the state level. While more than three-quarters of these programs are administered by three agencies (the Departments of Health and of Natural Resources and the Pollution Control Agency), seven other agencies have major programs and interests and six more have at least some related responsibilities. The state deals with at least 12 federal agencies and six interstate organizations in water and related land resources management.

The distribution of program responsibilities among ten major organizations has contributed to a lack of public understanding of state water and related land resources management efforts and to difficulty in achieving the goals of these efforts. A 1980 survey of local officials and interest groups revealed that only 35 percent of those polled felt they understood the state's management strategy. The fragmentation of programs has led to problems in recognizing and dealing efficiently and effectively with the interdependence of water and related land resources management solutions. Coordinated state water planning and management, as well as the ability to work closely with local governments, is a prerequisite to development of the local-state partnership called for in the Water Planning Board's "Special Study on Local Water Management."

The State of Minnesota is faced with two basic choices: (1) maintaining and improving coordination among existing programs or (2) undertaking a major restructuring of water management responsibilities to place authorities under a single agency. The former is the approach, allowing for some modifications in structure, central to the water and related land resources management strategy proposed by the Water Planning Board.

THE MINNESOTA WATER PLANNING BOARD RECOMMENDS THAT:

- ** The Legislature establish (or specifically designate) a permanent "water resources coordinating body" at the state level. This body should serve as a forum for coordination of planning and management activities and for provision of assistance in carrying out these activities. It is the alternative preferred over a major restructuring of management responsibilities.
- ** The Legislature should select the coordinating body from among the following options: (1) the Environmental Quality Board; (2) the Department of Natural Resources; (3) the Department of Energy, Planning and Development; (4) a combination of the EQB (decision-making) and DEPD (planning support) authorities; (5) a citizens board; or (6) an agency-citizens board modeled after the present Water Planning Board. If either the DNR or the DEPD is designated to be the coordinating body, the Legislature should require that agency to establish a multi-agency committee to assure inter-agency coordination.
- ** The coordinating body should be given responsibility for: (1) coordinating the on-going water and related land resources planning process, including the evaluation and updating of the framework plan; (2) providing a forum for coordination of agency programs and budget requests in order to promote a consistent approach to planning and management; (3) assisting state and local agencies in planning activities, including assistance in the preparation of local plans; (4) carrying out duties assigned under the "Comprehensive Local Water Management Act," if adopted by the Legislature; and (5) administering federal funding for planning programs affecting more than one agency. In all of its activities, the coordinating body should provide the opportunity for the expression of public and local government views.
- ** The Legislature should provide for the chairperson of the coordinating body (or appropriate commissioner) to represent the State of Minnesota on interstate organizations (e.g., the Upper Mississippi River Basin Association, the Red River Water Resources Council, and the Missouri Basin States Association).

LOCAL WATER MANAGEMENT AUTHORITIES

Authorities	County	City	Township	Watershed District	Soil & Water Conservation	LRRWMS	Lake Improvement District	Drainage and Conservancy	Rural Water Systems	Lake Conservation District	Sanitary Districts	Regional Development Commission ^{2/}
Number of units	87	855	1800	37	92	1	2	3	5	2	5	13
Public water and sewer systems	X	X	X	X	X	X	X	X	X	X	X	
Stormsewers and stormwater	X	X	X	X	X	X	X	X	X	X	X	
Drainage ^{3/}	X	X	X	X	X	X	X	X	X	X	X	
Flood control	X	X	X	X	X	X	X	X	X	X	X	
Management of lakes	X	X	X	X	X	X	X	X	X	X	X	
Establishment and operation of lake improvement districts	X	X	X	X	X	X	X	X	X	X	X	
Water surface use regulation	X	X	X	X	X	X	X	X	X	X	X	
Dam safety	X	X	X	X	X	X	X	X	X	X	X	
Stream maintenance	X	X	X	X	X	X	X	X	X	X	X	
Flood plain zoning	X	X	X	X	X	X	X	X	X	X	X	
Shoreland management	X	X	X	X	X	X	X	X	X	X	X	
Erosion control	X	X	X	X	X	X	X	X	X	X	X	
Public waters regulation	X	X	X	X	X	X	X	X	X	X	X	
Water quality protection ^{4/}	X	X	X	X	X	X	X	X	X	X	X	
Water planning	X	X	X	X	X	X	X	X	X	X	X	
Water appropriation	X	X	X	X	X	X	X	X	X	X	X	

^{1/} Does not include joint powers agreements or the Metropolitan Waste Control Commission. Authorities cited for townships refer only to non-urban townships. Authorities of urban towns parallel cities.

^{2/} Does not include certain powers available only to the Metropolitan Council.

^{3/} Includes reclaiming and filling of wetlands.

^{4/} Includes regulating use of streams for waste disposal, control of vegetation in public waters, and septic tank and feedlot regulation.

RECOMMENDATION:

ENACTMENT OF A COMPREHENSIVE LOCAL WATER MANAGEMENT ACT

The strain of a population which has doubled during the last generation of Minnesotans and of modern practices which place greater stresses on water resources than ever before has caused water management problems to emerge in every area of the state. Area-wide ground-water quality concerns in southeastern Minnesota, flooding in southwestern Minnesota and in the Red River Valley, localized water supply deficiencies in western Minnesota, and soil erosion throughout the state are prime examples.

Nearly 150 special purpose districts, including 37 watershed districts and 92 soil and water conservation districts, have emerged to deal with local problems. Their authorities are in addition to those of counties, cities, and townships. The frustrations and problems of these local authorities in dealing with emerging problems are the major reason for proposing action to strengthen local water management.

No one organization at the local level serves as a focus for water management decisions. While water and related land resources problems are addressed, it is often not until they reach crisis proportions. Sound management strategy requires that some organization at the local level be responsible for anticipating problems and taking action to prevent their emergence, as well as to solve existing problems. Sound management strategy further dictates that state government work with local governments as a partner in addressing water problems.

The 1982 Legislature adopted a surface water planning act for the seven-county metropolitan area (Laws 1982, Chapter 509). Its goal should be pursued statewide.

THE MINNESOTA WATER PLANNING BOARD RECOMMENDS THAT:

- ** The Legislature enact a comprehensive local water management act for the 80 counties outside the metropolitan region consistent with the Board's recommendations in its "Special Study on Local Water Management." Specifically, the act should assign to counties the basic responsibility and necessary authorities for developing and implementing comprehensive water and related land resources plans. It should:
- A. Require that county planning be based on hydrologic units within the county and that intercounty coordination take place where problems or their solutions cross county boundaries.
 - B. Provide incentives to encourage county planning (e.g., eligibility to receive special state financial and technical assistance, to exercise additional water management powers, and to administer appropriate state permit programs at the local level).
 - C. Provide alternative means of financing county water planning and management, including county-wide and special service area ad valorem tax levies not subject to levy limits, special powers to assess benefitted properties, and the power to charge user fees for water-related services provided.
 - D. Identify plan components which must be addressed by counties.
 - E. Provide the authorities and flexibility necessary to enable implementation of comprehensive plans by counties (or organizations they designate).
- ** The Legislature should assign the state coordinating body the responsibility to (1) assist counties in complying with planning requirements, (2) establish planning guidelines, (3) approve local plans, and (4) resolve conflicts which may arise in preparing and implementing local plans.

