

WATER RESOURCES ADMINISTRATION IN MINNESOTA, 1972

by

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Water Resources Research Center

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FOREWORD

This Bulletin is published in furtherance of the purposes of the Federal Water Resources Research Act of 1964. The purpose of the Act is to stimulate, sponsor, provide for, and supplement present programs for the conduct of research, investigations, experiments, and the training of scientists in the field of water and resources which affect water. The Act is promoting a more adequate National program of water resources research by furnishing financial assistance to non-Federal research.

The Act provides for establishment of Water Resources Research Centers at Universities throughout the Nation. On September 1, 1964, a Water Resources Research Center was established in the Graduate School as an interdisciplinary component of the University of Minnesota. The Center has the responsibility for unifying and stimulating University water resources research through the administration of funds covered in the Act and made available by other sources; coordinating University research with water resources programs of local, State and Federal agencies and private organizations throughout the State; and assisting in training additional scientists for work in the field of water resources through research.

This Bulletin is number 49 in a series of publications designed to present information bearing on water resources research in Minnesota and the results of some of the research sponsored by the Center. This Bulletin is concerned with organizations with water and related land resources programs in Minnesota. Water Resources policy matters and the need for re-organization of agencies are discussed. Hopefully, the information in this Bulletin will assist the 1973 session of the Legislature in its consideration of legislation pertaining to water and related land resources. The contents of this Bulletin also should assist citizens and State, local and Federal agency personnel in better understanding their government for water and related land resources.

This Bulletin serves as the Research Project Technical Completion Report for the following Center project:

OWRR Project No.: A-021-Minn.

Project Title: Water Resources Administration in Minnesota

Principal Investigator: W.C. Walton, Univ. of Minn., Graduate School

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Publication Abstract:

In 1970, Minnesota's State government contained at least 21 departments, agencies, boards, commission, committees, etc. with water and related land resources responsibilities. Expenditures by these organizations increased from \$5.7 million in 1950 to \$31.9 million in 1970. About 86% of expenditures were made by the Department of Conservation. Total State agency staff complements increased from 1,100 in 1960 to 1,400 in 1970. Prime responsibility for water and related land resources programs rested in 3 Com-

mittees of the Senate and 2 Committees in the House. The Governor's and Legislature's control of the State's administrative apparatus is hampered through fragmented organization. A recommended plan of reorganization centers on consolidation of major functions within a Department of Natural Resources. There is need for the Legislature to enunciate a comprehensive environmental policy for the State.

In 1970, there were 5 International, 5 regional, 3 interstate, and 4 Federal-State organizations with programs in the State. Federal responsibilities in water and related land resources planning, development and management in Minnesota was divided among 30 units in 8 executive departments and agencies; 6 independent agencies; 6 units in the executive office of the President; 9 other boards, committees, councils and commissions; and 1 quasi-official agency. In fiscal Year 1970, Federal outlays for water and related land resources activities in the State totaled about \$75 million or 2.3 percent of total Federal outlays in Minnesota of about \$3.3 billion. There were about 1,300 Federal employees residing in Minnesota in fiscal year 1970 with assignments pertaining to water and related land resources.

In 1971, there were at least 49 Interest groups in Minnesota with major water and related land resources programs, 4 Leagues and Associations with minor water and related land resources programs, at least 80 organizations that tend to have a continuing interest in water and related land resources issues, and at least 150 National organizations concerned with water and related land resources programs which have or could have members in the State. The Minnesota Senate 1971 registration files for lobbyists listed 110 lobbyists in the field of water and related land resources; the House files listed 138 lobbyists. Of the 53 Interest groups (49 Interest groups and 4 Leagues and Associations mentioned above), 40 were conservation-preservation oriented, 8 had the word environmental in their name, and 5 were development and management oriented. Taking into consideration multiple memberships, it is estimated that approximately 25,000 citizens in Minnesota were members of the 53 Interest groups in 1971. Membership in individual Interest groups ranged from 13 to 12,000. Expenditures in 1971 for water and related land resources programs of the 53 Interest groups probably totaled in excess of \$250,000. Annual expenditures by individual Interest groups ranged from \$100 to in excess of \$35,000. These figures do not include the thousands of hours of volunteer time by members. The sources of income were dues, contributions, donations and grants. The affairs of 45 of the 53 Interest groups were under the direction of Officers; 8 Interest groups had Boards; and 14 Interest groups had staffs. It is estimated that the number of water and related land resources Interest groups increased from about 16 in 1950 to 25 in 1960 to 33 in 1965 to 53 in 1971.

In the past, there has been considerable activity in Minnesota associated with the development and management of water and related land resources. For example, water-supply and sewage treatment plants have been constructed at most cities and villages as well as by many industries. Water-oriented recreation facilities have been provided in connection with parks, waysides, reserves, and monuments, etc. scattered throughout the State. Fish management programs have been extended to many areas and hundreds of wildlife management areas have been developed. Wetland waterfowl production areas are being managed. Agricultural lands have been drained in extensive areas and farmers have made considerable progress in the installation of conservation practices to reduce and control soil erosion.

Some flood control and prevention has been accomplished as soil and water conservation projects and as projects of the U.S. Army Corps of Engineers. Extensive improvements of rivers and harbors for navigation are located along the Mississippi River and in the Duluth-Superior area. Past development and management practices, as substantial as they are, have not kept pace with the steadily growing demands placed upon water and related land resources. Not only does Minnesota have catch up problems to contend with in the future, continuing pressures and demands for enhancement of the environment and improved economic well-being can be expected to create steadily growing demands for water and related land resources. There exists many water and related land resource problems associated with such matters as: pollution of streams, lakes and groundwater; water-oriented recreation; water supply; flooding; navigation; and land use.

Responsibilities for water and related land resources data acquisition and handling in Minnesota are shared among many Federal, State, local and private organizations. The diffusion of responsibility makes it difficult to launch a comprehensive attack on environmental and other problems. Divided responsibility means that some needed data acquisition and handling programs slip between the cracks and disappear from view. One such program is the development of a statewide water and related land resources - data system. A statewide water and related land resources - data system is needed to improve the coordination of data acquisition and handling responsibilities, to improve the efficiency of data programs, and to upgrade and fill deficiencies in data programs. Institutional arrangements must be devised to design the system.

A State Environmental Policy Bill, H.F. No. 2405, introduced by Messrs. Dunn, Norton, Becklin, Munger and Knutson passed the House on May 21, 1971 with a vote of yeas 117 and nays 12. A companion bill, S.F. 2048, introduced by Messrs. Gage, Gustafson, and Popham and referred to the Committee on Civil Administration was not reported out-of-Committee. H.F. No. 2405, passed by the House, was introduced in the Senate on May 22, 1971. The bill was never read for the third time, thus, it never came up for vote in the Senate. This bill addressed itself to many existing water and related land resources planning policy questions as did a report approved by the Land and Water Resources Committee, House of Representatives on November 30, 1970. During 1971 and 1972, several Subcommittees of Committees of the State Senate and House held joint hearings on water and related land resources issues. Governor Anderson in April 1972 established an Environmental Quality Council with a Citizens Advisory Committee. These actions could lead to the passage of a State Environmental Policy Act during the 1973 Session of the Legislature and to the improvement of government for water and related land resources programs in Minnesota.

Publication Descriptors: *State government/ *Legislation/ *Water policies/ Administration/ Budgeting/ Programs/ Coordination/ Institutions/ Minnesota/ Organizations/ Water law/ Water Districts/ Political Aspects/ Environment/ Water Resources/ Federal Government/ Interest Groups/ Lobbying/ Attitudes/ Resource Agencies/ Issues/ Ecology

Publication Identifiers: *State Governmental Reorganization/ *Legislative Process/ *State Environmental Policy/ Federal Governmental Reorganization/ Citizen Participation/ Viewpoints/ Associations

INTRODUCTION

The Water Resources Research Center, University of Minnesota supported a two-year research project entitled "Hydrologic and Other Aspects of Water Laws in Minnesota." The project began on July 1, 1967 and was completed on June 30, 1969. The results of the research were published in the following two Center Bulletins: "Codified and Uncodified State Laws and Municipal Ordinances Bearing on Water and Related Land Resources in Minnesota", 1968, W.C. Walton, R.A. Haik and D.L. Hills; University of Minnesota, Water Resources Research Center, Bulletin 9 and "Aspects of Water Resources Law in Minnesota", 1969, R.A. Haik, W.C. Walton and D.L. Hills; University of Minnesota, Water Resources Research Center, Bulletin 11.

The first Bulletin contains reproductions of the numerous legislative enactments bearing on water and related land resources. In addition, selected uncodified legislative enactments and ordinances of villages and cities bearing on water and related land resources which have the force and application of law are presented. All pertinent uncodified laws enacted during the 1965 legislative session are presented in the first Bulletin together with selected uncodified laws of other legislative sessions to provide the reader with an insight into the nature and scope of uncodified laws in the field of water and related land resources. The offices of selected villages and cities in Minnesota with varying water problems were visited during fiscal year 1968 and a sampling of local water use regulations was compiled. The local ordinances presented in the first Bulletin indicate the extent to which the development and management of water resources presently resides in local units of government.

During the fiscal year 1969 the research was concerned with the analysis and interpretation of existing Federal, State, and local legislation and major court decisions bearing on water and related land resources in Minnesota. The second Bulletin contains a compilation and a discussion of the major court decisions in Minnesota concerned with legal water rights, a discussion of pertinent aspects of the State's statutes, a discussion of aspects of Federal statutes and Supreme Court decisions, and recommendations concerning ways and means for improving water laws. Some of the subjects with which the second Bulletin is concerned include:

water policies as expressed in Minnesota's water laws, problems associated with differing scientific and legal classifications of water, provincialism and precedent in court decisions, insecurity of existing water rights, the adequacy of current legislation regulating water permits by the Department of Conservation, the adequacy of the existing riparian doctrine of water rights, coordination of State agencies, and conflicts of Federal-State jurisdiction.

The second Bulletin pointed out that there has grown a complex arrangement for the administration of water resource activities in Minnesota. A considerable part of the administrative system remains in private and local government hands; but a larger (and increasing) share falls to State and Federal governments. The trend has been toward more and more public involvement in water resource activities through a larger and larger number of administrative agencies. The administrative system has become so large and complicated that few if any governmental officials and citizens have a clear

understanding of the entire system. There are many responsible people who feel that the proper development and management of water resources is being hindered by present institutional arrangements.

For each of the demands for governmental action in the water-resource field in Minnesota a State program can be identified. A reciprocal relationship has been developed between those who sought the service in the first instance and the public agency established to provide the service. The pattern at the State level is duplicated, in essence, at the Federal level and responsibilities for the various programs at both levels are fragmented among a large number of agencies.

The institutions participating in water resources activities have various goals and look at the use and misuse of water from a variety of viewpoints. Each institution has different resources at hand to be used in pursuit of its particular goals. The institutions work with different sectors of the public and have varying amounts of influence; some have a small clientele, others are more broadly based.

In Minnesota, the planning, development, and management of water and related land resources in the past has been largely the responsibility of local units of government such as counties, cities and villages. The confusion and often contrary decisions that result from this provincial approach are reflected in the general legislation applicable to local units of government and in the special legislation adopted at each legislative session to deal with specific local problems.

There are several examples of the nullifying effect of existing water laws. Statements concerning mandatory coordination and cooperation of State, local, and Federal agencies and other organizations such as commissions and compacts contained in the codified and uncodified State water laws, for the most part, are weak expressions describing piece-meal cooperation, often on a voluntary basis, between agencies and organizations. Responsibility for comprehensive coordination and cooperation within the water and related land resources development and management field is not centralized. There is not a single entity charged specifically with the responsibility of coordinating Federal, State, interstate, local, and non-governmental activities pertaining to water and related land resources planning, development and management.

The most ambitious attempt by the State legislature to require coordination has been the establishment of the Water Resources Board which was created with the declared power of resolving contradictions in the existing programs when applied in a specific proceeding and with the objective of establishing a forum where conflicting aspects of the public interest can be presented and considered, the inconsistencies resolved, and a controlling State water policy determined. The Water Resources Board has an excellent assignment, but there is no requirement imposed upon agencies to present problems to the Board. Thus, an excellent legislative objective is set forth in the State law, but by reason of the lack of any requirement to submit questions to the Board, there have been few if any State-wide water policies enunciated by the Water Resources Board since its creation in 1955.

During most recent legislative sessions there have been hearings concerning reorganization of State agencies in the field of natural resources. Two Governors have appointed committees to study Minnesota's government and to make recommendations in part pertaining to reorganization of State agencies. During the 1967 session of the Legislature, the Department of Conservation was reorganized and a Pollution Control Agency was created. Reorganization study committees were not provided with a comprehensive document on the water-resource institutional environment and they had to make recommendations without adequate information. A comprehensive compilation of information pertaining to water resources administration in Minnesota did not exist. Few had a clear understanding of the complicated influence and interactions of water-resources institutions.

Based on these conclusions, the Center decided to support a 3-year research project entitled "Water Resources Administration in Minnesota," starting July 1, 1969. The objectives of the research project were (1) to inventory, appraise and evaluate water and related land resources legal institutions, administrative structures, and public administrative processes and techniques, legislative process and policies in Minnesota and (2) to make recommendations which could lead to improved and better coordinated water and related land resources programs. The history of water and related land resources administration was to be traced. The application of water laws, resources and methods used in working for institutional goals, the nature of each institution's involvement in water and related land resources activities, coordination between units of government, and administrative costs were to be examined. The research project included a study of: institutional factors which have influenced water and related land resources development and management and interstate compacts, international commissions, Federal-State planning organizations, and intrastate water resource districts. Legal and administrative devices used in some other States were to be compared with those in use in Minnesota.

The results of the research project were to be published in 4 Bulletins. One Bulletin was to contain information on water and related land resources State administration, legislative process and policies in Minnesota as of 1970. Two Bulletins were to be concerned with information on Federal administration and voluntary organizations in Minnesota. The fourth Bulletin would summarize the contents of the other 3 Bulletins.

The first Bulletin was released in January 1971 and is entitled "Water and Related Land Resources State Administration, Legislative Process and Policies in Minnesota, 1970," by W.C. Walton and D.L. Hills. In this Bulletin, information is provided concerning the membership, powers, duties, staff, budgets, programs, policies and interrelationships with other organizations of State departments, agencies, boards, commissions and committees which have primary or substantial responsibilities in the water and related land resources field. Detailed data is summarized covering the Department of Conservation, Pollution Control Agency, Soil and Water Conservation Commission, Water Resources Board, State Board of Health, State Planning Agency, State Geological Survey and Iron Range Resources and Rehabilitation Commission. The activities of special-purpose districts, counties, townships, municipalities and courts are described. State administrative structure and institutional arrangements in States (Iowa, South Dakota, North Dakota, Wisconsin and Michigan) adjoining Minnesota are summarized.

Information is presented concerning water and related land resources measures introduced in the 1969 session of the Legislature, Senate and House Committees handling water and related land resources bills, registration files for lobbyists and the Minnesota Resources Commission. Water and related land resources policies enunciated to date by the Legislature as formal declarations, statements and resolutions are listed. Existing State policy questions are identified and a list of specific policy statements which could be debated by the 1971 legislature is given. Environmental concerns and the need for a State environmental policy are discussed. A list of specific environmental policy statements and actions which could be debated by the 1971 legislature is provided.

In the second Bulletin which was released in September 1971 and entitled "International, Regional, Federal-State, Interstate and Federal Organizations With Water and Related Land Resources Programs in Minnesota, 1971", by W.C. Walton and D.L. Hills, information is provided concerning the membership, powers, duties, staff, budgets and programs of International, regional, Federal-State, interstate and Federal organizations with water and related land resources programs in Minnesota. Congressional process as it affects water and related land resources and proposals for reorganization of Federal agencies is described.

The third Bulletin which was released in February 1972 and entitled "Interest Groups With Water and Related Land Resources Programs in Minnesota, 1971", by W.C. Walton and D.L. Hills, is concerned with water and related land resources oriented Interest groups in Minnesota and lobbying at the State level. Information is provided on Interest groups' history; goals, objectives and policies; programs and projects; membership; organization structure; staff; expenditures; contacts with governmental agencies; and interests in water and related land resources issues. The information contained in this Bulletin was largely obtained from reports and other documents of Interest groups.

In this Bulletin, the fourth and final in the series, information contained in the other 3 Bulletins is summarized. In addition, data is presented on Minnesota's water and related land resources development and management programs and water and related land resources data acquisition and handling programs in the State. Information is provided concerning the progress made during 1971 and 1972 by the Legislature and Executive Branch in adopting a State environmental policy, reorganizing State agencies, and reacting to planning policy questions.

ORGANIZATIONS WITH WATER AND RELATED LAND RESOURCES PROGRAMS IN MINNESOTA

In 1970; in addition to Special-Purpose Districts, County Boards, District Courts, Port Authorities and Municipal Agencies; there were about 122 organizations with water and related land resources programs in Minnesota as follows: State organizations - 21, International organizations - 5, Regional organizations - 5, Interstate organizations - 4, Federal-State organizations - 4, Federal organizations - 30, and Interest groups - 53. State agency staff compliments associated with these programs totaled 1,400; there were about 1,300 Federal employees residing in Minnesota with assignments pertaining to the planning, development and management of water and related land resources. Annual State outlays for water and related land resources activities totaled about \$26 million; annual Federal outlays totaled about \$75 million. Annual expenditures for these programs totaled about 2.0 percent of total State annual expenditures and about 2.3 percent of total annual Federal outlays in Minnesota. Approximately 25,000 citizens in Minnesota were members of Interest groups with water and related land resources programs.

State Organizations

State organizations concerned with water and related land resources planning, development, and management in Minnesota were: Department of Conservation, Pollution Control Agency, Soil and Water Conservation Commission, Water Resources Board, Iron Range Resources and Rehabilitation Commission, Department of Economic Development, Department of Agriculture, Department of Administration, Department of Highways, State Board of Health, Geological Survey, Executive Council, Land Exchange Commission, State Geographic Board, State Historical Society, State Planning Agency, Department of Civil Defense, State College Board, Board of Regents - University of Minnesota, Minnesota Committee on Interstate Cooperation, and Minnesota Resources Commission.

The most active State organizations were: Department of Conservation, Pollution Control Agency, Soil and Water Conservation Commission, Water Resources Board, State Planning Agency, State Board of Health, and Minnesota Resources Commission. Major functional areas and associated State agencies were: Water Supply - State Board of Health and Department of Conservation; Water Pollution - Pollution Control Agency; Recreation, Fish and Wildlife - Department of Conservation; Water Resources - Department of Conservation; Flood Control - Department of Conservation, Soil and Water Conservation Commission and Water Resources Board; Waterborne Transportation - Department of Conservation and Water Resources Board; Land Drainage, Treatment and Irrigation - Soil and Water Conservation Commission, Department of Conservation and Water Resources Board; Forestry and Minerals - Department of Conservation; Power - Department of Conservation; and Comprehensive Water and Related Land Resources Planning - State Planning Agency.

Expenditures by State agencies associated with water and related land resources programs increased from \$5.7 million in 1950 to \$31.9 million in 1970. About 89 percent of expenditures in 1950 were made by the Department of Conservation; 86 percent of expenditures in 1970 were made by the Department of Conservation. In 1950, about 91 percent of expenditures

consisted of State funds; in 1970 about 83 percent of expenditures consisted of State funds. Total State agency staff complements associated with water and related land resources increased from 1,100 in 1960 to 1,400 in 1970. About 84 percent of the total staff complement was in the Department of Conservation in 1970; about 54 percent of the staff consisted of professional, administrative and management personnel and about 46 percent consisted of clerical, technicians, laborers, etc. employees.

Department of Conservation (Natural Resources)

The Legislature in 1931 created the Department of Conservation under the administration of a five-member, Governor appointed Board of Commissioners. The Department was composed of four Divisions: Forestry, including parks; Game and Fish; Lands and Minerals; and Drainage and Waters. In 1937, the Board was abolished and the control of the Department was vested in a single Commissioner.

In 1970, the Department had a Deputy Commissioner, an Assistant Commissioner and four Bureaus: Bureau of Information and Education, Bureau of Business Management, Bureau of Engineering Services, and the Bureau of Planning. A Deputy Attorney General functioned as the legal council for the Department. The Department had five Divisions: Division of Lands and Forestry; Division of Game and Fish; Division of Enforcement and Field Services; Division of Parks and Recreation; and the Division of Waters, Soils and Minerals.

The Commissioner of Conservation was appointed by the Governor, by and with the advice and consent of the Senate and he served at the pleasure of the Governor. The Deputy Commissioner, Assistant Commissioner and Division heads were appointed by the Commissioner and they served in the unclassified service of the State. Effective January 1971, the name of the Department was changed to the Department of Natural Resources.

The Commissioner of Conservation had charge and control of all the public lands, parks, timber, waters, minerals, and wildlife of the State. The Division of Lands and Forestry had been granted jurisdiction and responsibility for the State-owned forests; the protection of all forested areas throughout the State, both in public and private ownership; and the general land sales and leasing programs of the Department. The Division of Game and Fish had been granted jurisdiction and responsibility for the protection, care and management of all wildlife, including birds, fishes, mammals and aquatic vegetation found within the State. The Division of Enforcement and Field Services had responsibilities related to: enforcing hunting, fishing and trapping regulations; public access programs; investigating lumber cutting, vandalism and littering; water law programs; pollution programs; wild rice programs; and game and fish census programs. The Division of Parks and Recreation administered control of the State park system, statewide system of trails, recreational river system, natural and scientific areas, and recreational facilities for snowmobiles. The Division of Waters, Soils and Minerals had been granted jurisdiction and responsibility to promote and regulate the exploration and extraction of State-owned minerals and develop a general water resources conservation program for the State, a program which includes the conservation, allocation, and development of all the waters of the State.

The Department of Conservation obtained operating funds from three sources: dedicated and general revenue appropriations from the State general fund; reappropriated revenue from the sale of Department services, assets and fines; and the Federal government. Total expenditures by the Department increased from \$1,441,000 in 1931 to \$27,128,000 in 1970. During fiscal year 1968, State fund expenditures by the Divisions of Waters, Soils and Minerals; Lands and Forestry; Enforcement and Field Services; Game and Fish; and Parks and Recreation were \$1,104,000; \$3,787,000; \$1,939,000; \$5,076,000; and \$2,761,000, respectively. In fiscal year 1968, the Department received \$3,744,000 in Federal aid; \$6,750,000 from the State general revenue; \$6,984,000 from dedicated game and fish funds; \$342,000 from wildlife acquisition funds; and \$4,665,000 from the State natural resources fund.

The staff complement of the Department increased from 933 in 1959 to 1164 in 1970. In 1970, the general distribution of staff, expressed as a percent of the total staff complement, was as follows: Administration - 7.9 percent; Division of Game and Fish - 31.4 percent; Division of Lands and Forests - 32.8 percent; Division of Parks and Recreation - 7.3 percent; Division of Waters, Soils and Minerals - 6.8 percent; and Division of Enforcement and Field Services - 13.8 percent. The numbers of staff in functional categories were as follows: administrator - 85, professional or manager - 562, clerical - 196, technician - 199, skilled - 43, semi-skilled - 36 and unskilled - 68.

The Department of Conservation was by far the largest State agency with major responsibilities in water and related land resources planning, development and management. Many of the Department's responsibilities were associated with the regulation of the use of natural resources. Through the administration of the water permit system and other programs, the Department had considerable jurisdiction in the fields of water use; flood control; navigation; recreation, fish and wildlife; land drainage, treatment and irrigation; and power. The Department's capabilities in comprehensive water and related land resources planning; investigations pertaining to water and related land resources; and liaison with the U.S. Army Corps of Engineers, U.S. Soil Conservation Service, and other Federal agencies with responsibilities for the development and management of water and related land resources could stand much improvement. Effective coordination of Divisions and balancing of programs was being hampered through the influence of dedicated funds, Division pressure groups, and the absence of an administrator with broad responsibilities in comprehensive planning for the Department.

Pollution Control Agency

The Pollution Control Agency programs in general included: classification and monitoring of the pollution status of streams and lakes; establishment of water quality standards; administration of Federal grants-in-aid for waste treatment plants; review of municipal and industrial waste treatment projects; inspection of treatment plants and non-treatable pollution sources; conduct of regulatory and enforcement procedures; and accomplishment of a wide range of other basic pollution control activities, including surveys and evaluation studies of new pollution sources. In addition, the Agency had broad responsibilities in air pollution control and solid wastes disposal.

Agency programs were based on a policy adopted by the Legislature which states that the prevention, control, and abatement of pollution of all waters of the State shall be provided, so far as feasible and practical, in furtherance of the conservation of such waters and the protection of the public health and in furtherance of the development of the economic welfare of the State. In exercising powers the Agency must give due consideration to the establishment, maintenance, operation and expansion of business, commerce, trade, industry, traffic and other economic factors and other material matters affecting the feasibility and practicability of any proposed action. It is the policy of the State to promote pollution control through financial incentives.

The Agency's administrative structure was a 9-member Board and an office of the Director who serves as the Executive Secretary and Chief Executive Officer of the Agency. The relationship of the Chairman of the Board and the Director particularly with regards to policy matters was not clear nor were the duties and responsibilities of the Board clearly stated in statutes.

The staff complement of the Agency increased from 16 in fiscal year 1967 to 90 in fiscal year 1970. Expenditures of the Agency and its predecessor the Water Pollution Control Commission increased from \$68,152 in fiscal year 1948 to \$717,476 in fiscal year 1969. State appropriations in fiscal year 1968 were \$478,435 and Federal allocations were \$231,431; State appropriations cost category expenditures were: salaries and wages \$241,504, supplies and expenses \$45,758 and grant-in-aid contributions \$16,173. Staff complement in fiscal year 1968 consisted of a director, 18 professional employees, 6 non-professional employees, 8 clerical employees and 2 custodial employees. There were 18 vacant positions.

Programs of the Agency in air pollution and solid wastes disposal were in the formative stages and they can be expected to greatly expand in the near future. Water pollution control responsibilities continuously accelerate in scope. It is apparent that large increases in budget and staff complement will be required if the Agency is to fulfill its duties.

Because of severe staff limitations, the Agency could participate only in a token way in the statewide and Federal-State water and related land resources planning activities of the Water Resources Coordinating Committee, State Planning Agency. Recent requirements of the Federal Water Quality Administration concerning detailed surveys of pollution problems and possible solutions as a prerequisite for granting Federal funds for construction of waste treatment facilities will force the Agency to greatly expand its river basin planning activities.

Additional support will be needed to defray costs associated with the Agency's agreement with the Department of Health. The Department was being called upon to perform ever-increasing laboratory, field and office services for the Agency.

Responsibilities pertaining to lake over-fertilization problems and possible remedies were divided between the Agency and the Department of Conservation. Neither organization has been charged with the duty of coordinating lake eutrophication programs and as a result these programs were weak.

There are those who feel that vesting both survey-review-monitoring and regulator-enforcement powers for pollution control in a single Agency is undesirable. It can be argued that the same Agency setting water quality standards and implementation schedules should not grant variances.

State Soil and Water Conservation Commission

The State Soil and Water Conservation Commission, Soil and Water Conservation Districts and Minnesota Association of Soil and Water Conservation Districts were all primarily concerned with planning, development and management activities pertaining to land treatment, drainage and irrigation and flood protection. Their multi-purpose programs also involved water supplies, pollution control and recreation, fish and wildlife projects. These organizations worked closely with the U.S. Department of Agriculture, particularly the Soil Conservation Service. The Commission relied heavily upon the Institute of Agriculture, University of Minnesota.

Land treatment practices promoted by these organizations included: contour farming, contour strip cropping, gradient terraces, diversions, grassed waterways, stubble mulching, pasture planting, feedlot windbreaks, conservation cropping systems, minimum tillage, grassland renovation, and farm ponds and pits. Drainage measures included: drainage field ditches, tile drains and drainage mains and laterals. Practices on watershed lands for forestry protection included: tree planting, livestock exclusion, hydrologic stand improvement, protection from overcutting and damaging logging, cultural practices and forestation, and woodland interplanting. Wildlife measures were concerned with habitat and wetland development and preservation. Programs often involved recreation developments. Flood protection practices included: floodwater retarding structures, channel improvements, grade stabilization structures, drainage outlets and streambank control.

The programs of these organizations were largely rural in nature but increasingly they are concerned with urban problems. For example, some projects involve low-streamflow augmentation for urban pollution control and surface-water storage for urban water supplies. The broad multi-purpose nature of programs caused the activities of these organizations to overlap with the activities of other State agencies. These organizations served as the link between the U.S. Department of Agriculture and local people.

One of the most important responsibilities of these organizations was developing small watersheds through provisions of Federal Public Law 566. Under the law, local organizations can apply for and obtain assistance in planning and installation of works of improvement for flood prevention and the conservation, development, utilization, and disposal of water in watershed areas not exceeding 250,000 acres in size. Local organizations are responsible for accomplishing work plans; securing land, easements and rights-of-ways and operation and maintenance of works. The State Soil and Water Conservation Commission accepted P.L. 566 watershed applications and approved or disapproved them for the Governor, and placed P.L. 566 eligible projects on a priority list for planning purposes. The Commission also served as sponsor for Type 4 Federal-State river basin planning efforts which focus on the study of potentially feasible P.L. 566 projects administered by the U.S. Soil Conservation Service. It should be mentioned that P.L. 566 projects are major elements of comprehensive Federal-State

regional water and related land resources plans. It is through the State Soil and Water Conservation Commission that P.L. 566 programs were promoted.

The staff of the Commission had an authorized strength of three clerical and two professional (Executive Secretary and Assistant) personnel. The staff was inadequate in number and capability to fulfill completely the duties of the Commission, particularly in relation to promoting the State's viewpoint towards Federal programs. The staff leaned heavily upon the U.S. Soil Conservation Service in technical and policy matters. Because of severe staff limitations, the Commission could participate only in a token way in the statewide and Federal-State water and related land resources planning activities of the Water Resources Coordinating Committee, State Planning Agency. To large extent, the Commission simply supplements the programs of the U.S. Soil Conservation Service.

The annual budget of the State Soil and Water Conservation Commission increased from \$2,000 in 1941 to \$329,807 in 1969. Expenditures in 1969 were: \$69,807 for the salaries of the Commission staff and other Commission administrative expenses, \$220,000 for direct assistance to soil and water conservation districts to partly cover expenses of district supervisors and district employees, and \$40,000 transferred to the U.S. Soil Conservation Service to provide funds for supplementing its watershed planning party.

A total of 91 soil and water conservation districts have been organized covering the entire State except Ramsey County. Most district boundaries coincided with county boundaries. The accomplishments of districts through 1969 can be summarized as follows: standard soil surveys - 17 million acres; terraces - 15 million feet; contour farming - 756,000 acres; diversions - 5 million feet; 16 thousand farm ponds; field ditches - 86 million feet; mains and laterals - 57 million feet; tile drains - 221 million feet; farmstead windbreaks - 48 thousand acres; field windbreaks - 32 million feet; tree planting - 113 thousand acres; about 7 thousand grade and stabilization structures; grassed waterways - 23 thousand acres; pasture and hayland planting - 218 thousand acres; stubble mulching - 292 thousand acres; wildlife habitat management - 513 thousand acres; and wildlife wetland management - 283 thousand acres.

The soil and water conservation districts received funds from the Legislature through the Soil and Water Conservation Commission, from counties, and from landowners for services rendered by the districts. The total annual budget from these services for all districts increased from \$50,000 in 1950 to \$753,970 in 1968. The distribution of funds in 1968 was as follows: \$215,000 Commission, \$157,533 county and \$381,600 district receipts. The average district annual budget in 1968 was about \$850. Most of the funds were used to hire district aids who assist in applying soil and water conservation practices. In 1968, the districts hired 145 aides, and 65 clerks full or part time. Federal funds for direct assistance to districts provided largely by the U.S. Soil Conservation Service totaled about \$3.5 million in 1967.

Soil and water conservation districts have not been granted the powers of eminent domain and taxation; they can not fulfill the requirements of Federal P.L. 566 programs. Thus, the districts must act jointly with counties or through watershed districts organized by the Water Resources Board

which have the powers of eminent domain and taxation to implement their programs. All plans prepared jointly with counties must be reviewed by the Water Resources Board with regard to State policy. During the Special Session of the 1971 Legislature, the Soil and Water Conservation Commission was placed in the Department of Natural Resources.

Water Resources Board

The Water Resources Board, created in 1955, had responsibilities in 3 main categories: watershed district establishment and review, water policy review, and miscellaneous tasks by special directives from the Legislature. The Board did not supervise watershed districts in pursuing their projects and activities, but did to some extent review plan and project completion progress.

The board's policy responsibilities were limited and included the task of determining State water policy, for certain prescribed conflicts. The Board can not act except upon petition calling for its assistance in policy controversies. The Board's policy function has been restricted to the preparation of a water law study and report to the Legislature in 1963, the submission of recommendations for changes in the Watershed Act to each session of the Legislature, and offering advice concerning water policy to the Executive Branch and the Legislature.

The main task of the Board was upon petition, to establish watershed districts through hearing procedures. These districts were chiefly concerned with programs and projects of the U.S. Army Corps of Engineers and U.S. Soil Conservation Service. Thus, the Board served as a link between these agencies and other Federal agencies and local groups desiring Federal assistance in solving such problems as flood damage; navigation expansion; the need for land treatment and drainage; the need for recreation, fish and wildlife facilities; and lake water-level fluctuations and eutrophication.

The accumulated expenditures of the Board through 1969 were \$247,000; in fiscal year 1969 the budget was \$26,701. The staff of the Board consists of an Administrative Secretary and one stenographer. The staff received some personnel assistance from the Department of Conservation and it has provided some work opportunity for undergraduate students. A member of the staff of the Attorney General office provided legal advice to the Board. The staff had the capability of participating only on a token basis in the statewide water and related land resources planning activities of the Water Resources Coordinating Committee, State Planning Agency.

In 1970, the Board had received 29 petitions for the establishment of watershed districts of which 24 have been approved, 3 were pending and one was dismissed. Of the 24 approved districts, 6 were very new and primarily in the organization state. The areas covered by the districts ranged in

size from 43 to 5,900 square miles; most district areas were less than 100 square miles.

The districts have the powers of eminent domain and taxation and they can meet the requirements of Federal agencies concerning local project responsibilities such as operation and maintenance of structures. Accumulated expenditures of established districts 1955 to 1969 for organization and administration total \$771,586. The average annual individual district organization and administrative expenses ranged from \$338 to \$41,700 and average \$6,900. Of these expenses, about 22% was for district office costs and managers' per diem costs, about 21% was for legal services, about 35% was for engineering services, about 18% was for data collection, about 1% was for project operation and maintenance, and about 3% was for viewers and appraisers fees. These expenses were borne on the local level.

The accumulated costs for projects completed or under construction in the districts total \$6,378,758. The local expenditures for these projects were about 41% of the total or about \$2,561,976. The local costs for proposed projects may be about 33% of the total or \$9,841,575.

Several districts were relatively inactive because project support had not been forthcoming. Some districts have completed projects while the activities of other districts has been essentially confined to the preparation and promotion of plans. Most of the watersheds can not solve their problems through projects located within the boundaries of the districts; the causes of many problems lie outside the district boundaries. Because activities are limited and watershed districts are small in number and area and are scattered throughout the State there has been little need for the Board to be concerned with the statewide implications of the actions of individual districts.

Department of Health

Of the seven Divisions within the Department of Health under the administration of the State Board of Health, the Division of Environmental Health was most directly concerned with water and related land resources. There were five Sections in the Division of Environmental Health: Water Supply and General Engineering Section; Hotels, Resorts and Restaurants Section; Industrial Hygiene Section; Radiation Control Section; and Analytical Services Section.

The Water Supply and General Engineering Section had as its general objective the prevention and correction of public health hazards in six general areas; public and semi-public water supplies, private water supplies, public and semi-public sewage disposal systems and excreta disposal, children's camps, and plumbing. Specific activities included: review and approval of plans and specifications, field surveys and reports, consultations and advice, education and training activities, certification of water works operators, and promulgation of standards and codes. The Radiation Control Section controlled sources of ionizing radiation, and the handling, storage, transportation, use and disposal of radioactive isotopes and fissionable materials. The Analytical Services Section provided chemical, bio-

chemical, bacteriological, physical, toxicological, and radiological analytical services to the Department of Health, to the Pollution Control Agency, and to other State agencies.

The Department of Health had district offices at Bemidji, Mankato, Rochester, Duluth, Worthington, Minneapolis, Fergus Falls, and Little Falls. Part of the work of district engineers was an extension of the program of the Division of Environmental Health.

The staff complement of the Division of Environmental Health associated directly with water and related land resources was 33 in 1950 and 38 in 1969. Expenditures by the Division pertaining to water and related land resources increased from \$107,000 in 1952 to \$272,000 in 1969. The sources of funds expended in 1969 were: State (\$189,000) and Federal (\$83,000). The Division of Environmental Health was being called upon to provide ever increasing analytical services for the Pollution Control Agency.

State Planning Agency

Several water and related land resources planning programs were administered by the State Planning Agency under the supervision of a Natural Resources Planning Director and a Water Resources Planning Director. A Water Resources Coordinating Committee assisted the Agency in state-wide and Federal-State planning activities. In addition, studies on land use, quality of the environment, outdoor recreation facilities and flood plains were conducted.

The Water Resources Planning Director served as Chairman of the Water Resources Coordinating Committee, as Minnesota's representative on the Upper Mississippi River Comprehensive Basin Study Coordinating Committee, Great Lakes Basin Commission and Souris-Red-Rainy River Basins Commission Committee. The latter four commissions and committees are Federal-State regional planning organizations. The Water Resources Coordinating Committee is composed of representatives from all State agencies, League of Minnesota Municipalities, Association of Minnesota Counties and Metropolitan Council having interests in water and related land resources planning, development and management. The Water Resources Planning Director administered funds associated with the Federal Water Resources Planning Act of 1965.