MINNESOTA 1980 WATER USE

MINNESOTANS USE SUBSTANTIAL AMOUNTS OF WATER EACH YEAR. THE "BASE" AGAINST WHICH CONSERVATION EFFORTS CAN BE GAUGED IS SHOWN BELOW.

Water Withdrawals -- 1980 (in billions of gallons)

Major Drainage Basin	Public Supplies			Rural Use			Electric Power	Self-Supp. Ind.	Total	% by Basin
	Comm-Ind.		Total	Livestock	Irrigation	Total				
	Res-Mun.	Comm-Ind.								
Upper Mississippi River	69.5	30.4	99.9	14.8	6.3	35.9	57.0	48.7	456.6	41.2
Lower Mississippi River	7.9	5.3	13.2	4.7	4.4	2.7	11.8	2.7	102.1	9.2
St. Croix River	1.5	0.4	1.9	2.8	1.1	0.1	4.0	0.2	105.0	9.5
Minnesota River	14.4	4.6	19.0	11.4	7.2	9.4	28.0	5.1	131.8	11.9
Lake Superior	8.5	4.2	12.7	1.9	0.3	---	2.2	141.9	253.8	22.9
Red River	4.5	2.4	6.9	4.4	2.3	8.4	15.1	0.7	42.2	3.8
Rainy River	1.3	0.2	1.5	2.2	0.2	0.1	2.5	---	4.0	0.4
Cedar River	2.0	0.8	2.8	0.8	0.8	0.3	1.9	---	4.9	0.4
Des Moines River	0.6	0.2	0.8	0.5	0.9	0.1	1.5	0.1	5.0	0.5
Missouri River	1.0	0.4	1.4	0.6	1.2	0.2	2.0	---	3.4	0.3
Total	111.1	48.9	160.1	44.1	24.7	57.2	126.0	199.4	1,108.8	100.1

SOURCE: United States Geological Survey

RECOMMENDATION:

CONSERVATION OF WATER RESOURCES

Water is inaccurately perceived by many as a free resource of unlimited availability. While water may be "free" to an individual user, inefficient or wasteful use imposes a cost on the state economy by depriving more efficient users of water necessary to produce goods and services or by hastening investments in water-related facilities (e.g., wastewater treatment plants). Increased population, high concentrations of water withdrawals in given areas, and more consumptive technologies lead to higher demands for a resource whose total supply is relatively fixed. In several areas, ground water contamination threatens available supplies.

Long-term demand reduction by water using activities is an important goal for the State of Minnesota because, among other things, it (1) prevents or delays construction of costly water supply and treatment facilities; (2) decreases energy demands and individual user costs for pumping, treating, and heating water; (3) frees supplies for future uses which may benefit the economy of the state; and (4) reduces the possibility of degrading the quality of available supplies.

Each year three to five Minnesota counties can be expected to experience moisture deficiencies. The state has experienced four major droughts in this century, with other less severe dry years occurring in an approximately 20-year cycle. In such drought years, improving water use efficiency becomes mandatory.

Ground-water contamination can result in a sudden and disruptive loss of supply, and requires rapid remedial measures, often including conservation. The capacity of state and local government agencies to respond to these emergencies must be enhanced.

THE MINNESOTA WATER PLANNING BOARD RECOMMENDS THAT:

- ** The Legislature direct the state coordinating body, in cooperation with the Departments of Natural Resources and Health, to prepare a long-range, comprehensive water conservation plan for the State of Minnesota as an informational document and framework for continuing discussion. The plan should have two major emphases: (1) education and technical assistance programs for individuals, user groups, and local governments and (2) responses to water shortages or water contamination emergencies. It should also outline future water demands and compare them to expected water availability and identify areas of water conservation potential.
- ** Conservation programs be implemented at the local and individual levels, employing state-supported education and technical assistance.
- ** The Governor direct the state coordinating body and appropriate state agencies to explore ways of combining energy and water conservation initiatives. Where conservation opportunities which are cost-effective are identified; the Governor should require the implementation of such conservation measures in state facilities and require agencies to encourage water conservation techniques in programs which they administer.

SYSTEMS FOR WATER INFORMATION MANAGEMENT WATER DATA SOURCES CATALOG

Metropolitan Council

1. Natural Resource Management Program

Minnesota Department of Agriculture

2. Dairy Induction Division
3. Food, Meat and Poultry Inspection Program
4. Pesticide Control Program

Minnesota Department of Health

5. Municipal Services
6. Ground Water Quality Information System
7. State Drinking Water Act
8. Southern Minnesota Groundwater Study

Minnesota Department of Natural Resources

- (Fish and Wildlife Division: Ecological Services)
 9. Natick Nuisance Control Program
 10. Chemistry and Bacteriology Laboratory Services
 11. Medical Evaluation Studies for Watershed Improvement Project
 12. Lake Soundings and Unidirectional Mapping: Statewide Program
 13. Rivers Survey for Special Studies
 14. Special Studies and Cooperative Programs
 15. Water Quality Monitoring in Selected Fish Lakes

- (Fish and Wildlife Division: Fisheries Section)
 16. Commercial Fisheries Regulation
 17. Fish Production: Hatcheries, Propagation
 18. Habitat Improvement Program
 19. Rehabilitation of Fish Population
 20. Lakes and Stream Surveys: General
 21. Research/Special Studies

- (Fish and Wildlife Division: Wildlife Section)
 22. Wildlife Management Area Inventory and Acquisition Plan

- (Minnesota Division: Environmental Services)
 23. Ecologic and Hydrologic Mapping
 24. Heavy Metals Research
 25. Wetland Mapping Capabilities
 26. Wetland Rehabilitation Program (Mining Permit)
 27. Wetland Exploration Rehabilitation
 28. Wetland
 29. Wet Program

THE SWR WATER DATA SOURCES CATALOG IS A LISTING AND DESCRIPTION OF THE WATER DATA COLLECTION REPORTS OF 8 STATE AGENCIES AND THE METROPOLITAN COUNCIL.

- (Parks and Recreation Division)
 30. Scientific and Natural Areas

- (Office of Planning and Research)
 31. Great River Study
 32. Minnesota Watershed Mapping Project
 33. Minnesota Wild and Scenic Rivers Program
 34. SCRN (State Comprehensive Natural Resources Inventory) System
 35. Stream Inventory and Data Retrieval System (River Mile Index)

- (Division of Waters)
 36. Dam Safety Program
 37. Flood Plain Management Program
 38. Groundwater Program
 39. Hydrographic Services
 40. Lake Hydrology Program
 41. Public Works Inventory and Designation Program
 42. Public Works Permits
 43. Stream Management Program
 44. State Climatology Plan
 45. Water Bank Program
 46. Water Use Program

- Minnesota Department of Transportation
 47. Ambient Water Quality Program
 48. Project Development and Wetland Mitigation
 49. Small Stream Flood Investigation
 50. Soil Impairing Program
 51. Undisturbed Dredging Program
- Minnesota Geological Survey
 52. Water Well and Engineering Test Logging Program

Minnesota Pollution Control Agency

- (Solid Waste Division)
 53. Hazardous Waste Management Regulatory Program

- (Water Quality Division: Groundwater Section)
 54. Land Application of Wastewater Program
 55. Routine Groundwater Monitoring Program
 56. Sludge Disposal Program
 57. Solid Waste Facility Inventory and Monitoring Program

- (Water Quality Division: Permit Section)
 58. Agricultural Waste Pollution Control Program (Feedlot Program)
 59. National Pollution Discharge Elimination System (NPDES)
 60. PCB Regulation Program
 61. Section 401 Certification (Disposal of dredge spoils)

- (Water Quality Division: Surveys and Standards Section)
 62. Biological Monitoring Program
 63. Citizen-Based Lake Monitoring Program
 64. Citizen-Based Lake Monitoring Program
 65. Invasive Lake Survey
 66. Invasive Surface Water Monitoring Program
 67. Lake Classification Program
 68. Lake Monitoring Program
 69. Lake Remediation Program
 70. Lake Surface Water Quality Monitoring Program
 71. Toxic Substance Monitoring Program
- (Water Quality Division: Other)
 72. Minnesota Effluent Data Violation Tracking System
 73. Municipal Facilities Assistance Fund: Construction Grant Program
 74. Water Quality Management Planning: Section 208 Non-Point Source Program

Minnesota State Planning Agency

75. Critical Areas Program
76. Minnesota Land Management Information
77. Power Plant Siting Program
78. Regional Copper-Nickel Study

State Soil and Water Conservation Program

79. Rural Rainfall Monitoring Program

RECOMMENDATION:

SYSTEMS FOR WATER INFORMATION MANAGEMENT (SWIM)

Gathering and utilizing timely and reliable data concerning the conditions and trends with regard to the state's water and related land resources is a key to efficient and effective water resources management. While it is not necessary or desirable to automate all sources of data, the failure to computerize important data sources has been identified in management studies as a major problem in sharing and disseminating information for use in planning and decision-making.

In Laws 1982, Chapter 524 the Legislature implemented a major recommendation of the Board's framework plan in establishing and funding a SWIM position in the Land Management Information Center. Because funding was provided through the Legislative Commission on Minnesota Resources in F.Y. 1983, a "change level" budget request must be approved to transfer a position and funds to the DEPD/LMIC budget for the 1983-85 biennium.

THE MINNESOTA WATER PLANNING BOARD RECOMMENDS THAT:

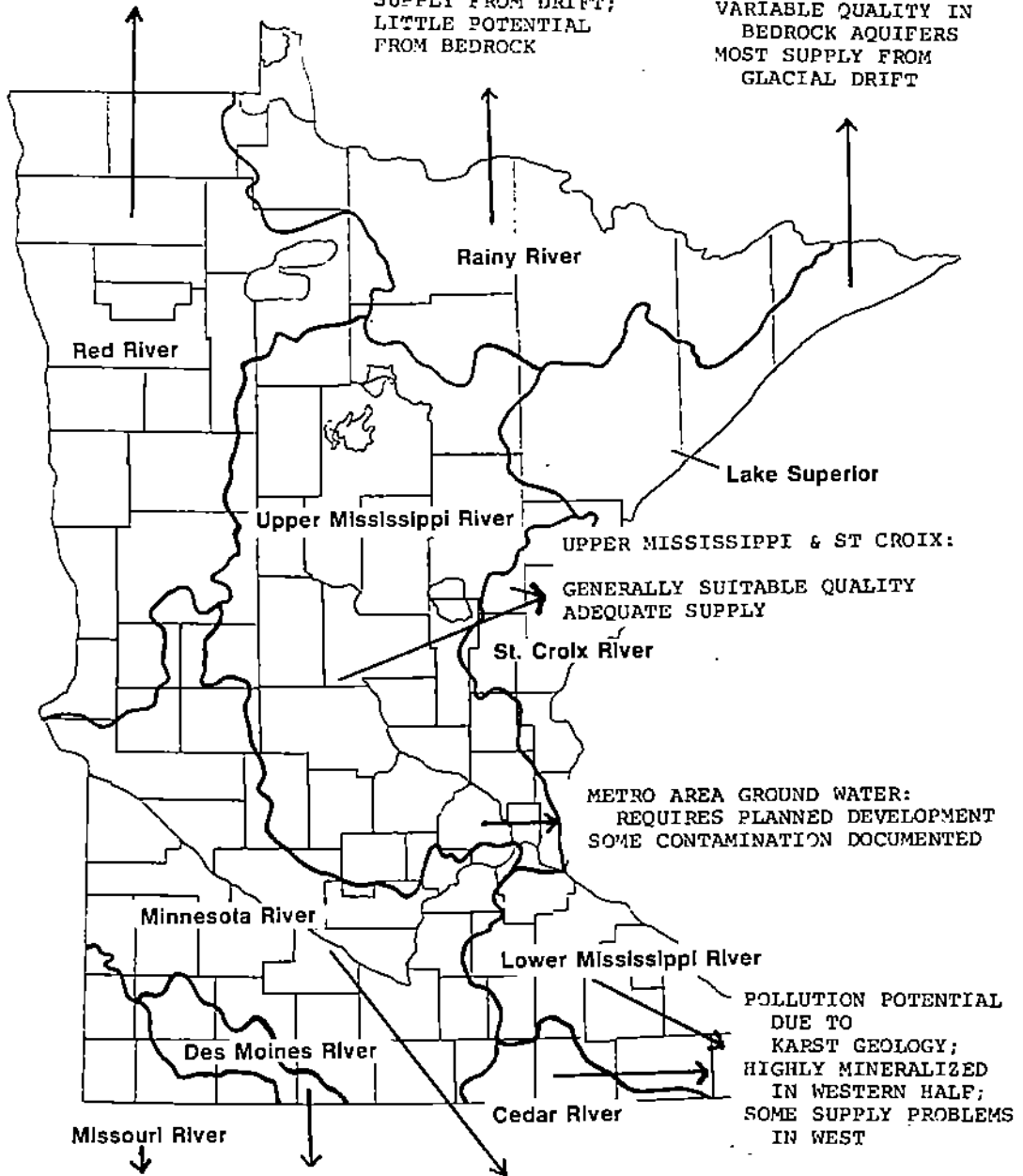
- ** The Legislature and the Executive Agencies continue to support the development of systems for water information management (SWIM) in a format compatible with the geographic and hydrologic reference systems of the state.
- ** The SWIM "clearinghouse" concept initiated in F.Y. 1983 through the establishment the position of SWIM data base coordinator in the Land Management Information Center be continued. Specifically, the Legislature should appropriate funds to DEPD/LMIC for a Research Analyst to serve as a data base manager and for use in projects which enhance water information management systems.

GROUND WATER CHARACTERISTICS BY RIVER BASIN

WATER OFTEN POOR QUALITY;
SUPPLY PROBLEMS IN
SOME AREAS;
LACK OF SPECIFIC INFORMATION

LOW DEMAND
SUPPLY FROM DRIFT;
LITTLE POTENTIAL
FROM BEDROCK

SOME SUPPLY PROBLEM
IN WESTERN HALF
VARIABLE QUALITY IN
BEDROCK AQUIFERS
MOST SUPPLY FROM
GLACIAL DRIFT



HIGH CONCENTRATIONS OF
NITRATES, IRON, MANGANESE;
LACK AQUIFERS IN SOME AREAS;
BURIED OUTWASH AND BEDROCK
SOURCES DIFFICULT TO LOCATE

WIDE VARIATIONS IN
QUANTITY AND QUALITY;
HIGH CONCENTRATIONS OF
IRON AND MANGANESE;
BURIED OUTWASH SOURCES
DIFFICULT TO LOCATE

RECOMMENDATION:

GROUND-WATER STRATEGY DEVELOPMENT PROGRAM

Ground-water use is a rapidly increasing percentage of water withdrawals in Minnesota. In 1976, ground-water use was about 14 percent of total water withdrawals in the state; in 1980, it was nearly 21 percent. By 1990, the ground-water share will be even greater. Approximately 60 percent of the urban population and nearly 100 percent of the rural population rely on ground water for drinking and other domestic uses.