The Water Resources Coordinating Committee was preparing a statewide water and related land resources framework plan with the assistance of consultants. The Committee had completed three documents which provide the Executive Branch and Legislature with information concerning possible problems, programs and projects for the period 1970 to 2020, and it has identified planning policy issues. As soon as the State adopts a set of planning policies, the Committee will prepare a plan with specific program ingredients and project priorities.

Members of the Committee, because of severe financial and manpower limitations, have been able to contribute only on a token basis to statewide and Federal-State planning programs. Most of the work load of the Committee had been assumed by the small staff of the State Planning Agency assigned to the Committee and by consultants retained by the State Planning Agency to assist the Committee.

The Water Resources Coordinating Committee was functioning without direct legislative mandate as a major State agency coordinating organization. The Committee had been successful with volunteer cooperation concerning non-controversial policy issue identification and information base matters. In the future, the Committee is likely to run into difficulties when controversial matters are encountered and compromises must be made among State agencies. A direct coordinating charge from the Legislature may be required to resolve impending planning conflicts.

The relation between the planning activities of the Committee and the development and management activities of other State agencies was unsatisfactory. Also, the relation between the Committee and the Governor's Environmental Cabinet was not clear. The Committee was having difficulty in preparing a statewide plan from a State's viewpoint and at the same time participating in Federal-State planning from a regional viewpoint. There had been no resolution between differences in State and regional planning viewpoints. In-put from local agencies and citizens in the Committee's planning activities had been limited.

The budget of the Water Resources Coordinating Committee had increased from \$52,000 in fiscal year 1967 to \$181,500 in fiscal year 1970. Expenses for Federal-State regional planning organization's assessments totaled \$50,000 in fiscal year 1970. Consulting services constituted about 20 percent of the fiscal year 1969 budget. The committee's budget (about \$94,000 in fiscal year 1970) associated with the Federal Water Resources Planning Act of 1965 was composed of 50 percent Federal funds provided by the Federal Water Resources Council and 50 percent non-Federal funds largely provided by the Minnesota Resources Commission.

The staff assigned to the Committee by the State Planning Agency consisted of a Water Resources Planning Director, 2 water resources planners, 1 secretary and 1 draftsman. The staff complement was unable to cope with the ever increasing responsibilities associated with the preparation of a statewide water and related land resources plan, much less, to participate in Federal-State regional planning activities. Representatives on the Committee have been provided with no direct funds or mandates to participate in the Committee's programs.

Other programs under the Natural Resources Planning Director were directed towards inventorying land use, flood plain areas, environmental conditions and outdoor recreation facilities and planning improvements in these areas. The budget for these programs increased from \$25,000 in fiscal year 1968 to \$346,000 in fiscal year 1970. Sources of funds for programs were State and Federal agencies. Most of the work was performed through contracts by faculty members and students at the University of Minnesota and consultants. The staff assigned to these programs by the State Planning Agency consisted of a Natural Resources Planning Director, 3 natural resources planners and 1 secretary.

Minnesota Geological Survey

The Minnesota Geological Survey was created in 1911 and placed under the administrative control of the Board of Regents of the University of Minnesota. The Survey was charged with the responsibility of undertaking an examination of the rocks, clays, marls and other materials in the State

with reference to the occurrence of ores, building materials and other valuable substances. A close relation between the Department of Geology and Geophysics of the University of Minnesota and the Survey has developed. Cooperative agreements have been developed with the U.S. Geological Survey and the Department of Conservation and other Federal, State and local agencies and University units.

Survey investigations have included the following: preparation of geologic maps of counties, collection of water well data, research on building stones and clays, studies of peat deposits, studies of iron-ore deposits, study of the geology of the Minneapolis-St. Paul metropolitan area, collection of subsurface and geological data, assistance in the topographic mapping of the State; research on the State's non-metallic mineral deposits, studies on sand and gravel resources, regional geologic mapping of both the bedrock and surficial deposits; aeromagnetic survey of the State, studies of water bearing strata of the State, copper-nickel exploration, and assisting in the classification of State lands.

A recently completed long-range plan for geologic research in the State calls for: a marked speed up in geologic mapping, intensive studies of both nonmetallic and metallic mineral deposits, increase in engineering and urban geology studies, broadening of the scope of water resources studies, and preparation of pamphlets and guidebooks on the geology and scenery of the State and of study materials for secondary schools.

The budget of the Survey increased from \$22,860 in fiscal year 1961 to \$314,000 in fiscal year 1971. Sources of funds in fiscal year 1970 were: State legislative special, University support funds, State natural resources account, Department of Conservation and other small contracts and grants. About 25 percent of expenditures are directly or indirectly related to water resources.

Previously to 1961, the staff of the Survey consisted of a part-time Director and several part-time faculty researchers. In 1961, a full-time Director was appointed and later several full-time staff members were employed. The staff complement in 1969 consisted of 9 full-time members, 2 secretaries, 4 part-time staff members, 4 part-time faculty members and 3 part-time graduate students. While insufficient funds are available to adequately pursue most survey programs, the greatest deficiency was associated with water resources programs.

Iron Range Resources and Rehabilitation Commission

The Iron Range Resources and Rehabilitation Commission was created by the 1941 Legislature under Minnesota Statute 298.22. The Commissioner appointed by the Governor with the advice and consent of the Senate for a term of two years, may use funds appropriated to him by law as he may determine to be necessary and proper in the development of the residents of any area "when the commissioner shall determine that distress and unemployment exists or may exist in the future in any county by reason of the removal of natural resources or possibly limited use thereof in the future and the decrease in employment resulting therefrom".

The Commission consisted of seven members, three State Senators and three members of the House of Representatives, and the Conservation Commissioner and recommended approval or disapproval or modification of expenditures and projects for rehabilitation purposes as provided by Laws 1943, Chapter 590.

Funds derived from the State occupational tax on iron ore dedicated to the IRR&RC Department were used in programs to develop natural resources and rehabilitation of the residents of northeastern Minnesota who were victims of serious economic conditions as a result of the reduced activity in mining operations and the loss of income and employment in the timber industry.

Money for recent operation of the Department in addition to the iron ore occupation tax came from a revolving fund created from rents, royalties and the sale of buildings and equipment, and participating Federal funds for research and economic opportunity programs. The financial base of the Department rested on the iron ore occupation tax (a tax based on natural iron ore mined). The Department, by law, received 10 percent of that half of the occupation tax which went into the State general revenue fund but this source of funds was dwindling, because of the change in mining operations on the Iron Range.

Many new jobs have been created as a result of new industries made possible with participating funds from the Department of Iron Range Resources and Rehabilitation. Most iron range resources and rehabilitation projects were operated and financed in conjunction with Federal, State or local agencies. Thus, IRR&RC had attracted more than a million dollars in Federal research and development money into the State over the past several years. IRR&RC often furnished some or all of the local share for new industry projects financed by the Federal Economic Development Administration or the Small Business Administration.

The IRR&RC had also worked with the U.S. Geological Survey in an iron range water study and publication of nickel and copper maps; with the Duluth Board of Education in farm management programs; with the University of Minnesota Soil Science Department in peat research; with the State Department of Conservation in the upper Rice Lake wild rice project and the Shannon river dam; with the Upper Great Lakes Regional Commission in financing the coho salmon project and the Nett Lake reservation wild rice production demonstration project; with the Department of Labor in the neighborhood youth corps, and with the University of Minnesota Geological Survey and other units in iron mining research. Receipts by the Commission during the period 1941 to 1969 totaled about \$21,600,000. The staff complement of the Department increased from 42 in 1960 to 60 in 1968.

Minnesota Resources Commission

Under the terms of the Omnibus Natural Resources and Recreation Act of 1963, the Minnesota Outdoor Recreation Resources Commission (MORRC) was created. In 1967, a natural resources bill amended the 1963 Act to formally change the role of the Commission and its name to the Minnesota Resources Commission (MRC).

Under the terms of the 1963 Act, the Commission was created to review, compile data and make recommendations to the Governor, Legislature, counties, and municipalities for the long-range program of development of the State's natural and recreation resources, including recommendations for the expenditure of funds of the natural resources account provided by a one cent per package tax on cigarettes. In 1967, the responsibility of the Commission to make recommendations to the Governor, counties and municipalities was terminated. The role and responsibility were limited to the Legislature, with a charge that:

any data compiled by the Commission will be made available to any standing or interim Committee of the Legislature upon request of the Chairman of the respective Committee. The 1967 amendment specified the role of the Commission:

...to provide the Legislature with the background necessary to evaluate programs to preserve, develop and maintain the natural resources of this State. Under the mandate of the 1967 amendments, the Commission functioned to:

- 1) undertake, on behalf of the Legislature between regular sessions, in-depth studies in a number of specific areas.
- 2) provide the standing Committees of both the House and the Senate with any data compiled by the Commission and, further, to respond to requests from the standing Committees for background information or evaluation of programs related to the broad spectrum of Minnesota's resources.
- 3) foster an accelerated program to develop and preserve Minnesota's natural and recreational resources.

From the start, the Commission has viewed its responsibility to identify and limit its recommendations for expenditure of natural resources funds to those programs not previously or adequately financed by other sources. This includes acquisition, development, special studies and planning. The natural resources program and funds are intended for land acquisition and facility development, special studies and planning. It was not the legislative intent that it be used to finance on-going programs. The objective and function was to provide new dollars to finance projects and programs not supported or adequately financed by other sources.

At the request of the Chairman of the Appropriations Committee, the Commission submits a listing of priority projects for possible financing from sources other than the 1¢ per pack cigarette tax authorized by the Omnibus Resources Act. The Commission funds were limited to those appropriated to it by the Legislature to cover the Commission costs of operations. The Commission was not an administrative agency and had no funds of its own for support, acquisition, development or management of resources. The Commission forwards to the House Appropriations Committee and the Senate Finance Committee its evaluation and recommendations for appropriations from/or natural resources funds for each ensuing biennium. Final determination of appropriations are made, however, by the Appropri-

ations and Finance Committees as part of the overall appropriations for State Departments' operations. Natural Resource funds are appropriated directly to the State agencies, the Governor, the University of Minnesota and other agencies charged by the Legislature with the responsibility of putting the programs recommended by the Commission into effect.

The Commission's accomplishments included: initiating the grants-in-aid to local units of government, acting as the catalyst to establish the State Planning Agency, and providing the funds for the establishing of a Bureau of Comprehensive Planning within the Minnesota Department of Conservation; supporting county and local units of government in planning for and acquiring and developing local and county recreational and natural resource facilities; leading to an acceleration which will guarantee that all Minnesota's land and water surfaces will be topographically mapped by 1973; providing the State and local units of government with dollars necessary for Federal grants-in-aid from a number of programs, most notably the Land and Water Conservation Fund, 701 planning funds and open space funds; obtaining proper recognition and financing for historic sites, archaeology, paleontology and natural areas as a vital resource to Minnesota and new laws to safeguard them; Fort Snelling had been a major restoration project of the Commission, involving the University of Minnesota in research into noxious aquatic vegetation control, the study and inventory of lakeshore lands, and vegetation management in State parks and recreation areas; assisting in the establishment of new State parks; providing funds for land acquisition within the hardwood forest; involving natural resources funds to support the acquisition and development of game and fish habitat, wildlife lands and wetlands; recommendations which have resulted in legislative appropriations from the natural resources fund to provide a contingency fund administered by the Legislative Advisory Commission to finance unexpected land acquisitions between regular sessions of the Legislature; recommendations to centralize natural and recreational resource land purchases in a single agency has been implemented under the jurisdiction of the Department of Administration's new land acquisition section; facilitating exchanges of land between State and Federal agencies in establishing Voyageurs National Park, a study of lakeshore lands including an inventory of available lakeshore property - by the University, and continued review of land exchanges by the Commission.

The Commission was composed of 7 Senators and 7 Representatives. The staff of the Commission was limited to one full-time secretarial employee, plus additional part-time secretarial help as needed, and one special projects coordinator. Professional services necessary for studies undertaken by the Commission were provided by the contract use of independent consultants for specific job assignments.

Chapter 790, Laws of 1963, provides, "The commission shall request each department or head of all State agencies with a direct interest and responsibility in any phase of outdoor recreation to appoint, and the latter shall appoint for his agency, a liaison officer who shall work closely with the commission and its staff." (Art. II, Sec. 3, Subd. 2) "The liaison officers designated as above shall constitute a fact finding group hereby designated as an advisory council...." Sec. 4, Subd. 1) and "The sole

and exclusive function of the advisory council shall be to advise the counsel the commission in the development of ways, means, and procedures...The advisory council shall not have policy making powers". (Art. II, Sec. 4, Subd. 2)

In addition to those specified as members of the Advisory Council by the law, the Commission broadened the membership to include the Chairman of each of the appropriate standing committees of the House and Senate to benefit not only from their knowledge but also to facilitate legislative familiarity of the activities, findings and recommendations of the Commission.

A summary of the appropriations made from the natural resources and other funds during the period 1963 through 1967 based on recommendations of the Commission is as follows:

<u>Program/Purpose</u>	<u>1963-67 Appropriation</u>
Parks	\$ 9,125,104
Grants-in-aid	3,224,000
Mapping	2,765,000
Wildlife land acquisition	1,275,000
Special Studies	1,064,460
Historic Sites	849,000
Tree Planting	800,000
Forest Roads	750,000
Spawning Land Acquisition	750,000
Minnesota Memorial Hardwood Forest	700,000
Contingency Funds	625,000
Administrative	595,246
Conservation Work Projects	500,000
MORRC	400,000
Spawning Land Development	350,000
Archaeology	167,500
Watershed, Soil & Water Conservation Projects	150,000
Wildlife Land Development	150,000
University of Minnesota	133,000
State Planning Agency	110,500
Forest Campgrounds	100,000
Interim Commissions	55,000
Promotion	25,000
Paleontology	14,000
Total	\$24,679,566
Natural Resources Funds	\$23,494,566

About 77 percent of the appropriations related to programs of the Department of Conservation and about 13.5 percent of the appropriations related to programs of the State Planning Agency. About 74 percent of the appropriations were for land acquisition and development associated with parks, forest, wildlife areas, spawning areas, campgrounds, public access and

recreational facilities. The largest single appropriation item outside land acquisition and development was for topographic, geological, mineral, forest and aerial mapping. Only about 4.8 percent of appropriations were for special studies.

The Commission had been able to devote little attention to such matters as water use and supplies; water quality and pollution control; flood damages and control; water-borne transportation; and land treatment, drainage and irrigation. The activities of the Commission have centered on recreation, fish and wildlife.

Comparison With Organizations in States Adjoining Minnesota

Most of the State organizations administering water and related land resources programs in Minnesota and adjoining States were plural-bodies Commissions, Boards, Councils and Committees. In general, the citizen members (averaging 7 in number) of the organizations were appointed by the Governor with the advice and consent of the Senate, and they served staggered or overlapping 4 to 6-year terms on a part-time per diem basis. The executive officers of most organizations were appointed by the organizations and not the Governor; Chairmen were elected by the members of the organizations.

Departments and other Divisions were under the direction and supervision of plural-bodied organizations. These administrative structural arrangements promote direct participation of citizens in water and related land resources government, and limit the Governor's control of State organizations.

The dominant water and related land resources oriented organizations in Minnesota, Iowa, South Dakota, North Dakota, Wisconsin and Michigan were: Department of Conservation, Natural Resources Council, Water Resources Commission, Water Commission, Natural Resources Board and Commission of Natural Resources, respectively. All States except Minnesota had plural-bodied dominant organizations. In General, power was concentrated to a much greater extent in the dominant organizations in South Dakota, North Dakota, Wisconsin and Michigan than it is in the Minnesota Department of Conservation.

The number of organizations participating in water and related land resources activities in the various States adjoining Minnesota was as follows:

State	Number of Organizations		
	Most Active State	Less Active State	Interstate
Minnesota	7	11	12
Iowa	6	10	5
South Dakota	6	10	9
North Dakota	7	10	4
Wisconsin	4	6	8
Michigan	3	5	3

It is apparent that Minnesota had a greater number of organizations than all other States. The large number of Interstate organizations in Minnesota largely resulted from the fact that parts of the State lie in 4 major river basins - Mississippi, Missouri, Red-Rainy, and Great Lakes. Michigan and Wisconsin, through recent reorganizations, have consolidated organizations to the greatest extent of all States. Even after reorganizations, there remains a large number of organizations (averaging 4 most active State and 5 less active State). Generally, health organizations, soil and water conservation organizations and Universities (Geological Surveys, etc.) remain unconsolidated. Because water and related land resources affect most sectors of State government in one way or the other, it is impossible to reduce the number of organizations to one. Power was dispersed among more organizations in Minnesota than it was in Michigan and Wisconsin.

The number of kinds of special-purpose districts participating in water and related land resources activities in the various States was as shown below:

State	Number of Kinds of Special-Purpose Districts
Minnesota	6
Iowa	5
South Dakota	6
North Dakota	6
Wisconsin	3
Michigan	5

Special-Purpose Districts, Counties, Townships, Municipalities and Courts

Water and related land resources constitutes a complex system which responds to the actions of man. Management is the process of controlling this system and includes the planning, development, and operation of water and related land resources projects and programs. Upstream activities determine the limits within which downstream activities may be carried out. Atmospheric, surface, and groundwaters are continuously interrelated in the hydrologic cycle. The quality of water is inseparably conditioned upon quantity, and quantity cannot be divorced from quality for purposes of any meaningful beneficial use. Actions taken in one river basin may affect the water situation in other basins, either directly by the physical transfer of water or indirectly through the allocation of economic resources or the stimulation of political concerns. No assessment of water and related land resources government is complete without some discussion of the institutional processes by or through which water and related land resources management functions.

There were 87 Counties, 91 Soil & Water Conservation Districts, 25 Watershed Districts and 4 Conservancy Districts besides several Lake Conservation Districts, Sanitary Districts, Port Authorities and District Courts involved in the planning, development and management of the State's water and related land resources. At the level of the local government, the County Boards of the various Counties and the District Courts are authorized to construct and maintain public drainage systems. A meandered lake may not be drained, except on the determination of the Commissioner of Conservation that such lake is not public waters. The County Boards or District Courts can construct and maintain all necessary structures and improvements for flood control and other public purposes related to flood control. The public water policy underlying the drainage legislation is the reclamation of land by the removal or management of surface water. Upon permission of the Commissioner of Conservation, the County Boards are given the power to maintain and improve and operate water control works for any body or any part of a body of water which is situated in a single County for the following reasons: to improve navigation thereon and to promote the public health, safety and welfare. The County Board is given the power to acquire by gift, purchase or condemnation, any existing dam or control works that may affect the level of such waters. The County Board is also given the power to acquire other land and property needed for the purpose of improving any body of water.

As to any body of water lying within a City, Village or Borough in the State, such municipality is given the same powers to improve the waters as are conferred on the County Boards. The Legislature has provided that there will be no improvements either by County Boards or by municipalities unless the public has access to some portion of the shore of such waters. In addition to the general powers granted to all County Boards, certain counties are given the additional power to determine and award damages to property affected by such improvements and to determine and assess special assessments against property affected thereby for benefits resulting in any way from such improvement.

The District Courts of any County are empowered to establish a Drainage and Conservancy District, upon the filing of a petition complying with the statutory requisites. Such Drainage and Conservancy Districts may be entirely within or partly within and partly without any County and include the whole or any part of one or more Counties. Such district may be for any or all of the following purposes: for the regulation of streams, channels, and watercourses, and the flow of water therein; for reclaiming or otherwise protecting land subject to overflow; for irrigation; for the prevention of forest fires; for regulation and control of flood waters and the prevention of floods; for diverting streams or watercourses and regulating their use; and regulating the use of streams, ditches, or watercourses for sanitation and public health. The district is governed by a Board. The plans for the district as a whole, or for any subdivision, are approved by the Commissioner of Conservation. The Board is also given the power to employ a chief engineer and an attorney. The rights enjoyed by landowners to use the waters of the district for any purpose continue as they existed at the time of the organization of the district. When improvements made by the district make possible a greater, better or more convenient use of or benefit from the waters of the district for any purpose, the right to such greater, better or more convenient use of or benefit from such waters is considered the property of the drainage and conservancy district, and such rights may be leased or assigned for reasonable compensation to the district. All parties desiring to use such waters or watercourses, not landowners upon the organization of the district, may make application to the board of directors for lease or for permission for such use, preferences given first to domestic and municipal water supplies. Districts are not allowed to charge for use of water taken by private persons for home and farm use or for watering stock. The Drainage and Conservancy Act of Minnesota has not been used to any great extent, and the few districts organized some 40 years ago have been abandoned or reorganized as Watershed Districts.

In order to carry out conservation of natural resources of the State through land utilization and flood control upon sound, scientific principles, a public corporation known as a Watershed District may be established for the protection of the public health and welfare and for the provident use of the natural resources. A Watershed District is established by the filing of a nominating petition with the Water Resources Board. The nominating petition is required to set forth the name of the proposed district, the necessity for the district, a statement setting forth the purpose of the contemplated improvements, and the territory to be included in the district. After the Watershed District is established and the first Board of Managers qualified, the Managers are required to adopt an overall plan for all of the purposes for which a district may be established. A copy of such plan is transmitted to the county auditor of each County affected, the Secretary of the Water Resources Board, the Commissioner of Conservation, the

Director of the Division of Waters, Soils and Minerals, and the governing bodies of all municipalities and Soil and Water Conservation Districts within the area, which parties may make comments and recommendations. Following a public hearing, an order is issued by the Water Resources Board describing an overall water management plan for the district. The Managers of a watershed district, when directed by the District Court or County Board, take over any judicial or County drainage system within its district.

Upon application to the Commissioner of Conservation, an owner of land within the State suitable for the growing of crops requiring irrigation may construct upon his lands and across any public ditch, drain, or watercourse within the boundaries of his land, dams, dikes, or other controlling works necessary to use the water for irrigation. It is specifically provided by Minnesota statutes that if at any time it appears that the structures authorized for irrigation cannot be maintained without impairing the utility of a public drain or watercourse nor without depriving the other landowners of the benefit thereof, upon demand of the owner or owners of such other land, the license secured from the State will be immediately revoked.

Minnesota statutes provide for the creation of a Sanitary District for the purpose of promoting the public health and welfare by providing for an adequate and efficient system and means of collecting, conveying, pumping, treating, and disposing of domestic sewage and garbage and industrial waste within the district in any case where the Pollution Control Agency finds there is need, and that such purposes cannot be accomplished by any existing agency. No Sanitary District may be created within 25 miles of the boundary of any city of first class without the approval of the governing body of such city and the approval of the governing body of every municipality in the proposed district. Specifically, such district may: construct and maintain facilities within or without the district required to control and prevent pollution of waters within its territory; construct and maintain facilities within or without the district to provide for disposal of sewage, industrial and other waste originating within its territory. The district has the power to require any person upon whose premises there is a source of sewage, industrial and other waste, to connect the same with its disposal facilities; construct and maintain facilities within or without the district to provide for the disposal of garbage or refuse originating within the district, and may require any person upon whose premises garbage is produced to dispose of the same through its system; and procure supplies of water so far as necessary to accomplish any of its purposes.

The policy of the State, as articulated by the Legislature, is as follows: it is hereby declared that it is for the public welfare, health, and safety of the people of Minnesota to provide for the conservation of the soil erosion, for land resource planning and development, and for flood prevention or the conservation development, utilization, and disposal of water, including but not limited to, measures for fish and wildlife, and recreational development, and thereby preserve natural resources, control floods, prevent impairment of dams and reservoirs, assist in maintaining the navigability of rivers and harbors, preserve wildlife, protect the tax base, and protect public lands by land-use practices. To effect these policies, a State Soil and Water Conservation Commission was established, and provision was made for the establishment of Soil and Water Conservation Districts, which districts become governmental subdivisions of the State, vested with extensive powers over all phases of soil and water conservation.

Chartered Cities having populations of not less than 4,000 nor more than 50,000 are empowered to acquire land for passenger or freight transportation terminals by purchase or condemnation. Such Cities are also empowered to construct and maintain docks, wharves and other transportation facilities and to charge a reasonable price for their use.

A Port Authority may be established to serve any city of over 50,000 inhabitants situated upon a port or harbor located on a navigable lake or stream. Port Authorities located upon the Great Lakes - St. Lawrence Seaway system are known as Seaway Port Authorities. Generally, Port Authorities are charged with the duties of promoting the general welfare of the port district, endeavoring to increase its volume of commerce, provision of adequate facilities, and the promotion of efficient, safe, and economic handling of commerce. Cities of the first class have the right and power to condemn lands to harbors, wharves, boat landings, and such canals and approaches thereto as may be required. Such cities are also authorized to establish and maintain public landings, wharves and docks, transfer railroad tracks, and loading, unloading, transfer and storage facilities. The cities may charge reasonable fees to maintain such facilities and regulate the manner of their use.

General powers delegated by the Legislature to cities and towns include authority to provide drainage systems, sewer systems and disposal plants and to require and regulate connection thereto and authority to establish, purchase, maintain and regulate the use of parks, playgrounds and recreational facilities. Other statutes grant specific power to cities and towns to establish water and sewer systems and flood control systems. Cities and towns may regulate use of land.

Water and related land resources management activities in the private sector exhibit considerable diversity in scope and purpose. They range from the drilling of a single well by a rural or suburban homeowner to provide a water supply for household needs to the installation of expensive ground and surface-water facilities - conveyance and treatment facilities to serve a large industrial complex; from the bulldozing of small farm ponds for livestock watering to the construction of a large dam for the generation of hydroelectric power and other purposes. Any activity in the private sector which alters or affects the surface of the land will also affect in some degree the land-water relationship, and such activities span the gamut of human enterprise. All construction activities, for example, influence seepage and runoff patterns to some extent. All agricultural operations, from the simple steps of clearing, cultivating, fertilizing, and harvesting, to the installation of elaborate irrigation and drainage systems, affect the quantity and quality of water withdrawn, consumed, and discharged.

International Organizations

Several International organizations are concerned with the water and related land resources in Minnesota. Included among these are: International Joint Commission, Great Lakes Study Group, Great Lakes Fishery Commission, Coordinating Committee on Great Lakes Basic Hydraulic and Hydrologic Data, and International St. Lawrence River Board of Control.

The International Joint Commission was formed to carry out the purposes of the Boundary Waters Treaty of 1909, which are:

.....to prevent disputes regarding the use of boundary waters and to settle all questions which are now pending between the United States and the Dominion of Canada...along their common frontier, and to make provision for the adjustment and settlement of all such questions as may hereafter arise.....

The Treaty gives the International Joint Commission responsibilities in several categories. The first of these responsibilities is to approve or disapprove all proposals for use, obstruction, or diversion of boundary waters on either side of the boundary which would affect the natural level or flow of the boundary waters on the other side. These proposals are brought before the Commission by what are termed "applications," filed by interested persons - either public agencies or private corporations or individuals. The second general responsibility of the Commission, which is becoming the major work of the Commission, is to investigate and make recommendations on specific problems referred to it by either or both governments. It is under this provision of the Treaty that requests, or "references", by the two governments have been made on such varied subjects as water pollution, air pollution, and regulation of the levels of the Great Lakes. A third category of Commission functions is authorized by the Treaty but has not been utilized to date. It would enable the two governments, with legislative consent, to agree to refer to the Commission a question for a decision which would be binding on the governments. A fourth area of Commission activity has arisen out of the exercise of its other functions. This is the continuing supervision of the works it has approved under its delegated powers and the surveillance of action resulting from its recommendations e.g., on pollution.

The Great Lakes Study Group is an informal International organization including representative of Canadian and United States agencies and institutions engaged in basic and applied research and engineering investigations related to the development and utilization of Great Lakes water resources. The Group was formed October 1962 as the Lake Erie Study Group and was later renamed the Great Lakes Study Group in recognition of the members' interests in all the Great Lakes. The primary purpose of this Group is to facilitate the exchange of information and to provide informal coordination among the various research activities relating to the lakes and their basins. The Group provides a forum for assisting and coordinating and eliminating duplication. It also sponsors a data repository for the acquisition, storage, retrieval, and dissemination of basic data. This responsibility is performed by the Great Lakes Regional Data Center of the U.S. Lake Survey, Corps of Engineers, U.S. Army.

The Great Lakes Fishery Commission is an International organization established by the Convention on Great Lakes Fisheries which was ratified by Canada and the United States in 1955. The Commission has the following responsibilities: to formulate a research program or programs designed to determine the need for measures to make possible the maximum sustained productivity of any stock of fish in the Convention area which, in the opinion of the Commission, is of common concern to the fisheries of the United States of America and Canada and to determine what measures are best adapted for such purpose; to coordinate research made pursuant to such programs, and, if necessary, to undertake such research itself; to recommend appropriate measures to the contracting parties on the basis of the findings of such research programs; to formulate and implement a comprehensive program for the purpose of eradicating or minimizing the sea lamprey populations in the Convention area; and to publish or authorize the publication of scientific and other information obtained by the commission in the performance of its duties.

The Coordinating Committee on Great Lakes Basic Hydraulic and Hydrologic Data was established in 1953 in the interest of expediting the investigations of Great Lakes problems being carried on by Canada and the United States. The objective of the Committee is to determine, through joint studies by appropriate Canadian and United States government agencies, mutually acceptable values of basic hydraulic and hydrologic data for the Great Lakes System during the period of record and in the future. The Committee established four subcommittees, vertical control, lake levels, physical data, and river flow - with representation from both governments to carry on the studies.

The International St. Lawrence River Board of Control supervises the regulation of Lake Ontario, and consequently the St. Lawrence river, in accordance with the International Joint Commission's orders of approval dated October 29, 1952, and July 2, 1956. An operating committee consists of the Ontario Hydroelectric Power Commission, the Quebec Hydroelectric Power Commission, the Power Authority of the State of New York, the St. Lawrence Seaway Development Corporation and the Department of Transport of the Dominion of Canada. The Canadian Section has been oriented primarily toward basic research. The United States Section has involved University people but has been primarily interested in, and influenced by, Federal agencies.

Regional Organizations

Minnesota participates in the activities of several regional organizations which are concerned with water and related land resources. Included among these are: Upper Great Lakes Regional Commission, Northern Great Lakes Area Council, Great Lakes Task Force, Conference of Great Lakes Congressman, and St. Lawrence Seaway Development Corporation. In addition, Minnesota has been requested to become a member of two midwest environmental groups: Midwest Nuclear Compact and Midwest Legislative Environmental Conference.

On August 25, 1965, Congress passed the Public Works and Economic Development Act of 1965. Section 503 of the Act outlines the program and planning responsibilities of the Upper Great Lakes Regional Commission as follows: to advise and assist the Secretary of Commerce in identification

of optimum boundaries for the Upper Great Lakes Economic Development Region; to initiate and coordinate the preparation of long-range overall economic development programs for the Upper Great Lakes Economic Development Region; to foster surveys and studies to provide data required for the preparation of specific plans and programs for the development of the Upper Great Lakes Economic Development Region; to advise and assist the Secretary of Commerce and the member States in the initiation and coordination of economic development districts. The objective is to promote maximum benefits from the expenditures of Federal, State and local funds; to promote increased private investment in the Upper Great Lakes Economic Development Region; to prepare legislative and other recommendations with respect to short-range and long-range programs and projects for Federal, State and local agencies; and to develop, on a continuing basis, comprehensive and coordinated plans and programs and establish priorities thereunder. Due consideration is given to other Federal and local planning in the Upper Great Lakes Economic Development Region. Other responsibilities are: to conduct and sponsor investigations, research and studies that include an inventory and analysis of the resources of the Upper Great Lakes Economic Development region; to sponsor demonstration projects designed to foster regional productivity and growth in cooperation with Federal, State and local agencies; to review and study Federal, State, and local public and private programs in cooperation with the agency involved; where appropriate, to recommend modifications or additions that will increase their effectiveness in the Upper Great Lakes Economic Development Region; to formulate and recommend, where appropriate, interstate compacts and other forms of interstate cooperation. The Commission is also working with Federal, State and local agencies in developing appropriate model legislation; providing a forum for consideration of problems of the Upper Great Lakes Economic Development Region; proposing solutions and establishing and utilizing, as appropriate, citizens and special advisory councils and public conferences; and making additional recommendations from time to time to the Secretary of Commerce and to the State Governors and appropriate local officials, with respect to: the expenditure of funds by Federal, State and local departments and agencies in the Upper Great Lakes Economic Development Region in the fields of natural resources, agriculture, education, training, health and welfare, transportation and other fields related to the purposes of the Public Works and Economic Development Act of 1965; such additional Federal, State and local legislation or administrative actions as the Commission deems necessary to further the purposes of the Public Works and Economic Development Act of 1965.

The Northern Great Lakes Area Council, a regional and international tourist organization, was formed in 1945 at a conference on Mackinac Island, Michigan. The Council objectives are: to encourage conservation and develop tourist and recreational resources of the Northern Great Lakes area; to advertise the area's recreational and health-giving facilities; to recommend expansion and improvement of air, rail, boat and highway transportation facilities; and to encourage uniform regulation of natural resources.

The Great Lakes Task Force was established pursuant to a request by the conference of Great Lakes Senators that "the port and shipping interests on the Lakes coordinate and join together in presenting their views on Great Lakes shipping matters." The purpose of the Task Force are: to encourage the orderly regional development of the Great Lakes region and

to foster and promote a quality environment for the region. The Task Force seeks out items or positions on which all component organizations can agree (not oppose), and presents views and recommendations as a unified body.

The Conference of Great Lakes Congressmen coordinates its activity with the Great Lakes Task Force and political, regional and business officials in the overall development and conservation of the Great Lakes region. As does the Conference of Great Lakes Senators, the Conference of Great Lakes Congressmen coordinates action in regard to the passage of bills that have an effect in the Great Lakes region.

The St. Lawrence Seaway Development Corporation was established by Congress to construct, maintain, operate and promote the United States portion of the navigation facility on the St. Lawrence river providing ocean access to Great Lakes deep-draft shipping. Included among the Seaway Corporation's goals are the: promotion of greater use and development of ports along the Great Lakes; development of the intermodal transportation aspects of commerce within the Great Lakes basin; increased use of the seaway by United States and foreign interests; implementation of the President's export program; implementation of the administration's merchant marine program; and development of a greater civic and industrial interest in the seaway. To achieve these goals the Corporation has considerable latitude in coordinating efforts of various echelons of navigation and transportation interests.

Interstate Compacts and Commissions

Minnesota has entered into four Interstate Compacts involving the creation of four Interstate Commissions which are concerned with water and related land resources planning, development and management in the State. These Commissions are: Great Lakes Commission, Minnesota-Wisconsin Boundary Area Commission, South Dakota-Minnesota Boundary Waters Commission and Tri-State Waters Commission. Current meetings are underway to consider the creation of the Great Lakes Management Compact.

Through their Legislatures, the States of Illinois, Indiana, Michigan, Minnesota and Wisconsin ratified the Great Lakes Compact in 1955. Subsequently, similar action was taken by Pennsylvania (1956), New York (1960), and Ohio (1963). In ratifying the Compact, the States designated the Great Lakes Commission as their joint research and advisory agency on Great Lakes water resources development, programs and problems. The purposes of the Compact are, through means of joint or cooperative action: to promote the orderly, integrated, and comprehensive development, use and conservation of the water resources of the Great Lakes basin; to plan for the welfare and development of the water resources of the basin as a whole as well as for those portions of the basin which may have problems of special concerns; to make it possible for the States of the basin and their people to derive the maximum benefit from utilization of public works, in the form of navigational aids or otherwise, which may exist or which may be constructed from time to time; to advise in securing and maintaining a proper balance among industrial, commercial, agricultural, water supply, residential, recreational, and other legitimate uses of water resources of the basin; and to establish and maintain an intergovernmental agency to

the end that the purpose of the Compact may be accomplished more effectively. Each party State agrees to consider the action the Commission recommends in respect to: stabilization of lake levels; measures for combating pollution, beach erosion, floods, and shore inundation; uniformity in navigation regulations within the constitutional powers of the States; proposed navigation aids and improvements; uniformity or effective coordinating action in fishing laws and regulations and cooperative action to eradicate destructive and parasitical forces endangering the fisheries, wildlife and other water resources; suitable hydroelectric power developments; cooperative programs for control of soil and bank erosion for the general improvement of the basin; and diversion of waters from and into the basin.

A Minnesota-Wisconsin Boundary Compact was ratified, enacted into law and entered into with the State of Wisconsin by the 1965 Minnesota legislature. An Interstate Commission to be known as the Minnesota-Wisconsin Boundary Area Commission was created as part of the Compact. The first meeting of the Commission was held in January 1966. The Commission was created largely as the result of interstate controversy surrounding the construction of the Northern States Power Company's Allen S. King generating plant at Oak Park Heights, Minnesota on lake St. Croix. The purpose of the Compact was the present and future protection, use and development in the public interest, of the lands, river valleys, and waters comprising the common boundaries of Minnesota and Wisconsin. Through the Compact, Minnesota and Wisconsin agreed: to consider, and to promote the consideration by its municipalities of, the recommendations of the Commission with respect to: joint regional planning for the development of boundary areas; measures for controlling air and water pollution, maintaining water quality, and controlling water use; programs for control of soil and river bank erosion and the general improvement of the river basins; diversion of waters from and into the rivers; restrictions and regulation of land use development designed to preserve the scenic and recreational attributes of the river basins; and other restrictions, regulations or programs.

The 1939 Legislature created an Interstate Commission known as the South Dakota-Minnesota Boundary Waters Commission, which consists of the Director of the Game and Fish Commission of South Dakota and the Commissioner of Conservation of Minnesota, or their legal successors, and an engineer appointed by the mutual consent of the Governors of South Dakota and Minnesota. The Commission has the power and authority: to investigate and determine the most desirable and beneficial levels of boundary waters artificially controlled and to prescribe a plan for controlling and regulating said levels; to prescribe and promulgate rules and procedure for the conduct of its investigations, surveys, and hearings; to make such orders as may be necessary to further the purposes of the law; and to hold hearings and take such evidence as may be presented, either after complaint or upon its own initiative, as to the desirability of any water level and plan of regulation, and to make such orders concerning the same as in its opinion are for the best interests of the public. Hearings are held at such time and place as may be designated by the Commission, in either State, in any county affected by the subject matter. The Commission can not incur any obligation for expenses except after an adequate legislative appropriation. The Commission may upon verified petition apply to the district court or the circuit court in either State, as the case may be, in any county affected by the subject matter, for an injunction restraining the violation

of any order, notice, rule or regulation made by it pursuant to the provisions of the law.

The Tri-State Waters Commission was created in 1937 in connection with an Interstate Compact ratified by Minnesota, North Dakota and South Dakota. The Compact was repealed by Act of the 1971 Legislature. It was the duty of the Commission to maintain and control lake levels and stream flow on boundary waters, but such action was to be taken only with the approval of the authorized county or State agencies, in which such lake or stream is located, but the Commission had no power or jurisdiction over water levels or stream flow in the Otter Tail river. The Commission had power to cooperate with any duly authorized Federal, State, or municipal agency in studies and surveys, construction, maintenance, and operation of water projects within the scope of its jurisdiction. The Commission was authorized to exercise the power of eminent domain, to acquire such real and personal property as may be reasonably necessary or appropriate for or incidental to the effectuation of its authorized purposes, and generally to exercise in connection with its property and affairs and in connection with property within its control any and all powers which may be exercised by a private corporation in connection with similar property and affairs.

Federal-State Organizations

In the last two decades, the water and related land resources planning programs of Federal agencies have expanded greatly and new Federal agencies have been brought into the planning field. Institutional arrangements for coordinating Federal planning efforts with the planning activities of the State, local and private organizations have improved. Federal-State planning organizations are conducting, or will be conducting, studies whose geographic major river basin and sub-river basin areas will essentially blanket the Nation. There are four Federal-State planning organizations concerned with water and related land resources planning, development and management in Minnesota. They are: Souris-Red-Rainy River Basins Commission, Great Lakes Basin Commission, Upper Mississippi River Comprehensive Basin Study Coordinating Committee and Missouri Basin Inter-Agency Committee.

The Federal Water Resources Council by resolution adopted December 28, 1966 concurred in the requests for the establishment of the Souris-Red-Rainy River Basins Commission of the Governors of the States of Minnesota and North Dakota to which the Governor of South Dakota had given his concurrence. Under the provisions of the Federal Water Resources Planning Act of 1965, the Commission is directed to prepare and keep up-to-date a comprehensive, coordinated joint plan for Federal, State, interstate, local and nongovernmental development of water and related resources. The comprehensive river basin plan was to be submitted on or before June 30, 1972. Federal funds (about \$1.4 million) were available for the preparation of a framework plan during fiscal years 1968, 1969 and 1970. The framework plan was originally scheduled for completion by June 30, 1970 and it was later scheduled for completion by June 30, 1972. A type 2 plan for the Red river basin excluding the Devils lake, Pembina and Roseau river basins was initiated in fiscal year 1971 and is scheduled for completion by January 1, 1972.

The Federal Water Resources Council by resolution adopted March 7, 1966 concurred in the requests for the establishment of the Great Lakes Basin Commission of the Governors of the States of Indiana, Michigan, Minnesota, Ohio and Wisconsin to which the Governors of Illinois, New York, and Pennsylvania had given their concurrence. Under the provisions of the Federal Water Resources Planning Act of 1965, the Great Lakes Basin Commission is directed to prepare and keep up-to-date a comprehensive-coordinated joint plan for Federal, State, interstate, local and nongovernmental development of water and related resources. The comprehensive river basin plan was to be submitted on or before June 30, 1973. Federal funds (about \$2.4 million) were to be available for a framework plan. This plan was to be completed by June 30, 1971. The framework plan has been rescheduled for completion during fiscal year 1972. Other activities of the Commission are: publication of the report "Long-Range Schedules of Priorities for Water and Related Land Resources Programs," this represents the first attempt to list and evaluate the priority of current and proposed Federal and State programs impacting on the Great Lakes basin water resources; securing funding of a study to determine the feasibility of applying limnological systems analysis techniques to planning for management of the water and related land resources of the Great Lakes basin; and coordination of numerous related water planning activities.

The Upper Mississippi River Comprehensive Basin Study, to develop a framework plan was authorized by a resolution of the U.S. Senate Committee of Public Works in May 1962. The Resolution directed the Army Corps of Engineers to review previous reports on the upper Mississippi river basin in the interest of comprehensive development of water and related land resources of the basin. The Army Corps of Engineers interpreted this congressional mandate to mean that a coordinated comprehensive study of the basin area should be carried out. It was felt that the cooperative efforts of Federal agencies, States, local public agencies, and private interests in the upper Mississippi basin should be invited. Actual start of the study began in fiscal year 1963. The study was originally scheduled for completion in December 1968; the framework plan was nearing completion in 1972.

The Missouri Basin Inter-Agency Committee, composed of the Governors of the ten States that lie partly or entirely within the Missouri river basin, and the seven Federal agencies actively involved in water and related land resource development, has a primary mission of coordination and programming of State and Federal activities in water and related resource development projects. In mid-1964, Federal agencies and States started a framework plan for the Missouri river basin area leading to a report scheduled for completion by June 30, 1969. A Federal cost of about \$5.5 million is estimated for the preparation of the plan which was nearing completion in 1972.

Four types of plans that have been used frequently in the literature of comprehensive river basin planning are the following:

Framework Plan (Type 1). A framework plan provides long-term projections of population growth and economic development; translation of such projections into demands for water and related land resource uses; hydrologic projections of water availability both as to quantity and quality and projections of related land resource availability; outline of the characteristics of projected water and related land resource problems and the

general approaches that appear appropriate for their solution. While potential sites may be identified, project formulation studies are not included in the framework plans. The framework plan provides general guides to future water resource development. The plan indicates which areas have water problems calling for prompt detailed planning efforts as well as those where no such problems are current or projected. In addition, the plan provides a substantial contribution of fact and analyses to subsequent detailed plan formulation. Normally, the framework plan is the first phase of the comprehensive plan to be prepared by river basin commissions established under the Water Resources Planning Act.

Comprehensive River Basin Plans (Type 2). Comprehensive river basin plans extend the scope beyond the type 1 plan to define and evaluate projects in sufficient detail, including project formulation, to comprise a basis for authorization of those Federal and Federally assisted projects to be initiated in the next 10 to 15 years.

Project or Single-Purpose Plans (Type 3). These are plans of narrower geographic compass or by a single agency that usually relate to one project or purpose or a proposal for preservation or improvement of water and related land resources. The studies indicate the relationship of the proposed programs and projects to the comprehensive plan for the river basin, if no comprehensive plan has completed, the relationship to probable later development needed or to be undertaken in the basin.

Cooperative Plans (Type 4). These plans are State-sponsored studies of water resources for all or a part of a State in which one or more Federal agencies are participating.

Framework plans involving Minnesota are being prepared by the Souris-Red-Rainy River Basins Commission, Great Lakes Basin Commission, Upper Mississippi River Comprehensive Study Coordinating Committee and Missouri Basin Inter-Agency Committee. A type 2 plan is being prepared by the Souris-Red-Rainy River Basins Commission. A type 4 river basin plan was prepared for the Big Sioux river basin which involves parts of Minnesota, South Dakota and Iowa. This plan was sponsored by the State Soil and Water Conservation Commissions in the three States as well as the East Dakota Conservancy Subdistrict and the South Dakota Water Resource Commission. The Soil Conservation Service, Economic Research Service, and the Forest Service, agencies of the Federal Department of Agriculture, cooperated with the sponsors in this type 4 planning effort. The Minnesota Soil and Water Conservation Commission is working with Federal Department of Agriculture on a type 4 plan for the southern Minnesota rivers basin in Minnesota.

Comparison of Federal-State and Interstate-Federal Organizations

The Great Lakes Commission in 1971 was considering the merits of a Great Lakes Basin Interstate-Federal Compact and Commission. Among the factors under consideration was a comparison of Federal-State and Interstate-Federal organizations; in other words, the differences between the Great Lakes Basin Commission operating in 1971 under the provisions of the Federal Water Resources Planning Act of 1965 and a Commission similar to the Delaware River Basin Commission operating under the provisions of an Interstate-Federal compact. Some facts concerning Federal-State and Interstate-Federal organizations are summarized below.

The reason most commonly expressed for the need for Federal-State and Interstate-Federal organizations is that unified regional development and control of water and related land resources is necessary because of the duplicating, overlapping, and uncoordinated administration by State agencies, Federal agencies, interstate agencies, regional agencies, and local agencies which exercise a multiplicity of powers and duties resulting in a splintering of authorities and responsibilities. Perhaps the most pressing controversy surrounding the present efforts to create Federal-State and Interstate-Federal organizations is concerned with various agencies "squatters rights" claims to particular jurisdictional areas of water and related land resources management.

According to the Federal Water Resources Planning Act of 1965, the President is authorized to declare the establishment of a river basin water and related land resources Commission (Federal-State Organization) upon request therefor by the Federal Water Resources Council, or request addressed to the Council by a State within which all or part of the basin or basins concerned are located if the request by the Council or by a State defines the area, river basin, or group of related river basins for which a Commission is requested, is made in writing by the Governor or in such manner as State law may provide, or by the Council, and is concurred in writing in by the Council and by not less than one-half of the States within which portions of the basin or basins concerned are located.

Each Commission for an area, river basin, or group of river basins: serves as the principal agency for the coordination of Federal, State, interstate, local and nongovernmental plans for the development of water and related land resources in its area, river basin, or group of river basins; prepares and keeps up to date, to the extent practicable, a comprehensive, coordinated, joint plan for Federal, State, interstate, local and nongovernmental development of water and related resources: provided, that the plan includes an evaluation of all reasonable alternative means of achieving optimum development of water and related land resources of the basin or basins, and it may be prepared in stages, including recommendations with respect to individual projects; recommends long-range schedules of priorities for the collection and analysis of basic data and for investigation, planning, and construction of projects; and fosters and undertakes such studies of water and related land resources problems in its area, river basin, or group of river basins as are necessary in the preparation of the plan.

Thus, Federal-State organizations, such as the Great Lakes Basin Commission, are essentially planning organizations. The duties of a Commission are to: submit to the Water Resources Council and the Governor of each participating State a report on its work at least once a year, copies of any such report is sent to the heads of such Federal, State, interstate, and international agencies as the President or the Governors of the participating States may direct; submit to the Water Resources Council for transmission to the President and by him to the Congress, and the Governors and the legislators of the participating States a comprehensive, coordinated, joint plan, or any major portion thereof or necessary revisions thereof, for water and related land resources development in the area, river basin, or group of river basins for

which such Commission was established. Before the Commission submits such a plan or major portion thereof or revision thereof to the Council, it transmits the proposed plan or revision to the head of each Federal department or agency, the Governor of each State, and each interstate agency, from which a member of the Commission has been appointed, and to the head of the United States section of any international Commission if the plan, portion or revision deals with a boundary water or a river crossing a boundary, or any tributary flowing into such boundary water or river, over which the international Commission has jurisdiction or for which it has responsibility. Each such department and agency head, Governor, interstate agency, and United States section of an international commission has ninety days from the date of the receipt of the proposed plan, portion, or revision to report its views, comments, and recommendations to the Commission. The Commission may modify the plan, after considering the reports so submitted. The views, comments, and recommendations submitted by each Federal department or agency head, Governor, interstate agency, and United States section of an international commission are transmitted to the Council with the plan. Recommendations the Commission may have for continuing the functions of the Commission and for implementing the plan, including means of keeping the plan up-to-date, are submitted to the Water Resources Council.

Each river basin Commission is composed of members appointed as follows: A chairman appointed by the President who also serves as chairman and coordinating officer of the Federal members of the Commission and who represents the Federal Government in Federal-State relations on the Commission and who during the period of his service on the Commission, does not hold any other position as an officer or employee of the United States, except as a retired officer or retired civilian employee of the Federal Government; One member from each Federal department or independent agency determined by the President to have a substantial interest in the work to be undertaken by the Commission, such member is appointed by the head of such department of independent agency and to serve as the representative of such department or independent agency; One member from each State which lies wholly or partially within the area, river basin, or group of river basins for which the Commission is established, and the appointment of each such member is made in accordance with the laws of the State which he represents. In the absence of governing provisions of State law, such State members is appointed and serves at the pleasure of the Governor; One member appointed by any interstate agency created by an interstate compact to which the consent of Congress has been given, and whose jurisdiction extends to the waters of the area, river basin, or group of river basins for which the river basin Commission is created; When deemed appropriate by the President, one member, who shall be appointed by the President, from the United States section of any international Commission created by a treaty to which the consent of the Senate has been given, and whose jurisdiction extends to the waters of the area, river basin, or group of river basins for which the river basin Commission is established.

State members of each Commission elect a vice chairman, who serves also as chairman and coordinating officer of the State members of the Commission and who represents the State governments in Federal-State relations on the Commission. In the work of the Commission every reasonable endeavor is made to arrive at a consensus of all members on all issues; but failing this,

full opportunity is afforded each member for the presentation and report of individual views: Provided, that at any time the Commission fails to act by reason of absence of consensus, the position of the chairman, acting in behalf of the Federal members and the vice chairman, acting upon instructions of the State members, is set forth in the record: Provided further, that the chairman, in consultation with the vice chairman, has the final authority, in the absence of an applicable bylaw adopted by the Commission or in the absence of a consensus, to fix the times and places for meetings, to set deadlines for the submission of annual and other reports, to establish subcommittees, and to decide such other procedural questions as may be necessary for the Commission to perform its functions.

Thus, the chairman of a Federal-State organization, such as the Great Lakes Basin Commission, represents the Federal government and he reports to the President through the Water Resources Council. A fear has been expressed that the Water Resources Council decision-making process may too often equate "national interest" with "Federal interest" with "Federal agency interest."

Each Commission recommends what share of its expenses shall be borne by the Federal Government, but such share is subject to approval by the Water Resources Council. The remainder of the Commission's expenses is otherwise apportioned as the Commission may determine. Each Commission prepares a budget annually and transmits it to the Council and the States.

Federal-State organizations operate under the provisions of the Water Resources Planning Act of 1965, whereas, Interstate-Federal organizations operate under the provisions of a Compact resulting from the enactment of concurrent legislation by Congress and by the State Legislatures involved. Commissions, such as the Delaware River Basin Commission, are created as a body politic and corporate, with succession for the duration of a Compact, as an agency and instrumentality of State and Federal governments.

The duration of a compact is for an initial period of 100 years from its effective date, and it is continued for additional periods of 100 years if not later than 20 years nor sooner than 25 years prior to the determination of the initial period or any succeeding period none of the signatory States, by authority of an act of its Legislature, notifies a Commission of intention to terminate the Compact at the end of the then current 100 year period.

A Commission develops and effectuates plans, policies and projects relating to the water resources of a basin. It adopts and promotes uniform and coordinated policies for water conservation, control, use and management in a basin. It encourages the planning, development and financing of water resources projects according to such plans and policies.

Thus, Interstate-Federal organizations, such as the Delaware River Basin Commission, in contrast to Federal-State organizations, such as the Great Lakes Basin Commission, are not limited to planning activities but also implement plans. The Delaware River Basin Commission may: Plan, design, acquire, construct, reconstruct, complete, own, improve, extend, develop, operate and maintain any and all projects, facilities, properties, activities and services, determined by the Commission to be necessary, con-

venient or useful for the purposes of the Compact; Establish standards of planning, design and operation of all projects and facilities in the basin which affect its water resources, including without limitation thereto water and waste treatment plants, stream and lake recreational facilities, trunk mains for water distribution, local flood protection works, small watershed management programs, and ground water recharging operations; Conduct and sponsor research on water resources, their planning, use, conservation, management, development, control and protection, and the capacity, adaptability and best utility of each facility thereof, and collect, compile, correlate, analyze, report and interpret data on water resources and uses in the basin, including without limitation thereto the relation of water to other resources, industrial water technology, ground water movement, relation between water price and water demand, and general hydrological conditions; Compile and coordinate systematic stream stage and ground water level forecasting data, and publicize such information when and as needed for water uses, flood warning, quality maintenance or other purposes; Conduct such special ground water investigations tests, and operations and compile such data relating thereto as may be required to formulate and administer a comprehensive plan; Prepare, publish and disseminate information and reports with respect to the water problems of the basin and for the presentation of the needs, resources and policies of the basin to executive and legislative branches of the signatory parties; and Negotiate for such loans, grants, services or other aids as may be lawfully available from public or private sources to finance or assist in effectuating any of the purposes of the compact; and to receive and accept such aid upon such terms and conditions, and subject to such provisions for repayment as may be required by Federal or State law or as the Commission may deem necessary or desirable.

A Commission consists of the Governors of the signatory States, ex officio, and one Commissioner appointed by the President of the United States to serve during the term of office of the President. Each member of the Commission appoints an alternate to act in his place and stead, with authority to attend all meetings of the Commission, and with power to vote in the absence of the member. Unless otherwise provided by law of the signatory party for which he is appointed, each alternate serves during the term of the member appointing him, subject to removal at the pleasure of the member. In the event of a vacancy in the office of alternate, it is filled in the same manner as an original appointment for the unexpired term only. Each member is entitled to one vote on all matters which may come before the Commission. No action of the Commission is taken at any meeting unless a majority of membership votes in favor thereof. A Commission provides for its own organization and procedure, and adopts rules and regulations governing its meetings and transactions. It organizes annually by the election of a chairman and vice-chairman from among its members. It provides by its rules for the appointment by each member in his discretion of an advisor to serve without compensation, who may attend all meetings of the Commission and its committees.

From a State point of view, Commissions created to carry out Interstate-Federal Water Compact's objectives, with membership comprised of the Governors of the signatory States and one Commissioner appointed by the President, favor States' control of Compact activities. Supervision of the Federal Commissioner is the responsibility of the Office of Management and Budget and not the Water Resources Council. Theoretically, the Federal Commissioner is free to vote as he deems appropriate, subject to Presidential control, even if his views differ from those of the affected Federal agencies in the basin.

Federal Executive Branch Agencies

Federal responsibilities in water and related land resources planning, development and management in Minnesota are divided among 30 units in 8 Executive Departments and Agencies: 6 Independent Agencies; 6 units in the Executive Office of the President; 9 other Boards, Committees, Councils and Commissions; and 1 Quasi-Official Agency. A number of other agencies, such as the General Accounting Office, which has the responsibility for auditing the operations of Federal water resources agencies and therefore has a considerable group of experts having knowledge of Federal water resources activities have not been included in the compilation, because their responsibilities are dependent upon primary activities of other agencies. Likewise, other agencies such as the Military Departments and the General Services Administration, which engage in water resources activities such as water supply, pollution control, and power generation solely for their own installations, are omitted.

Federal Executive Branch agencies concerned with water and related land resources planning, development and management in Minnesota are: Executive Office of the President--Office of Management and Budget, Domestic Council, Office of Emergency Preparedness, Office of Science and Technology, National Council on Marine Resources and Engineering Development, Council on Environmental Quality; Executive Departments--Department of the Interior including: Office of Saline Water, Environmental Planning Staff, Office of Water Resources Research, United States Fish and Wildlife Service - Bureau of Sport Fisheries and Wildlife, National Park Service, Bureau of Mines, Geological Survey, Bureau of Land Management, Bureau of Indian Affairs, Bureau of Outdoor Recreation, Bureau of Reclamation; Department of Agriculture including: Farmers Home Administration, Forest Service, Soil Conservation Service, Economic Research Service, Agricultural Research Service, Cooperative State Research Service, Extension Service, Agricultural Stabilization and Conservation Service; Department of Commerce including: Office of Business Economics, Economic Development Administration, National Oceanic and Atmospheric Administration; Department of Defense - Army Corps of Engineers; Department of Health, Education and Welfare; Department of Housing and Urban Development; Department of Transportation including: Federal Highway Administration and Coast Guard; and Department of Justice; Independent agencies - Atomic Energy Commission, Federal Power Commission, Interstate Commerce Commission, National Science Foundation, Water Resources Council, Environmental Protection Agency; other Boards, Committees, Councils and Commissions--Citizen's Council for Environmental Quality; National Water Commission; Advisory Board on National Parks, Historic Sites, Buildings, and Monuments; Federal Advisory Council on Regional Economic Development; Federal Council for Science and Technology; Federal Radiation Council; Migratory Bird Commission; National Forest Reservation Commission; National Park Foundation; Presidents Science Advisory Committee; Quasi-Official Agency--National Academy of Engineering-National Research Council; and Twin Cities Federal Executive Board.

In fiscal year 1970, Federal outlays for water and related land resources activities in Minnesota totaled about \$75 million or 2.3 percent of total Federal outlays in Minnesota of approximately \$3.3 billion. About 1.2 percent of Federal outlays for water and related land resources activities in the entire Nation were made in Minnesota. Federal outlays generally means

obligations of government administered funds, except deposit funds. However, in some instances the data may represent costs or expenditures. Fiscal years 1967-1970 Federal outlays for water and related land resources programs in Minnesota subdivided by agency are:

Agency	Outlays (Millions of Dollars)			
	1967	1968	1969	1970
Department of the Interior	15.0	22.1	24.6	34.6
Department of Agriculture	24.2	25.2	21.7	20.9
Department of Commerce	4.1	2.5	2.7	2.8
Army Corps of Engineers	7.8	7.6	10.7	4.7
Department of Health, Education and Welfare	0.3	0.2	0.7	0.8
Department of Housing and Urban Development	3.8	9.3	3.9	8.3
Department of Transportation	1.6	1.8	1.9	2.5
Total	56.8	68.7	66.2	74.6

Total Federal outlays for water and related land resources programs in Minnesota increased from about \$57 million in fiscal year 1967 to \$75 million in fiscal year 1970. Most of the increase has occurred in water pollution control and fish and wildlife programs.

In fiscal year 1970, there were about 1,300 Federal employees residing in Minnesota with assignments pertaining to the planning, development and management of the water and related land resources. In fiscal year 1967, there were about 1,200 such Federal employees. The distribution of Federal employees according to Departments in fiscal year 1970 were approximately as follows: Department of Agriculture - 466, Army Corps of Engineers - 437, Department of the Interior - 289, Department of Commerce - 73, and others 35. In the Department of Agriculture the largest number of Federal employees were with the Soil Conservation Service, Forest Service and Agricultural Research Service, in that order. The largest number of Federal employees in the Department of Interior were with the Bureau of Sport Fisheries and Wildlife, Geological Survey, and others in that order. Most of the Federal employees in the Department of Commerce were with the National Weather Service. Most Federal employees were located in the Twin Cities and at Duluth.

Department of the Interior

Total Federal outlays in connection with the Department of the Interior water and related land resources activities in Minnesota varied approximately during fiscal years 1967-70 as shown below:

Fiscal Year	Federal Outlays (Millions of Dollars)
1967	15.0
1968	22.1
1969	24.6
1970	34.6

Fiscal Year 1970 program summaries for Departmental agencies are:

<u>Agency and Program</u>	<u>Federal Outlays</u> <u>(100,000 dollars)</u>
Bureau of Sport Fisheries and Wildlife	125.93
Management and Investigations of Resources	14.60
Construction	3.64
General Administration Expenses	3.79
Federal Aid in Wildlife Restoration	13.20
National Wildlife Refuge Fund	4.00
Migratory Bird Conservation Account	75.78
Federal Aid in Fish Restoration and Management	5.66
Contributed Fund	0.01
Sport Fish Production	2.79
Sport Fish Management	0.67
Wildlife Services	1.45
Anadromous Fish Management	0.34
Bureau of Mines	33.76
Conservation and Development of Mineral Resources	24.36
Health and Safety	3.85
Solid Waste Disposal	0.17
Consolidated Working Funds	3.00
Helium Fund	0.02
Contributed Funds	0.03
Mining Health and Safety Grants	0.03
Geological Survey	2.33
Mineral and Water Resources Investigations	6.98
and Topographic Mapping	6.98
Federal Water Pollution Control Administration	160.70
Water Supply and Water Pollution Control	19.18
Construction Grants for Waste Treatment	137.62
Building and Facilities	3.90
Bureau of Land Management	0.66
Management of Land and Resources	0.64
Construction and Maintenance	0.02
Bureau of Commercial Fisheries	0.98
Management and Investigations of Resources	0.18
Federal Aid for Commercial Fisheries	0.47
Promote and Develop Fishery Products	0.33
Bureau of Reclamation	0.33
Construction and Rehabilitation	0.33
Bureau of Outdoor Recreation	5.62
Outdoor Recreation Assistance	5.62
Office of Water Resources Research	2.30
Office of Saline Water	1.05
Department of the Interior - General	7.85
Forest Protection and Utilization, FS	0.32
General Investigations CE	0.43
Construction CE	1.10
Parks and Forests	1.49
Water Resources	3.76
Administration	0.75
Total	346.16

The program of the Department of the Interior's Bureau of Sport Fisheries and Wildlife in Minnesota is keyed both to the primary responsibilities of the Bureau for the management and preservation of migratory birds and to participation in a variety of State fish and wildlife management programs. Many Bureau operations pertain to Federal lands within the State and to programs of wildlife management of National significance. State conservation agencies, the Bureau of Sport Fisheries and Wildlife, and other Federal agencies engaged in natural resource management work closely to coordinate their efforts.

The National Park Service administers two areas in Minnesota--Pipestone National monument and Grand Portage National monument. For these areas, and the other units of the National Park System, the National Park Service has developed a long-range program to provide essential facilities and services for the visiting public. At the request of the State, the National Park Service made a study of the Kabetogama peninsula and the surrounding lands and water adjacent to the boundary between the United States and Canada. This study resulted in a proposal to establish Voyageurs National Park. A number of legislative proposals have been introduced and/or passed in Congress to preserve, for public use and enjoyment, the scenic St. Croix river in Minnesota-Wisconsin, including its principal tributary, the Namekagon river. The National Park Service established on January 1, 1971 a land acquisition office at Duluth. The office has responsibilities related to the following Federal park, riverway and lakeshores: Voyageurs National Park, St. Croix National Scenic Riverway, Apostle Island National Lakeshore, Indiana Dunes National Lakeshore, and Sleeping Bear Dunes National Lakeshore.

For more than four and a half decades, the Bureau of Mines has been contributing to the advancement of Minnesota's thriving mineral economy. Bureau research in mining and metallurgy develops improved methods for extracting and processing a variety of ores and other mineral-bearing substances. Bureau evaluations of the State's mineral resources help provide a sound and knowledgeable basis for their conservation and development. Bureau health and safety programs are a source of constant assistance in minimizing hazards in the mineral industries. The Bureau's activities in Minnesota are carried on in close cooperation with State officials and with all segments of industry. These activities are centered at a modern research installation in the Minneapolis-St. Paul area and at a health and safety field office in Duluth that serves the six-State area of Minnesota, North and South Dakota, Nebraska, Wisconsin and Michigan. The Bureau's Twin Cities Research Center is one of the best equipped installations in the world for scientific investigations in mining and metallurgy.

The U.S. Geological Survey, St. Paul district, in cooperation with State and local agencies, is responsible for appraisal of the quantity and quality of the State's water resources, for interpretive studies pertaining to existing or potential water problems, and for research in the field of hydrology and related sciences. As a Federal agency concerned with water, the Survey's role is unique; it provides the main bulk of data on which practically all development and management activities related to water are based. The Survey is also unique in the extent to which it shares with State and local water agencies the responsibility for planning and financing water resources investigations. The data network maintained by the Survey in cooperation with State and local agencies is the chief source of basic water data in the State.

In Minnesota the Bureau of Land Management has administrative jurisdiction over approximately 41,000 acres of public lands in 22 counties. About 97 percent is in Koochiching, Lake of the Woods and Roseau counties.

Department of Agriculture

Total Federal outlays in connection with the Department of Agriculture water and Related land resources activities in Minnesota varied approximately during fiscal years 1967-70 as shown below:

Fiscal Year	Federal Outlays (Million Dollars)			
	1967	1968	1969	1970
	24.2	25.2	21.7	20.9

In fiscal years 1967-70, Federal outlays in connection with the various agencies in the Department of Agriculture were as follows:

Agency	Federal Outlays (Million Dollars)			
	1967	1968	1969	1970
Soil Conservation Service	3.1	4.5	4.2	4.0
Forest Service	10.3	7.0	7.1	7.6
Farmers Home Administration	0.5	4.1	3.6	2.3
Agricultural Research Service	1.2	0.8	0.7	0.8
Agricultural Stabilization and Conservation	8.8	8.4	5.7	5.7
Other	0.3	0.4	0.4	0.5
Total	24.2	25.2	21.7	20.9

Fiscal year 1970 program summaries for agencies are:

Agency and Program	Federal Outlays (100,000 dollars)
Soil Conservation Service	40.35
Resource Conservation and Development	3.83
River Basin Surveys and Studies	0.65
Watershed Planning	1.33
Watershed Works of Improvement	4.07
Conservation Technical Services	26.55
Soil Survey	3.92
Forest Service	75.78
Forest Roads and Trails	15.04
Shared Revenue from National Forest	1.18
Forest Protection and Utilization	49.47
Assistance to State-Tree Planting	1.41
Working Capitol Fund	5.05
Expenses, Brush Removal	0.36
Cooperative Work	2.02
Land and Water Conservation Fund	1.25

Farmers Home Administration	23.27
Loans	14.69
Recreational Facilities	2.68
Water Systems	1.31
Sewer Systems	5.84
Water and Sewer Systems	4.02
Individual Soil and Water	0.84
Grants	8.58
Water System Development	0.32
Sewer System Development	7.13
Water and Sewer System Development	1.13
Agricultural Research Service	7.51
Soil and Water Conservation Research	7.51
Agricultural Stabilization and Conservation	57.12
Agricultural Conservation (REAP)	57.12
Other	5.00
Cooperative Extension Work and Grants for Research	5.00
TOTAL	209.03

In 1902, Congress established the Minnesota forest reserve on some 200,000 acres of coniferously wooded hills at the headwaters of the Mississippi river. First National forest to be set aside by Act of Congress, this tract of land in northern Minnesota was established to save the area from the depredations of unprincipled timber operators. Subsequently, the forest was renamed the Chippewa--after the Indian tribe. In 1909, a second National forest was established in Minnesota--the Superior, in the northeastern "Arrowhead" section of the State. The Forest Service of the Department of Agriculture administers these two National forests so that their many natural resources may most benefit the people on a continuing basis. The Forest Service also conducts research on forest management and protection at a number of projects locations in Minnesota. In cooperation with State natural resource organizations, the Forest Service offers assistance to private and industrial foresters in the State.

The Soil Conservation Service was established under authority of the Soil Conservation Act of 1935. It has responsibility for developing and carrying out a soil and water conservation program in cooperation with farmers and ranchers and other land users and developers, with community planning agencies and regional resource groups, and with other agencies of government--Federal, State, and local. The program includes soil erosion control, flood prevention, sediment reduction, land-use planning in rural-fringe areas, recreation, beautification, and water development for agriculture, recreation, wildlife, municipal, and industrial use. The soil and water conservation program is carried on through technical help to locally organized and operated soil conservation districts, local sponsors of watershed protection projects and resource conservation and development projects, and consultive assistance to other individuals and groups. Assistance to individual district cooperators includes: giving the cooperator a soil and land-capability map of his land; giving him information about practical alternatives for treating and using the land within its capabilities as indicated on the map; helping him develop an orderly plan for installing the treatment measures and making the land use changes needed; and helping him apply parts of the plan that require special skills or knowledge. One important basis for conservation planning is the cooperative soil survey for

which the SCS is responsible. The work is carried out in cooperation with the State Agricultural Experiment Station and other State and Federal agencies. The soil surveys provide information about soils that is needed for land-use planning on both agricultural and nonagricultural land. Users of the published surveys include farmers and ranchers, engineers, highway departments, planning and zoning bodies, builders, realtors, and others. SCS has the responsibility for the watershed activities and river basin surveys and investigations of the Department of Agriculture. Under the watershed Protection and Flood Prevention Act, local sponsoring organizations are given technical and financial help for land treatment and structural measures for flood prevention, fish and wildlife development, recreation, and agricultural and municipal water supply in watersheds up to 250,000 acres in size. Under the Food and Agriculture Act of 1962, SCS assists local sponsoring groups accelerate planning and development of land and water resources in multiple county areas. Projects may include such measures as flood prevention; developing water resources for recreation, wildlife, agricultural, municipal, or industrial use; conservation planning and establishment on individual land units; improving recreation facilities, including historical and scenic attractions; encouraging new industries to locate in the area and to process products of the area; improving markets for crop and livestock products; and long-range planning to coordinate public efforts in the area. Technical and financial assistance is available for planning and carrying out project measures. SCS gives technical help to landowners and operators who participate in the agricultural conservation, cropland conversion, and cropland adjustment programs of the Department of Agriculture and certifies to the adequacy of practices installed. SCS also gives technical help to the Farmers Home Administration in making soil and water conservation loans to landowners and operators.

The Agricultural Research Service, Soil and Water Conservation Research Division, Corn Belt Branch conducts soil, water and watershed studies designed to meet the needs of the brunizem, gray brown podzolic, podzol, chernozem, gray wooded and associated soils in the corn belt, with particular emphasis on problems of soil structure, microclimatology, soil and plant relations, moisture conservation, hydrologics of structures, watershed hydrology, sedimentation, water and wind erosion control, water and soil loss prediction, irrigation and drainage. States included are: Illinois, Indiana, Iowa, Kentucky, Michigan, Minnesota, Missouri, Ohio and Wisconsin.

Army Corps of Engineers

Total Army Corps of Engineers expenditures for activities in Minnesota varied during the period fiscal year 1967-70 as shown below:

<u>Fiscal Year</u>	<u>Expenditures (Millions of Dollars)</u>
1967	7.75
1968	7.46
1969	10.71
1970	4.70

Fiscal year 1970 expenditure distribution according to appropriation or fund name is shown below:

<u>Appropriation or Fund Name</u>	<u>Expenditure</u>
General Investigations	\$ 600,704
Construction, General	949,520
Operation and Maintenance, General	2,909,195
Others	235,269
Total	\$ 4,694,688

In Minnesota Corps of Engineers water resources projects fall into two major categories: flood protection works and the development and improvement of navigable waterways. However, often other purposes--such as pollution abatement, fish and wildlife conservation, improvement of recreation, and water supply control--are served. Among the harbor projects which have been completed in Minnesota are Grand Marais harbor, Two Harbors, and Duluth-Superior harbor, all on lake Superior. These projects have included improvements such as the construction of breakwaters, and maneuvering basins; the use of dredging to make deeper and wider channels; and/or the building of anchorage areas and basins for small boats. The upper Mississippi river has been improved by a system of 28 locks and dams. The navigation pools are an important recreation facility, and their stable slack-water bank areas constitute one of the Nation's major flyways for waterfowl. Another important project is the St. Anthony Falls upper harbor project, which makes it possible for barges, towboats, and pleasure craft to ascend the falls of St. Anthony into the center of industrial Minneapolis. Flood control is the other major concern of the Corps in Minnesota. The Red river of the north drainage basin, Red lake river-Clearwater river, lake Traverse and Bois de Sioux river, Mississippi river near Aitkin, and Redwood river at Marshall, are among the areas improved by Corps' flood control projects. Straightening, clearing, and enlarging of river channels, creation of diversion channels, and construction of levees, floodwalls, and reservoirs are some of the ways in which flood control is provided. Flood control projects are underway on the Mississippi river at St. Paul and South St. Paul; at Winona, also on the Mississippi; and at Rushford, on the Root river and Rush creek, as well as elsewhere. The Corps offers emergency aid during floods or other disasters. This aid may include rescuing marooned people, removing property or livestock which is endangered, and repairing or strengthening of levees. During the record flood of 1964, Corps officials directed flood fighting in many Minnesota towns along the Mississippi and its tributaries.

Department of Commerce

Total Federal outlays in connection with the Department of Commerce water and related land resources activities in Minnesota varied approximately during fiscal years 1967-70 as shown below:

<u>Fiscal Year</u>	<u>Federal Outlays in Minnesota (Millions Dollars)</u>
1967	4.1
1968	2.5
1969	2.7
1970	2.8

In fiscal years 1967-70, Federal outlays in Minnesota in connection with the various agencies in the Department of Commerce were as follows:

Agency	Federal Outlays (100,000 dollars)			
	Fiscal Year			
	1967	1968	1969	1970
National Oceanic and Atmospheric Administration (ESSA)	8.04	8.22	7.74	8.76
Economic Development Administration	33.00	17.00	19.00	19.60

Fiscal Year 1970 program summaries for agencies are given below:

Agency and Program	Federal Outlays (100,000 dollars)
National Oceanic and Atmospheric Administration	8.76
Weather and Climate Guidance	8.61
River and Flood Forecasting	0.15
Economic Development Administration	19.60
Grants and Loans for Public Works and Development	
Facilities and to Business or Development Companies	17.10
Economic Development - Technical Assistance, Administrative Assistance, Research and Information and Regional Action Planning Commission	2.50
Total	28.36

Working together with, and utilizing data gathered by other Federal agencies, and agencies of the State, the National Weather Service monitors the meteorological and hydrological conditions affecting the river discharges in Minnesota. Serving the State are the River Forecast Center, located in Kansas City, Missouri, the Weather Service Forecast office at Minneapolis and the Weather Service office at Fargo, North Dakota. Both Minneapolis and Fargo are river district offices. The Minneapolis Weather Service forecast office prepares and disseminates to the general public weather forecasts for Minnesota as well as for North and South Dakota. The Minneapolis and Fargo offices are coordinated with the river forecast center in Kansas City with respect to predicted weather conditions, river forecasts and/or flood warnings. Meteorological guidance is supplied via special communications with the weather service National meteorological center in Suitland, Maryland where computer models of the atmosphere, data from thousands of observations points around the Nation and the World, satellite pictures and radar observations are combined into accurate analyses of current weather conditions used in weather forecast and river flood forecasts.