Ground-water conflicts are emerging in Minnesota. In the case of Crookston Cattle Co. v. City of Crookston, the Minnesota Supreme Court was asked to decide whether the City of Crookston could withdraw ground water for use in its municipal supply system if it affected the potential future use of ground water for irrigation by an adjoining landowner. In Swift County where ground water used for irrigation has increased 520 percent since 1977, well interference complaints involving 20 complainants have emerged in the last five years. It is estimated that over 1,500 potential ground-water contamination sites exist statewide. In the metropolitan area, over a dozen municipal wells have had to be abandoned or deepened in the last three years due to contamination of ground water.

Concern of local leaders and organizations is also emerging. In a 1980 survey conducted by the Water Planning Board, nearly 70 percent of 330 local officials responding indicated that water quality--ground and surface--is an important problem in their area. Sixteen of 43 organizations which identified natural resources issues for consideration by the Legislative Commission on Minnesota Resources at the Commission's annual issues seminar included ground-water management among their issues.

THE MINNESOTA WATER PLANNING BOARD RECOMMENDS THAT:

- ** The major elements of the 1983-85 ground-water strategy development program proposed to the Legislative Commission on Minnesota Resources in May 1982 be adopted, including appropriations for programs consistent with this strategy development program. The major elements of the proposal are that:
- A. The Legislature continue to support existing ground-water management (quantity and quality) and monitoring programs at no less than their current levels.
 - B. In gathering ground-water quality information, the State of Minnesota should continue to target its efforts on (1) high ground-water demand areas or areas where ground-water demand is expected to increase substantially, (2) alternative technologies which are more cost-effective than drilling (e.g., geophysical techniques), and (3) potential sources about which the least is known (i.e., unconsolidated buried drift aquifers in high-use areas).
 - C. To better define ground-water quality and the effect of land use practices on ground-water quality, the State of Minnesota should expand its ground-water quality monitoring and analysis efforts with emphasis on (1) contamination of ground-water supplies by unregulated waste dump sites, (2) organic chemical concentrations in ambient ground water and in municipal drinking water supplies, and (3) the effects of agricultural practices on ground-water quality in geologically sensitive areas.
 - D. The State of Minnesota should strengthen its efforts to incorporate automated information management and dissemination techniques and computerized ground-water modeling in the examination of sensitive areas of the state.

GROUND WATER AND RELATED MANAGEMENT PROGRAMS

<p style="text-align: center;">WATER RESOURCES BOARD</p> <p>Water Policy Conflict Resolution Watershed District Formation and Plan Review</p>	<p style="text-align: center;">TRANSPORTATION</p> <p>Undisturbed Boring Program Soil Engineering Program</p>
<p style="text-align: center;">ENERGY, PLANNING, AND DEVELOPMENT</p> <p>Land Management Information Center Systems for Water Information Management</p>	<p style="text-align: center;">PUBLIC SAFETY</p> <p style="text-align: center;">-Division of Emergency Services-</p> <p>Emergency Water Supply Services</p>
<p style="text-align: center;">SOIL AND WATER CONSERVATION BOARD</p> <p>Overnight of Soil and Water Conservation Districts</p>	<p style="text-align: center;">SOUTHERN MINNESOTA RIVERS BASIN BOARD</p> <p>Regional Water and Related Land Resources Planning Coordination of Natural Resources Management</p>
<p style="text-align: center;">WATER PLANNING BOARD</p> <p>Statewide Framework Water and Related Land Resources Plan Coordination of State Water Resources Management</p>	<p style="text-align: center;">WASTE MANAGEMENT BOARD</p> <p>Hazardous Waste Management Plan Solid Waste Management</p> <p>Siting of Hazardous Waste Facility</p>
<p style="text-align: center;">NATURAL RESOURCES -Division of Waters-</p> <p>Water Appropriation Permits Ground Water Hydrology</p> <p>Information Systems Development Underground Gas and Liquid Storage Permits</p>	<p style="text-align: center;">AGRICULTURE</p> <p style="text-align: center;">Dairy Division*</p> <p style="text-align: center;">Agronomy Services Division (Pesticide and Fertilizer Licensing)</p> <p style="text-align: center;">Food, Meat, and Poultry Division*</p>
<p style="text-align: center;">ENVIRONMENTAL QUALITY BOARD</p> <p>Environmental Impact Assessment Critical Areas</p> <p>Program Review and Policy Conflict Resolution Pipeline Routing and Power Plant Siting</p> <p>Permit Coordination Environmental Policy Planning</p>	<p style="text-align: center;">UNIVERSITY OF MINNESOTA -Minnesota Geological Survey-</p> <p>Hydrogeologic Mapping (Statewide) Water Well Drillers Logs Database</p> <p>Hydrogeochemistry Mapping High Capacity Well Database (HICAPS)</p> <p style="text-align: center;">-Department of Geology & Geophysics-</p> <p>Research and Mapping of Karst in Southeastern Minnesota</p>
<p style="text-align: center;">POLLUTION CONTROL AGENCY -Division of Water Quality-</p> <p>Water Quality Management Planning NPDES Permit Program</p> <p>Standards Development State Disposal System Permits</p> <p>Municipal Sludge Disposal Agricultural Waste Unit</p> <p>Emergency Response Unit (Spills)</p> <p style="text-align: center;">-Division of Solid and Hazardous Waste-</p> <p>Site Response Unit Solid & Hazardous Waste Facility Review</p> <p>Hazardous Waste Generator Permits Ground Water Surveys Ambient Monitoring</p> <p>Solid and Hazardous Waste Facility and Transportation Permits Solid & Hazardous Waste Program Development</p>	<p style="text-align: center;">HEALTH -Division of Environmental Health-</p> <p>Water, Exploratory, and Monitoring Well Construction Analytical Services (Laboratory)</p> <p>Safe Drinking Water Program Health Risk Assessment</p> <p>Occupational Health*</p> <p>Hotels, Resorts & Restaurants*</p> <p>Environmental Field Services*</p>