Department of Health, Education and Welfare

Total Federal outlays in connection with the Department of Health, Education and Welfare water and related land resources activities in Minnesota varied approximately during fiscal years 1967-70 as shown below:

Fiscal Year	Federal Outlays (Million Dollars)
1967	0.3
1968	0.2
1969	0.7
1970	0.8

A fiscal year 1970 program summary for the Department is given below:

Agency and Program	Federal Outlays (100,000 dollars)
Health, Education and Welfare	6.28
Public Works and Economic Development Act	
Grants to State for Comprehensive State Health Plan	0.25
NIH General Research Support and Training	1.00
Grants	7.53
Total	

Department of Housing and Urban Development

Total Federal outlays in connection with the Department of Housing and Urban Development water and related land resources activities in Minnesota varied approximately during fiscal years 1967-70 as shown below:

Fiscal Year	Federal Outlays (Million Dollars)
1967	3.8
1968	9.3
1969	3.9
1970	8.3

A fiscal year 1970 program summary for the Department is given below:

Agency and Program	Federal Outlays (100,000 Dollars)
Housing and Urban Development	4.10
Open Space Developed Land - Urban Parks	0.45
Public Works Planning Advances	43.25
Public Facility Loans	33.86
Basic Water and Sewer Facilities	1.11
Open Space Land Program	82.77
Total	

Department of Transportation

Total Federal Outlays in connection with the Department of Transportation water and related land resources activities in Minnesota varied approximately during fiscal years 1967-70 as shown below:

Fiscal Year	Federal Outlays (Millions Dollars)
1967	1.6
1968	1.8
1969	1.9
1970	2.5

In Minnesota, the Federal Highway Administration has responsibilities in the water and related land resources field in two areas: control of water pollution and use of public recreation land for highway construction. FHWA serves the State largely as a granting agency; State agencies do all planning and design work based upon criteria and review rules and regulations developed by FHWA.

Twin Cities Federal Executive Board

Federal Executive Boards were organized by direction of President Kennedy in 1961 and continued by President Johnson and President Nixon. The Twin Cities Federal Executive Board was created in 1966. The Boards are considered to be "little cabinets" in the sense that their membership is comprised of the highest Federal official of each Federal agency in the twenty five major metropolitan areas of the country. The Boards were created primarily to increase the effectiveness and economy of Federal programs, and they operate under the leadership of the director, Office of Management and Budget. Their activities are largely self generated in nature and almost unlimited in scope. Through committees and task forces, the Boards devote their efforts to improve overall programs of the Federal government, effective relations with State and local governments, critical urban problems of communities, and improved service to the public. The Twin Cities Federal Executive Board is composed of about 45 Federal agency executives who meet once a month. One of the Board's recent projects was to help establish a new Federal information center with one telephone number. The object was to help the public get information or to direct callers to the proper Federal office in the Twin Cities. A Board committee also has recommended that special telephones tied in with the center be installed in the lobbies of the Minneapolis and St. Paul post offices for the public's convenience. The Board has a natural resources and environment sub-committee of a community cooperation committee operating under the policy committee. The objective of the sub-committee is to promote an awareness of the importance of maintaining and improving the quality of our natural resources and the environment through focusing available program support and expertise of the Federal agencies on the problem. The sub-committee's efforts centered on developing an awareness of the crisis in our natural resources and environment.

Environmental Protection Agency

There are several independent agencies in the Federal government with major responsibilities in the field of water and related land resources. They are: Environmental Protection Agency, Water Resources Council, Atomic Energy Commission, Federal Power Commission, Interstate Commerce Commission and National Science Foundation.

The following Federal agencies were recently moved to the new Environmental Protection Agency (EPA): the functions carried out by the Federal Water Quality Administration (from the Department of the Interior); functions with respect to pesticides studies vested in the Department of the Interior; functions carried out by the National Air Pollution Control Administration (from the Department of Health, Education and Welfare); func-

tions carried out by the Bureau of Solid Waste Management and the Bureau of Water Hygiene, and portions of the functions carried out by the Bureau of Radiological Health of the Environmental Control Administration (from the Department of Health, Education and Welfare); certain functions with respect to pesticides carried out by the Food and Drug Administration (from the Department of Health, Education and Welfare); authority to perform studies relating to ecological systems vested in the Council on Environmental Quality; certain functions respecting radiation criteria and standards vested in the Atomic Energy Commission and the Federal Radiation Council; and functions respecting pesticide registration and related activities carried out by the Agricultural Research Service (from the Department of Agriculture). With its broad mandate, EPA also develops competence in areas of environmental protection that have not previously been given enough attention such as the problem of noise, and it provides an organization to which new programs in these areas can be added. The Environmental Protection Agency is charged with the control of pollutants which impair water quality; it is broadly concerned with the impact of degraded water quality. It performs a wide variety of functions, including research, standard-setting and enforcement, and provides construction grants and technical assistance. Federal grants of approximately \$150,000 a year make up a sizable portion of the State's annual budget for water pollution control. In addition to the money paid to the State, towns and cities in Minnesota have received grants of \$17.2 million to aid in constructing 195 waste treatment projects costing \$17.2 million for the control of municipal pollution. At three institutions of higher learning--The University of Minnesota, Winona State College, and St. Mary's College--a total of 11 water pollution research projects and training programs in sanitary engineering have received grant support approximating \$200,000 a year. The Minnesota State Health Department utilized still another grant to demonstrate the usefulness of the channel aeration process in the treatment of sewage. The research goals of a National Water Quality Laboratory at Duluth are: to detect and determine the variety and amounts of pollutants affecting all organisms in the aquatic food chain, including fish; to develop ways of detecting obscure indications of slow deterioration in environmental conditions in order to restore, maintain, and avoid destruction of our aquatic resources; and to develop more precise biological indicators of pollution, and develop rapid and effective autopsy techniques to determine what kills fish and other aquatic organisms.

Water Resources Council

The Water Resources Council was established by the Water Resources Planning Act of 1965 on July 22, 1965. The functions of the Council are to: maintain a study and prepare a National water assessment; coordinate and review river basin, regional plans and programs prepared by Federal-State interests; coordinate water and related land resources planning policies and programs with 12 Federal agencies; administer Federal financial grants to States for water and related land resources planning; establish principles, standards and procedures for Federal participants in the preparation of plans and formulation and evaluation of Federal water and related land projects; and establish and assist river basin commissions, interagency committees and coordinating groups. The purpose of the Council is to encourage the conservation, development, and utilization of water and related land resources of the United States on a comprehensive and coordinated basis by the Federal government, States, localities, and private enterprise.

National Water Commission

Other Boards, Committees, Councils and Commissions with major interests in the field of water and related land resources are: Advisory Board on National Parks, Historic Sites, Buildings, and Monuments; Citizens Advisory Committee on Environmental Quality; Federal Advisory Council on Regional Economic Development; Federal Council for Science and Technology; Federal Radiation Council; Migratory Bird Conservation Commission; National Forest Reservation Commission; National Park Foundation; National Water Commission; and president's Science Advisory Committee.

The National Water Commission was created on September 26, 1968 to study the Nation's water needs and water problems, and to recommend improved National policies so that future needs for water and water related services may be efficiently met. The Commission was allotted five years and was authorized an appropriation of \$5 million to accomplish its mission; this is believed to be the largest allotment of money and time ever made available to an independent commission for studying water resources. According to the Federal National Water Commission Act of 1968, Public Law 90-515, the Commission shall (1) review present and anticipated National water resource problems, making such projections of water requirements as may be necessary and identifying alternative ways of meeting these requirements--giving consideration, among other things, to conservation and more efficient use of existing supplies, increased usability by reduction of pollution, innovations to encourage the highest economic use of water, interbasin transfers, and technological advances including, but not limited to, desalting, weather modification, and waste water purification and reuse; (2) consider economic and social consequences of water resource development, including for example, the impact of water resource development on regional economic growth, on institutional arrangements, and on esthetic values affecting the quality of life of the American people; and (3) advise on such specific water resource matters as may be referred to it by the President and the Water Resources Council.

Federal Outlays for Natural Resources Programs

The changing composition of the Federal government budget as presented in the document "The Budget of the United States Government, Fiscal Year 1972, Superintendent of Documents," U.S. Government Printing Office, Washington, D.C. is shown in the table below.

Function	Percent of Total Budget						Outlay in 1970 (billion \$)
	FY 1945	1950	1955	1960	1965	1970	
National Defense	85.7	30.4	58.7	49.8	41.9	40.8	80.3
International Affairs and Finance	3.5	11.1	3.0	3.3	3.7	1.8	3.6
Space Research and Technology	*	0.1	0.2	0.4	4.3	1.8	3.7
Agricultural and Rural Development	1.7	6.5	5.9	3.6	4.1	3.2	6.2
Natural Resources	0.3	2.9	0.7	1.1	1.7	1.3	2.5
Commerce and Transportation	4.4	3.9	1.6	5.2	6.2	4.7	9.3
Community Development and Housing	-0.2	0.6	*	1.1	0.2	1.6	3.0
Education and Manpower	0.2	0.5	0.8	1.1	1.9	3.7	7.3
Health	0.2	0.6	0.4	0.8	1.5	6.6	13.0
Income Security	1.3	10.8	13.4	19.8	21.7	22.3	43.8
Veterans Benefits and Services	1.2	20.5	6.6	5.9	4.8	4.4	8.7
General Government	0.8	2.7	1.7	1.4	1.9	1.7	18.3
Interest Allowances	3.7	13.3	8.8	9.0	8.7	9.3	3.3
Undisturbed Deductions	---	---	---	---	---	---	---
Total	-2.8	-3.9	-1.8	-2.5	-2.6	-3.2	-6.4
	100.0	100.0	100.0	100.0	100.0	100.0	196.6

*less than 0.05%

The budget for natural resources programs has ranged from 0.3 to 2.9 percent of the total annual budget and outlays for natural resources programs were about 2.5 billion in fiscal year 1970 or 1.3 percent of total outlays. The President's budget for fiscal year 1972 calls for natural resources program outlays of \$4.2 billion or 1.9 percent of total outlays.

Natural resources program budget outlays by subfunction in fiscal year 1970 are given below:

Subfunction	Outlay (Millions of Dollars)
Water Resources and Power	2,245
Land Management	754
Recreation Resources	370
Mineral Resources	94
Other Natural Resources Programs	122
Deductions for Offsetting Receipts	-1,105
Total Natural Resources	2,480

Water resources and power programs develop projects to control water pollution, produce hydroelectric power, control floods, prevent erosion, improve navigation, and provide recreation facilities. Public land and national forest programs preserve wildlife, scenic resources, and wilderness areas. At the same time, these programs yield forest products, livestock forage, water and minerals, and afford broad opportunities for recreation. Under land management programs, access roads and trails are constructed and the resources of the lands are protected from damage by fire, insects, disease, erosion, and improper use. Recreation programs include management and protection of the National park system, construction and maintenance of park facilities, operation of National wildlife refuges, sport fishery and wildlife research and technical assistance, construction of Federal fish hatcheries, and preservation of historical properties. Mineral resources programs include research on the conservation and development of minerals and fuels, research in metallurgy and mining, economic and statistical analysis, and coordination of oil and gas activities. Other natural resources programs include such activities as water resources investigations, geological and mineral resource surveys, and topographic and mapping.

Federal natural resources program outlays in fiscal year 1970 by program and agency are given in the table below.

Program and Agency	Outlay (Millions of Dollars)
Water resources and power:	
Environmental Protection Agency (water pollution control)*	262
Corps of Engineers*	1,195
Department of the Interior:	
Bureau of Reclamation*	263
Power marketing agencies*	139
Office of Saline Water*	30
Office of Water Resources Research and Other	12
Tennessee Valley Authority	211
Soil Conservation Service--watershed projects*	115
Federal Power Commission and Other	28
Subtotal, water resources and power	2,245
Land management:	
Forest Service*	556
Bureau of Land Management and other*	193
Mineral resources*	94
Recreation resources:	
Bureau of Outdoor Recreation	117
National Park Service*	139
Bureau of Sport Fisheries and Wildlife*	115

Other natural resources programs	122
Deductions for offsetting receipts:	
Interfund and intragovernmental transactions	-1
Proprietary receipts from the public	-1,195
Total	2,480

*Includes both Federal funds and trust funds

Federal natural resources outlays in fiscal year 1970 for public works programs associated with water resources and related developments are given in the table below.

Program and Agency	Outlays (Millions of Dollars)
Flood control works:	
Agriculture: Soil Conservation Service (mostly grants)	62.2
Army: Corps of Engineers--Civil	273.6
Grants	6.4
Interior: Bureau of Reclamation	2.3
State: International Boundary and Water Commission	.6
Tennessee Valley Authority	7.5
Total flood control works	352.6
Beach erosion control: Army: Corps of Engineers-Civil	2.5
Irrigation and water conservation works:	
Agriculture: Soil Conservation Service (mostly grants)	15.5
Interior:	
Bureau of Indian Affairs	4.3
Bureau of Reclamation	64.7
Loan and grant program	3.8
Total irrigation works	88.3
Navigation facilities:	
Army: Corps of Engineers--Civil	189.2
Transportation: Saint Lawrence Seaway Corporation	.1
Tennessee Valley Authority	-----
Total navigation facilities	189.3
Multiple-purpose dams and reservoirs with hydroelectric power facilities:	
Army: Corps of Engineers--Civil	269.2
Interior: Bureau of Reclamation	63.0
Tennessee Valley Authority	13.4
Total multiple-purpose facilities	345.6
Power plants: Tennessee Valley Authority	261.7
Power transmission facilities:	
Interior	
Bureau of Reclamation	23.1
B eville Power Administration	101.9
Southwestern Power Administration	3.1
Tennessee Valley Authority	59.5

Total power transmission facilities	187.6
Water supply and waste disposal facilities:	
Funds appropriated to the President: Appalachian regional development program (grants)	5.2
Agriculture: Farmers Home Administration (grants)	21.9
Commerce: Economic Development Administration (primarily grants)	75.5
Housing and Urban Development:	
Grants	109.0
Loan disbursements	43.7
Interior: Bureau of Reclamation	23.9
State: International Boundary and Water Commission	.3
Environmental Protection Agency (grants)	176.4
Total water supply and waste disposal	455.9
Total water resources and related developments	<u>1,883.5</u>

Interest Groups

In 1970, there were at least 49 Interest groups in Minnesota with major water and related land resources programs, 4 Leagues and Associations with minor water and related land resources programs, at least 80 organizations that tend to have a continuing interest in water and related land resources issues, and at least 150 National organizations concerned with water and related land resources programs which have or could have members in the State. Some of the more active Interest groups were: American Camping Association, Minnesota Section; Association of Minnesota Counties; Citizens League; Clear Air, Clear Water, Unlimited; Ducks Unlimited, Minnesota Chapter; Ecological Society of America, Minnesota Chapter; Environmental Science Center; Fort Snelling State Park Association; Friends of The Wilderness; Izaak Walton League; League of Women Voters of Minnesota; League of Minnesota Municipalities; Minnesota Academy of Science; Minnesota Association of Commerce and Industry; Minnesota Association for Conservation Education; Minnesota Association of Soil and Water Conservation Districts; Minnesota Association of Watershed Districts, Inc.; Minnesota Chapter, The Nature Conservancy; Minnesota Council of State Parks; Minnesota Committee

for Environmental Information; Minnesota Conservation Federation; Minnesota Environmental Defense Council; Minnesota Public Interest Research Group; Minnesota Environmental Control Citizens Association; Minnesota Public Interest Research Group; Minnesota Waterfowl Association, Inc.; Nine Mile Creek Citizens' Committee, Inc.; Quentico Superior Foundation; Northern Environmental Council; Red River Valley Development Association; Red Lake River Planning Commission; Riverbend Association; Sierra Club (North Star Chapter); Save Lake Superior Association; Society of American Foresters (Upper Mississippi River Section); The Wildlife Society (Minnesota Chapter); Upper Midwest Research and Development Council; and Upper Mississippi Waterway Association.

Of the 53 Interest groups (49 Interest groups and 4 Leagues and Associations mentioned above), 40 were conservation-preservation oriented, 8 had the word environmental in their name, and 5 were development and management oriented. Taking into consideration multiple memberships, it is estimated that approximately 25,000 citizens in Minnesota were members of the 53 Interest groups in 1970. Membership in individual Interest groups ranged from 13 to 12,000. Expenditures in 1970 for water and related land resources programs of the 53 Interest groups probably totaled in excess of \$250,000. Annual expenditures by individual Interest groups ranged from \$100 to in excess of \$35,000. These figures do not include the thousand's of hours of volunteer time by members. The sources of income were dues, contributions, donations and grants. The affairs of 45 of the 53 Interest groups were under the direction of Officers; 8 Interest groups had Boards; and 14 Interest groups had staffs. It is estimated that the number of water and related land resources Interest groups increased from about 16 in 1950 to 25 in 1960 to 33 in 1965 to 53 in 1970. Some of the Interest groups with large numbers of members and expenditures in 1970 were: Minnesota Environmental Control Citizens Association, Minnesota Public Interest Research Group, Minnesota Conservation Federation, Minnesota Association of Commerce and Industry, and Sierra Club.

A study was made to determine Interest groups' interests in the functional activities of resource agencies, resources development and management programs, and resource issues and Interest groups' contacts with resource agencies. The following conclusions were reached on the basis of available information.

With regard to Interest groups' interests in the functional activities of resource agencies, the activity deemed to be of interest to the greatest number of groups was regulation and enforcement followed in order by education and information dissemination, resource development and management, investigations and surveys, research, data collection and handling, public administration, planning (local and private), planning (statewide), and planning (interstate and regional). Interest groups seem to have a limited direct interest in planning activities especially those on a statewide or interstate-regional basis.

Concerning Interest groups' interests in the various agency resource development and management programs, the program deemed to be of interest to the greatest number of groups was fish and wildlife protection followed in order by recreational facilities, wilderness preservation and aesthetics, parks and forests, pollution control (restoration of lakes), land drainage and wetlands, mining, pollution control (thermal and radiation), pollution

control (waste water treatment), water supply (quality), pollution control (agricultural wastes), pollution control (solid waste disposal), water supply (quantity), land treatment, flood control, waterborne transportation, and irrigation. Environmental quality considerations pervade all program interests.

Listed below are some of the major water and related land resources issues in Minnesota which have received Interest groups' attention during the last 5 years.

Issue

Big Stone Lake Pollution
Blue Earth River Dam
Boise-Cascade-Pollution
Channel to Connect Mississippi River and Lake Superior
Cattle-Feed Lots-Pollution
Channel-Improvement on Lower Minnesota River
Conservation Education
Creation of Pollution Control Agency
Creation of Upper Mississippi River Basin Commission
DDT - Ban
Dam on St. Croix River
Deer Program
Detergents
Environmental Bills
Flood Control Methods - Red River Valley
Floodplain Management
Four-State River Compact
Great Lakes Seaway Tolls
Ham Lake Airport Site
Hunting Season
Lake Access
Lake Pollution
Lakeshore Zoning
Mineral Exploration, Boundary Waters Canoe Area
Minneapolis Sewer Controversy
Minnetonka Lake Pollution
Mississippi River Oil Slicks
Nine-Mile Creek Preservation
Northern States Power Plants
Parks Versus Freeways
Pesticides
Pollution at Alexandria
Pollution Control Agency Membership
Pollution of Mississippi River
Protection of Timber Wolf
Reactor At Elk River
Recycling
St. Croix River as a National Scenic Riverway
Snowmobiles
State Agency Reorganization
State Nuclear Policy
Sugar Beet Plants - Red River Valley
Taconite Tailings - Lake Superior

12-Foot Channel on Upper Mississippi River
Twin Cities' Groundwater Pollution
Twin Cities' Water Shortage
U.S. Steel Plant-Duluth-Pollution
Upper Mississippi National Recreation Area
Voyageurs National Park
Water Quality Standards
Watercraft Waste Disposal
Watershed Districts-Metropolitan Council
Wetlands Programs
Wild Rice Harvest
Wildlife Habitat Improvement

With regard to Interest groups' contacts with State resource agencies, the agency with which the greatest number of groups had contact was the Department of Natural Resources (Conservation) followed in order by Pollution Control Agency, Department of Economic Development, State Board of Health, State Planning Agency, State Soil and Water Conservation Commission, Department of Highways, Iron Range Resources and Rehabilitation Commission, Water Resources Board, Department of Agriculture, and Minnesota Geological Survey.

Concerning Interest groups' contacts with Federal resource agencies, the agency with which the greatest number of groups had contact was the Fish and Wildlife Service followed in order by Forest Service; National Park Service; Environmental Protection Agency; Army Corps of Engineers; Soil Conservation Service; Agricultural Stabilization and Conservation Service; Farmers Home Administration; Atomic Energy Commission; Bureau of Recreation; Department of Transportation; Department of Housing and Urban Development; Department of Health, Education and Welfare; Bureau of Indian Affairs; Federal Power Commission; National Weather Service; Geological Survey; and Bureau of Mines.

Interest groups seem to have limited direct contacts with the following interstate and regional organizations: Great Lakes Basin Commission, Great Lakes Commission, International Joint Commission, Minnesota-Wisconsin Boundary Area Commission, Missouri Basin Inter-Agency Committee, Souris-Red-Rainy River Basins Commission, South Dakota-Minnesota Boundary Waters Commission, Upper Great Lakes Regional Commission, and Upper Mississippi River Comprehensive Basin Study Coordinating Committee.

LEGISLATIVE AND CONGRESSIONAL
HANDLING OF WATER RESOURCES

A review was made of proposed measures pertaining to water and related land resources that were introduced in the 1969 Session of the Minnesota Legislature. Committee actions on bills, the membership of pertinent Senate and House standing Committees and Senate and House registration files for lobbyists are discussed below. A review was made of the more than 24,000 proposed legislative measures that were introduced in the two Sessions of the 89th Congress (Schad, T.M. and E. Boswell. "Congressional Handling of Water Resources." Water Resources Research, Vol. 4, No. 5, Oct. 1968) to shed light on congressional handling of water resources legislation. The results of the review by T.M. Schad and E. Boswell are abstracted below.

Legislative Handling of Water Resources

Water and Related Land Resources Measures Introduced in 1969 Session of the Legislature

In the Senate the prime responsibility for water and related land resources rested largely with the following standing Committees: Game and Fish, Public Domain, and Civil Administration and Metropolitan Affairs. It was in these Committees and their subcommittees that most water and related land resources legislation was considered. But, several other Committees were also involved; the Finance Committee, with its control over funds, had considerable jurisdiction over how water and related land resources programs were effectuated. Most pollution programs were considered by the Civil Administration and Metropolitan Affairs Committee, whereas, most Department of Conservation programs were considered by the Game and Fish and Public Domain Committees. In the House prime responsibility rested with the following standing Committees: Conservation and Land and Water Resources. The Appropriations Committee, with its control over funds was also heavily involved.

To see how water and related land resources legislation was divided among Committees, a review was made of the titled and digests of all the legislative measures introduced in the 1969 session of the Legislature. The Journal of the Senate, Sixty-Sixth Session of the Legislature, 1969 contains information on 2,682 bills of the Senate. Of the total bills introduced, 262 or about 10 percent were concerned with water and related land resources. The number of water and related land resources bills initially referred to 12 standing Committees is shown below:

<u>Number of Bills</u>	<u>Senate Committee Bill was Initially Referred to</u>
109	Game and Fish
61	Public Domain
30	Civil Administration and Metropolitan Affairs
19	Local Government
13	Finance
10	Agriculture
7	Rules and Legislative Expense

5	Public Highways
3	Tax and Tax Laws
1	Education
1	Public Welfare

The subject matter of bills initially introduced is summarized below:

<u>Number of Bills Introduced</u>	<u>Subject Matter of Bill</u>
84	Game and Fish
24	Pollution
20	State Parks and Refuges
15	Snowmobiles
9	Trails
8	Recreation and Historic Sites
8	Conservation Department
8	Lakes and Lakeshores
8	Flood Damage, Control and Management
8	Drainage
8	Watershed and Other Districts
8	Commissions
7	Wild Rice
6	Water Safety
5	Forests
5	Soil and Water
5	Stream and Lake Improvements
4	City Parks
4	Reconstruction of Dams
3	Fluoridation
3	Waterways Improvements
2	Groundwater
2	Pesticides
2	Water Resources Survey
2	Highway Rest Areas
1	Well Drilling
1	Water Use Fee
1	Weather Modification
1	Water Utility

The Journal of the House, 66th Session of the Legislature, 1969, contains information on 3,094 bills of the House. Of the total bills introduced, 263 or about 9 percent were concerned with water and related land resources. The number of bills initially referred to 16 standing House Committees is shown below:

<u>Number of Bills</u>	<u>House Committee Bill Was Initially Referred To</u>
113	Conservation
91	Land and Water Resources
13	Government Operations
10	Appropriations
7	County and Township Government
7	Metropolitan and Urban Affairs
4	Highways
4	Cities of the Second and Third Class

3	Claims
2	Agriculture
1	Higher Education
1	Public Institutions
1	Taxes
1	General Legislation, Veterans and Consumer Affairs
1	Municipal Affairs

2	Trails
2	Wild Rice
2	Groundwater
2	Historic Sites
2	Floodplain Control and Management
1	Lakeshore Zoning
1	Recreation and Natural Areas
1	Watercraft Safety
1	Highway Rest Areas
1	Lake Restoration
1	Waterway Improvements
1	Water Control

The subject matter of bills initially introduced is summarized below:

<u>Number of Bills Introduced</u>	<u>Subject Matter of Bill</u>
100	Game and Fish
30	Pollution
14	State Parks and Recreation
14	Snowmobile
11	Conservation Department
11	Watershed and Other Districts
10	Commissions
9	Drainage
8	Trails
7	Watercraft Safety
7	Flood Damage, Control and Management
7	Recreation and Historic Sites
7	Wild Rice
4	River Improvements and Control
3	Soil and Water
3	Forestry
3	Lakes and Lakeshore
3	City Parks
3	Dam Reconstruction
2	Groundwater
2	Water Rights
2	Waterway Improvements
1	Weather Modifications
1	Well Drilling
1	Highway Rest Areas

About 23 percent or 57 of the water and related land resources bills considered by both the Senate and House passed were enacted into law. The subject matter of these bills is summarized below:

<u>Number of Bills Passed</u>	<u>Subject Matter of Bill</u>
16	Game and Fish
4	Pollution
4	State Parks
3	Conservation Department
3	Forestry
3	City Parks
3	Watershed and Other Districts
2	Drainage
2	Snowmobiles

Of the total number of bills in all fields introduced in the Senate and House, 1159 bills passed together with 8 resolutions. The ratio of total bills passed and total bills introduced was 43 percent.

It is interesting to note that about 75 percent of all water and related land resources bills introduced, and about 77 percent of all water and related land resources bills passed, were associated with the activities of the Department of Conservation. Most of the bills introduced would amend or repeal statutes. Many of the bills introduced were concerned with rules and regulations associated with the activities of the Department of Conservation.

Most water and related land resources bills introduced in the House had companion bills introduced in the Senate and had 3 authors. Bills introduced in the House were assigned to a Committee by the Speaker of the House. Most bills were assigned automatically, but the chief author of a bill could request a particular Committee assignment for his bill. Once a bill was assigned to a Committee it was not heard until the chief author requested a hearing. Bills were introduced in the Senate as provided in rule 35 of the permanent rules of the Senate, "all bills shall be referred by the president of the Senate without motion to the proper standing committee, . . .". The Rules Committee becomes involved in the referral process only when and if a member questions the referral upon the first reading (introduction) of the bill or at the time a committee of first referral reports the bill. The normal procedure for re-referring a bill from one Committee to another is for the Chairman of the Committee to which the bill was first referred to discuss the proper reference with the author of the bill and by motion on the floor of the Senate have the bill withdrawn and re-referred to another Committee. In the Senate as in the House a bill did not come up for a hearing until there was a request for a hearing by the chief author.

Commonly more than one bill was introduced dealing with the same subject matter. There was prestige connected with being the chief author of a bill and there was a feeling that a Committee Chairman could sometimes be convinced that there was great interest in a matter if several bills were introduced on the same matter. It is not only a matter of ethics but a matter of law that neither the revisor of statutes nor any employee of his office shall reveal to any person not an employee of the office the contents or nature of any request or statement for the drafting of a bill. Duplication of bills was most noticeable in the game and fish field, and contributed to the relatively low percentage of game and fish bills passed.

Interim studies by standing Committees are generally the result of a specific request for such a study and a general consensus among the Legislators that such a study is needed, rather than simply because any given bill was not reported favorably by a Committee during the session.

Information concerning membership of the Senate and House standing Committees to which water and related land resources bills were initially referred to during the 66th Session of the Legislature, 1969, is summarized below:

Name of Committee	Senate Committees Name of Chairman	Number of Members and Caucus Affiliation		
		Conservative	Liberal	Total
Agriculture	Josefson	17	9	26
Civil Administration and Metropolitan Affairs	Harren	20	7	27
Education	Hanson	19	7	26
Finance	Sinclair	15	6	21
Game and Fish	Ukkelberg	14	8	22
Judiciary	Rosenmeier	17	6	23
Local Government	Dosland	18	10	28
Public Domain	Sundet	11	7	18
Public Highways	Larson	18	8	26
Public Welfare	Franz	15	7	22
Rules & Legislative Expense	Holmquist	17	0	17
Taxes and Tax Laws	Wright	14	7	21
<u>House Committees</u>				
Agriculture	Stone	23	10	33
Appropriations	Fitzsimmons	22	11	33
Cities of 2nd & 3rd Class	Frenzel	16	9	25
Claims	Klaus	12	9	21
Conservation	Becklin	21	12	33
County & Township Government	Voxland	17	8	25
General Regulations, Veterans and Consumer Affairs	Wright	15	10	25
Governmental Operations	Renner	23	10	33
Higher Education	Searle	21	10	31
Highways	Mueller	23	11	34
Land and Water Resources	Gimpl	15	11	26
Legislative Administration and Rules	Dirlan	25	0	25
Metropolitan & Urban Affairs	Alberton	22	11	33
Municipal Affairs	Jopp	11	6	17
Public Institutions	Gustafson	12	9	21
Taxes	Anderson	22	12	34

Water and related land resources bills were initially referred to 12 or 75 percent of the total (16) Senate Committees. All of the Chairmen of the Committees to which these bills were initially referred to were Conservatives. Membership on committees ranged from 17 to 28 and averaged 23. On the average, about 68 percent of Committee members were conservatives. All members on the Rules and Legislative Expense Committee were Conserva-

tives. About 68 percent of the Senate as a whole was aligned with the majority or Conservative group.

Water and related land resources bills were initially referred to 16 or 57 percent of the total (28) House Committees. All of the Chairmen of the Committees to which these bills were initially referred were conservatives. Membership on Committees ranged from 17 to 34 and averaged 28. On the average, about 65 percent of Committee members were conservatives. All members on the Legislative Administration and Rules Committee were Conservatives.

In the Senate there were a total of 22 Liberals and 45 Conservatives. In the House there were a total of 48 Liberals, 85 Conservatives, and 2 Independents.

Committee membership assignments in the House was made by the Speaker of the House. Before each Session each representative was sent a list of Committees. Each representative ranked Committees in order of his preference and returned the list to the Speaker. In making assignments, the Speaker took the following factors into consideration: schedule coordination, balanced work loads, qualifications, and past Committee assignments.

Committee membership assignments in the Senate were made by the Committee on Committees which was composed of the 8 members of the majority persuasion with the greatest seniority. In general, the longer the tenure a legislator had, the greater the impact he had on legislative decision-making. The most senior majority member of a Committee generally was its Chairman.

The Committee Chairmen determined and fixed the groundrules of committee hearings in the House. Time allotted to speakers was set by the Chairman. The Committee hearings of the Senate were conducted according to the rules of the Senate, though some of the formality was dispensed with.

Committee hearings were open to the public. Lobbyists and the general public were permitted to speak to a bill. People were invited to testify by the authors of a bill or by the Chairman. The chief author of a bill or the Chairman often contacted the house research staff for information to be presented during house hearings and for suggestions concerning people whom the Chairman might invite to testify. The Senate Committee Chairmen often contacted the Senate Council for information to be presented during Senate hearings and for suggestions concerning people whom the Chairmen might invite to testify.

Any interested party could leave his or her name with a Committee clerk or secretary and ask to be notified when any particular bill was scheduled for a hearing. While the meeting time and place of each committee was published there was not published agenda. A list of bills to be heard each day was posted at the Capitol. If the citizen does manage to find out what bills were scheduled to be heard by a particular committee there was no assurance that the bill he was interested in would be heard, both because it was difficult to predict how long public testimony would take and because there was nothing to prevent the Chairman from changing his agenda and introducing extra bills. The Committee meetings were limited to one hour each because of scheduling difficulties.

The House Research Department was authorized by the House Committee on Legislative Administration and Rules during the 1967 legislative Session and was activated during the 1969 legislative Session. The Director of the Department was an Attorney. Research assistants were attorneys or people with education in political science. They were politically inactive and the department was non-partisan. There were 3 legislative interns on the research staff during legislative sessions. The interns were seniors majoring in political science at the University of Minnesota. They received three credit hours for their work with research staff. Personnel of the Department had an average age of under 30 years and they served at the pleasure of the House Committee on Legislative Administration and Rules. The Department did research both for Committees and for individual members of the House. In 1969 there was 1 research assistant with some experience in water and related land resources. The Senate legal Counsel Department was established after the 1967 legislative Session. All members of the Department were politically inactive lawyers. There were 5 members on the staff and the Department's annual budget was about \$100,000. The Department served Committees but not individual Senators. The chief function of the Department was to assist in making laws. The Counsel assisted Committees in selecting experts to testify at hearings.

Registration Files for Lobbyists

The Senate registration files for lobbyists listed 109 lobbyists in the field of water and related land resources. Information concerning the subjects of interest of these lobbyists is summarized below:

<u>No. of Lobbyists With Interest in Subject</u>	<u>Subject</u>
2	Wildlife
2	Tourism
3	Parks and Recreation
4	Public Utilities
4	Water Supply
5	Land and Forests
7	Government Reorganization
8	Minerals
11	Natural Resources
23	Pollution Control
12	General Conservation Matters

Organizations represented by lobbyists include: Minnesota Timber Producers Association, Association of Minnesota Counties, Minnesota Municipal Utility Association, Muskies Inc., Minnesota American Automobile Association, Help Our Wolves Live, League of Minnesota Municipalities, Southern Minnesota Conservation Association, Metropolitan Clean Air Committee, League of Women Voters, St. Paul Fly Tiers and Fisherman, Minnesota Academy of Science, St. Paul Winter Carnival Association, Ramsey County Sportsman Association, Snowmobile Association, Lake Superior Industrial Bureau, Minnesota Asphalt Paving Association, Minnesota Water Conditioning Association, Citizen's League, Association of North Suburban Residents, Minnesota Lakeshore League, Minnesota Association of Soil and Water Conservation Districts, Association of Minnesota Forest Service Em-

ployees, Minnesota Association for Conservation Education, Save Minnesota Deer, Minnesota Conservation Officers Association, Minnesota Council of State Parks, Minnesota Association of Consulting Engineers, Izaak Walton League, Minnesota Environmental Defense Council, Minnesota Water Conservation Association, Minnesota Arrowhead Association, and Minnesota Live Bait Dealers Association.

The House registration files for lobbyists listed 141 lobbyists in the field of water and related land resources. Information concerning the subjects of interest of the lobbyists is summarized below:

<u>Number of Lobbyists With Interest in Subject</u>	<u>Subject</u>
1	Tourism
1	Game and Fish
2	Flood Plain Zoning
2	Water Supply
2	Wildlife
5	Public Utilities
5	Minerals
6	Government Reorganization
8	Lands and Forests
12	Parks and Recreation
12	Soil and Water
21	Natural Resources
23	Pollution Control
41	General Conservation Matters

In addition to organizations mentioned earlier in connection with Senate lobbyists, the following organizations were represented by House-lobbyists: Minnesota Conservation Federation, Forest Industry Information Committee, Minnesota Timber Producers Association, Beautification of St. Louis Park, Outdoor News, and Duck Hunters Association of Minnesota. Many lobbyists were registered with both the House and the Senate. There were 855 registered lobbyists; about 16 percent of these lobbyists registered in the field of water and related land resources.

Congressional Handling of Water Resources

Congressional Committees

"In each House of the Congress the prime responsibility for water resources rests largely with the Committee on Interior and Insular Affairs and the Committee on Public Works. It is in these two Committees and their standing subcommittees that most water resources legislation is considered. Other Committees are also involved in numerous specific aspects of water resources legislation. These include the House Committees on Agriculture; Merchant Marine and Fisheries; Interstate and Foreign Commerce, and Foreign Relations; and House and Senate Committees on Banking and Currency. The Appropriations Committees of both Houses, with their control over funds, have considerable jurisdiction over how water resources programs are effec-

tuated, and the government operations committees, with investigatory powers may also play a significant role. In addition, several other Committees in both Houses, plus the joint Committee on Atomic Energy, consider bills involving water resources from time to time.

The Public Works Committees of the House and Senate are responsible for navigation and flood control programs of the Corps of Engineers. There are two major exceptions, the watershed protection programs of the Department of Agriculture, which come under the Agriculture and Forestry Committees, and the flood control projects on the U.S.-Mexican boundary, which come under the purview of the Foreign Relations and Foreign Affairs Committees. The multiple-purpose projects of the Corps of Engineers are also considered by the Public Works Committees, and in several instances substantial multiple-purpose authorizations for the Bureau of Reclamation have been included in omnibus flood control legislation handled by the Public Works Committees.

The research and construction grant programs for the abatement of water pollution that are carried out by the Federal Water Quality Administration also come under the Public Works Committees. Road and highway drainage, which forms a significant part of the Federal aid highway programs, comes under these Committees, as do the dams, reservoirs, and power plants of TVA. Authorization of the St. Lawrence Seaway Development was handled by the Public Works Committee in the House and by the Foreign Relations Committee in the Senate.

In both Houses, the Interior and Insular Affairs Committees are responsible for irrigation and reclamation projects, including multiple purpose hydroelectric power projects in the 18 western States, Alaska, and Hawaii. Other legislation reviewed by the Interior and Insular Affairs Committees includes the desalting program, wildlife preservation and stream pollution control in the national parks, waterbased outdoor recreation, public water supply and irrigation for Indian lands, fish and wildlife preservation and watershed protection on public lands, collection of basic data on the surface and ground water, and recent legislation dealing with comprehensive river basin planning and water resources research.

The Merchant Marine and Fisheries Committees of the House and the Commerce Committee of the Senate handle legislation on navigation aids to the Coast Guard, weather data, and research on weather modification by the Weather Bureau. Legislation dealing with inland and marine fisheries and the preservation of sport fish and wildlife in general comes under these Committees. Inland waterways legislation is referred to the Committee on Interstate and Foreign Commerce in the House and the Committee on Commerce in the Senate. Legislation dealing with hydraulic research in the Bureau of Standards is the responsibility of the Commerce Committee of the Senate and House Committee on Science and Astronautics. Proposed legislation affecting water quality work remaining in the public health service would be reviewed by the Senate Labor and Public Welfare Committee and the House Interstate and Foreign Commerce Committee.

The Committees on Agriculture and Forestry are responsible for land and water conservation on agricultural lands. These responsibilities have been exercised through these Committees and their predecessors for decades. Beginning with the Flood Control Act of 1936, pro-

grams for run-off and waterflow retardation and soil erosion prevention on watersheds, under the Secretary of Agriculture, were authorized in omnibus flood control legislation emanating from the Public Works Committees and their predecessors. With the enlargement of the watershed program in 1954 (Public Law 566 of the 83rd Congress), it became obvious that flood control works sponsored by the Soil Conservation Service could reach a magnitude comparable with the smaller projects of the Corps of Engineers. Recognizing the similarity, the responsibility for approval of work plans prepared under authority of this legislation was divided arbitrarily by size of impoundment between the Public Works Committees and the Agriculture Committees, through their responsibilities for legislation to provide irrigation, water supply, and sewerage facilities in rural areas. A similar situation arises in connection with legislation having to do with financial and technical assistance in disaster areas. Certain programs of the Forest Service involving waterbased recreation are likewise considered by the Agriculture Committees.

Water projects involving either the U.S. and Mexico or the U.S. and Canada on their common boundaries generally come under the jurisdiction of the House Foreign Affairs Committee and the Senate Foreign Relations Committee. The need for Federal assistance to urban areas has resulted in programs for planning and construction of public water supply and sewerage facilities that stem from legislation under the jurisdiction of the Banking and Currency Committees of both Houses.

The Appropriations Committees of both houses play a significant role in water programs of all agencies, because they review the budget requests submitted by the administration and make their own recommendations for funding. From time to time, under suspension of the rules or agreement to waive points of order, there is "legislation in an appropriations bill" that may authorize a project or program without reference to the appropriate substantive Committee. The Appropriations Committees also include comments in their reports on appropriations legislation that may be followed by the Federal agencies to almost the same degree as if they were included in the statute. To handle their work loads within the deadlines imposed by the Federal fiscal year, both Appropriations Committees have created subcommittees, each responsible for one of the major spending bills. The Subcommittee on Public Works Appropriations in each body is responsible for water resources and other programs of the Corps of Engineers, the Bureau of Reclamation, the Tennessee Valley Authority, the Panama Canal, the Power marketing Agencies of the Interior Department, the Water Resources Council and its river basin Commissions, and others. The appropriations Committees thus attempt to assure coordinated consideration of water resources matters. The Senate provides for ex-officio membership on the Appropriations Committee of 3 members of certain substantive legislative Committees to consider the annual appropriations bills providing funds for the agencies concerned. As a result, the possibility of conflicting policies emanating from the appropriations subcommittees and these substantive legislative Committees should be minimized. For bills which might affect water resources, such ex-officio membership includes members for the Committee on Agriculture and Forestry for the Department of Agriculture appropriations bills from the Committee on Public Works for Rivers and Harbors Appropriations, and from the joint Committee on Atomic Energy for the appropriations for development and utilization of atomic energy.

The Committees on Government Operations also have broad general authority over the way Federal programs are effectuated. Specifically these Committees consider reorganization legislation involving water resources agencies among others, but probably their most significant effect on water resources programs stems from studies and reports made to improve the efficiency and economy of government operations. There are several subcommittees under each of the Government Operations Committees, to which various functions involving water resources are delegated.

Interstate Compacts on apportionment of water for irrigation are referred under the rules to the Committees on Interior and Insular Affairs in both Houses, whereas Interstate Compacts are generally referred to the Judiciary Committees in both Houses. The Ways and Means Committee in the House and the Finance Committee in the Senate, handles bills to authorize Federal tax incentives to industry for water pollution abatement works.

Legislation is sometimes referred to 2 or more Committees. Occasionally, legislation to authorize a proposed water resources project is presented in two bills, each for referral to the appropriate Committee. More frequently, however, it appears that each Committee works independently. Water pollution abatement is a subject on which several Committees have apparently dealt independently with similar legislative matters.

The Congressional Committee structure for dealing with water resources has evolved over a long period of time. Through 1945, in more than a century and a half of legislative activity, the House had set up 67 standing Committees and the Senate 72. In 1945 Congress undertook a review of its own operations through a Joint Committee on the Organization of Congress. In the Legislative Reorganization Act of 1946 that resulted, the 33 standing Committees of the Senate were consolidated into 15 new Committees, and 48 standing Committees of the House of Representatives were consolidated into 19. The Congressional structure for handling water resources is roughly parallel in the 2 Houses. The Committee structure established in the 1946 Act has continued to the present day with the exception that in 1958, to meet problems arising from increased involvement in space activities, the Committee on Aeronautical and Space Sciences was created in the Senate and the Committee on Science and Astronautics in the House. The Senate Committee has no responsibilities in the field of water resources but the House Committee has jurisdiction over the Bureau of Standards and the National Science Foundation as well as over research generally, which may lead it into fields related to water resources. Thus, at present, there is a total of 16 standing Committees in the Senate and 20 in the House, of which 10 and 12, respectively, appear to have responsibilities that touch on water resources. In addition, there is a Joint Committee on Atomic Energy, which exercises all the functions of standing Committees in connection with legislative matters involving nuclear energy.

Jurisdiction of Congressional Committees

The jurisdiction of Congressional Committees is specified in Rule 25 of the Senate and 11 of the House, which refer guidance for the referral of bills. Referrals of bills under the rules are made by the Speaker of the House and the President of the Senate, although in practice this function is carried out by the parliamentarian in each House. The jurisdiction of the Committees is described in somewhat general terms, so that a considerable

exercise of judgment is required in the referral of bills. The power of the Congressional Committees is such that the Committee to which legislation is referred may have a considerable effect on its program.

Committees on Interior and Insular Affairs, Public Works, and Appropriations probably have the most significant effect on water resources legislation. All 3 of these Committees in both Houses have found it necessary to subdivide their work load by creating subcommittees. The subdivision of work related to water resources is most pronounced in the Appropriations Committees, where there are 8 subcommittees on the Senate side and 7 on the House side that report bills including funds pertaining to some aspect of water resources.

Because of the large number of subcommittees, the water resources functions are subdivided. The Table below shows the 29 Federal agencies having programs related to water resources and the legislative Committees to which they report. Each agency also reports annually to the subcommittee of the Appropriations Committee that handles its annual and supplemental appropriations.

Department or Agency	Water-Related Work	Committee Having Jurisdiction	
		House	Senate
Department of Agriculture			
Agricultural Stabilization & conservation Service	Financial & tech. assist. for conservation work in disaster areas	Agriculture	Agric. and Forestry
Farmers Home Administration	Financial & tech. assist. for rural water supply and sewerage	Agriculture	Agriculture and Forestry
Forest Service	Watershed protection, recreation	Agric. Interior & Insular Affairs	Agric. & Forestry & Insular Affairs
Soil Conservation Service	Watershed protection, irrigation, water supply, recreation, flood control	Agriculture Public Works	Agriculture and Forestry Public Works
Department of Commerce			
Bureau of Public Roads	Road & highways	Public Works	Public Works
Environ. Sciences Services Administration	drainage Hydro-meteorological Investigations, weather modification research	Interstate & Foreign Commerce	Commerce
Bureau of Standards	Hydraulics research	Science & Astronautics	Commerce
Department of Defense			
Corps of Engineers: Civil Functions	Navigation, flood control, water supply, recreation, hydroelectric power,	Public Works	Public Works

	& multiple-purpose projects		
Dept. Health, Education & Welfare Public Health Service	Water quality	Public Works Interstate & Foreign Commerce	Public Works Labor & Public Welfare
Department of Housing & Urban Development Land & Facilities Development Administration	Loans & grants for sewerage projects	Banking and currency	Banking and Currency
Office of Planning Standards & Coordination	Loans & grants for public works planning	Banking and Currency	Banking and Currency
Department of the Interior Office of Water Resources Research	Grants & contracts for water resources research	Interior and Insular Affairs	Interior and Insular Affairs
Office of Saline Water	Research and development on desalting	Interior and Insular Affairs	Interior and Insular Affairs
U.S. Fish & Wildlife		Int. & Insular Affairs	Interior & Insular Affairs
Bureau of Sport Fisheries & Wildlife	Conservation of fish & wildlife	Merchant Marine & fisheries	Commerce
Bureau of Commercial Fisheries			
Bureau of Indian Affairs	Indian water resource projects	Int. & Ins. Affairs	Int. & Ins. Affairs
Geological Survey	Water resources basic data	Int. & Ins. Affairs	Int. & Ins. Affairs
Bureau of Land Management	Wtr. Res. mngmt. on public lands	Int. & Ins. Affairs	Int. & Ins. Affairs
National Park Service	Wtr. Res. mngmt. in nat'l. parks	Int. & Ins. Affairs	Int. and Ins. Affairs
Bureau of Outdoor Recreation	Wtr.-based recreation policies	Int. & Ins. Affairs	Int. & Ins. Affairs
Bureau of Reclamation	Irrigation, water supply, hydroelectric power, multiple purpose projects	Interior and Insular Affairs	Interior and Insular Affairs
Bonneville Power Admin.		Interior and Insular Affairs	Int. and Ins. Affairs
S.W. Power Admin.	Marketing of hydroelectric power	Public Works	Public Works
S.E. Power Admin.			
Federal Water Pollution Control Administration	Pollution abatement, research & grants	Public Works	Public Works
Department of State International Boundary & Water Commission--U.S. & Mexico	Water resource development	Foreign Affairs	Foreign Relations

International Joint Commission-U.S. & Canada	Studies of water resources matters	Foreign Affairs	Foreign relations
Treasury Department U.S. Coast Guard	Aids to navigation	Merchant Marine & Fisheries	Commerce
Independent Agencies Appalachian Reg. Comm.	Wtr. resources investigations	Public Works	Public Works
Atomic Energy Comm.	Research & demonstration desalt.	Joint Comm. on Atomic Energy	
Delaware River Basin Commission	Wtr. resources planning & management for all purposes	Judiciary	Judiciary, Public works, Int. & Ins. Affairs
Federal Power Commission	Hydroelectric power studies	Interstate & for.	commerce
National Science Foundation	Water resources research	Sci. & Astronaut.	Labor & Public Welfare
St. Lawrence Seaway Development Corp.	Navigation on St. Lawrence river	Public Works	Public Works Foreign Relt.
T.V.A.	Multiple-purpose water resource development	Public Works	Public Works
Water Resources Council and River Basin Commissions	Water resources planning	Interior and Insular Affairs	Interior and Ins. Affairs

A number of recent legislative enactments show that congressional action tends to transcend boundaries set up by arbitrary divisions of responsibilities among several congressional Committees, or among the different agencies in the Executive Branch of the Federal government that engaged in the same type of work. When necessary, special attention can be given to water resources outside of the standing Committees. For example, in 1959 the Senate created a Select Committee on National Water Resources (Senate Resolution 48, 1959), which made studies and reports on all aspects of water resources before ceasing to exist on Jan. 31, 1961. Similar action can be taken in the future by either House, if necessary, or a special joint Committee could be created by concurrent resolution to consider all aspects of water within a single congressional Committee. A certain measure of coordination in matters related to water resources is provided also by the service of members on more than one of the Committees dealing with water resources. Furthermore, the rules of the Senate result in liaison between its Appropriations Committee and certain legislative Committees through ex-officio memberships.

Legislative Measures Introduced in 89th Congress

A cursory review was made of the titles and digests of all the legislative measures introduced in the 89th Congress, which ran from Jan. 4, 1965 to Oct. 22, 1966. For this purpose, the Digest of Public General Bills and Selected Resolutions, 89th Congress, 1st and 2nd Sessions, Final Issues, 1965-66, and the legislative calendars of the several committees were used.

The review covered 18,551 House bills, 13,222 House Joint Resolutions, 3931 Senate bills and 198 Senate Joint Resolutions, a grand total of 24,002 potential legislative enactments. House and Senate concurrent resolutions and simple House and Senate Resolutions were not considered, as they do not form the basis for public laws.

Of the total number of bills scanned by title and digest, 1289 bills and resolutions were concerned with water resources development of one kind or another or had some other direct or indirect relationship to water resources. House bills and joint resolutions included in this category total 998 and Senate measures 291. Thus, a little over 5 percent of all the proposed legislation introduced in the Congress in 1965 and 1966 was concerned with water resources. When it is considered that about 6,500 of the bills in both Houses were private bills, the percentage of potential public measures involving water resources is much greater, about 7.2 per cent or 1 in 14.

The proposed water resource legislative measures were referred to a total of 13 Committees in the House and 11 Committees in the Senate, as indicated in the table below. In addition to the bills originating in the Senate referred to Senate Committees, the appropriations bills, which must originate in the House, were referred to the Senate Committee on Appropriations after passing the House. These have not been counted as Senate, as no attempt was made to tally the Acts referred to House Committees. Since acts do not show up in the tally, this inventory should not be considered as covering the work load of any Committee on measures to water resources. The number of measures not counted, of course, is far more offset by identical bills introduced in the House to cover the same period.

The tabulation show that the House Public Works Committee received for its consideration the largest number of water related bills in both Sessions of the 80th Congress, with the Interior and Insular Affairs Committee running a very close second, followed by the Merchant Marine and Fisheries Committees with a much smaller number of bills. The Agriculture, Appropriations, Banking and Currency, and Ways and Means Committees ranked next with about an equal number of referrals, and a scattering referred to the other Committees listed.

House Committee	Number of Bills	Senate Committee	Number of Bills
Agriculture	31	Agriculture & Forestry	14
Appropriations	37	Appropriations	1/
Armed Services	1	Banking and Currency	12
Banking & Currency	34	Commerce	25
Foreign Affairs	14	Finance	4
Government Operations	20	Foreign Relations	3
Interior & Insular Affairs	339	Government Operations	4
Interstate and Foreign Commerce	11	Interior and Insular Affairs	113
Judiciary	10	Judiciary	3
Merchant Marine and Fisheries	68	Labor and Public Welfare	2
Public Works	394	Public Works	111
Science & Astronautics	4		
Ways and Means	35		
TOTALS	998		291

1/House Acts not counted in Senate

The largest number of individual water resources related bills referred to the House Public Works Committee pertained to authorization of flood control or navigation projects of surveys that might lead to recommendations of projects. The total number of project and survey bills was 132. There were 51 bills having to do with pollution abatement, 49 relating with the St. Lawrence Seaway, and 41 on accelerated public works and regional development, including a number of Appalachia bills. There were 35 bills to authorize flood, hurricane, or other disaster relief. There were 41 bills of a general policy nature. The remainder of the bills referred to public works included a small number affecting TVA, the Arkansas River Compact, and bridges and dams on navigable rivers. Many of the bills referred to this Committee were identical.

In the House Committee on Interior and Insular Affairs there were 117 bills related to the authorization of proposed reclamation projects or of surveys leading to such projects. The largest number of bills (168) referred to this Committee involved water-based recreation, including such subjects as scenic rivers, national lakeshores, national recreation areas, parks, and wild rivers. Some 58 of these were identical proposals for Federal cooperation with the State of New York and New Jersey to preserve the resources of the Hudson river, and there 34 bills to authorize establishment of a Hudson highlands national scenic riverway. There were about 50 bills dealing with general policy on such matters as water resources research and planning, weather modification to increase precipitation, small reclamation projects, extension of desalting program, user fees in recreation areas, and similar matters. A few other bills referred to this Committee covered miscellaneous subjects such as hydrologic surveys in the Delmarva Peninsula, Federal participation in a desalting plant, and other individual water matters not included in the reclamation program.

The Committee on Merchant Marine and Fisheries, which had the third largest number of bills, received measures relating to anadromous fish, oceanography, inland waterway rules, interoceanic canals, pesticides, and pollution of navigable waters, as well as general bills relating to fish and wildlife.

The water related bills referred to the Ways and Means Committee all dealt with providing tax incentives for water pollution abatement works through rapid amortization or an investment credit. The House Appropriations Committee had referred to it a number of bills and joint resolutions pertaining to specific water projects or programs, as well as the major appropriations bills containing funds for water resources related programs. The Banking and Currency Committee had several bills proposing flood and other disaster loans, as well as legislation including loans and grants for water supply and sewerage facilities in connection with urban and suburban development or redevelopment.

The Committee on Agriculture had measures relating to the watershed program, recreation development in connection with watersheds and national forest lands, rural water supply, and sewerage facilities, as well as flood disaster and drought assistance for farmers.

The House Government Operations Committee handled bills involving reorganization of Federal agencies having water resources responsibilities, in addition to investigations in several water related areas of Federal agency operation. The water related bills referred to the Judiciary Committee

were to proclaim various public observances of water awareness or water conservation week or month.

The Interstate and Foreign Commerce Committee was concerned with solid waste disposal, jurisdiction of the Federal power commission over certain canals and waterways, and non-navigability of certain streams. The Foreign Affairs Committee had measures relating to water resources development on the Rio Grande, as well as legislation involved in the water for Peace Conference. Some of the bills proposing establishment of National Sea Grant Colleges went to the Committee on Science and Aeronautics, but the legislation that finally became law was reported by the Committee on Merchant Marine and Fisheries.

The Senate Committee on Interior and Insular Affairs received the largest number of bills, with the Committee on Public Works having almost the same total, followed by the Commerce Committee, then by the Agriculture and Forestry Committee.

The Senate Interior Committee measures included 45 authorizations or modifications of reclamation projects, 33 involving water related recreation areas and 21 covering various aspects of general water resources policy, including the bill that became the Water Resources Planning Act of 1965 and modifications to the Water Resources Research Act. Other measures included 6 involving Indian irrigation, 3 for power marketing agencies, 2 Interstate Compact consent bills, and several miscellaneous items.

The Senate Public Works Committee had 53 bills authorizing projects, modifications of projects, or surveys of potential projects. There were 17 pollution abatement bills, 10 bills involving bridges and dams or navigable waterways, and 10 for economic development and public works acceleration programs. In addition to the Omnibus River and Harbor and Flood Control bill there were 10 other bills proposing changes in general policy for work related to water resources. The balance of this Committee's bills included 5 disaster relief proposals, consent legislation for an Interstate Compact and modifications to TVA and St. Lawrence Seaway financing. The calendar of the Senate Committee on Public Works also lists action of 69 resolutions approving small watershed plans of the Department of Agriculture under P.L. 566 and 103 resolutions requesting reviews of previous reports by the Department of the Army. These figures give some idea of the magnitude of the work load of these Committees over and above the proposed legislative measures. Bills referred to the Commerce Committee covered subjects ranging from research on weather modification to control of jellyfish as well as more normal subjects such as enhancement of fisheries and wildlife resources, water for power plants, and changes in navigable waterways. The smaller number of water related bills referred to the Committee on Agriculture and Forestry dealt with such matters as rural water and sewerage facilities, recreation and fish and wildlife conservation on agricultural and forest lands, watershed development, loans to fish farmers, and control of pesticides.

Because of the number of bills dealing with urban problems and with flood disaster assistance, the Senate Banking and Currency Committee was very close behind the Agriculture and Forestry Committee in number of bills handled. Bills referred to the Judiciary Committee in the Senate included consent legislation for an Interstate Compact, as well as the proposed pay-

ment for a water filtration plant which was referred to the armed services committee in the House, and a proposed proclamation for a National Clean Water Week. In the Senate, as in the House, water related bills dealing with tax matters involving water resources went to the Finance Committee, reorganization of Executive Branch agencies went to the Government Operations Committee, and bills dealing with water projects on National boundaries and a joint resolution on the water for peace conference went to the Committee on Foreign Relations. The 2 bills referred to the Committee on Labor and Public Welfare involved grants for health and sanitation services and the National Sea Grant College proposal. Thus it can be seen that, although the basic referrals are similar in both Houses there are several areas in which the jurisdiction is not identical.

THE NEED FOR A STATE ENVIRONMENTAL POLICY

Until recently, the average citizen regretted the deterioration of the State's environment but accepted it as the necessary price of progress. Now citizens are asking if the kind of progress experienced is all desirable, whether it can be achieved differently, and whether it is worth the sacrifice of environmental assets. Many traditional assumptions are being questioned, and attitudes toward population growth, economic expansion, and the use of our natural resources are no exceptions. The State must translate these new values and attitudes into an effective long-range broad policy if it is to achieve the goal of a satisfactory environment in the future.

A review of the State statutes will disclose that Minnesota's Legislature has not to-date enunciated a broad environmental policy. There are over 640 pages of statutes pertaining to natural resources; about 65 formal declarations, statements and resolutions scattered in these pages can be classified as specific environmental policies. There is need to consolidate existing specific policy statements so their visibility can be improved, they can be considered as a whole body, and inconsistencies and deficiencies in light of environmental concerns can be minimized. Specific policy statements should be revised, expanded, and added to a broad policy statement to form a comprehensive environmental policy for the State.

The policy of the State consists not only of formal declarations and statements enunciated by the Legislature, but also consists of the rules and regulations adopted by State and local agencies. There is need to consolidate existing environmental rules and regulations so that they can be considered as a whole body and inconsistencies and deficiencies in light of environmental concerns can be minimized.

The Department of Conservation has not developed and published rules, regulations and criteria for evaluating water permit applications in accordance with the Administrative Procedure Code of the State although it has had the opportunity to do so since 1945 when the first Code relating to promulgation of rules and regulations was established. The failure of the Department to follow these procedures may be due in part to the lack of sufficient Department personnel and funds necessary for promulgating the rules and regulations. Many restrictions are imposed by administrative action although one cannot find the printed rules and regulations which set forth the criteria for the permit restriction. Restrictions include the prohibition against assignment of the water right, limitations on what constitutes riparian lands, establishment of priorities of use lands, prohibitions on the transportation of appropriated water, and limitations on the amount appropriated for irrigation purposes.

The Water Resources Coordinating Committee, State Planning Agency in its publication entitled "Alternative Programs and Projects for Managing Minnesota's Water and Related Land Resources Through the Year 2020" states that "The State must make decisions concerning the following existing planning policy questions before a statewide framework water and related land resources plan can be prepared:

Should the State endorse and promote Federal-State regional framework water and related land resources plans which have been prepared largely by Federal agencies acting as representatives of the Souris-Red-Rainy River Basins Commission, Great Lakes Basin Commission, Upper Mississippi River Comprehensive Basin Study Coordinating Committee, and Missouri River Inter-Agency Committee?

Should the State endorse Federal-State plans in which the impacts of programs and projects on the State's environment have not been adequately identified and analyzed?

Should the State endorse Federal-State plans which are predicated on the planning policy that further development of both urban and rural flood plain areas is to be encouraged by constructing dams and other structures to reduce existing and potential flood-plain damages?

Should the State endorse Federal-State plans which are predicated on the planning policy that Minnesota will store flood waters behind a series of large dams on the Mississippi and Minnesota Rivers, thereby:

- Permitting further development of flood-plain areas along the mainstem of the Mississippi River downstream from the State?
- Providing low-streamflow augmentation for pollution control along the mainstem of the Mississippi River downstream from the State?
- Providing low-streamflow augmentation for navigation purposes on the Mississippi River and Missouri River beyond the border of the State?

Should the State endorse Federal-State plans which are predicated on the planning policy that the U.S. Bureau of Reclamation should divert large quantities of water from Minnesota and the Rainy River to irrigate large tracts of land in North Dakota and to dilute, from authorized irrigation projects in North Dakota, return flows which will discharge into the Red river and cause a serious water-quality problem?

Should the State endorse Federal-State plans which are predicated on the planning policy that secondary treatment of wastes will be deemed adequate during the next 50 years and that most future water-quality problems will be solved by providing low-streamflow augmentation through dams and reservoirs constructed by the U.S. Army Corps of Engineers and U.S. Soil Conservation Service?

Should the State endorse Federal-State plans which are predicated on the planning policy that water-borne transportation should be further subsidized and expanded, in part, by deepening the navigation channel in the Upper Mississippi River from 9 to 12 or possibly 15 feet and extending the navigation channel with a 9-foot depth up the Minnesota River to Mankato?

Should the State endorse Federal-State plans which are predicated on the planning policy that most future water-supply problems will be solved by utilizing surface water impounded behind Federal dams?

Should the State postpone acceptance or rejection of Federal-State plans until impacts on the environment of recommended programs and projects are

carefully analyzed and the State decides what regional responsibilities are reasonable for Minnesota to accept?

Should the statewide framework water and related land resources plan be predicated on the following planning policies?

- Declare environmental quality and protection as the number 1 priority in selecting programs and projects.
- Keep impacts on the environment to a minimum in selecting programs and projects.
- Keep Federal influence on State policies to a minimum in selecting programs and projects.
- Do not fully accept regional responsibilities associated with reducing by structural means flood damages beyond the boundaries of the State, providing low-stream flow augmentation for pollution control and navigation purposes beyond the boundaries of the State, and diverting water from the State to irrigate lands in North Dakota.
- Solve existing and future flood damage problems chiefly through non-structural measures such as reasonable flood plain zoning, flood proofing, etc., and by constructing local protection works such as levees, floodways, and channel improvements.
- Solve existing and future pollution problems chiefly through construction of advanced waste treatment plants and limited low-stream-flow augmentation.
- Restrict navigation improvements within the State on the Upper Mississippi River to maintenance and improvement of existing 9-foot channel and associated structures.
- Select recreation programs and projects tailored to the State's landscape regions."

Thus, the preparation of a statewide framework water and related land resources plan has been postponed until the Legislature provides further guidance in the form of an Environmental Policy. The State should adopt a broad Environmental Policy patterned after the National Environmental Policy Act of 1969 (Public Law 91-190).

In addition to planning policy questions, there are several other important matters with which an Environmental Policy should be concerned. The people of the State should be provided annually with a comprehensive report describing the status and trends of environmental quality. Natural resources program and project documentations should include statements describing impacts on the environment as well as impacts on population growth, industries, firms, employment, consumers and taxpayers. Programs and projects should be licensed only after due consideration has been given to these impacts. Proposed rules, regulations, and criteria associated with resource use permits issued by agencies should be subject to comprehensive review and revision in light of an Environmental Policy.

Policies Enunciated by the Legislature

Water and related land resources policy declarations, statements and resolutions enunciated prior to 1971 by the Legislature are listed below.

Conservation Policies

Chapt. 112 Sec. 112.34 Subdiv. 1 ref (2) p. 1298

carry out conservation of the natural resources of the state through land utilization, flood control and other needs upon sound scientific principles for the protection of the public health and welfare and the provident use of the natural resources.

Chapt. 84 Sec. 84.03 ref (2) p. 967

The commissioner, biennially, shall report to the legislature his acts and doings, with recommendation for the improvement or conservation of state parks, state public camp grounds, public access sites, boat launching facilities, state recreation reserves, trails, and state monument sites, and all other recreational lands under the jurisdiction of the department of conservation, and for desirable accessions thereto, such report to include an inventory of the tracts and parcels of land, and rights, interests, and easements therein, held by the state or withdrawn from sale for any of these purposes, with the value thereof.

Chapt. 84 Sec. 84.161 ref (2) p. 975

for the purpose of improving habitat for fish, wild fowl and game, wild rice and for forestry and fire protection.

Chapt. 86 Sec. 86.12 ref (2) p. 1047

lands, waters, forests, wetlands, wildlife, and such other natural resources which serve economic purposes also serve to varying degrees and for varying uses outdoor recreation purposes, and that sound planning of resource utilization for the full future welfare of this state must include coordination and integration of all such multiple uses.

Chapt. 138 Sec. 138.51 ref (2) p. 1578

provide for the preservation of historic sites, buildings, structures, and antiquities of state and national significance for the inspiration, use, and benefit of the people of the state.

Chapt. 89 Sec. 89.01 ref (2) p. 1080

observe the best methods of reforesting cut-over and denuded lands, foresting waste and prairie lands, preventing destruction of forests and lands by fire, administering forests on forestry principles, encouraging private owners to preserve and grow timber for commercial purposes, and conserving the forests around the headwaters of streams and on the watersheds of the state.

Chapt. 105 Sec. 105.38 ref (2) p. 1212

conserve and 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.

control and supervise, so far as practicable, the construction, reconstruction, repair, removal, or abandonment of dams, reservoirs, and all control structures in any of the public waters of the state.

Chapt. 111 Sec. 111.82 ref (2) p. 1297

promote the retention and conservation of all water precipitated from the atmosphere in the areas where it falls, as far as practicable.

Chapt. 40 Sec. 40.02 ref (2) p. 449

provide for the conservation of the soil and water resources of this state, and for the control and prevention of soil erosion and land resources planning and development, and for flood prevention or the conservation development, utilization, and disposal of water, including but not limited to measures for fish and wildlife and recreational development, and thereby preserve natural resources, control floods, prevent impairment of dams and reservoirs, assist in maintaining the navigability of rivers and harbors, preserve wildlife, protect the tax base, and protect public lands by land-use practices.

Chapt. 777 H.F. No. 1405 Sec. 1 105.485 Subdiv. 1 Sec. 3(396.03) ref. (1) p. 1450-51-53

provide guidance for the wise development of shorelands of public waters and thus preserve and enhance the quality of surface waters, preserve the economic and natural environmental values of lands, and provide for the wise utilization of water and related land resources of the state.

encourage a distribution of population and mode of land utilization that will facilitate the economical and adequate provision of transportation, roads, water supply, drainage, sanitation, education, recreation, or other public requirements.

Chapt. 590-S.F. No. 1455 Sec. 1 104.01 Subdiv. 3 ref (1) p. 1016

not to prohibit but to guide development of the flood plains of this state consistent with the enumerated legislative findings to provide state coordination and assistance to local governmental units in flood plain management; to encourage local governmental units to adopt, enforce and administer sound flood plain management ordinances, and to provide the commissioner of conservation with authority necessary to carry out a flood plain management program for the state and coordinate federal, state, and local flood plain management activities in this state.

Chapt. 107 Sec. 106.021 Subdiv. 2 ref (2) p. 1226

drain in whole or in part lakes which have become normally shallow and of a marshy character and are not of sufficient depth or volume to be of any substantial public use.

Chapt. 87 Sec. 87.01 ref (2) p. 1050

encourage and promote the use of privately owned lands and waters by the public for beneficial outdoor recreational purposes.

Chapt. 84 Sec. 84.09 ref (2) p. 969

strictly regulating the wild rice harvesting upon all public waters of the state.

Chapt. 361 Sec. 361.01 ref (3) p. 3913

promote safety for persons and property in connection with the use of the waters of the state.

Chapt. 105 Sec. 105.51 Subdiv. 1 ref (2) p. 1218

For the conservation of the underground water supplies of the state, the commissioner is authorized to require the owners to control artesian wells to prevent waste.

Chapt. 97 Sec. 97.48 Subdiv. 15 ref (2) p. 1170

The commissioner shall acquire by gift, lease, purchase, or condemnation in the manner prescribed by Chapter 117, in the name of the state, from the game and fish fund, parking or camping areas of not to exceed five acres, adjacent to public waters to which the public theretofore had no access or where the access is inadequate and upon which the public has a right to hunt and fish, and such easements and rights of way as may be required to connect such areas with public highways, provided, no acquisition costing over \$1,000 shall be made without first obtaining the approval of the executive council, and provided further that the authority herein granted shall not extend to lakes completely surrounded by lands owned and maintained for the purpose of conducting an educational or religious institution, or to lakes which are unmeandered or which contain less than 200 acres within the meander lines; provided, that in the case of any lake containing less than 200 acres but not less than 150 acres within the meander lines, the authority herein granted shall apply where the lands, easements, or rights of way required are acquired by gift or purchase but not by condemnation.

Chapt. 84 Sec. 84.44 ref (2) p. 978

regulation and control of the operation of aircraft and watercraft upon or over any wilderness area and public waters therein is necessary for the protection and promotion of public health, safety and welfare and other interests of the public therein and for the protection and conservation of natural wilderness conditions and other natural resources therein for the public benefit.

Chapt. 362 Sec. 362.10, 362.12 Subdiv. 1 ref (3) p. 3922

The department of economic development shall encompass the following functions: promotion of tourism.

The department shall: conduct or encourage research designed to further new and more extensive uses of natural or other resources of the state and designed to develop new products and industrial processes.

Chapt. 117 Sec. 117.461 Subdiv. 1, 2 ref (2) p. 1366-1367

The business of mining and beneficiating semi-taconite, as defined in Minnesota Statutes, Section 298.34, is declared to be in the public interest and necessary to the public welfare, and the taking of private property therefore is declared to be for a public use and purpose.

The commissioner of conservation is authorized to grant permits and licenses or leases on and across lands owned by the state for any of the purposes set forth in subdivision 1, and to lease state owned lands for the depositing of stripping, lean ores, tailings, or waste products of such business.

Chapt. 93 Sec. 93.13 ref (2) p. 1128

When a meandered or public lake does not exceed 80 acres in area, within the original meander line, and is surrounded in part by state land upon which a state mineral lease has been issued and is in force and effect, then such lake, with the approval of the executive council, may be drained and the iron ore removed from the bed thereof.

Chapt. 774-H.F. No. 1207 Sec. 1 93.44 ref (1) p. 1439

provide for the reclamation of certain lands hereafter subjected to the mining of metallic minerals where such reclamation is necessary, both in the interest of the general welfare and as an exercise of the police power of the state, to control possible adverse environmental effects of mining, to preserve the natural resources, and to encourage the planning of future land utilization, while at the same time promoting the orderly development of mining, the encouragement of good mining practices, and the recognition and identification of the beneficial aspects of mining.

Pollution Control Policies

Chapt. 1046-H.F. No. 2311 Sec. 116.01 ref (1) p. 2117

meet the variety and complexity of problems relating to water, air and land pollution in the areas of the state affected thereby, and to achieve a reasonable degree of purity of water, air and land resources of the state consistent with the maximum enjoyment and use thereof in furtherance of the welfare of the people of the state.

Chapt. 115 Sec. 115.42 ref (2) p. 1340

provide for the prevention, control, and abatement of pollution of all waters of the state, so far as feasible and practical, in furtherance of conservation of such waters and protection of the public health and in furtherance of the development of the economic welfare of the state; safeguard the waters of the state from pollution by: preventing any new pollution; and abating pollution existing when Laws 1963 Chapt. 874, became effective.

Chapt. 115 Sec. 115.44 Subdiv. 1, 2, 4 ref (2) p. 1340-1341

Due to variable factors, no single standard of quality and purity of the waters is applicable to all waters of the state or to different seg-

ments of the same waters. Group the designated waters of the state into classes, and adopt classifications and standards of purity and quality therefore. Such classifications shall be made in accordance with considerations of best usage in the interest of the public.

Chapt. 116 Sec. 116.07 Subdiv. 2 ref (2) p. 1352

adopt standards of air quality, including maximum allowable standards of emission of air contaminants from motor vehicles, recognizing that due to variable factors, no single standard of purity of air is applicable to all areas of the state.

Chapt. 115 Sec. 115.43 ref (2) p. 1340

give due consideration to the establishment, maintenance, operation, and expansion of business, commerce, trade, industry, traffic and other economic factors and other material matters affecting the feasibility and practicability of any proposed action, including but not limited to, the burden on a municipality of any tax which may result therefrom and shall take or provide for such action as may be reasonable, feasible and practical under the circumstances.

Chapt. 1000-H.F. No. 569 Sec. 290.06 ref (1) p. 2007

providing an income tax credit for pollution control equipment.

Chapt. 272 Sec. 272.02 ref (2) p. 2757-2758

all property described in this section to the extent herein limited shall be exempt from taxation: real and personal property used solely and exclusively for the abatement and control of air or water pollution.

Chapt. 825-S.F. No. 1541 Sec. 1 116.15 ref (1) p. 1513

authorizing state grants in aid for the payment of interest on loans made by political subdivisions of the state for the acquisition and betterment of public lands and buildings and other public improvements of a capital nature needed for the purposes of the control of water pollution.

Chapt. 115 Sec. 115.49 Subdiv. 1 ref (2) p. 1345

If the Commission determines after a hearing on the subject matter that cooperation between two or more municipalities is necessary to prevent, control, or abate pollution, it may adopt a resolution so declaring and determining whether it will be feasible to secure such cooperation by contract between the municipalities concerned.

Chapt. 144 Sec. 144.35 ref (2) p. 1614

The board shall have general charge of all springs, wells, ponds, and streams so used and take all necessary and proper steps to preserve the same from such pollution as may endanger the public health.

Chapt. 144 Sec. 144.12 ref (2) p. 1603

the board may control, by requiring the taking out of licenses or permits, or by other appropriate means, any and all of the following matters:

the business of scavengering and the disposal of sewage the pollution of streams and other waters and the distribution of water by private persons for drinking or domestic use the general sanitation of tourist camps, summer hotels, and resorts in respect to water supplies, disposal of sewage, garbage, and other wastes atmospheric pollution which may be injurious or detrimental to public health sources of ionizing radiation, and the handling, storage, transportation, use and disposal of radioactive isotopes and fissionable materials.

Chapt. 18 Sec. 18.45 ref (2) p. 277

The purpose of the plant pest act is to prevent the introduction into and the propagation and dissemination within this state of plant pests and to provide for their suppression and control.

Chapt. 18 Sec. 18.051 ref (2) p. 261

the abatement or suppression of mosquitoes of any kind, whether disease bearing or merely pestiferous, within any or all areas of the state, is advisable and necessary for the maintenance and betterment of the health, welfare and prosperity of the people thereof; and is found and declared to be for public purposes.