*Activities include surveillance of water supplies

- E. In managing ground-water supplies, the State of Minnesota should stress total management of critical aquifers, including identification of aquifer limitations and development of allocation and monitoring plans.
 - F. The State of Minnesota should expand the local role in ground water planning and management (recognizing that coordinated local effort on an areawide basis may be necessary), such as through the use of county sanitarians in domestic water supply quality monitoring and analysis in sensitive ground-water areas or through assistance to counties in developing and adopting county water well construction codes.
 - G. State agencies should work through the Water Resources Research Center of the University of Minnesota to coordinate groundwater research with state management needs.
 - H. Through the Department of Natural Resources, state interests in ground-water management should be coordinated with the United States Geological Survey to assure maximum benefits from cooperative program funds.
- ** The full Legislature approve the recommendations of the LCMR to fund this program in the 1983-85 biennium. Specifically, the Legislature should approve the use of LCMR funds for (1) an accelerated ground-water management program (DNR, \$300,000); (2) ground-water analysis near dump sites (PCA, \$145,000); (3) a volatile organics survey of public water supplies (MDH, \$130,000); (4) organic analysis of ground water (PCA, \$100,000); (5) Garvin Brook watershed project monitoring (PCA, \$30,000 to be used in conjunction with the ongoing RCWP project in the watershed); (6) continued study of Karst aquifers (University of Minnesota, \$60,000); and (7) a computer analysis of contamination spreading through aquifers (University of Minnesota, \$180,000).
- ** The Legislature, as recommended by the LCMR, should appropriate general fund dollars to the Minnesota Geological Survey to continue the process of computerizing subsurface data from well driller's logs. This process has previously been funded by the LCMR.
- ** The Department of Natural Resources should continue to accelerate its efforts to address ground-water depletion and establish guidelines for a ground-water depletion prevention policy. These guidelines should be developed to aid in continued permit issuance and should be reviewed and revised through specific studies and local pumping tests.

WATER SUPPLY AND USE IN MINNESOTA

THE STATE OF MINNESOTA HAS A BEGINNING IDEA OF THE BALANCE IN ITS
"WATER RESOURCES CHECKBOOK"

(in billions of gallons)

Major Drainage Basin	Est. Ground Water Available	Estimated Surface Water		Precipitation		Water Use			
		Average	1976 Drought	Estimated Precip.	Runoff % of Precip.	Withdrawal (1980)	Consumption (1980) 5/	Withdrawal as % of Runoff (1980)	
Upper Mississippi River	500-800	2,035	1,285	9,372.5	1,603.0	18.0	456.6	61.2	27.1
Lower Mississippi River	175-300	2,607 ^{1/}	2,392 ^{1/}	2,901.2	650.6	22.4	102.1	10.0	15.7
St. Croix River	85-175	1,330 ^{1/}	1,146 ^{1/}	1,722.9	513.1	29.8	105.0	3.7	20.5
Minnesota River	130-280	627	269	6,780.3	781.6	11.5	131.8	27.6	16.9
Lake Superior	55-110	698 ^{2/}	474	2,988.7	1,119.8	37.5	253.8	62.1	22.7
Red River	77-165	768	673	6,609.5	551.6	8.3	42.2	13.7	7.7
Rainy River	35-85	3,137 ^{3/}	2,153 ^{3/}	5,107.3	1,565.1	30.6	4.0	0.3	2.6
Cedar River	25-50	44	23	634.0	123.5	19.5	5.0	1.4	4.0
Des Moines River	10-25	64	20	705.3	100.4	14.2	5.0	2.2	5.0
Missouri River	5-10	N.A.	N.A.	803.9	96.6	12.0	3.4	0.9	3.5
Total	1,097-2,000	11,310 ^{4/}	8,435 ^{4/}	37,625.6	7,185.3	19.1	1,108.9	183.1	15.4

- 1/ Includes water from Wisconsin portion of watershed unit.
- 2/ Estimates are considered low because of number of ungauged tributaries flowing into Lake Superior.
- 3/ Includes water from the Canadian portion of the basin.
- 4/ Assumes Missouri River basin is zero.
- 5/ Assumes same ratio of consumption to withdrawal as estimated in for 1976.

SOURCES: Minnesota Geological Survey; Department of Natural Resources; Department of Agriculture; United States Geological Survey.

RECOMMENDATION:

ACCELERATED SURFACE WATER DATA ANALYSIS

The 1982 decision of the United States Supreme Court in Sporhase v. Nebraska and renewed interest in interstate and interbasin diversions of water heighten the importance of accelerated data collection and analysis to develop an accurate picture of present and future water use and changes in total available supply related to seasonal and climatic variations.

THE MINNESOTA WATER PLANNING BOARD RECOMMENDS THAT:

- ** The Legislature appropriate funds to accelerate studies of low flows in potentially water-short major watershed units of the state. This acceleration of a continuing activity of the Department of Natural Resources should be designed to determine how much flow is necessary to supply instream uses, how much of the flow is currently appropriated and how much is expected to be demanded in the future, and how much flow may remain available for appropriation.
- ** The Department of Natural Resources should immediately convene a task group including at least the MPCA, DEPD (including the LMIC), MDH, and WPB to define rivers and streams (or segments thereof) which require priority analysis of low flows and to determine the feasibility of computer analysis. This task force work should be completed without regard to the Legislature's decision on the appropriation of funds for accelerated studies.
- ** The Legislature appropriate funds to accelerate the establishment of protection elevations and to quantify withdrawal demands (present and projected future) for major lakes and reservoirs, through the Department of Natural Resources.
- ** By January 1, 1985, the Department of Natural Resources in cooperation with the state coordinating body and DEPD/LMIC, prepare a detailed proposal for implementation of a "water accounting system" for consideration by the Governor and the Legislature. This system should be based on findings from both the accelerated surface water data analysis program and the ground-water strategy development program recommended by the Water Planning Board, assuming funding for these prerequisite activities is provided. It should utilize all relevant water information system components developed to date.

DAMAGE FROM FLOODING

ESTIMATED AVERAGE ANNUAL DAMAGES IN MINNESOTA BY SUBBASIN
(DAMAGES IN BASE YEAR PRICES ADJUSTED TO REFLECT 1980 PRICES,)
DAMAGES EXPRESSED IN THOUSANDS OF DOLLARS.

Subbasin	Base Year	Damages in Base Year Dollars	Damages in 1980 Dollars
<u>Mississippi 1/</u>			
Headwaters	1966	2,521	7,535
Cedar, West Fork	1966	38	110
Cannon, Zumbro, Root	1966	2,700	3,377
Minnesota	1966	3,040	23,935
West Fork & Des Moines	1966	140	427
Mississippi Mainstem	1966	1,930	6,555
<u>Red River 2/</u>			
Mustinka	1967	243	635
Roseau	1967	666	1,869
Two Rivers	1967	75	212
Tamarac	1967	105	296
Middle Snake	1967	466	1,276
Red Lake	1967	535	1,580
Sand Hill	1967	133	365
Wild Rice, Marsh	1967	760	2,065
Buffalo	1967	609	1,629
Ottertail	1967	119	314
Red River, Mainstem	1967	2,200	6,487
Red River Tributaries	1967	1,451	3,804
<u>Rainy River 2/</u>			
Lake of the Woods	1967	106	284
Little Fork River	1967	43	143
<u>Great Lakes 1/</u>			
St. Louis River	1970	122.9	309
Superior Slope		20.9	54
TOTAL STATE			68,261

1/ Existing conditions.

2/ With existing projects, including those for which construction has been started or have been funded prior to December, 1967.
Sources: Upper Mississippi River Comprehensive Basin Study, Vol. V, 1970; Souris-Red-Rainy River Basins Comprehensive Study, Vol. III, 1972; and Great Lakes Basin Framework Study, Appendix 14, 1975.