Miscellaneous Policies

Chapt. 105 Sec. 105.72 ref (2) p. 1222

The code of water law of Minnesota is contained in numerous statutes enacted from time to time, which must be considered as a whole to effect a systematic administration of water policy for the public welfare. Seeming contradictions in these laws when applied in a specific proceeding create a need for a forum where the conflicting aspects of public interest involved can be presented and by the consideration of the whole body of water law the controlling policy can be determined and apparent inconsistencies resolved.

Chapt. 473 Sec. 473.01 ref (3) p. 4635

Comprehensive planning for the orderly and economical growth of entire metropolitan areas consistent with the general welfare requires the establishment of regional planning commissions.

Chapt. 4 Sec. 4.10 ref (2) p. 133

In order that the state benefit from an integrated program for the development and effective employment of its resources, and in order to promote the health, safety, and general welfare of its citizens, it is in the public interest that a planning agency be created in the executive branch of the state government to engage in a program of comprehensive statewide planning.

Chapt. 12 Sec. 12.02 ref (2) p. 178

Because of the existing and increasing possibility of the occurrence of disasters of unprecedented size and destructiveness resulting from enemy

attack, sabotage, or other hostile action, or from fire, flood, earthquake or other natural causes, and in order to insure that preparations of this State will be adequate to deal with such disasters, and generally to provide for the common defense and to protect the public peace, health, and safety, and to preserve the lives and property of the people of the State, it is hereby found and declared to be necessary: to create a State civil defense agency, and to require the creation of local organizations for civil defense in the political subdivisions of the State.

Chapt. 3 Sec. 3.29 Subdiv. 6 ref (2) p. 112-113

encourage and assist the legislative, executive, administrative and judicial officials and employees of this state to develop and maintain friendly contact by correspondence, by conference, and otherwise, with officials and employees of the other states, of the federal government, and of local units of the federal government, and of local units of government.

Chapt. 115 Sec. 115.06 Subdiv. 1 ref (2) p. 1328

assist and cooperate with any agency of another state, of the United States of America or of the Dominion of Canada or any province thereof in any matter relating to water pollution control.

Chapt. 84 Sec. 84.031 ref (2) p. 967

Whenever any person, firm, association, or corporation, or any state or political subdivision, agency or commission thereof shall disturb, obstruct, or interfere with the natural flow or condition of public waters beyond the boundaries of the state in a manner so as to seriously affect the public welfare and interests of the state, the commissioner of conservation may institute proceedings in behalf of the state in any court having jurisdiction to abate or enjoin the continuance thereof.

Chapt. 458 Sec. 458.16 ref (3) p. 4491

It shall be the general duty of any such port authority to promote the general welfare of the port district, and of the port as a whole; to endeavor to increase the volume of the commerce thereof.

Chapt. 161 Sec. 161.1419 Subdiv. 1 ref (1) p. 1782

It is declared to be the policy of the state and to be in the best public interest for the promotion of public safety, recreation, travel, trade, and the general welfare of the people to cooperate with the federal government and with interstate Mississippi river parkway planning commission.

Chapt. 114 Sec. 114.09 Subdiv. 2 ref (2) p. 1322

Each of the states of North Dakota, South Dakota, and Minnesota undertakes to cooperate with the other two states for the most advantageous utilization of the waters of the Red River of the North, for the control of the flood waters of this river, and for the prevention of the pollution of such waters.

Minnesota-Wisconsin Boundary Compact - A Compact for the purpose of present and future protection, use and development in the public interest of the lands, river valleys and waters which form the boundaries of this state is hereby ratified.

It is hereby determined and declared that the harbors in this state are valuable natural resources; that there are tracts of land in this state located in harbors upon the Great Lakes - St. Lawrence Seaway, which by reason of topography, submersion, erosion, depletion and other causes tend to impede navigation and are valueless for any useful riparian purpose; that the conservation, development, reclamation and protection of these lands so as to constitute them economically valuable is an essential governmental function of the state of Minnesota; that the conservation, development, reclamation and protection of such lands will promote the public welfare of the state of Minnesota by developing to usefulness certain of these lands, and that such processes are essential to assure the inclusion of the state of Minnesota in both domestic and foreign systems of water-borne commerce; that the fortunate position of the state of Minnesota with respect to the Great Lakes - St. Lawrence Seaway will not be fully realized in terms of economic benefit to the citizens of this state unless certain of such lands are conserved, developed, reclaimed, and protected; that these processes of restoring such lands to economic usefulness will provide employment; will reduce unemployment; will tend to increase navigation and commerce in the state of Minnesota; and will benefit in many other ways the people of the state of Minnesota.

promote the orderly, integrated, and comprehensive development, use, and conservation of the water resources of the Great Lakes Basin (hereinafter called the basin); plan for the welfare and development of the water resources of the Basin as a whole as well as for those portions of the Basin which may have problems of special concern; make it possible for the states of the Basin and their people to derive maximum benefit from utilization of public works, in the form of navigational aids or otherwise, which may exist or which may be constructed from time to time; advise in securing and maintaining a proper balance among industrial, commercial, agricultural, water supply, residential, recreational, and other legitimate uses of the water resources of the Basin; establish and maintain an intergovernmental agency to the end that the purposes of this compact may be accomplished more effectively.

1963 Regular Session Resolutions

Resolution No. 2 - H.F. No. 16

A resolution memorializing Congress to establish a great river road as an interstate system from Canada to the Gulf of Mexico.

Resolution No. 6 - S.F. No. 393

A resolution memorializing the Congress of the United States to enact legislation authorizing and directing the Department of the Army, acting through the district engineer, U.S. Army Engineers, Saint Paul, Minnesota, to enter into agreements with the State of Minnesota for the regulation, utilization and control of water levels in the headwater lakes of the Mississippi River, for the purpose of controlling such water elevations and the discharge from the reservoirs involved to preserve and protect, in accordance with the plans of the State of Minnesota, the full utilization and control of such waters in the interests of the people of the state.

1955 Regular Session Resolutions

Resolution No. 1 - H.F. No. 227

A concurrent resolution Memorializing the President of the United States, the Federal Maritime Board, and the Congress of the United States to support measures to restore package freight service on the Great Lakes.

1957 Regular Session Resolutions

Resolution No. 5 - H.F. No. 1008

A joint resolution memorializing the President and the Congress of the United States to support measures for the lamprey control program of the Great Lakes.

Resolution No. 3 - H.F. No. 257

A concurrent resolution memorializing the President and the Congress of the United States to support measures authorizing the deepening of all Great Lakes connecting channels to a depth of thirty-six feet.

1959 Regular Session Resolutions

Resolution No. 2 - S.F. No. 169

A resolution memorializing Congress, the President and the Secretary of Agriculture to enact legislation enabling producers of agricultural products to benefit from the Great Lakes-St. Lawrence Seaway.

1961 Regular Session Resolutions

Resolution No. 4 - S.F. No. 395

A resolution memorializing the Congress of the United States to provide adequate funds to the appropriate federal agency for the purpose of conducting an up-to-date survey of the Minnesota river within the state of Minnesota, and bringing up-to-date the report of the chief of engineers, United States

Army, dated June 6, 1935, relative to the utility of the river for navigation, flood control and related purposes and the justification of federal fund participation therein.

- (1) Laws of Minnesota 1969
- (2) Minnesota Statutes 1967 Vol. 1, Ch. 1-299
- (3) Minnesota Statutes 1967 Vol. 2, Ch. 300-648

Water Permit System

General charge and control over the waters of Minnesota is given to the Commissioner of the Department of Natural Resources. The Legislature provided the statutory means for State control and regulations over waters in part as follows: "It shall be unlawful for the State, any person, partnership, or association, private or public corporation, county, municipality, or other political subdivision of the State to appropriate or use any waters of the State, surface or underground without the written permit of the Commissioner."

The Department of Natural Resources, in administering the water permit system, as it concerns appropriation and use of surface waters, has adopted the position that permits for appropriation of public waters will be issued only to owners of riparian lands. The amount of surface water which may be allowed to be appropriated and used under the permit system is based on reasonable and beneficial use with considerations given to the consumptive water requirements and the return of waste waters from a given operation to the same watercourse. Water appropriated or used under this administrative policy is generally restricted to use anywhere within the watershed of the lake or stream from which water is taken. In some instances, permits have allowed diversions of water from minor subwatersheds, but, the waste waters must be returned to the same major watershed from which they were appropriated.

The appropriation and use of surface waters for irrigation purposes, under present administrative practice, is restricted to a maximum annual appropriation limit based on acreage contained only in riparian forty-acre tracts or government lots which directly abut the surface water source. The allowable surface water appropriated may be used on any lands contiguous to the riparian forty-acre tracts or government lots as long as these lands are owned by the permittee and are within the same watershed as the source of the appropriated water.

Permits for appropriation of ground and surface waters issued by the Department of Natural Resources may be terminated by the Commissioner, without notice, at any time he deems it necessary for the conservation of water resources of the State, or in the interest of public health and welfare, or for violation of any of the provisions of the permit. In addition, the Commissioner may prescribe any other conditions within the permit.

More certain statutory rights to the use of water have been afforded Minnesota's mining industry. In the case of a permit for the drainage, diversion, control, or use of waters when necessary for the mining of iron ore, taconite, copper, copper-nickel or nickel, the Department of Natural Resources grants permits for such a term as the Department finds

necessary for the completion of the proposed mining operations, and the Department may allow and prescribe in the permit such time as the Department deems reasonable for the commencement or completion of any operations or construction under the permit or the exercise of the rights granted thereby. The original term of the permit or the time allowed for the performance of any condition thereof may be extended by the Department for good cause shown upon application of the permittee.

The Legislature has, from time to time, enacted special legislation pertaining to appropriation and use of surface waters of the State. A typical example is the law enacted in 1965 which authorized the City of Cloquet to establish, construct, operate and maintain all or any part or parts of a watersupply system from Lake Superior wholly within the State or partly within and without the State if it deems to be in the public interest to do so. This law allows the City of Cloquet to appropriate and use the water of Lake Superior by diverting the water from the lake into the St. Louis River Watershed, a tributary to Lake Superior, without the need for a permit from the Department of Natural Resources.

A leading question in recent years has been whether Minnesota's modified riparian law of water rights, with its principles of reasonable and beneficial use and elements of the water permit system, should be radically altered or even set aside in order to deal more effectively with present and potential conflicts between water uses. There is no evidence indicating that Minnesota's water laws have been a serious deterrent to the development of the State. Furthermore, available information concerning the future balance between water demands and needs and the availability of water resources between competitive users will not become crucial provided some changes are made in the present water permit system.

IMPROVEMENT OF STATE GOVERNMENT

The Governor's and Legislature's control of the State's administrative apparatus for water and related land resources is hampered through fragmented organization. No formal State mechanism exists for effectively coordinating the activities of Departments, Agencies, Boards, Commissions and Committees. More than one State agency has responsibilities in most functional areas and responsibilities of State agencies overlap. Mandatory coordination and cooperation statements in the State's statutes are, for the most part, weak expressions describing piece-meal cooperation, often on a voluntary basis. Groups of State personnel, each concerned primarily with a particular functional area of water and related land resources, tend to form hierarchies apart. State officials often communicate more frequently with their counterparts in the Federal government, local government, and Interest groups than with the other State agencies. Interfunctional coordination in water and related land resources government is weak in formulating plans, seeking revenues, or executing programs.

The patchwork quilt of water and related land resources government leads to general confusion and makes it difficult for the citizen, legislator, and State employee and executive to comprehend his State government. The citizen finds it difficult to know where to go for information, help and service or how to influence policy; the legislator must spend months and possibly years in mastering the intricacies of the Executive Branch and the competing claims for support from its agencies; a State executive finds it difficult to learn of other agencies and officials concerned with activities related to his own; and an ordinary State employee may never fathom other than the immediate organization in which he works.

The deficiencies in Minnesota's water and related land resources government result in needless inefficiency and slow response to changing public needs. Over-all organizational dispersion and fragmentation in the government impose serious limitations upon the internal organizations and operation of water and related land resources agencies.

Minnesota's organizational structure for water and related land resources probably ranks about midway in modernity and effectiveness among the 50 States. In recent years, a few States such as California, New York, Wisconsin, and Michigan have taken definitive action to simplify and streamline their water and related land resources government.

The diffusion of responsibility makes it extremely difficult to launch a co-ordinated attack on complex problems. It is as if the various units of an attacking army were operating under a variety of highly independent commands. When one part of the answer to a problem lies in one Department and other parts lie in other Departments, it is often impossible to bring the various parts together in a unified campaign to achieve a common goal.

Basic analysis of public needs often suffers from a piecemeal approach. Problems are defined so that they will fit within established jurisdictions and bureaucratic conventions. And the results of government action are typically measured by the degree of activity within each program rather than by the over-all impact of related activities.

The role of a given agency in the policy-making process can be fundamentally compromised by the way its mission is defined. The narrower the mission the more likely it is that the agency will see itself as an advocate within the administration for a special point of view. When any department or agency begins to represent a parochial interest, then its advice and support inevitably become less useful to the man who must serve all of the people as their Governor. Even when agencies make a concerted effort to broaden their perspectives, they often find it impossible to develop a comprehensive strategy for meeting public needs.

Some of the factors and issues involved with the reorganization of natural resource agencies are discussed below.

Those advocating the consolidation of agencies argue that administrative efficiencies, improved environmental policy analysis, and planning benefits will accrue from consolidating pollution control with resource management activities in a "superdepartment." A "superdepartment" is more efficient because it allows tradeoffs on natural resource issues to be made on a rational, non-political basis within the context of one department. Consolidation is aimed at abandoning the advocacy system in favor of the integrated "ecology" system.

Many people feel that the advocacy system is most important and argue for several small agencies. The advocacy system assumes that environmental issues are matters of social choice that need public debate. This can be encouraged by creating an agency that can argue just for pollution control, while another agency advocates the State's interest in, say, fish and wildlife. The advocacy system with smaller agencies is expected to lead to better articulation of public issues and, consequently, increased public participation in State decision making.

There are those who argue that "superdepartments" can expect increased political support from a linking of private conservation and environmental Interest groups. Some people argue that the advocacy system produces stronger pollution regulations when unencumbered by other missions. Many people are impressed with the "ecological imperative," the interrelationships in the real world of pollution and resource management.

In general, there are two extremes of organizational alternatives for "superdepartments": 1) structure the department around programs such as water quality, air quality, etc. as in the past; or 2) structure the department by functions such as enforcement, research, planning, etc.

When departments attempt to implement a functional approach, political constraints arise -- Legislative Committees fear loss of their legislative jurisdiction over agencies' programs, and private Interest groups -- such as sportsmen clubs -- fear loss of influence with the program officials with whom they have developed close relations. The civil service system proves to be a constraint. Whole new sets of rules have had to be drafted to allow the director to shift personnel within the department in such a way as to require water pollution people to be concerned about air pollution. Probably the greatest constraint has been that very little information is available that defines in functional terms the interaction of different resource and environment problems, and the management implications of these interactions.

Arguments put forth in support of a functional organization are that: in this way water, air and land pollution control programs can best be integrated for management purposes to match their interactions in the environment. Such a structure will best encourage the generation of new knowledge about interactions of problems in the environment. This follows the "ecological imperative" argument that provided the conceptual justification for a unified environmental department in the first place. This structuring

represents a radical shift of staff assignments from the previous organizational patterns, which is useful, because it will break up old alliances among agency personnel and among public officials and their clientele groups in the private sector and the Legislature. It is hoped that such a shake-up will instill new ideas and new policies into the State's environmental decision-making. It reduces staff overlaps, because the same man that sets standards for water quality can bring his experience to bear in setting air standards.

On the other hand, these arguments are offered in support of the program-oriented organizational structure: it pinpoints one man and holds him accountable for each problem -- water pollution, air pollution, solid wastes, etc. Spotlighting one responsible official will give him an incentive for more effective actions and encourage overall public responsiveness of public officials. The program structure facilitates better understanding of State pollution control efforts on the part of the public, Legislature and other agencies of government. Air pollution and water pollution are more meaningful concepts to the general public than distinctions of research, planning, standard-setting, and enforcement, and thus, can arouse more financial and political support and encourage public participation in programs. In this way individuals can evaluate and influence their government, and the public agencies will be more attentive to public desires. Legislative Committee structures, established over the years to match the program-type organization will not be disturbed. It is believed that more political and financial support will flow to the agency from the Legislature if these patterns are not disrupted. State personnel can adjust more easily to the program structure because this pattern is most like the pre-reorganization structure. This way administrative confusion will be minimized and reorganization will not slow down pollution control.

Some people believe functions to be mutually supportive and should be combined in one agency. Others contend that standards-setting and enforcement prosecution conflict and should be divided. Planning and research, with their long-range perspective, will always be neglected in a combined function agency.

Policy boards are expected to incorporate many views in the formation of environmental policy in order that the varied interests of society may be better served. But when these various views include spokesmen for pollution, agriculture, industry, or local governments, does this have the effect of weakening environmental policies? Or conversely, does such a board add expertise and produce a political consensus on such policies that helps to guarantee their implementation?

Are policies drafted by board members who serve an appointive term, more or less responsive to public demands for environmental quality than those formulated by a departmental director, who can be replaced at any time? Is response time to a crisis faster in an agency directed by one person than those governed by a committee? If policy boards are used, should membership be a full-time job or part-time?

The relative merits of policy boards and their composition raises another important issue for every State. To what degree should private citizens participate in the actual decision-making of state government and how should this process be structured? The wide-spread use of citizen boards and commissions in some cases to formulate policies and carry out operational functions, is the ultimate in private participation. But, this device has fallen into disrepute because, at best, such individuals do not have the time to become expert, only meeting once a month or so, and at worst, their public policy-making is a conflict of interest with their private jobs.

There are many who feel that no reorganization of water and related land resources State agencies is necessary; coordination of existing agencies should be strengthened. On the other hand, several organizations such as the Land and Water Resources Committee of the House of Representatives and the Citizens League have studied State government for water and related land resources and have prepared reports recommending reorganization. It should be recognized that there are as many potentially feasible plans for reorganization as there are viewpoints concerning government. No reorganization plan could possibly meet with everyone's approval and there will be great opposition to any major change.

Based on the results of research, the writer concludes that reorganization is needed and he recommends that the reorganization plan which follows be debated together with other reorganization plans during Sessions of the Legislature. The main features of the recommended plan of reorganization consist of: the creation of an Environmental Council in the Governor's Office, the creation of an Environmental Quality Commission, and the broadening of the duties and responsibilities of the Minnesota Resources Commission. The recommended reorganization plan is aimed primarily at strengthening the consideration of State agencies of environmental concerns, strengthening the voice of citizens in environmental State government, improving the coordination of natural resources State agencies, and other State agencies, strengthening the Governor's staff with respect to environmental affairs and strengthening the relation between the Executive Branch and the Legislature and the relation between State government and citizens.

Environmental Council

The Environmental Council could consist of the heads of the following State agencies: State Planning Agency, Department of Natural Resources, Pollution Control Agency, and Department of Health. The director of the State Planning Agency could serve as chairman of the Environmental Council, and the chairman of the Environmental Quality Commission could serve as an ex officio member of the Environmental Council.

The Environmental Council could employ three full-time executive employees, one of which could serve in the unclassified service as the executive director of the Environmental Council. The other two full-time executive employees could serve in the classified service. All three full-time executive employees could have combined qualifications in the following areas: natural resource management, environmental planning and governmental organization.

The Environmental Council could employ such administrative and clerical employees in the classified service as may be necessary to carry out its functions. In addition, the council could employ and fix the compensation of such experts and consultants as may be necessary for the carrying out of its functions.

The Environmental Council could establish an Advisory Committee consisting of the heads of the following State agencies: Department of Economic Development, Department of Agriculture, Department of Administration, and Department of Highways. The head of the Department of Administration could serve as chairman of the Advisory Committee which could meet with the Environmental Council at least four times a year.

The Environmental Council could have the following duties and functions.

Coordinate the various programs and activities of State agencies as they relate to State environmental policies.

Assist and advise the Governor in the preparation of the environmental quality report described below and all other environmental issues in which action or comment by the Governor is required by law or is otherwise appropriate.

The environmental quality report could set forth (1) the status and condition of the major natural, man-made, or altered environmental classes of the State, including, but not limited to, the air, the aquatic, and the terrestrial environment, including, but not limited to, the forest, dryland, wetland, range, urban, suburban, and rural environment; (2) current and foreseeable trends in the quality, management and utilization of such environments and the effects of those trends on the social, economic and other requirements of the State; (3) the adequacy of available natural resources for fulfilling human and economic requirements of the State in the light of expected population pressures; (4) a review of the programs and activities, including regulatory activities, of the Federal government in the State, the State and local governments, international, regional, Federal-state, interstate organizations, and nongovernmental entities or individuals, with particular reference to their effect on the environment and on the conservation, development and utilization of natural resources; (5) a program for remedying the deficiencies of existing programs and activities,

together with recommendations for legislation; (6) a review of identified potentially feasible programs and projects for solving existing and future natural resources problems; (7) the status of statewide natural resources plans; (8) and a statewide annual natural resources development and management program and budget.

Gather timely and authoritative information concerning the conditions and trends in the quality of the environment both current and prospective, to analyze and interpret such information for the purpose of determining how such conditions and trends affect State policy, and to compile and submit to the Governor studies, reports or advice relating to such conditions and trends.

Review and appraise the various programs and activities of the State government in the light of State policy for the purpose of determining the extent to which such programs and activities are contributing to the achievement of such policy, and to make recommendations to the Governor with respect thereto.

Develop and recommend to the Governor State policies and to foster and promote the improvement of environmental quality to meet the conservation, social, economic, health, and other requirements and goals of the State.

Make and furnish such studies, reports thereon, and recommendations with respect to matters of policy and legislation as the Governor may request.

Review all major Federal-state and State-interstate organizations' program and project proposals which relate to environmental quality and to make recommendations to the Governor concerning the acceptability of the proposals.

At its discretion convene an annual environmental quality congress including, but not limited to, representatives of State, Federal and regional agencies, citizen organizations, associations, industries, colleges and universities, and private enterprises who are active in or have a major impact on environmental quality. The purpose of the congress could be to receive reports and exchange information on progress and activities related to environmental improvement. These reports along with other information available to the Environmental Council could serve as the basis for an annual report to the Governor, the Legislature, and the people on the state of the environment.

Provide the Environmental Quality Commission with such administrative, clerical and technical assistance as may be required by the commission to carry out its functions.

Meet with the Environmental Quality Commission at least four times a year, at approximately three month intervals, to receive advice from the Environmental Quality Commission and to coordinate the activities of the Environmental Council and the Environmental Quality Commission.

Develop and recommend to the Governor an annual natural resources development program and budget. The program and budget could consist of: a description of all existing and proposed public projects to be undertaken during the next year, statements concerning the relationships of proposed projects to natural resources plans, a current annual budget for initial investment costs and operation and maintenance costs of projects, a proposed annual budget for initial investment costs and operation and maintenance costs of proposed projects, and statements concerning the criteria used in the State's cost sharing in proposed projects.

At the Environmental Council's discretion to demand a public hearing on a permit decision made by a State agency and based upon the results of the hearing to issue or deny a permit in the name of the State.

In exercising its powers, functions, and duties under this act, the Environmental Council could:

- (a) Consult with the Environmental Quality Commission and with such representatives of science, industry, agriculture, labor, conservation organization, Federal, State, and local governments and other groups, as it deems advisable; and
- (b) Utilize, to the fullest extent possible, the services, facilities, and information, including statistical information, of public and private agencies and organizations, and individuals, in order that duplication of effort and expense may be avoided, thus assuring that the Council's activities will not unnecessarily overlap or conflict with similar activities authorized by law and performed by established agencies.

Environmental Quality Commission

The Environmental Quality Commission could consist of seven members from private life appointed by the Governor with the advice and consent of the Senate. The terms of office of members could be for six years in duration, provided that the first council could have two members appointed for terms ending January 1, 1975, two members appointed for terms ending January 1, 1977, and three members appointed for terms ending January 1, 1979. The chairman of the Environmental Quality Commission could be elected by the members. He could serve as an ex-officio member of both the Environmental Council and the Advisory Council to the Minnesota Resources Commission.

The members of the Environmental Quality Commission could be paid a per diem of \$35 per day and could be reimbursed for all reasonable expenses incurred in the performance of their duties.

The duties and functions of the Environmental Quality Commission could be as follows:

- (a) To review and appraise the various programs and activities of the State government in light of environmental quality concerns for the purpose of determining the extent to which such programs and activities are contributing to State environmental policies and goals;
- (b) To hold meetings throughout the State as it deems necessary for the purpose of gathering information on public and private

opinions concerning the adequacy of the State's environmental quality policies and the extent to which these policies are being implemented;

- (c) To give advice and counsel to the Environmental Council; and
- (d) To make recommendations to the Governor, Legislature and the public once each year starting January 1, 1974, regarding any needed State policy or program changes to foster and promote the improvement of environmental quality.

Minnesota Resources Commission

The role of the Minnesota Resources Commission would be expanded to provide the Legislature with the background necessary to evaluate programs associated with the environmental quality of the State. The Commission would serve as the focal point for interactions between the Environmental Council, Environmental Quality Commission and the Legislature.

Water and Related Land Resources Planning

The first statewide framework and assessment water and related land resource plan should be prepared by 1975. Responsibility for the preparation of the framework water and related land resources plan could be centered in the Department of Natural Resources. Funds associated with Title III of the Federal Water Resources Planning Act of 1965 could be used in preparing the plan.

The Department of Natural Resources could establish an advisory Water Resources Planning Coordinating Committee to assist the Department in preparing the plan. Representatives from the following State agencies could serve on the Committee: Department of Natural Resources, State Planning Agency, Pollution Control Agency, Department of Economic Development, Department of Agriculture, Department of Health, Department of Highways, and Geological Survey. The Assistant Commissioner of Planning, Department of Natural Resources could serve as the Chairman of the Committee. The Committee could establish two Consulting Councils through which local units of government and Interest groups could participate in the preparation of plans. A Local Government Consulting Council could consist of representatives from the League of Minnesota Municipalities, Association of Minnesota Counties, Metropolitan Council, and Regional Development Commissions. An Interest Group Consulting Council could consist of representatives from the Izaak Walton League, Minnesota Association of Commerce and Industry, Minnesota Association of Soil and Water Conservation Districts, Minnesota Association of Watershed Districts, Minnesota Environmental Control Citizens Association, Minnesota Public Interest Research Group, Northern Environmental Council, Sierra Club, and the Upper Mississippi Waterway Association.

The Water Resources Planning Coordinating Committee could have available to it a full time water and related land resources planning staff consisting of a planner, economist, ecologist, engineer, hydrologist, social scientist, geologist, biologist, and soils scientist. These personnel could in part be assigned to the Committee from participating State agencies. In addition, the Committee could retain Consultants for short-term assignments.

The Water Resources Planning Coordinating Committee could provide advice to the Governor's representatives on the Souris-Red-Rainy River Basins Commission, Great Lakes Basin Commission, Upper Mississippi River Basin Commission, Missouri River Basin Commission, Great Lakes Commission, Upper Great Lakes Regional Commission, and Minnesota-Wisconsin Boundary Area Commission. The Committee could also provide personnel to serve on Work Groups of these organizations. The alternate Governor's representatives on the Souris-Red-Rainy River Basins Commission, Great Lakes Basin Commission, Upper Mississippi River Basin Commission, and Missouri River Basin Commission could be residents of the respective basins in Minnesota. They could also serve as Chairmen of Citizens Advisory Councils which could be established for each basin.

Implementation or feasibility level water and related land resources plans should be prepared by 1980 for each of the eleven planning regions associated with the State Regional Development Act of 1969. These plans should contain a statement indicating the relationship of the feasibility level plan to the statewide framework water and related land resources plan. Implementation or feasibility level plans could be prepared by the Metropolitan Council and Regional Development Commissions. The Department of Natural Resources could prepare plans for the regions which have not established Regional Development Commissions.

Water and related land resources plans of counties, municipalities, and special-purpose districts should contain statements indicating the relationship of these plans to the regional and statewide plans.

The Regional Development Act of 1969 provides for the creation of Regional Development Commissions outside the Twin City Metropolitan Area. This Act was designed to provide a mechanism for intergovernmental cooperation and planning at the regional scale. More specifically, the Act allows for local, State, and Federal government cooperation and involvement in a planning process. In 1969, a seven-county area in northeastern Minnesota was designated a planning region by Governor Harold LeVander. This region was the first to be created following the passage of the Regional Development Act. Region 3, or the Arrowhead Regional Planning Commission as it has been named, has since initiated its efforts to develop a coordinated regional development plan which would meet the problems of growth and development in that area. After receiving a majority petition of local governments in April, 1971, Governor Wendell Anderson authorized the establishment of Region 2, a five-county area in northwestern Minnesota. Region 2 has since been designated the Headwaters Regional Planning Commission. Region 2 is currently preparing its planning activities in accordance with the specific duties and powers granted to regional commissions by the 1969 Act. In February, 1972, Governor Wendell Anderson, again having been petitioned by local governmental units representing a majority of the population in this area, announced the formation of Region 9. A nine-county area in south-central Minnesota, Region 9 is the third regional commission established under the powers of the 1969 Regional Development Act.

Implementation of Plans

The State could encourage the implementation of water and related land resources plans by financing in part programs and projects identified in plans. A Water Resources Development Fund could be established to finance a statewide system of State grants-in-aid. The State, through the grant system, could finance portions of the non-Federal initial investment costs associated with selected Federal-State-Local cost sharing projects and portions of the initial investment costs associated with selected State and local projects not eligible to receive Federal aid. The Legislature could allocate funds for distribution through appropriate State agencies based on recommendations made by the Governor's Environmental Council in cooperation with a Water Resources Development Coordinating Committee.

A statewide water and related land resources development program and budget could be formulated annually by the Water Resources Development Coordinating Committee for the review and approval of the Governor's Environmental Council. The program and budget could consist of: a description of all existing and proposed public projects to be undertaken during the next year with or without State grant-in-aid, statements concerning the relationships of proposed projects to water and related land resources plans, a current annual budget for initial investment costs and operation and maintenance costs of projects, a proposed annual budget for initial investment costs and operation and maintenance costs of proposed projects, and statements concerning the criteria used in the State's cost sharing in proposed projects through the Water Resources Development Fund.

Representatives of the following State agencies could serve on the Water Resources Development Coordinating Committee: Department of Natural Resources, Pollution Control Agency, State Planning Agency, Department of Health, Department of Economic Development, and Department of Agriculture. Representatives from the Department of Natural Resources and Pollution Control Agency could serve as Co-Chairmen of the Committee. The Committee could seek the advice of appropriate State agencies, interstate Commissions, county auditors, governing bodies of municipalities, governing bodies of special-purpose district; Metropolitan Council, and Regional Development Commissions.

State and Federal water and related land resources development grants could be distributed through appropriate State agencies. For example, in general, grants associated with the Federal Land and Water Conservation Fund Act could be distributed by the Department of Natural Resources and grants associated with the Federal Water Pollution Control Act could be distributed by the Pollution Control Agency. There may be some cases where grants could be distributed jointly by two or more State agencies. For example, grants associated with inland lake renewal projects could be jointly distributed by the Department of Natural Resources and Pollution Control Agency.

The implementation of water and related land resources plans could be accomplished by municipalities and counties or by special-purpose districts established by municipalities and counties. Municipalities and

counties have required powers of eminent domain, taxation, and zoning. Further proliferation of special-purpose districts could be discouraged.

Authority to regulate the use of public bodies of water and related land could be given to municipalities and counties or to special-purpose districts established by municipalities and counties. Guidelines for the regulation of the use of public bodies of water and related land could be provided by the Department of Natural Resources. The Legislature could enact a statewide sediment control law which makes it mandatory of counties and municipalities to adopt and implement ordinances controlling sediment discharge from construction and development projects. The Department of Natural Resources could promulgate model standards and criteria to serve as guidelines for ordinances. The problems associated with statewide soil erosion should be attacked through the adoption and implementation of water and related land resources plans. In addition, erosion control could be encouraged through grants in connection with the Water Resources Development Fund and the statewide water and related land resources development program and budget.

Permits and Environmental Impact Statements

Applicants for permits from the Department of Natural Resources, Pollution Control Agency, Department of Health and Department of Agriculture involving water and related land resources could furnish environmental impact statements on: the environmental impact of the proposed action, any adverse environmental effects which cannot be avoided should the proposed action be implemented, alternatives to the proposed action, any measures which would compensate for adverse environmental effects, and any irreversible and irretrievable commitments of resources which would be involved in the proposed action should it be implemented. Environmental impact statements could be given due consideration by State agencies in the review of permits.

Any State agency which has not adopted permit rules and regulations consistent with the provisions of the State Administrative Procedure Code could be required to do so within two years after authorization to adopt rules and regulations has been given. All rules and regulations could require environmental impact statements.

Periodically all water and related land resources rules and regulations could be reviewed on a comprehensive basis to insure that the rules and regulations are consistent with one another and with applicable policies enunciated by the Legislature. Any inconsistencies could be noted and brought to the attention of appropriate State agencies through the Attorney General's Office which could take the results of the periodical reviews into consideration in their approval of rules and regulations. An advisory Water Resources Rules and Regulations Coordinating Committee could be established with representatives from the Attorney General's Office, Department of Natural Resources, Pollution Control Agency, Department of Health, Department of Agriculture, and State Planning Agency. The representative of the

Attorney General's Office could serve as Chairman of the Committee.

Applicants for permits from the Department of Natural Resources, Pollution Control Agency, Department of Health and Department of Agriculture could furnish copies of applications and supporting data to: the chief executive officer of affected cities, villages, and boroughs; the chairman of the affected township board of supervisors; secretaries of the affected special-purpose districts; the chairman of the affected county board; the chief executive officers of appropriate State agencies; and the chief executive officers of the Metropolitan Council and Regional Development Commissions. Each State and local governmental unit with an interest in an application could provide comments and recommendations to the appropriate State agency within a specified time. State and Local units of government could be required to keep the public fully and promptly informed of the status of permit applications.

Information concerning decisions made by State agencies regarding permits could be furnished to the same officers as those who received copies of applications for permits. These officials and the Chairman of the Environmental Quality Commission could, within a specified period of time, be able to demand a public hearing on the permit decision reached by a State agency.

The chief executive officer of the Governor's Environmental Council could be kept fully and promptly informed of the status of permit applications. He could, within a specified period of time, be able to demand a public hearing on a permit decision and based upon the public hearing to resolve conflicts in the name of the State.

County Boards could be required, within 2 years to adopt after public hearings are held rules and regulations for reviewing requests for public drainage system permits. These rules and regulations could conform with guidelines prepared by the Department of Natural Resources and adopted by that Department after public hearings have been held. The Department of Natural Resources and other appropriate State agencies could provide comments and recommendations concerning public drainage system permits.

Data System

A statewide water and related land resources-data system could be developed and maintained to improve the coordination of data acquisition and handling responsibilities, to improve the efficiency of data programs, and to upgrade and fill deficiencies in data programs. The statewide water and related land resources-data system is the total statewide activity to acquire, process, store, and disseminate data needed for the evaluation, planning, development and management of Minnesota's water and related land resources.

The Department of Natural Resources could serve as the statewide water and related land resources-data system central. A data exchange could be operated by the Department of Natural Resources. The exchange could be the focal point for receipt of data requests and for referral of the requests either to the appropriate agency holding the data or to an internal unit maintaining a file for information collected by organizations that are will-

ing to make their data available to users but are not in a position to serve as the prime contact for dissemination of the information. The Department of Natural Resources could prepare and maintain a catalog of data, centralize the data handling subsystem, facilitate interchange of data between agencies and between agencies and users, and permit each collecting agency to act as a data center. A large computerized central bank could be maintained by the Department of Natural Resources which could be concerned with selected data.

Agencies should store those data gathered as part of their operations in data banks which could be component parts of the statewide data exchange. Automatic conversion of manual files into machine-readable form is not desirable. As data and other materials from manual files are retrieved in response to requests, they could be put into machine-readable form.

The Department of Natural Resources could provide the requestor a single contact point for requesting water and related land resources data. This should not preclude direct requestor contact with collector agencies, especially when the requestor knows of the location of needed data in the files of a collector agency. When direct requests are filled by an agency, the Department of Natural Resources should be notified of such action. The Department of Natural Resources through an index, could be capable of notifying the requestor of the location of data which will satisfy his request and also notifying the responsible agency of the inquiry. The responsible agency could fill the request and simultaneously notify the Department of Natural Resources of that action.

An advisory Water Resources Data System Coordinating Committee could be established. Membership on the Committee could consist of representatives from the following organizations: Department of Natural Resources, State Planning Agency, Department of Administration, Pollution Control Agency, State Board of Health, Department of Economic Development, Department of Agriculture, Iron Range Resources and Rehabilitation Commission, U.S. Soil Conservation Service, U.S. Forest Service, U.S. National Weather Service, U.S. Army Corps of Engineers, U.S. Bureau of Sport Fisheries and Wildlife, U.S. Geological Survey, Environmental Protection Agency, University of Minnesota, and State College System. The Director, Division of Waters, Soils and Minerals, Department of Natural Resources could serve as Chairman of the Water Resources Data System Coordinating Committee.

The Committee could design the statewide water and related land resources-data system. The system should have two main components: 1) a data acquisition subsystem, and 2) a data handling subsystem. The Committee should be concerned with the activities of instrumentation, methodology, and technology development that are directly in support of data acquisition, processing, storage and dissemination. The Committee could consider such items as bibliographies of methods, techniques, and standards used in the various agencies; glossary of terms; instrumentation and equipment used in information collection; published standards and procedures currently used by various agencies; and methods of laboratory or office analysis and processing. Problems concerning data station identification, data accuracy, symbols, notations, nomenclature, and units of measurement could be considered. The Committee could consider design characteristics for a statewide subsystem to handle water and related land resources data. The data

handling activities, both manual and automated, of agencies collecting and using information should be pulled together into an overall statewide water and related land resources data exchange. The Committee could be concerned with standards and formats for storing and disseminating data and the soft and hardware for computerized files.

The Committee could perform the following functions: operate a statewide network for acquiring data; coordinate a statewide network and specialized data activities; and maintain a central catalog of data and on activities being planned or conducted to acquire data. Coordination could be accomplished with participation of all concerned agencies, by reviewing the data requirements and activities of all agencies and subsequently: identifying common needs for water and related land resources data; establishing and revising as appropriate the statewide network; advising user agencies promptly of the extent to which the statewide network can meet their specialized requirements for data; and achieving optimal coordination of network and specialized data activities in order to meet, effectively and economically, the variety of needs of agencies concerned. Each year the coordinating process could culminate in a plan. That plan could: identify long-range and intermediate agency objectives; relate proposed water and related land resources data acquisition activities to objectives; identify planning assumptions; and call attention to unresolved inter-agency issues and views of the agencies concerned. The statewide data network activities could be based on identified water and related land resources data needs not being met by existing acquisition activities; identification of future data needs and arranging for their acquisition; the designation of appropriate standards of data acquisition and processing; the coordination of ongoing and planned data acquisition activities so as to increase the efficiency and economy of these efforts and avoid unnecessary duplication of effort; establishment of mechanisms for continuing review of the network to evaluate its efficiency, economy, and capability of meeting data needs.

MINNESOTA'S WATER AND RELATED LAND RESOURCES -
DEVELOPMENT AND MANAGEMENT PROGRAMS

A review of the general literature pertaining to Minnesota's water and related land resources and past and possible future development and management programs was made to provide background information for effective action concerning an Environmental Policy and reorganization of State agencies. Information contained in the following references is summarized below to assist those making policy and reorganization of State agency decisions:

Background Information for Framework Statewide Water and Related Land Resources Planning in Minnesota. June 1969. State Planning Agency. Tech. Bull. No. H2.

Minnesota Water and Related Land Resources - First Assessment. June 1970. State Planning Agency.

Alternative Programs and Projects for Managing Minnesota's Water and Related Land Resources Through the Year 2020. January 1971. State Planning Agency.

On a gross basis, the capabilities of the State's water and related land resources exceed projected demands and needs for at least the next 50 years. As a whole, the State has abundant water resources with an average annual precipitation of 25 inches, average annual runoff of 5 inches, and large reserves of groundwater. However, the State is less fortunate in the distribution and timing of water resources. Rainfall varies from 32 inches in the southeast to 19 inches in the extreme west during a year of normal precipitation. During a drought year that may occur in 2 percent of any given number of years, precipitation varies from only 15 inches in the northeast to 9 inches in the west.

In Minnesota there are 15,291 lake basins larger than ten acres. Including the State's portion of Lake Superior, lakes cover an area of 4,059 square miles, or about 4.8 percent of the State's area. In addition, the State has approximately 25,000 miles of streams, and contains the headwaters of the Mississippi River. Lakes are not evenly distributed throughout the State. They are most numerous in the northeast and central parts of the State.

Minnesota, except perhaps for areas in the northern and western parts and some local areas, has large supplies of groundwater. Bedrocks in the southeastern part of the State yield small to moderate quantities of water. Glacial deposits, except in the northern, western, and southwestern portions of the State, generally contain concentrations of sand and some gravel that are excellent environments for groundwater.

The natural quality of water resources is, on a gross basis, favorable for most uses. Lakes in the northeast have a low concentration of salts; whereas, lakes in the southwest have a high concentration of salts. The dissolved solids are less than 500 parts per million (ppm) in most streams. They are highest in streams in the western part of the State and lowest in the northeastern part.

In the past, there has been considerable activity in Minnesota associated with the development and management of water and related land resources. For example, water-supply and sewage treatment plants have been constructed at most cities and villages as well as by many industries. Water-oriented recreation facilities have been provided in connection with parks, waysides, reserves, and monuments, etc. scattered throughout the State. Fish management programs have been extended to many areas and hundreds of wildlife management areas have been developed. Wetland waterfowl production areas are being managed.

Agricultural lands have been drained in extensive areas and farmers have made considerable progress in the installation of conservation practices to reduce and control soil erosion. Some flood control and prevention has been accomplished as soil and water conservation projects and as projects of the U.S. Army Corps of Engineers. Extensive improvements of rivers and harbors for navigation are located along the Mississippi River and in the Duluth-Superior area.

Projected Problems and Solutions

Past development and management practices, as substantial as they are, have not kept pace with the steadily growing demands placed upon water and related land resources. Not only does Minnesota have catch up problems to contend with in the future, continuing pressures and demands for enhancement of the environment and improved economic well-being can be expected to create steadily growing demands for water and related land resources. There exists many water and related land resource problems associated with such matters as: pollution of streams, lakes and groundwater; water-oriented recreation; water supply; flooding; navigation; and land use.

Projected growth of the State's population and economic activity is based on the belief that a viable economy with substantially full employment may be maintained in the face of both international and domestic problems. The total population of the State is projected to double between 1967 and 2020, from 3,582,000 to about 7,000,000. Increases in population may continue to be concentrated in urban centers, especially the Minneapolis-St. Paul area. In 1967, about 71 percent of the population was concentrated in the southeastern part of the State. By the year 2020 about 82 percent of the State population is projected to be concentrated in the urbanized southeastern sector of Minnesota.

Water Supply

In 1965, the amounts of water withdrawn for public supplies, rural supplies, irrigation supplies, and self-supplied industrial supplies were 260, 120, 6, and 1,400 million gallons per day (mgd). The State's average per capita use of water was about 107 gallons per day. Of the 1,786 mgd withdrawn for the above-mentioned supplies, about 276 mgd was consumed. Although all basins in the State will experience substantial growths in withdrawals, the greatest withdrawal increases will occur in the Upper Mississippi river basin. The largest single areas of withdrawals of water will occur in the Lake Superior watershed and the Twin Cities Metropolitan Area. Total water withdrawals, except for thermoelectric and hydroelectric power

uses, in the State are projected to increase from 1,159 mgd in 1960 to 3,290 mgd in 2020 or about 2.8 times. Consumption is projected to increase from 162 mgd in 1960 to 287 mgd in 2020 or about 1.8 times. Total water withdrawals in the Twin City Metropolitan area are projected to increase from about 230 mgd in 1960 to 760 mgd in 2020. Per capita municipal water use in the State is projected to rise to 118 gallons per day in the year 2020.

Projected water supply demands, data on extended dry-weather low-stream flow, and data on the availability of groundwater were utilized to make judgments as to the need for future development of new water supply sources in various areas of the State and to identify potential water supply problems. Major water supply problems, assuming continued development of sources, are projected for the following places: Minneapolis-St. Paul, starting approximately 1980; Marshall, starting approximately 2020; New Ulm, starting approximately 2000; Worthington, starting approximately 1980; and Iron Range area, starting approximately 1980. The water supply demands of the rest of the State can be met by more fully utilizing developed sources and by expanding water supply facilities. Water supply problems can be solved by impounding available surface waters and/or, locating new groundwater sources. A few long pipelines to sources may need to be provided. The greatest potential water supply problems are projected to occur at Minneapolis-St. Paul and the Iron Range area. Properly developed, the State has adequate water supplies, even during extended dry periods, to meet all foreseeable domestic, municipal, industrial and irrigation demands.

Water Pollution

Despite the fact that upgrading of treatment works and construction of facilities for untreated wastes has been proceeding at a rapid rate as approved water quality standards are being enforced, in 1971 Minnesota had serious and undesirable water quality problems. Recent progress in the construction of waste treatment plants has prevented much serious deterioration in water quality in the face of significant increases in population and industrial production. Trends in many areas are promising, but available data is not sufficient to answer the question whether overall water quality is getting better or worse.

The Federal Environmental Protection Agency estimates that, except for some watersheds in northeastern and eastern Minnesota, streams in the State in 1970 were locally polluted (10-19.9 percent stream miles violate Federal water quality criteria), extensively polluted (20-49.9 percent stream miles violate Federal water quality criteria), or predominantly polluted (>50 percent stream miles violate Federal water quality criteria). Streams in much of the State were locally polluted. Pollution conditions were most serious in watersheds in northwestern Minnesota.

The sources of harmful substances which enter streams and make them less desirable for other uses are many and varied. The most common is the discharge of organic matter with high bacterial content from municipal sewer systems, carrying wastes from homes and other human habitations and from industrial plants. Food processing industries, such as canneries, sugar refineries, packing plants, and creameries, have large volumes of organic wastes which must be disposed. Pulp and paper mills have both

chemical and fiber wastes, the disposal of which is difficult. Stream-electric generating plants raise the temperatures of reaches of streams and cause thermal pollution. Nuclear power plants may discharge minute but harmful radioactive materials into streams. Agricultural runoff with sediment, pesticides, herbicides, and feed lot wastes causes problems. Harmful oil spills sometimes occur. Minnesota has a special pollution problem resulting from the increased mining of ores which require beneficiation or separation of the valuable mineral from the worthless rock. Large volumes of water are used to transport the tailings in disposal areas. Disposal of taconite tailings in Lake Superior is a problem. Solid waste disposal and septic tanks are polluting water resources.

Polluting problems such as low dissolved oxygen levels; high total coliform bacteria densities, and degradation of aesthetics result in damages to the legitimate water uses for recreation, municipal and industrial water supply, irrigation, and fish and wildlife propagation. Pollution is a problem below most principal river communities and industries.

Many lakes have problems of pollution. Urbanization, industrialization and agricultural activities have unbalanced nature's delicate system. The use of lakes for human, industrial, and boat waste disposal is only one of the many influences. Agricultural drainage, increased sedimentation resulting from poor land development practices and even waste water treatment itself also contribute to lake problems.

A number of primary treatment and other types of plants were built between 1914 and 1934. The program of Federal grants for public works during the depression and up to World War II stimulated sewage treatment plant construction. Municipal and industrial sewage or waste treatment plant construction was necessarily suspended during the War. Despite the previous progress made, large volumes of raw or incompletely treated sewage and industrial wastes were being discharged in 1945 into the waters of the State. These discharges came from 114 sewer municipalities having no sewage treatment plants and at least 60 others having inadequate plants, and from about 700 industrial plants having separate outlets. During the period 1945 through 1963, a total of 252 sewage treatment projects were constructed, including new plants and major remodeling or reconstruction of old plants.

The percentage of total population of sewer municipalities served by sewage treatment was 85.2 in 1945, 91.7 in 1957, 98.3 in 1963, 99.2 in 1967, 99.4 in 1969, and 99.6 in 1971. The percentage of total population of sewer municipalities served by secondary treatment was 65.2 in 1957, 89.4 in 1967, 90.3 in 1969, and 92.5 in 1971. In 1968, the urban population with adequate municipal treatment works totaled 769,000; the urban population with less than adequate municipal treatment works was 1,324,000. An urban population of 277,000 had no municipal treatment works.

The number of industries discharging wastes through separate outlets were estimated to be 700 in 1945, 717 in 1948, 1,124 in 1957, 935 in 1962, and 732 in 1967. The estimated numbers of these for which some forms of treatment was provided are: 230 in 1945, 247 in 1948, 503 in 1957, 479 in 1962, and 453 in 1967. The estimated numbers of these for which no treatment was provided are: 470 in 1945, 470 in 1948, 621 in 1957, 456 in 1962, and 279 in 1967. Thus, the number of industries discharging through separate outlets was the same in 1967 as it was in 1948; the number of these

industries providing some form of treatment in 1967 was about twice that in 1948. Since 1948, there has been a substantial increase in the percentage of industries with separate outlets providing some form of waste treatment. In addition, there have been substantial improvements in methods of treatment. However, industrial loading of municipal treatment systems has increased.

The total State population (1970 census) was 3,805,069. As of January 1, 1971, there were 854 municipalities in the State with a total population of 2,914,669. There were 232 municipalities without sewer systems with a total population of 153,570; 532 municipalities with sewer systems served a total population of 2,761,099; 23 municipalities had a sewer system without treatment with a total population of 11,693; 508 municipalities had a sewer system with treatment (451 treatment plants) serving a total population of 2,749,406; 458 municipalities had secondary treatment (403 treatment plants) serving a total population of 2,553,962; and 15 municipalities had tertiary treatment facilities serving a total population of 58,763.

In the Seven County Metropolitan area in April 1971 the population in 86 municipalities served by sewers with secondary treatment was 1,631,186; the population in 5 municipalities served by sewers with tertiary treatment was 15,042; the population in 1 municipality served by sewers with no discharge was 3,733. Seventeen municipalities with populations less than 500 serving a total population of 4,398 were without sewer systems; 24 municipalities with populations greater than 500 serving a total population of 43,713 were without sewer systems.

There were 3 Metropolitan Sewer Board installations: Metropolitan Wastewater Treatment Plant, Blue Lake Wastewater Treatment Plant, and Seneca Road Wastewater Treatment Plant. All 3 plants were under construction in 1971. The Metropolitan Wastewater Treatment Plant served 45 municipalities with a total population of 1,463,519. In addition, 35 municipalities with a total population of 194,972 were served with facilities owned and operated by the Metropolitan Sewer Board.

There were 13 industries whose wastes were not discharged directly to municipal sewerage systems and had separate outlets and significant discharges. Five of these industries had secondary treatment facilities; 5 had primary treatment facilities; and 3 had no treatment facilities. Industry contributed about 60 percent of the total organic waste load in the Seven County Metropolitan area in 1971.

Only 5 of the Metropolitan Sewer Board's 33 treatment plants met State water quality standards in October 1971. The total population of the municipalities served by these plants were 42,049. The Metropolitan Wastewater Treatment Plant met all standards except the one for suspended solids. Between 1971 and 1976, the Metropolitan Sewer Board plans about \$220 million capital sewer system improvements involving treatment facilities and interceptors.

In April 1971, there were 2,644 identified waste sources in the out-state portion of Minnesota (i.e. outside the Seven County Metropolitan area); of these sources 728 were municipal and 1,916 were industrial. The municipal sources included 7 with tertiary treatment facilities, 362 with

secondary treatment facilities, 51 with primary treatment facilities, and 308 with no treatment facilities. The types and numbers of the most significant industrial sources were: irrigation, cooling and miscellaneous - 585; slaughterhouse and locker plants - 434; milk receiving and processing plants - 372; unclassified industries - 26; soft drink bottling plants - 25; potato processing, grain and potato washing plants - 20; and iron ore mines and concentrators - 16. About 467 industrial sources were handled by waste water treatment plants.

Tertiary treatment was provided for a municipal population of 23,623; secondary treatment was provided for a municipal population of 823,216; primary treatment was provided for a municipal population of 215,349; and no treatment was provided for a municipal population of 79,668. A total of 253 municipalities required urgent or definite near-term corrective treatment action. In addition, 63 municipalities required future improvement prior to 1980. Considering sewer communities with a total population of 1,055,708, treatment facilities serving about 894,148 people or about 85 percent of the sewer community population required significant facility improvement prior to 1980.

The cost estimates (1971 dollars) for the improvement of municipal collection and treatment systems in the out-state portion of Minnesota during the period 1971-80 are as follows: improve existing secondary treatment - \$103,558,000; add secondary treatment to municipalities with only primary treatment - \$20,284,000; add sewers and treatment for unsewered municipalities of population less than 500 - \$9,600,000; add sewers and treatment for unsewered municipalities of population greater than 500 - \$4,368,000; and add secondary treatment to sewer communities currently without treatment - \$1,290,000. The total 10-year cost is \$139,100,000. These cost estimates do not include needs relating to: separation of combined sewers, provision of tertiary treatment facilities in response to more stringent future standards, and extension and upgrading of collection sewer systems for currently sewer communities.

Total future waste loads to receiving waters, assuming a satisfactory degree of treatment (generally secondary treatment) for municipal and industrial waste discharges, were estimated and compared with low streamflows. Water quality problem areas were projected where low stream flows are insufficient to meet the flow required to assimilate future waste discharges with a degree of treatment deemed satisfactory in 1969. Project major water quality problem areas are: Cedar River near Austin, starting in 1969; Shell Rock River near Albert Lea, starting in 1969; Okabena Creek near Worthington, starting in 1969; South Fork Zumbro River near Rochester, starting in 1969; Minnesota River near Ortonville, starting in 1969; South Fork Crow River near Hutchinson, starting in 1980; Mississippi River at Minneapolis-St. Paul, starting in 1980; Cannon River near Faribault, starting in 1980; Straight River near Owatonna, starting in 1980; Minnesota River near Mankato, starting in 2000; Minnesota River near New Ulm, starting in 2020; Headwaters of small streams in the Iron Mining Range urban areas, starting about 1980; and Ada, Barnesville, and Detroit Lakes, in the Red River Basin, starting in 1969. Future return flows from irrigation projects associated with the Garrison Diversion Unit for diversion of water from Garrison Reservoir on the Missouri River in North Dakota will cause water quality problems along the Red River. Many minor problem areas are projected to occur as a result of waste discharges into small intermittent streams within the State. Problem areas other

than those identified may develop in the future due to the relocation of major industries and the resultant population growth. Alternatives for solving water quality problems are: low streamflow augmentations; advanced waste treatment; and holding ponds with regulated discharges. Continuous expansion of waste treatment facilities will also be necessary.

Recreation

The recreation resources of the State are mainly the lakes. The lake resource is enhanced for recreation where it is associated with rough terrain, northern hardwood or pine forests, or sandy soil for prime beaches. In some areas, noticeably around Brainerd, density of lake homes equals that of some Twin City suburbs, without adequate sewer provisions. Lake-shore property is being purchased faster than homes are being built, indicating speculators are buying up such land. About one-fourth of all outdoor recreation is and will continue to be dependent on water. Land next to water is essential for access to and full enjoyment of water-oriented recreation. Free public access was provided by launching sites on 1,220 lakes in 1968. There were 1,430 access sites in the State, 60 of which were on rivers, with 31,800 parking spaces at boat launching sites. The State leads with 861 sites; county, townships and city sites total 426, and Federal Government sites total 143 sites. Marinas of the private sector can accommodate 9,081 boats, and many thousands of boats can be accommodated at resorts. In 1968, the State had about 280,000 licensed water craft (except sailboats and canoes). Approximately, 2,033,491 acres of water surface was available for boating. There are 4,074 miles of canoeing waters. In-land surface water acreage and mileage for fishing was about 2,700,115 acres and 12,048 miles, respectively. There were 575 swimming beaches and 117 pools available throughout the State in 1967. One-fourth, or more than 12.5 million acres of Minnesota's 51.2 million acres, are publicly owned and suitable for statewide public outdoor recreation facility development. The U.S. Forest Service administers two national forests in the State: the Superior National Forest with approximately 2,500 acres and containing the 1,000,000-acre Boundary Waters Canoe Area and the Chippewa National Forest containing over 726,000 acres. These two forests contribute an important share of the State's recreation supply, and in recent years they have expanded their recreational facilities. The U.S. Bureau of Sport Fisheries and Wildlife administers 5 wildlife refuges in Minnesota with 168,000 acres. There are 2 areas administered by the National Park Service: Grand Portage National Monument (315 acres) and Pipestone National Monument (283 acres). There were 41 campgrounds, 12 day-use areas, 21 hiking and riding trails, and 4 canoe routes in State forests in 1968. Minnesota had 86 State parks, recreation areas, waysides, historic sites and monuments, comprising 146,730 acres of land and 5,362 acres of water. There were 911,523 acres of State wildlife management areas. The State had a network of 452 waysides, turn-outs, and picnic areas on its highways. There were 331 county recreation areas, and 3,561 acres of land administered by public schools for recreation purposes in 1967. Municipal parks and recreation areas totaled 41,553 acres in the State. There were 3,500 private resorts. Approximately 9.2 million acres were available for hunting. Several major recreation areas are proposed for development in the State: Voyageurs National Park in northern Minnesota, St. Croix River Valley, and Upper Mississippi Valley National Recreation Area.

The amount of recreation participation on an average Sunday during the warm weather season was developed into a demand figure in terms of activity occasions-participation in any activity for more than a half-hour in one day. The indication is that recreation activity will increase at a much faster rate than the population increases. In 1967, boating, canoeing, swimming, waterskiing, and sailing demands on an average summer Sunday totaled 373,956; 32,739; 1,119,598; 102,137; and 655,433 activity occasions, respectively. Corresponding projections for 1985 are 904,183; 81,719; 2,987,713; 323,649; and 1,538,929 activity occasions, respectively. The fishing participation rate per capita in 1967 was 7.8 activity occasions and is projected to increase slightly in the future. There were 285,482 big-game hunters in 1966. Projections indicate that in 1980 there will be approximately 340,000 big-game hunters. Small-game hunters totaled 233,156 in 1965 and are projected to total 325,000 in 1980. Waterfowl management plans will provide opportunities for about 150,000 duck hunters. The projected 1980 demands for recreation in the Upper Mississippi River Basin in Minnesota will be 1.87 times the 1960 demand. Thereafter, demand is expected to increase to 3.06 times the 1960 demand by the year 2000, and to 4.25 times by the year 2020.

The anticipated statewide recreation facilities needs for 1980 include: 262,336 acres of developed recreation lands, 2,000 acres of land for swimming facilities, 43,000 spaces for boat launching. The greatest need for recreation land will occur in the Twin City Metropolitan area. Potential for new State parks and the developments of existing State park lands will help to meet recreation needs. Wetland acquisitions as of July 1, 1968, and needs through the year 2000 are 476,213 acres and 607,217 acres, respectively. By 1975, 44,360 acres of new park land should be purchased. Approximately 2,713 acres should be developed for special purposes such as swimming, camping, picnicking, access and trails. There is a need for the purchase of an additional 28,822 acres of land by 1975 within or adjacent to existing State parks. New forest land for primitive-type campgrounds should be purchased in the Memorial Hardwood Forest by 1975. The total deficiency for new public-access acreage by 1980 is 913 acres of land. By 1975, purchase of 690 acres should be completed, and 450 of these acres should be developed by providing parking spaces, boat ramps, and sanitary facilities. Easement or acquisition should be completed on 1,200 miles of new trails involving 4,000 acres of land. About 190 acres of land should be acquired for wayside rest and picnic stops along highways by 1975. About 233,080 acres of land should be developed by 1975 for wildlife management.

Floods

Major floods have occurred from 7 to 11 times during the past 100 years in the Minnesota River Valley; Upper Mississippi River Valley; Cannon, Zumbro and Root River Valleys; and Red River Valley. Based on available information, there is evidence that there has been a reduction of frequency of loss of life from floods. At the same time the frequency of major property damage from floods has increased with increased development and use of flood plains. Without flood plain management or new flood control and protection works, total average annual flood damage potential for Minnesota is projected to increase from \$22 million in 1966 to about \$80 million (1968 dollars) in 2020. Average annual flood damages were greatest in the Minnesota River Basin and Red River Basin, and least in the Missouri River Basin in 1966. Overall, up-

stream and downstream flood damages were about equal. Downstream flood damages are projected to be 1.7 times as great as upstream flood damages by the year 2020. About 4 million acres in the State are subject to inundation. Flood damages in the Great Lakes basin and Rainy River basin are limited and small. Urban flood damage centers are most numerous in the Upper Mississippi River basin. It is estimated that present flood damage reduction programs reduce the average annual flood damage in Minnesota by about 28 percent. Existing flood damage reduction projects consist mostly of channel improvements, diversion channels, levees, drainage improvements, dikes, pumping facilities, and land treatment.

At the current rate of Federal and non-federal expenditures, and without flood plain management, flood control and prevention will not keep pace with the increase in flood damages that can be anticipated as a result of intensive use and development of flood plains. About 53 potentially feasible flood control projects in the State have been identified by the U.S. Army Corps of Engineers. Many of these projects are multi-purpose and provide such benefits as recreation facilities, pollution dilution and water supply, in addition to flood control. Projects are located mostly in the Upper Mississippi River and Red River Basins and involve several large dams and reservoirs. The U.S. Soil Conservation Service has identified 684 potentially feasible multipurpose P.L. 566 flood prevention projects in all parts of the State, except the northeast part.

Navigation

Existing navigation facilities on the Mississippi River, with favorable channel conditions and proper distribution of up-and-down-bound traffic, can economically handle from 25 to 40 million tons of traffic annually. Traffic is projected to increase from about 9 million tons in 1969 to 27 million tons in 2020. Upward river traffic has accounted for about 70 per cent of the total in recent years. Transportation of coal, petroleum products and grain accounts for most of the traffic. River terminals in Minnesota are located on the lower Minnesota River and at Minneapolis, St. Paul, Red Wing, and Winona on the Mississippi River. The Duluth-Superior harbor is served by 60 major docks. The shipping of iron ore dominates the traffic picture of the harbor. Grain shipments and coal and coke receipts are next in volume of traffic. Average traffic in the Duluth Harbor is projected to increase from about 67 million tons in 1969 to 90 million tons in the year 2020. The 50-year life of existing navigation structures on the Upper Mississippi River will be reached about 1990. Lock and Dam No. 1 at Minneapolis may need to be replaced. Industrial expansion in the lower Minnesota river basin may justify navigation development 25 miles up the river or even to Mankato within the next 50 years. The development of a 12 foot and possibly a 15 foot channel on the Upper Mississippi river may prove feasible within the next 50 years. Extension of the navigation season on the Upper Mississippi river may be feasible. The feasibility of a waterway connecting Lake Superior and the Mississippi river is being considered.

Land Treatment and Drainage

In the 1950-59 period, 205 open-ditch projects were completed in the State to drain lands for agricultural purposes. Projects involved 2,333 miles of open ditches. In addition, 47 closed or tile projects were con-

structed, involving 936 miles of tile for improved drainage. The benefited agricultural area was about 11 million acres. About 10 million acres had benefited by previous drainage. Areas drained are concentrated in the Red River basin, Minnesota River basin, and in southern counties in the State. The U.S. Soil Conservation Service has identified the following land areas as having a drainage problem with respect to agriculture: Lands suitable for crop land having excess water as a major problem, 17,754,900 acres and lands suitable for cropland having excess water as a secondary problem 1,013,000 acres. Studies indicate that of the 46,210,397 acres inventoried in the State by the U.S. Soil Conservation Service: 40% have erosion problems, 27% need treatment and feasible to treat, and 12% have been protected by treatment. The most serious erosion problems are in the southwestern part of the State. Protection by treatment is appreciable in the southeastern part of the State. There are about 15,143,500 acres of cropland, 2,489,400 acres of pasture and 16,075,434 acres of forest and woodland that require conservation treatment and that would be feasible to treat in the State. The U.S. Soil Conservation Service has identified 8,304,200 acres that require watershed project action. About 35,004 farmers or 25.2% of all farmers have been assisted in completing a plan for soil and water conservation for their farms.

Irrigation

The use of water for irrigation in Minnesota has grown from a minimum number of acres in the 1930's to about 17,000 acres in 1964. Supplemental irrigation may increase substantially in the future, especially in the field of speciality crops as potatoes and vegetables. An inventory was made by the U.S. Bureau of Reclamation of arable lands in the Souris-Red-Rainy River basin to determine their irrigability. Potential irrigable lands with surface water supplies total: 1,065,500 acres in North Dakota, 285,000 acres in Minnesota, and 3,500 acres in South Dakota. Potential irrigable lands with groundwater supplies total 138,000 acres in North Dakota and 58,000 acres in Minnesota. With no large supplies of surface water available for potentially irrigable lands in North and South Dakota, development of these lands depends upon the importation of water. The potentially irrigable lands are in addition to the lands to be irrigated through the Garrison Division Unit that utilizes Missouri River water importation. North Dakota is searching for water to irrigate its lands, since additional Missouri river water is not likely to be made available for State use. The Rainy River or Lake of the Woods in Minnesota is a source that could provide the quantity and quality of water for irrigation in Minnesota and North and South Dakota, as well as water for diluting return irrigation flows in the Red River. To serve the potential irrigable lands 1,500,000 acre-feet of water would have to be imported annually from the Lake of the Woods (international waters). The U.S. Bureau of Reclamation has conceived a plan to serve potential irrigable lands utilizing the Rainy River. A complex system costing about \$300 million would import Rainy River water to lands in North Dakota and Minnesota. The immense development plan would involve gravity diversion of Rainy River water from the natural storage of the Lake of the Woods.

Power

The total power plant generating capacity installed in Minnesota as of 1966 was over 3.5 million kilowatts. Hydroelectric power plant capacity

amounted to 5.1 percent of this figure and 94.9 percent was from thermal power plants. It is estimated that thermal electric capacity will be about 99 percent of the total electric generating capacity in Minnesota by the year 2020 or about 60.0 million kilowatts. More than 17 billion kilowatt hours were produced in 1966. Estimates for nuclear power supply are negligible in 1969 and about 67 percent of the total generation in 2020. Power imports amounted to about 20 percent of the total capacity in 1960 and they may amount to about 8 percent of the total capacity in 2020. The State is taking part in several major plans for power development involving the generation, transmission, and exchange of electric power among the various organizations in the utility business. Power supply owners in the State are members of the Missouri Basin System Group (MBSG), Mid-Continent Area Power Planners (MAPP), and Upper Mississippi Valley Power Pool. The generating capacity and loads of investor-owned utilities comprised by far the largest segment of the power industry in the State in 1969. Steam plants using coal and gas as fuels generate the major portion of electrical energy. The trend towards larger plants will promote a tendency toward joint efforts of several utilities in a single project. The development of higher transmission voltages will encourage a trend toward integration of utilities into large operating systems. The upper Mississippi River Basin will probably be blanketed by 500-kv and 765-kv transmission grids interconnecting all major cities by 1990.

Cost of Programs

Accurate data concerning past initial investments and annual operation and maintenance costs in the water and related land resources field in Minnesota are not available. First approximations and rough estimates (probably conservative) are summarized in the table below.

Estimated Investment in Development and Management Costs

Category of Resource Development and Management	Million 1968 Dollars		Operation and maintenance ^{1/}	
	Investment through 1969		Fed. Non-Fed.	
	Fed.	Non-Fed.	Fed.	Non-Fed.
Water Supply	10	755	neg.	46.0
Water Quality	15	510	neg.	7.5
Recreation, Fish, Wildlife and Forests	95	175	4.0	20.0
Flood Control	49	14	0.5	0.3
Navigation	379	9	4.0	neg.
Land Drainage, Irrigation and Treatment	250	206	neg.	4.5
Total	798	1,669	8.5	78.3

^{1/}Annual rehabilitation, operation and maintenance cost in 1969.

Investments through 1969 total approximately \$2.5 billion (1968 dollars). The non-federal sector expended approximately 68 percent of \$1.7 billion. The Federal sector expended approximately 32 percent, or \$0.8 billion expenditures. Non-federal public sector expenditures were 40 percent of the total, and private sector expenditures were 28 percent of the total. The State made approximately 10 percent of the non-federal public sector expenditures.

Total, Non-federal, and Federal annual operation and maintenance costs in 1969 were about \$86.8 million, \$78.3 million and \$8.5 million, respectively. Cost expenditure distribution was as follows: Non-federal public sector costs approximately 59 percent of the total, Non-federal private sector costs approximately 31 percent of the total, and Federal costs were approximately 10 percent of the total. Only about 20 percent of the annual operation and maintenance public sector costs were borne by the State.

Accurate data concerning initial investments and annual operation and maintenance costs associated with potentially feasible future programs and projects are not available. First approximations and rough estimates (probably conservative) are summarized in the table below.

Investments during the period 1970-1985 total \$1.7 billion (1968 dollars) or about 70 percent of total past investments through 1969 in water and related land resources development and management. Investments during the period 1985-2020 total \$4.25 billion (1968 dollars) or about 2.5 times the investments during the period 1970-1985. Investments during the 50-year period 1970-2020 total \$5.96 billion (1968 dollars) or about 2.4 times the total past investments through 1969.

Federal sector investments are about 51 percent of the total and non-federal sector investments, or about 49 percent of the total. Non-federal public local-sector investments are 62 percent of non-federal investments, private sector investments are 28 percent of non-federal investments and public State sector investments are 10 percent of non-federal investments and public State sector investments are 10 percent of non-federal investments.

Total annual operation and maintenance costs in 2020 are estimated at \$282 million (1968 dollars) or about 3.2 times the annual operation and maintenance costs in 1969. Non-federal and federal operation and maintenance costs are expected to be \$167 million and \$115 million, respectively.

During the 15-year period ending in 1970, Federal appropriations for water and related land resources development in Minnesota averaged about \$16.4 million annually, and totaled about \$246 million. With no constraints imposed, this rate would have to be increased 3.3 times to meet total Federal fiscal requirements for the 15-year period ending in 1985; or about 3.7 times through the 50-year period ending in 2020. It is not unreasonable to assume that future Federal appropriation rates will increase. However, projections of probable magnitude of investment rates that may prevail in the long-term future cannot be made with any degree of reliability.

Cost of Potentially Feasible Future Programs and Projects

Million 1968 Dollars

Basin	Investment 1970-1985		Investment 1985-2020		Operation and Maintenance 2020		Investment 1970-2020	
	Non-Fed.	Fed.	Non-Fed.	Fed.	Non-Fed.	Fed.	Non-Fed.	Fed.
Mississippi River	595	532	1,789	1,896	134	98.0	2,384	2,428
Red-Rainy Rivers	205	241	158	328	22	16.4	363	569
Great Lakes	93	26	40	10	9	0.3	133	36
Missouri River	12	6	18	9	2	0.3	30	15
Total	905	805	2,005	2,243	167	115.0	2,910	3,048
Function								
Water Supply	128	10	317	19	51	5	445	29
Water Quality	378	343	854	794	52	44	1,232	1,137
Recreation, Fish, Wildlife	75	181	33	118	7	24	108	299
Flood Control	150	166	227	190	19	17	377	356
Navigation	1	34	362	853	-	10	363	887
Land treatment, drainage, irrigation, Forests	173	71	212	269	38	15	385	340
Total	905	805	2,005	2,243	167	115	2,910	3,048

A possible Federal investment program for the 1970 to 1985 period was estimated reflecting a reasonable increase in the average annual historical average of \$16.4 million. It was assumed that the historical average of Federal appropriations would increase at the rate equal to the past rate of increase of about 2% per year plus the projected increase in Gross National Product during the 1970 to 1985 period (4.2%). In constant dollars this rate is 6.6 percent and would give a mean equivalent value of about \$24.6 million annually, or \$363 million during the 15-year period. Constraining of the implementation of plans to this estimate investment level would drastically curtail programs. However, the more critical "needs" would still be met, such as water supply and water quality requirements.

During the 15-year period ending in 1970, non-federal expenditures for water and related land resources development in Minnesota averaged about \$27.2 million annually, and totaled about \$406 million. Non-federal expenditures historically have exceeded Federal expenditures.

Selecting Future Programs

Some of the factors which will be considered in selecting future programs and projects are discussed below.

Water and related land resources planners have been and are chiefly concerned with the preservation, development, and use of natural resources. Impacts on the environment of possible programs and projects have not been properly identified. In light of the present environmental concerns, planners in the future will have to be more concerned with the protection and quality of man-made and natural environments for human health and welfare. Plans based on ecologically sound policies for man-environment relationships must be developed. These plans must be based on the assumption that changes in the attitudes, values, and expectations of people are inevitable.

During the New Deal period the United States government adopted two important techniques - multiple-purpose planning and benefit-cost analysis - for evaluating public investments in natural resources, and the years since then have been devoted to perfecting and applying them. Accomplishments have been substantial, especially in the development of water resources. At the same time, these techniques, in the process of development, have come to serve ends somewhat different from those that were intended by their early advocates, and, predictably, bureaucratic organizations and professional groups have acquired vested interests in the procedures that have evolved.

Cost-sharing, or cost apportionment, refers to the division of financial responsibility for a program or project between Federal and non-Federal interests. To the extent that non-federal interests reimburse the Federal government in whole or in part for project costs, and the Federal government provides grants or other financial assistance in support of non-federal projects, they are sharing in costs. Current cost-sharing policy for water and related land resources has developed during a period of over 100 years as Federal dams and other structures have become increasingly multiple purpose and as Federal assistance has proliferated in

support of non-federal public projects. These cost-sharing policies are a collection of separate policies individually chosen by Congress. The effects of this separatism in the development of cost-sharing policies have been threefold: differences in policy exist among Federal agencies in providing similar water resources programs; differences in policy exist among different water resource development purposes within an agency program; differences in policy exist within the same development purpose within an agency program.

Inefficiencies and inequities can arise under existing cost-sharing provisions for Federally assisted water resource programs. Differences in cost-sharing policy can encourage the following inefficiencies: beneficiaries may not choose the least cost alternative for solving problems; the optimal development scale may not be chosen; there may be less than optimal use of existing capacity. The equity problems of differing cost-sharing arrangements include: differing patterns of reimbursable cost distribution for similar programs; the tilting of project costs toward nonreimbursable functions; the arbitrariness of existing cost-sharing provisions.

Cost-sharing policy must be taken into consideration in formulating statewide water and related land resources plans. The State should encourage the revision of Federal cost-sharing policy to reduce inefficiencies and inequities. The State could adopt and implement policies aimed at reducing inefficiencies and inequities through its own financial assistance programs.

The discount rate plays a central role in benefit-cost analysis because it provides a mechanism for comparing benefits which occur in future years with the current cost of a proposed project. A new formula for determining the discount rate to be used in the economic analysis of Federal water and related land resources projects was established by the Federal Water Resources Council in 1968.

Financial feasibility, including adequate repayment provision for certain reimbursable costs, is required in most Federal water and related land resources project authorizations. Repayment interest rates have an effect on project evaluation.

The supposedly objective standard for deciding whether a project is worthy of approval is the "benefit-to-cost" ratio. The potential benefits of a project are measured against the estimated costs, and the resulting ratio must be at least one-to-one - that is, one dollar of benefit for each dollar spent (the Corps prefers the term "invested") - to qualify. There is, however, considerable flexibility in the process, and at times the benefit-cost ratios of controversial projects are recomputed until they come out right.

In the book entitled "The Outlook for Water", 1971, N. Wollman and G.W. Bonem, The Johns Hopkins Press, Baltimore, Maryland, the results of a study aimed at determining how adequate the supplies of freshwater will be in the United States during the next five decades are described. The study involves a national (forty-eight contiguous States) economic model which is based on the assumption that regional economic activity to the year 2020 will grow or decline relative to the growth of the national economy at rates consistent with recent trends. In other words, the model is used to estimate the adequacy of water resources if past population and economy trends continue in the future.