RECOMMENDATION:

FLOODING AND FLOOD DAMAGE REDUCTION

Although the past 10 years of flood plain management initiatives in Minnesota have aided in limiting increases in flood damages to those associated with inflation, the direct economic losses due to flooding in the state are estimated to be \$60 million to \$70 million annually (1980 dollars). Indirect costs (e.g., reduced tax revenues and electrical outage costs) are estimated to equal the direct losses.

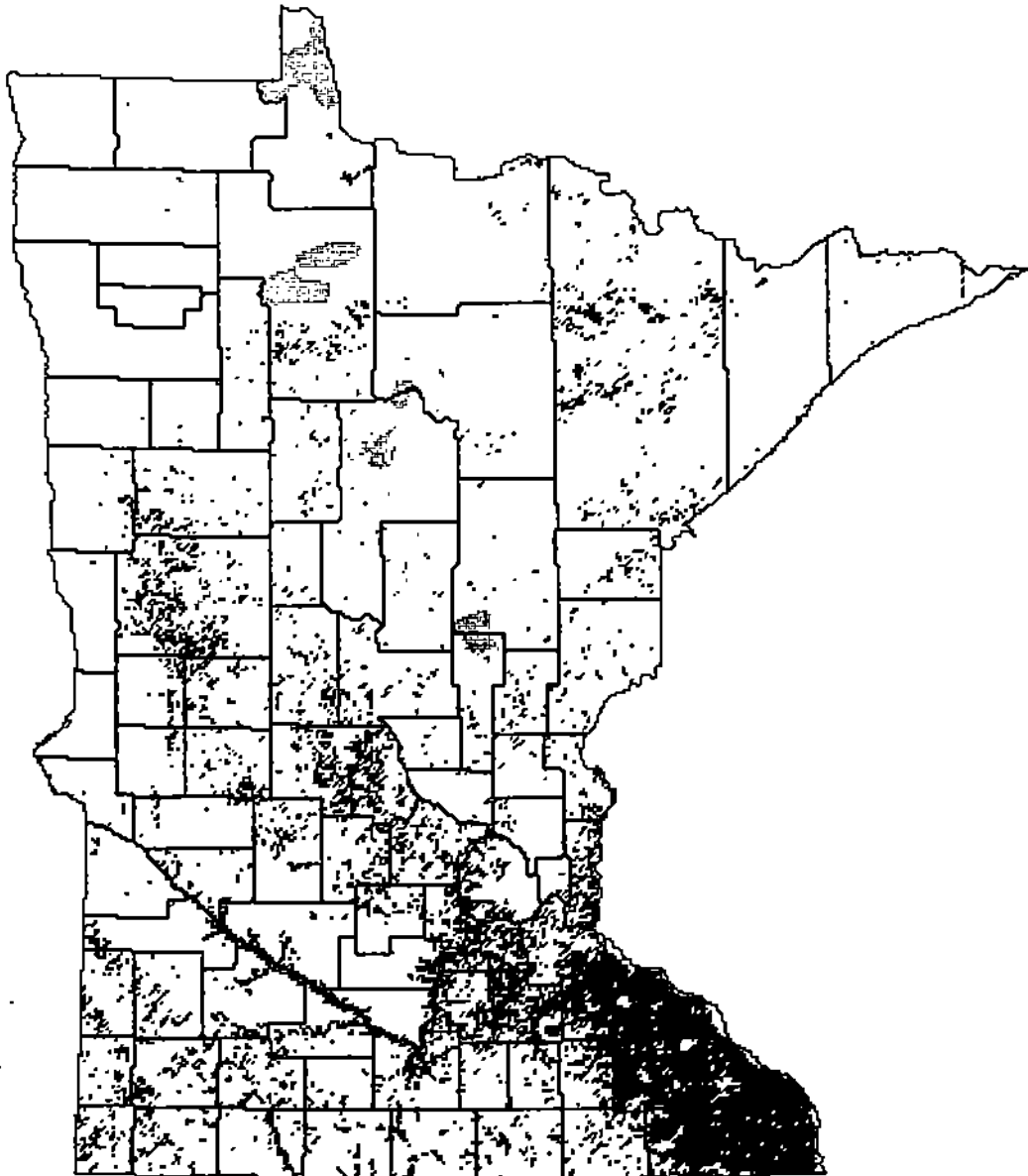
Presidential Disaster Declarations have been made for Minnesota four times in the last decade. During the decade, estimated damages surpassed \$1 billion. Major floods in the Red River basin in 1975, 1978, and 1979 produced losses of \$329 million and inundated as many as one million acres in a single year. In 1978, five persons lost their lives in Rochester due to floods. In 1980, there was summer flooding at Fairmont and Winona.





Although flooding is a recurring event on all rivers and streams in Minnesota, state cost-sharing is available in only two areas (the Red River and Upper Minnesota River basins) and only for floodwater impoundment. In addition, the federal contribution to flood damage reduction is declining and local cost-sharing requirements are increasing from an average of eight percent of project costs in rural areas to a minimum of 35 percent.

THE MINNESOTA WATER PLANNING BOARD RECOMMENDS THAT:

- ** The Legislature amend Minnesota Statutes, Chapter 104 to provide for a statewide program of cost-sharing assistance to implement both structural and non-structural components of comprehensive flood plain management plans approved by the state. This statewide program should replace the two specific flood damage reduction programs which are currently authorized and funded. The program should be jointly administered by the Department of Natural Resources (generally, initial eligibility determinations through review and approval of flood plain management plans and administration of non-structural grants) and the Soil and Water Conservation Board (generally, administration of structural grants), based on a formal agreement between the agencies.
- ** The purpose of the statewide program be to provide incentives to local units of government to accelerate the implementation of effective flood plain management measures. Watershed districts, municipalities, counties, organizations formed by joint powers agreements, and (in special cases) regional authorities should be allowed to implement projects under the program. The local contribution should not be at a fixed rate, but should be proportional to the benefits which would be expected to accrue to the local area.
- ** In the 1983-85 biennium, the program be funded through either general revenues or the issuance of general obligation bonds. In the longer-run, the program should be financed consistent with the recommendations of the task force to study financing alternatives recommended (in a separate recommendation) by the Water Planning Board.

CRITICAL EROSION AREAS



SYMBOL	COUNT	PERCENT	ACRES	LEGEND
	1	1555	0.4	4835200.0 - PRIORITY UPLAND EROSION
	2	2663	3.1	1784320.0 - PRIORITY SHORELAND EROSION
	3	1114	1.3	716160.0 - WATER (100 PERCENT COVERAGE)
	4	12710	16.7	91179520.0 - NOT PRIORITY UPLAND OR SHORELAND EROSION

SOURCE: MINNESOTA SOIL AND WATER CONSERVATION BOARD: MAP PREPARED BY THE DEPARTMENT OF ENERGY, PLANNING, AND DEVELOPMENT/LAND MANAGEMENT INFORMATION CENTER.

MAP IS BASED ON PRELIMINARY DATA

RECOMMENDATION:

EXPANSION OF EROSION AND WATER QUALITY COST-SHARING

Cropland erosion is the most significant source of sediment entering waters in Minnesota. Nearly 4.2 million acres of agricultural land--about one out of seven acres of crop and pastureland--in Minnesota may require treatment to reduce sediment delivery to acceptable levels. Construction activities and shoreland erosion contribute significantly to sedimentation in some areas. Water quality data shows that levels of sediment are frequently high enough to cause serious water quality problems.

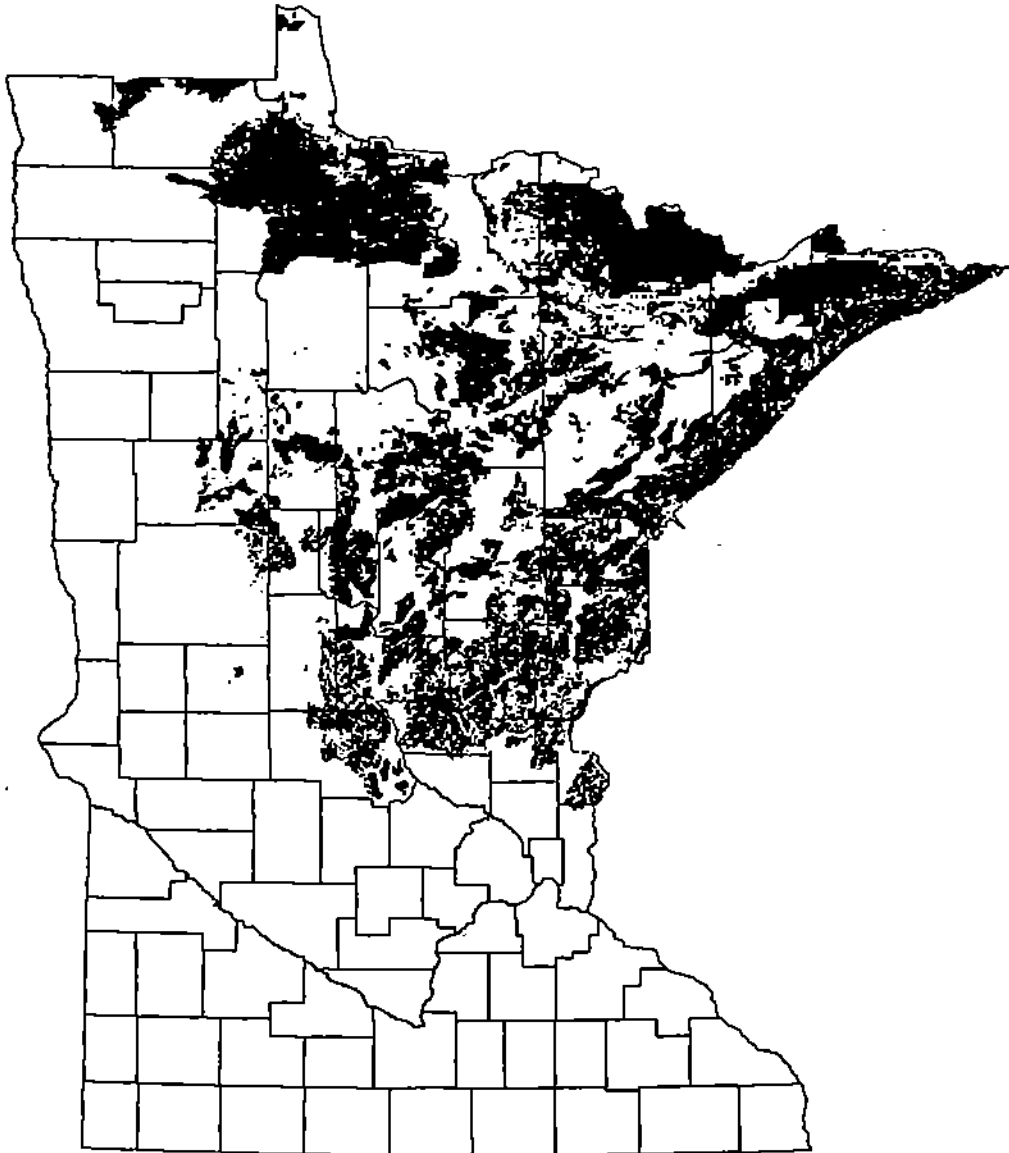
Gross erosion due to wind and water runoff from urban and rural areas in Minnesota is estimated to be 100 million tons per year. Only about one-third of the cropland in critical erosion areas of the state is adequately protected against erosion. Urban erosion control is frequently overlooked, although about one acre in every 20 of urbanland is believed to have serious erosion problems (about 56,000 acres).

It is estimated that the cost of installing soil erosion control practices on cropland, pastureland, urban land, roadsides, and shorelands could approach \$1.3 billion. Current state, local, and federal expenditures are about \$9 million per year (excluding federal and state technical assistance). A special federal project in the Garvin Brook watershed (Winona County) provides about \$200,000 per year (\$2 million for 10 years) for an experimental program in the watershed.

THE MINNESOTA WATER PLANNING BOARD RECOMMENDS THAT:

- ** The state soil and water conservation cost-sharing program (including assistance for projects designed to solve lake-shore, stream bank, and roadside erosion) be expanded by providing additional funds for cost-sharing on high priority erosion, sedimentation, and water quality problems with landowners and SLR project sponsors. A doubling of available cost-sharing funds from about \$1.6 million to \$3.2 million per year could be sustained based on current soil and water conservation district applications.
- ** The state coordinating body (in cooperation with the appropriate state entities actively support continued federal funding at a minimum of F.Y. 1982 levels (adjusted for inflation in future years) for financial and technical assistance programs of the United States Department of Agriculture for erosion and sediment control, including Soil Conservation Service technical assistance, Agricultural Conservation Program financial assistance, Rural Clean Water Program financial and technical assistance, and water quality research efforts of the Science and Education Administration through Agricultural Experiment Stations.

AREAS SENSITIVE TO
ACID PRECIPITATION



SOURCE: MINNESOTA POLLUTION CONTROL AGENCY

RECOMMENDATION:

ACID PRECIPITATION

Many north-central and northeastern Minnesota counties contain lakes which are extremely or moderately sensitive to acid deposition. Between 512 and 967 lakes in the state are estimated to be extremely sensitive to acidic deposition, although the lower end of this range is probably most reflective of actual sensitivity. Currently, no lakes in the state have been found to be acidified due to the effects of acid precipitation.

Eighty-five percent of the sport fishing activity in Minnesota occurs in the economic development regions having acid sensitive waters. "Initial expense" revenue from sport fishing in the state during 1980 was \$346 million, and such revenue could reach \$500 million (1980 dollars) by 1995. In the Boundary Waters area tourism-related expenditures could fall from an estimated \$63 million annually to about \$21 million and 3,000 jobs could be lost if fish populations declined and accompanying biological degradation from acid precipitation occurred.

Acidification of lakes poses a threat to the health of citizens. Acid precipitation presents a serious potential for adverse health effects through the introduction of toxic metals to drinking water supplies and fish tissues. Softwater lakes are the most susceptible to these effects. Burntside Lake, serving over 4,800 persons in Ely as the major drinking water source, is a softwater lake and may be susceptible to the effects of acid rain despite its relatively large size.

Shallow ground-water supplies may also be affected by acid deposition. The sand and gravel soils in parts of the Kettle River watershed (Pine County) coupled with the thin glacial drift cover may make ground-water supplies in this region especially vulnerable to acid precipitation.

THE MINNESOTA WATER PLANNING BOARD RECOMMENDS THAT:

- ** The Legislature provide additional funding to the Minnesota Pollution Control Agency to address two critical management questions: (1) What is the current extent and rate of soil, ground water, and surface water acidification in Minnesota due to acid deposition? and (2) What is the predicted time frame in which significant changes in the chemical characteristics of soils, ground water and surface water will occur as the result of acidic deposition? The Legislative Commission on Minnesota Resources will recommend the use of \$186,000 of its funds for soil acidification and watershed studies in the 1983-85 biennium. The WPB recommends that the full Legislature concur in the LCMR decision.
- ** The Legislature continue to fund the Acid Precipitation Program which is included in the MPCA biennial budget and support the "change level" request which is necessary to implement the 1982 "Acid Deposition Control Act" and to assist in completing the studies recommended above. The "change level" request included in the Acid Deposition Program request is for \$291,000. The state general fund will be compensated for 60 percent of the program budget from an assessment on Minnesota utilities, substantially reducing the state budget impact of the "change level" request.

HAZARDOUS WASTE SITES

THE MPCA MAINTAINS A LIST OF DISPOSAL SITES WITH THE POTENTIAL
TO CAUSE SERIOUS HARM TO HEALTH AND THE ENVIRONMENT

FACILITY AND LOCATION	PRIORITY	FACILITY AND LOCATION	PRIORITY
Ironwood Sanitary Landfill (Spring Valley)	A	Ford Motor Company (St. Paul)	C
FMC-Northern Ordnance Division (Fridley)	A	Former Maple Plain Dump	C
Isanti Solvent Sites	A	Former N.W. Refinery (New Brighton)	C
LeHillier/Mankato Well Contamination	A	General Mills-Henkel Corporation (Minneapolis)	C
New Brighton/Arden Hills Ground Water	A	Hopkins Agricultural Chemical	C
Oakdale Hazardous Waste Dump	A	Interlake, Inc. (Duluth)	C
Reilly Tar and Chemical (St. Louis Park)	A	Marvin Windows (Warroad)	C
South Andover Sites	A	MKG Co. (Minneapolis)	C
Burlington Northern (Brainerd/Baxter)	B	Medtronic, Inc. (Fridley)	C
Consolidated Container Corp. (Kanabec Co.)	D	Medals Reduction, Inc. (St. Paul)	C
Former City of Hastings Dump	B	Minnegasco (Minneapolis)	C
Hibbing Sanitary Landfill and Kitzville Dump	B	Morris Arsenic Site	C
Joslyn Manufacturing & Supply (Brooklyn Center)	B	Onan Corporation (Fridley)	C
Koppers Coke (St. Paul)	B	PCI, Inc. (Shakopee)	C
MacGillis and Gibbs/Bell Lumber & Pole (New Brighton)	B	Perham Arsenic Site	C
NL, Inc./Taracorp, Inc. & Golden Auto Parts Co. (St. Louis Park)	B	Proform, Inc. (St. Paul)	C
Nutting Truck & Caster (Faribault)	B	Rice Street Site (Maplewood)	C
St. Regis--Wheeler Div. (Cass Lake)	B	3M Chemolite Disposal Site (Cottage Grove)	C
Washington County Sanitary Landfill	B	Tonka Corporation (Mound)	C
Waste Disposal Engineering Sanitary Landfill (Andover)	B	Trio Solvents (New Brighton)	C
Airco Lime Sludge Pit (Minneapolis)	C	Union Scrap (Minneapolis)	C
Arrowhead Refining Co. (Duluth)	C	U.S. Steel (Duluth)	C
Boise Cascade Waste Dump (Ranier)	C	Wadena Arsenic Site	C
Duluth Air Force Base former disposal sites	C	Sam Weisman & Sons, Inc. (Winona)	C
Duluth Missabe & Iron Range Railway Co. (Proctor)	C	White Bear Lake Township Dump	C
Ritari Post and Pole (Sebeka)	D	Windom Municipal Dump	C
3M Disposal Site (Kerrick)	D	Ashland Oil Co. (Cottage Grove)	D
Whittaker Corp., Minneapolis Castings & Chemical Div.	D	Ashland Oil Co. (Pine County)	D
Winona Sanitary Landfill	D	Hutchinson Technology Inc.	D

Source: Minnesota Pollution Control Agency, December 1982. (NOTE: A equals highest priority. Alphabetical within priority class.)

RECOMMENDATION:

"STATE SUPERFUND" LEGISLATION

While Minnesota's hazardous waste rules and Waste Management Act represent major steps in dealing with the state's hazardous wastes and their threats to surface and ground-water supplies, legislation is still needed to remedy the problems created by past disposal practices.

In Minnesota, some 3,000 generators produce about 150,000 tons of hazardous wastes (e.g., waste soil, solvents, chemical and metal sludges, acids, and cyanides) per year. The Minnesota Pollution Control Agency believes a large portion of these wastes may be disposed of improperly within the state and is working on a list of 50 disposal sites with the potential to cause serious harm to health and the environment. Nationally, the U.S. Environmental Protection Agency estimates that about 90 percent of hazardous wastes are not managed and disposed of in an environmentally sound manner. To clean up over 8,000 hazardous waste dump sites in the nation may require \$50 billion, an average of over \$6 million per site.

Examples of water-related problems which can result from mismanagement of hazardous wastes have emerged in St. Louis Park, where creosote has contaminated water supplies, and at Oakdale, where waste solvents have been found in local wells. Cleanup, if possible, in St. Louis Park will cost a minimum of \$20 million.

Attempts to clean-up hazardous waste sites have encountered two major problems: (1) the failure to clearly define legal responsibilities and (2) the lack of governmental funds to meet expensive cleanup costs.

THE MINNESOTA WATER PLANNING BOARD RECOMMENDS THAT:

- ** The Legislature adopt an "Environmental Response and Liability Act" that establishes a statutory standard of strict liability for the release of hazardous substances to the environment.
- ** The Legislature provide necessary authority and funding for the state to undertake the cleanup of those sites where a responsible party does not do so and to provide for the state match required for projects under the federal "Superfund."

MAJOR PUBLICATIONS OF THE MINNESOTA WATER PLANNING BOARD

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

This report is referred to as the framework water and related land resources plan for the State of Minnesota. It is supported by 12 technical papers, five staff working papers, and the final reports of the three interagency work groups involved in the preparation of the framework plan. All technical papers, working papers, and final work group reports are available through the Water Planning Board.

"Toward Efficient Allocation and Management: Special Study on Local Water Management," Minnesota Water Planning Board, January 1981.

This report was requested by the Legislature to supplement the framework plan. It is supported by seven staff technical support papers and one report. The technical support papers and the conference report are available through the Water Planning Board.

"Partnerships in Water Management: Minnesota's Challenge of the 1980s," Minnesota Water Planning Board, June 1982.

This brochure is a summary of the "Special Study on Local Water Management." It was prepared to accompany a slide presentation addressing the same concern. The brochure and the slide presentation are available through the Water Planning Board.

ON THE WATERFRONT, a quarterly newsletter of the Water Planning Board.

The Water Planning Board prepares a quarterly newsletter to inform water-related interest groups, professionals, and citizens of major issues in water and related land resources management. The eight-page newsletter is available from the Board.

OTHER PUBLICATIONS

Since 1979, the Minnesota Water Planning Board has been responsible for the publication of seven additional reports dealing with industrial water conservation potential, municipal conservation potential and planning, the economics of agricultural drainage, and assistance in local water planning.

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