The supply of fresh water for each of twenty-two water resource regions in the Nation was calculated at the dependable levels of streamflow that can be counted on 98 percent of the time. The supply is water resources obtainable through maximum streamflow regulation, that is, the point at which more surface water storage would result in net losses through evaporation. Water requirements for each of the regions were estimated for the years 1980, 2000 and 2020. The principal factors in requirements were withdrawal uses and the dilution streamflow needed to maintain water quality. Estimates of supplies were compared with the requirements of each region to indicate the surplus or deficit to be expected in 1980, 2000 and 2020 under various combinations of selected assumptions and constraints.

The population of the forty-eight contiguous States was 178 million in 1960; according to medium model projections, taking into account the decline in the U.S. birth rate over the past decade, the population will reach 233 million in 1980, 303 million in 2000, and 393 million in 2020. According to high projections, population will reach 520 million in 2020. In 1960, 65 percent of the people were in standard metropolitan statistical areas; by 2020 this percentage is projected to rise to 84 (medium projection). By 2020 the gross national product (GNP) is projected to reach (in constant dollars) eight times its 1960 level. A ten fold increase is projected for chemicals, twelve fold for steam-electric generation, and eighteenfold for rubber and plastics. Food processing, petroleum refining, and primary metals are expected to increase less rapidly than GNP; irrigation is projected to increase only 40 percent.

Withdrawals of water by the year 2020 are expected to be about three and a half times larger than in 1960. To attain desired levels of water quality, the model, during one exercise, stipulated an instream dissolved oxygen content of 4 mg/l and reducing biochemical oxygen demanding substances in waste discharges to within 2 1/2 percent of their original potential. Needs for dilution flow under this 97 1/2 percent waste treatment would be minimum. It was assumed that in maintaining dilution flows the requirements for swamps and wetlands, navigation, hydroelectric power, sport fish habitat, etc. would also be met automatically. Estimates of water supplies and required streamflows under the 97 1/2 percent waste treatment condition are given in the table below. Maximum regulated stream flows and required streamflows were compared and regional deficits were noted (underlined figures indicate deficits). A deficit implies that projected population and economic growth will not be possible, or that the deficit will be overcome, at extra cost, by methods not considered in the model - importation of water from another region, for example, or interregional shifts of population or economic activity.

Region	Maximum Regulated Streamflow	Required Streamflow			High 2020
		1980	Medium 2000	2020	
New England	60,895	3,177	4,522	6,474	9,935
Delaware and Hudson	28,629	6,486	9,785	14,627	25,907
Chesapeake Bay	46,657	6,025	10,410	17,767	39,329
Ohio	99,457	4,154	6,748	11,055	23,041
Eastern Great Lakes	33,278	4,800	7,995	13,482	30,471
Western Great Lakes	30,283	10,639	17,502	30,641	71,965
Upper Mississippi	46,125	3,350	5,321	8,275	16,133
Lower Missouri	16,211	957	1,657	2,896	5,703
Southeast	186,030	25,451	48,176	87,941	186,781
Cumberland	14,647	1,810	4,280	9,088	23,529
Tennessee	40,389	3,019	5,742	10,381	24,493
Lower Mississippi	35,207	3,130	5,311	8,536	16,732
Lower Arkansas-White-Red	51,661	3,099	4,463	6,064	10,114
Upper Missouri	25,600	15,912	18,179	24,084	38,553
Upper Arkansas-White-Red	7,053	6,730	7,486	8,969	14,550
Western Gulf	25,900	17,235	26,747	44,441	98,408
Upper Rio Grande - Pecos	3,000	5,507	6,529	8,921	12,901
Colorado	11,400	16,950	25,204	42,643	65,373
Great Basin	6,934	6,251	7,011	10,046	18,038
South Pacific	815	8,135	12,278	18,055	26,098
Central Pacific	45,478	26,834	30,309	37,267	54,872
Pacific Northwest	134,570	25,068	36,886	58,005	96,342
United States	956,219	204,719	302,541	470,658	909,268

Data in the table indicate by the time 2020 high projections are realized the blight of water shortage will cover large parts of the Nation. All maneuvering room will be lost except that afforded by technology and population control.

Minnesota is in the Upper Mississippi region and is blessed with maximum regulated flow exceeding future requirements. The results of the study suggests that in the future ever increasing pressure will be brought to bear on Minnesota to regulate to a maximum its streamflows in order to provide water for regions with deficit flows. On the otherhand, it is possible that there may be interregional shifts of population and economic activity into Minnesota in the future. These possibilities must be taken into consideration in selecting future programs for the development and management of the State's water and related land resources.

Social goals have been involved throughout our nation's long concern with planning the use of water and related land resources. Secretary of the Treasury Gallatin's Report on Roads and Canals of 1803 proposed, for the first time, a comprehensive plan for canals and other navigable waterways to provide low-cost transport covering the whole of a largely unpopulated and undeveloped United States. The goals were: economic development, further political unity and military defense. This proposal was made before the advent of the railroad and after the Louisiana Purchase of 1803.

When Federal authority to undertake navigation projects at Federal expense by the Army Corps of Engineers became clearly established after the Civil War, economic development of the Middle West with the aid of cheap waterway transportation of grain and other bulk commodities was a basic national policy objective. But such projects were conceived of as providing not only waterway transportation but also competition to railroads with the socio-economic objective of regulating freight rates.

The enactment in 1902 of the Reclamation Act pushed the Federal government's responsibility for economic development further West through provision of agricultural water developments that extended the possibilities of Western settlement. As a means of furthering a second objective, that of a nation of family farms, the Act also provided that no Federally developed water could be supplied to lands in excess of 160 acres for any one landholder. And the landholder was required to be a "bona fide resident on such land."

After the turn of the century, multiple-purpose development increasingly became a national goal of water and related land resource development under the aegis of the Conservation Movement. Not only navigation and irrigation, but also hydroelectric power, flood control, domestic and industrial water, land stabilization, drainage, watershed protection and enhancement of outdoor recreation, and fish and wildlife eventually became purposes of such development. Although economic development was not the sole objective of these purposes, it was a widely supported common objective.

When Congress passed the Flood Control Act of 1936, it established procedures to be followed in evaluating projects for flood control purposes. The projects were to be submitted to Congress for authorization, and the Act declared that the projects should be undertaken:

if the benefits to whomsoever they may accrue are in excess of the estimated costs, and if the lives and social security of people are otherwise not adversely affected.

Subsequent development within the Executive Branch of benefit-cost analysis and establishment of the critical role of the benefit-cost ratio in deciding upon the worth of Federal and Federally assisted water projects stems from this legislation.

"Proposed Practices for Economic Analysis of River Basin Projects," May, 1950, a report of the Subcommittee on Benefits and Costs of the Federal Inter-Agency River Basin Committee, was the first published inter-agency coordinated effort to implement both Congressional desires for evaluation procedures and the parallel views of the Report of the President's Water

Resource Policy Commission of 1950. The theoretical economic underpinnings of these evaluation procedures stem from developments in normative economic theory.

The report of May, 1950, is known as the "Green Book" and was republished in May, 1958, with minor revisions. It sets forth "criteria and principles" of "general economic welfare" for application by agencies within the framework of their particular programs and responsibilities." Goals or objectives other than "general economic welfare," defined as economic analysis within the context of the Reclamation Act's 160-acre rule. This rule, it was understood, reflected an objective other than "general economic welfare" as defined in the Act.

The proposed practices, moreover, called for identification of all beneficial or adverse effects of a project in both tangible (i.e., monetary) and intangible terms. An "intangible" beneficial effect of a flood control project--an effect which the Congress clearly had in mind when it established flood control as a national, largely non-reimbursable project purpose--is the saving of human life. However, the great weight given by both the Office of Management and Budget (formerly the Bureau of the Budget) and the Congress (1) to a benefit-cost ratio in terms of tangible values (e.g., savings in property damage) and (2) to a ratio of one or greater as the basic criterion of authorization and funding of a water development project, has made all other goals secondary. Regional development per se, that is provision of settlement opportunities or improvement of underdeveloped areas, was a major objective of Congress in passage of the Reclamation Act of 1902 and the Tennessee Valley Act of 1933. But it, too, was made a secondary goal to that of national economic efficiency.

The Green Book was never adopted by the Federal-Inter-Agency River Basin Committee or its successor committees. But, the basic philosophy and many of the explicit and implicit criteria and principles of the Green Book were embodied in Budget Circular A-47 issued by the U.S. Bureau of the Budget on December 31, 1952. The most fundamental standards and procedures of the Circular were these:

- (a) The most economical means of meeting needs in a region were to be set forth as an important consideration in reviewing proposed projects.
- (b) The relative economy of alternative means available on a national basis for meeting needs was to be set forth for consideration.
- (c) Benefits and costs, in total and separately for each purpose, were to be set forth. Where benefits and costs could not be estimated in monetary terms, their relative significance was to be stated in as precise and quantitative terms as possible.

Lastly, in the words of the Circular itself:

- (d) While it is recognized that a comparison of estimated benefits with estimated costs does not provide a precise measure of the absolute merits of any particular program or project, one essential criterion in justifying any program or project will, except

in unusual cases where adequate justification is presented, be that its estimated benefits to whomsoever they may accrue exceed its estimated costs.

The Green Book called for the application of its criteria and principles within the framework of an agency's particular programs and responsibilities. In contrast, "A-47" called for analyses of proposed water projects by sponsoring departments and agencies in terms of its standards and procedures, with explicit indications to where legal requirements or official agency views were at variance. The upshot of these standards and procedures was this: a program or project proposed for authorization or funding had to have a benefit-cost ratio greater than one in terms of tangible benefits and tangible costs from a national point of view. By implication, changes would be sought in those laws inconsistent with the standards and procedures of "A-47". Contrary views of departments and agencies would be accepted only in unusual cases that were adequately justified.

The Bureau of the Budget attempted rigorously to apply "A-47" to all projects presented for review in the 1950's. This effort led to great dissatisfaction with "A-47" within Congress beginning in about 1956. Few, if any, in Congress called for abandonment of benefit-cost analysis per se, but there was a widespread call for its liberalization. Specifically suggested changes in evaluation procedures were: change of the period of analysis from 50 to 100 years, recognition of secondary benefits of water projects, treatment of opportunities for enhancement of recreation and fish and wildlife as one of the primary purposes of water projects, and elimination of taxes foregone in costs allocated to public electric power.

"Policies, Standards and Procedures in the Formulation, Evaluation and Review of Plans for Use and Development of Water and Related Land Resources," an interdepartmental agreement approved by the President for application by the Federal departments concerned and the Bureau of the Budget, replaced Budget Bureau Circular A-47 on May 15, 1962. Although it was only a document of the Executive Branch and never approved formally by the Congress, Senator Clinton Anderson, then Chairman of the Senate Committee on Interior and Insular Affairs, saw to publication of the agreement by the Senate on May 29, 1962. In an introductory statement, he indicated the mood of many in Congress at that time:

The new policies and standards, established in an agreement of the four Department heads, replace Budget Bureau Circular A-47 which caused considerable contention, both as to content and as to the propriety of its source.

The publication has become widely known as "Senate Document 97." This appellation has led some to the mistaken belief that the new policies and standards set forth in this document had their origin in the Legislative rather than the Executive Branch.

The basic objective in the formulation of plans, according to Senate Document 97, "is to provide the best use, or combination of uses, of water and related land resources to meet all foreseeable short or long-term

needs." In pursuit of this objective, full consideration is to be given to the following multiple objectives and "reasoned choices made between them when they conflict":

Development - Water and related land resource development and management are taken to be essential to economic development and growth for all the various multiple-purposes including outdoor recreational and fish and wildlife enhancement. (Previously in "A-47", full consideration of outdoor recreation and fish and wildlife had not been given in project formulation with respect to possible specific enhancement measures involving joint facilities and in project analysis through estimation of tangible benefits and allocation of joint as well as separable costs.)

Preservation - Proper stewardship of the Nation's natural beauty is taken to require preservation in "particular instances" of open space; green space; wild areas of rivers, lakes, beaches and mountains; and areas of unique natural beauty or of historical and scientific interest. (To highlight "preservation" as an objective of water and related land "use", as distinct from "development," was new to water planning standards in 1962. This newness occurred despite the fact that conflicts between "development" and "preservation" had erupted in the past.)

Well-being of people - Hardship and basic needs of particular groups are to be of concern, but development for "the benefit of the few to the disadvantage of the many" is to be avoided. In accord with this objective, socio-economic policy requirements established by the Congress are to be observed (e.g., the 160-acre rule in relation to Federal supply of water for irrigation and "preference clauses" relating to the sale of Federal power to local public and rural electric cooperatives).

Planning, according to Senate Document 97, is to include all relevant means to achieve proposed project objectives and purposes (including non-structural means) singly, in combination, or in "alternative combinations reflecting different basic choice patterns." Comprehensive plans are to be formulated initially to include all units and purposes which satisfy national economic efficiency criteria in terms of tangible benefits and costs. Thus Senate Document 97 clearly provides that optimum plans in terms of criteria of national economic efficiency are to be presented for consideration within the Executive Branch and to Congress. In addition, however, such optimum plans are to provide baselines from which alternative plans reflecting intangible values can be judged (e.g., by determining the developmental benefits foregone if preservation of a scenic river is relevant as an alternative to multiple purpose development.) And, according to Senate Document 97, when major differences arise among technically-possible plans seen as desirable for a river basin on the basis of intangible benefits and costs, in comparison to optimum plans based on tangible benefits and costs, alternative plans expressing these major differences are to be presented for consideration within the Executive Branch and to Congress.

Regional, state, and local points of view or objectives are to be considered as well as national points of view concerning the criterion of national economic efficiency or other national policy. A comparison of

differences arising from these various points of view is also to be included in reports.

Finally, Senate Document 97 provides that general and specific judgments are to be made upon comprehensive plans, programs, and project proposals as a basis for recommendation to Congress. Review aimed at arriving at such judgments is to be based upon the provision of Senate Document 97 itself, applicable laws, their legislative intent, Executive policies and orders as well as recognized technical standards. In contrast to "A-47," no requirement is presented that says projects must have a benefit-cost ratio greater than one as a basis for recommendation to Congress. On the other hand, Senate Document 97 did not bar the Bureau of the Budget then, nor does it bar the Office of Management and Budget today, from adopting such a benefit-cost ratio requirement as its own administrative standard. This requirement has been the unwritten rule since promulgation of "Senate Document 97" on May 15, 1962.

In July, 1968, the Water Resources Council proposed the amendment of Senate Document 97 to change the formula for determining discount rates used in the calculation of benefits and costs. This proposal precipitated a new Congressional call for liberalization which was supported by various developmental interest groups. This was due to the fact that the formula change would have the immediate effect of raising the discount rate resulting in a lowered benefit-cost ratio and making infeasible many borderline projects that formerly were considered feasible. Initially, in response to Congressional pressure, the Council directed its efforts toward developing specific improvements in analytical procedures for carrying out the policies and objectives that had not been well developed in Senate Document 97: These improvements would help meet certain specific criticisms. At that time, the Council also adopted the new discounting formula. Later, in view of the Council's obligation under Section 103 of the Water Resources Planning Act of 1965 to promulgate its own "principles, standards, and procedures," with the approval of the President, the Council enlarged its attention span to this much broader task.

To serve as a basis for public hearings, a report of a Special Task Force of the Council was published in June, 1969, which reflected this broader task. This report came to be known as the "Blue Book." After the hearings, in June, 1970, reports of the Special Task Force on "Principles" and "Standards" for water and land resources planning were made available to the interested public. A third report, "Procedures" for water and land resources planning, is to be developed later. The first two are now known as the "Orange Books."

"The overall purpose of water and land planning," the Special Task Force asserts in the Orange Book on Principles, "is to reflect society's preferences for attainment of the objectives defined below":

- A. "To enhance national economic development by increasing the value of the Nation's output of goods and services and improving national economic efficiency.
- B. "To enhance the quality of environment by the management, conserva-

tion, preservation, creation, restoration, or improvement of the quality of certain natural and cultural resources and ecological systems.

- C. "To enhance social well-being by the equitable distribution of real income, employment, and population, with special concern for the incidence of the consequences of a plan on affected persons or groups; by contributing to the security of life and health; by providing educational, cultural, and recreational opportunities; and by contributing to natural security.
- D. "To enhance regional development through increases in a region's income, increases in employment; and improvements of its economic base, environment, social well-being, and other specified components of the regional objective."

"No one objective," the Special Task Force further asserts, "has any inherently greater claim on water and land use than any other. These Principles do not imply the relative priorities to be assigned among the multi-objectives in plan formulation and evaluation."

In these general statements, the Special Task Force offers its conception of appropriate objectives of water and land resources planning. But it also makes clear its position, here and in subsequently more detailed provisions, that national economic efficiency should no longer be considered the primary objective.

Summary

One important water problem in Minnesota concerns water supplies for the Minneapolis-St. Paul metropolitan area and the Iron Range area. The water-supply withdrawals at Minneapolis-St. Paul may exceed streamflow in the Mississippi river during extended dry periods sometime within the next 20 years. The possible viable solutions to this problem are: reduced withdrawals of water, greater use of groundwater resources, importation of surface water from the St. Croix river or Mississippi river below Minneapolis-St. Paul, impoundment and release of surface waters behind one or more dams on the Minnesota river or its tributaries, impoundment and release of surface waters behind one or more dams on the Mississippi river or its tributaries above Minneapolis-St. Paul, and a combination

of two or more of these solutions. The relative merits of these alternate solutions from a State-Local point of view have not been evaluated. Little attention has been given to the statewide and regional implications of solutions. Environmental, economic and political aspects of solutions are not documented. Legislation is needed to assure the Governor transmits to the Legislature by 1975 a report summarizing the pros and cons of possible viable solutions and recommending an optimum solution. The Department of Natural Resources in cooperation with the Metropolitan Council and other agencies could provide leadership in performing this task.

As the result of the expanding taconite industry, water-supply problems in the Iron Range area are anticipated during extended dry periods within the next 20 years. The possible viable solutions to this problem are: reduction in withdrawals of water, greater use of groundwater resources, importation from Lake Superior or from the Rainy river, and a combination of two or more of these solutions. Legislation is needed to assure the Governor transmits to the Legislature by 1975 a report summarizing the pros and cons of possible solutions and recommending an optimum solution. The Department of Natural Resources in cooperation with the Iron Range Resources and Rehabilitation Commission and other agencies could provide leadership in performing this task.

Another important water problem concerns water quality throughout the State. Estimates of waste loadings (municipal, industrial and agricultural) of streams are incomplete and available data is not sufficient to quantify the status and trends in water quality. Costs of controlling all water pollutants or sources have not been estimated. An accounting of direct damage attributable to water pollution is not available. The statewide magnitude of lake eutrophication problems and possible viable solutions have not been evaluated. The status and trends in groundwater quality are unknown on a comprehensive statewide basis. The extent of agricultural pollution and possible viable solutions is not documented. Present waste treatment facility needs to meet water quality standards based in general on secondary treatment have been evaluated. However, within 20 years, wastes at many locations even after secondary treatment may exceed the assimilative capacities of streams during extended dry periods. Future overloading of streams may be prevented by advanced waste treatment, using holding ponds, augmenting streamflow impounding and releasing surface water behind dams, or a combination of two or more of these solutions. Little attention has been given to the viability of these possible solutions.

Legislation is needed to assure the Governor transmits to the Legislature by 1975 a report summarizing the status and trends in water quality and the pros and cons of possible viable solutions to existing and future water quality problems and recommending optimum solutions. The report should provide information on: impacts of water quality improvement costs on local and State population growth, industries, firms, employment, consumers, taxpayers and trade and impacts of water quality programs on other water programs. The Pollution Control Agency in cooperation with the Department of Natural Resources and other agencies could provide leadership with respect to performing tasks associated with surface waters; the State Board of Health could provide leadership with respect to groundwaters; and the Department of Agriculture could provide leadership with respect to agricultural runoff.

Another important water problem concerns water-based recreation. Some issues prevalent over the past years which are still unresolved are: the definition of the respective roles of various levels of government and the private sector in outdoor recreation, specifically the role of the State in serving the needs of urban areas; conflicts in recreation surface water use, particularly in or near urban areas; the extent of protection of unique natural waterways; differences in viewpoints on criteria for aesthetic protective purposes; degree of control that will be determined appropriate under lakeshore development zoning regulations that are recommended by the Department of Natural Resources to be adopted by the Counties; and fragmentation of responsibility for recreational navigation and the unclear role of the State in this area. Legislation is needed to assure the Governor transmits to the Legislature by 1975 a report summarizing the pros and cons of these issues and recommending optimum solutions. The Department of Natural Resources in cooperation with other agencies could provide leadership in performing this task.

Another important water problem concerns flood control and drainage. The flood damage problem is particularly acute in the Red river valley and in the Minnesota river valley. Possible viable solutions to problems have been suggested by the U.S. Army Corps of Engineers and U.S. Soil Conservation Service. These solutions stress structural measures (primarily small and large dams and drainage ditches) and regional points of view. Alternative viable solutions stressing flood plain zoning, local protection improvement works, and a State point of view have not been evaluated. There is controversy concerning the affects of past and future drainage practices on flood damages.

Legislation is needed to assure the Governor transmits to the Legislature by 1975 a report summarizing the pros and cons of viable flood problem solutions involving the latest concepts of flood plain management and recommending optimum solutions. The report should include detailed information on such factors as: areas of flood plains that could be reasonably zoned, areas that could be locally protected, regional affects of flood plain management practices, cost sharing of programs, the interrelationship between flood control programs and other water programs, and impacts of programs on the environment, economy, population, and taxpayers. The Department of Natural Resources in cooperation with other agencies could provide leadership in performing this task.

Another important water problem concerns water-borne transportation. Some issues prevalent over the past years which are still unresolved are: the feasibility of deepening the navigation channel in the Upper Mississippi river from 9 to 12 or possibly 15 feet, the feasibility of extending the navigation channel with a 9-foot depth up the Minnesota river to Mankato, and the feasibility of a waterway connecting Lake Superior and the Upper Mississippi river. Legislation is needed to assure the Governor transmits to the Legislature by 1975 a report summarizing the pros and cons of viable water-borne transportation programs. The report should include a review of the progress made by the U.S. Army Corps of Engineers on its study of the 12-foot navigation channel on the Upper Mississippi river and recommendations relating to the impact of the 12-foot channel on fish and wildlife. The Department of Natural Resources in cooperation with Port Authorities and other agencies could provide leadership in performing this task.

Another important water problem concerns International, Regional, Federal-State, and Interstate, organizations with water programs in Minnesota. The Governor will soon receive for his review and comment Federal-State water and related land resources planning documents prepared by the Upper Mississippi River Coordinating Committee, Missouri Basin Inter-Agency Committee, Souris-Red-Rainy River Basins Commission, and Great Lakes Basin Commission. A Missouri River Basin Commission and an Upper Mississippi River Basin Commission have been created; in addition the Great Lakes Commission is considering the adoption of a Great Lakes Basin Interstate-Federal Compact. The Minnesota-Wisconsin Boundary Area Commission is studying the need for radification by the Federal government of its Interstate Compact. Water matters concerning Minnesota are being considered by the International Joint Commission. Water plans being prepared by many organizations in the United States and Canada could have significant impacts on Minnesota.

Legislation is needed to assure the Governor periodically transmits to the Legislature reports on the State's participation in the activities of International, Regional, Federal-State and Interstate organizations. The reports should evaluate the pros and cons of Minnesota joining organizations and the impacts of organizations' programs on the affairs of the State. The reports should keep the Legislature abreast of developments throughout the Nation which have significant implications on State water policy. The Minnesota Commission on Interstate Cooperation in cooperation with the State Planning Agency and other agencies could provide leadership in performing this task.

A review of identified potentially feasible programs and projects for solving existing and future water and related land resources problems should be made in context with existing and emerging State policies and information concerning resource availability. Programs and projects should be segregated into three categories: Category 1 - Programs and projects which appear to be consistent with planning policies, Category 2 - Programs and projects which appear to be inconsistent with planning policies, and Category 3 - Programs and projects for which additional information is required before a decision can be made as to whether or not they are consistent with planning policies.

The programs and projects which are consistent with policies should be endorsed by the State and immediate steps be taken to implement these programs and projects. Action should be initiated by the State to reject those programs and projects which are inconsistent with planning policies. Decisions concerning programs and projects in Category 3 should be delayed until additional information is obtained.

Studies involving a statewide economic model must be conducted before decisions can be made concerning programs and projects in Category 3. These studies should be patterned after the economic model described in the book entitled "The Outlook for Water", 1971, N. Wollman and G.W. Bonem, The John Hopkins Press, Baltimore, Maryland. Alternative combinations of flood plain management, water quality improvement through low streamflow augmentation, water supply, and land use programs should be tested and their relative merits appraised.

The people of Minnesota have expressed a great concern with the environmental quality of the State. They are moving rapidly to restore and protect their environment. Gathering timely and authoritative data concerning the conditions and trends in the quality of the environment is one of the keys to effective management for environmental quality. The detection of environmental changes, desirable or undesirable, natural or manmade, is impossible without established base lines and repeated observations. Such measurements are essential for the identification of environmental needs and the establishment of program priorities, as well as for the evaluation of program effectiveness. They provide an early warning system for environmental problems which allows corrective action to be taken before the problems become serious.

The measurement of the status and trends in the environment is an exceedingly complex problem. To paint an accurate picture of Minnesota's environment will necessitate deciding upon adequate indicators of environmental quality, determining and evaluating specific information requirements, and improving data collection methods. Federal, State and local agencies and private concerns are all involved in activities to understand, describe, and predict the environment. Improved institutional arrangements are necessary to develop an integrated system to provide required information.

The status and trends in Minnesota's environment are unknown on a comprehensive, detailed basis. The undesirableness and seriousness of trends are accepted general knowledge, but there exists no well-documented gauge of the State environmental quality conditions. Little attention has been given to deciding upon adequate indicators of environmental quality on a statewide basis, determining and evaluating specific information requirements, and improving data acquisition and handling methods.

The nature and gravity of the State's water and related land resources problems are underscored in reports by the State Planning Agency. These reports make it clear that Minnesota needs to emphasize statewide planning and accounting for water and related land resources development and management. To assure that data are on hand to support this effect will require improved coordination of Federal, State, local and private data collection and handling programs, and emphasis on the description and evaluation of water and related land resources systems consistent with modern approaches to planning, development and management. These approaches call for an improved and better organized effort to acquire the right kinds and amounts of data, and for the development of better techniques for their processing and analysis. In short, statewide water and related land resources problems dictate a sense of urgency to develop, and coordinate a statewide water and related land resources - data system.

Without valid data programs, the most important water and related land resources problems or the most cost-effective methods of attacking them cannot be accurately determined. The success of efforts to correct problems can not be evaluated. Data acquisition and handling is not a substitute for action. But, in the long run, action without adequate data programs is more likely to be ineffective.

Responsibilities for water and related land resources data acquisition and handling in Minnesota are shared among many Federal, State, local and private organizations. The diffusion of responsibility makes it difficult to launch a comprehensive attack on environmental and other problems. Divided responsibility means that some needed data acquisition and handling programs slip between the cracks and disappear from view. One such program is the development of a statewide water and related land resources - data system.

A statewide water and related land resources - data system is needed to improve the coordination of data acquisition and handling responsibilities, to improve the efficiency of data programs, and to upgrade and fill deficiencies in data programs. Institutional arrangements must be devised to design the system. The statewide water and related land resources - data system is defined as the total statewide activity to acquire, process, store, and disseminate data needed for the evaluation, planning, development and management of Minnesota's water and related land resources.

Water and Related Land Resources - Data System Task Force

It is recommended that a Water and Related Land Resources - Data System Task Force be established under the Department of Natural Resources. Membership on the Task Force could consist of representatives from the following organizations: State - State Planning Agency, Department of Administration, Pollution Control Agency, State Board of Health, Department of Economic Development, Iron Range Resources and Rehabilitation Commission, Water Resources Board, Department of Agriculture; Federal - Soil Conservation Service, Forest Service, National Weather Service, Army Corps of Engineers, Bureau of Sport Fisheries and Wildlife, Geological Survey, and Environmental Protection Agency; University of Minnesota; State College System; and Metropolitan Council.

The Task Force should be charged with the responsibility of recommending design characteristics of a statewide water and related land resources - data system. The system should have two main components: 1) a data acquisition subsystem, and 2) a data handling subsystem. The Task Force should be concerned with the activities of instrumentation, methodology, technology development and institutional arrangements that are directly in support of data acquisition, processing, storage and dissemination.

Data Network

Recommendations should be made concerning a statewide water and related land resources - data network. "Statewide network" data identifies that which has continuity and common use among agencies in contrast to "specialized data" associated with individual agency objectives. The network should supply information on quantity and quality of the water and related land resources at any place in Minnesota with sufficient accuracy to meet general needs for data and should serve as a foundation for more precise work to meet specialized needs for data. The foregoing requires a determination of appropriate accuracy and setting of standards to attain this accuracy.

A basic principle that must not be ignored in the design of the statewide network is the multipurpose use of data. Needs for and uses of data differ greatly, ranging from generalized statewide or local information on availability of resources, to resources accounting for state regional units, to detailed accounting of resources in connection with design and operation of a specific project, or solution of a specific local problem. The network should include not only data acquired through station-type observations, but also data obtained through areal observations and synoptic studies of water and related land resources systems. Ideally, the statewide network should supply a base level of general information, should meet the need for statewide and local resources accounting, and should, insofar as practicable, meet needs for data in support of specific projects or problems. The statewide network should be both user-oriented and problem-oriented. Its design will require realistic anticipation of future problems and needs for data. The network should be responsive both to immediate mission-oriented needs and to the need for a statewide base level of information.

It is an established principle of information theory (and common sense) that the cost of acquiring data should be proportional to its value. Setting quantitative estimates of value of different classes of data is one of the major problems to be resolved in designing the statewide network. This will require extensive economic study and analysis of benefits of water data before a final network can be developed.

Data Acquisition

Recommendations should be made concerning data acquisition. A system should be devised that will generate the optimum combination of reliability, economy and timeliness in the acquisition of data. According to sampling theory, the desired degree of precision or accuracy of results govern the level of the effort to be expended. In turn, judgement of the accuracy needed is based on the value of given results relative to the cost of obtaining them. Once a value has been assigned and the necessary degree of accuracy specified, the appropriate total level of effort can be computed. The extent of variability within each group of items to be sampled affects the distribution of effort among different kinds of data. In some cases it is possible to determine the value of water and related land resources data for a specific purpose. However, no quantitative measure exists of the value of data for multiple and general purposes. Lacking such a measure, scientific judgement of value must suffice, based on the objective of providing a statewide base level of information adequate for estimating the resources at any given place or time. This statement is also a guide to the degree of accuracy required. No formula will translate the words adequate and estimate into quantitative expressions.

In order to ensure that the data incorporated into the statewide network are compatible, comparable, of acceptable quality to the user concerned, or are adequately coded to identify acquisition or analysis by other than recommended procedures, an understanding and agreement must be reached among the operating, the contributing, and the users on standards to be used in measuring, sampling, analyzing, and processing the data. Continuing effort must be applied to the development of standard proce-

dures for data acquisition to ensure reliability, promote interchangeability for all practical purposes, and are readily acceptable to users. The use of standards for information acquisition will identify and ensure that the information incorporated into the statewide water and related land resources data network will meet certain requirements for content, uniformity, and timeliness for a wide variety of purposes. Standards should provide explicit guidelines for the collection of data in the field and laboratory and for the processing and analysis of such data prior to entry into the data handling subsystem. A source which recommends and documents standard procedures for data acquisition, even though incomplete, has long been needed.

The Task Force should consider such items as bibliographies of methods, techniques, and standards used in the various agencies; glossary of terms; instrumentation and equipment used in information collection; published standards and procedures currently used by various agencies; and methods of laboratory or office analysis and processing. Problems concerning data station identification, data accuracy, symbols, notations, nomenclature, and units of measurement should be considered.

Data Handling

The Task Force should consider design characteristics for a statewide subsystem to handle water and related land resources data. The data handling activities, both manual and automated, of agencies collecting and using information need to be pulled together into an overall statewide water and related land resources data exchange. The Task Force should be concerned with standards and formats for storing and disseminating data and the soft and hardware for computerized files.

Institutional Arrangements

Finally, the Task Force should make recommendations concerning institutional arrangements for implementing a statewide water and related land resources - data system. Institutional arrangements should be devised to perform the following functions: operate a statewide network for acquiring data; coordinate a statewide network and specialized data activities; and maintain a central catalog of data and on activities being planned or conducted to acquire data.

Coordination should be accomplished with participation of all concerned agencies, by reviewing the data requirements and activities of all agencies and subsequently: (1) identifying common needs for water and related land resources data; (2) establishing and revising as appropriate the statewide network; (3) advising user agencies promptly of the extent to which the statewide network can meet their specialized requirements for data; and (4) achieving optimal coordination of network and specialized data activities in order to meet, effectively and economically, the variety of needs of agencies concerned. Each year the coordinating process should culminate in a plan. That plan should: (1) identify long-range and intermediate agency objectives; (2) relate proposed water and related land resources data acquisition activities to objectives; (3) identify planning assumptions; and (4) call attention to unresolved inter-agency issues and views of the agencies concerned.

A central catalog could provide information needed in developing the annual plan for use in the budgetary process. An inventory of ongoing data-acquisition activities is essential to accomplishing this objective. The concept of the catalog of data is based on the premise that development of such a catalog provides a basis for organizing data-acquisition activities in an orderly fashion. The catalog also enables data-users to determine if needed data are available and, if so, from whom they can be obtained.

The statewide data network activities should be based on identified water and related land resources data needs not being met by existing acquisition activities; identification of future data needs and arranging for their acquisition; the designation of appropriate standards of data acquisition and processing; the coordination of ongoing and planned data acquisition activities so as to increase the efficiency and economy of these efforts and avoid unnecessary duplication of effort; establishment of mechanisms for continuing review of the network to evaluate its efficiency, economy, and capability of meeting data needs.

One potentially feasible institutional arrangement which should be considered by the Task Force is described below. The Department of Natural Resources could serve as the statewide water and related land resources - data system central. A statewide water and related land resources - data system interagency committee could be established in the Department of Natural Resources. A data exchange could be operated by the Department. The exchange could be the focal point for receipt of data requests and for referral of the requests either to the appropriate agency holding the data or to an internal unit maintaining a file for information collected by organizations that are willing to make their data available to users but are not in a position to serve as the prime contact for dissemination of the information. With the assistance of the interagency committee the Department of Natural Resources could prepare and maintain the catalog of data. The Department could also centralize the data handling subsystem and facilitate interchange of data between agencies and between agencies and users and could permit each collecting agency to act as a data center. A large computerized central bank could be maintained by the Department which could be concerned with selected data.

Each agency could store those data gathered as part of their operations in data banks which will be component parts of the statewide data exchange. Automatic conversion of manual files into machine-readable form would not be desirable. As data and other materials from manual files are retrieved in response to requests, they could be put into machine-readable form.

The Department of Natural Resources could provide the requestor a single contact point for requesting water and related land resources data. This would not preclude direct requestor contact with collector agencies, especially when the requestor knows of the location of needed data in the files of a collector agency. When direct requests are filled by an agency, the Department could be notified of such action. The Department through an index, could be capable of notifying the requestor of the location of data which will satisfy his request and also notifying the responsible ag-

ency of the inquiry. The responsible agency will fill the request and simultaneously notify the Department of that action.

The interagency committee could assist the Department of Natural Resources by establishing and revising standards and formats for storing and disseminating data, both for manual and computerized files; developing software for internal manipulation of data, for exchange of information between agencies, and for dissemination of information to individual requestors; assessing the data interests of agencies and users and inventorying current practices in observing, measuring, and recording information and in the storing and disseminating of such information; and assessing agency information needs.

Background Information

Available information concerning water and related land resources data acquisition and handling programs in Minnesota in 1971 are summarized below to assist the water and related land resources - data system Task Force in its deliberations. Information is arranged under major headings such as water quality, surface water, groundwater, floods, etc. which constitute the various functional areas of water and related land resources data acquisition and handling programs.

The programs identified are further subdivided into three categories: Data Collection, Investigations and Comprehensive Studies. These three categories are defined as follows:

Data collection includes programs whose primary goal is the acquisition of basic data, inventories, and surveys on a regular basis, such as records of temperature, precipitation, streamflow, lake levels, flood discharges, etc. The interpretation of data is not included in this category.

Investigations include programs whose primary goal is the interpretation and analysis of basic data, inventories and surveys to provide information limited in areal extent and pertaining to a single aspect or a few aspects of water and related land resources. Normally, investigations apply to local areas and to specific water and related land resources problems.

Comprehensive Studies include programs whose primary goal is the collection of basic data and the interpretation and analysis of basic data, inventories, and surveys to provide information on a large areal basis and pertaining to all or most of the aspects of water and related land resources. Data collection and investigations may provide input for a comprehensive study which often is of a more generalized nature than an investigation.

The organizations having water quality data collection programs in Minnesota ranked in order of organization expenditures are: Northern States Power Company, Minnesota Pollution Control Agency, Minnesota Department of Natural Resources, U.S. Forest Service, Municipalities, Minnesota Department of Health, U.S. Geological Survey, Metropolitan Sewer Board, Environmental Protection Agency, and University of Minnesota. Recent annual expenditures for water quality data collection programs averaged about \$870,000 (1969 dollars). About 29 percent of the expenditures are Federal

funds; about 36 percent are State funds; about 15 percent are local funds; and about 20 percent are private funds. Annual expenditures could increase to about \$2,306,000 (1969 dollars) in 1985 and about \$2,600,000 (1969 dollars) in 2020. About 22 percent of the 1985 expenditures could be Federal funds; about 56 percent could be State funds; about 14 percent could be local funds; and about 8 percent could be private funds.

The organizations conducting water quality investigation programs in Minnesota ranked in order of organization expenditures are: Minnesota Pollution Control Agency, U.S. Geological Survey, Metropolitan Council, Northern States Power Company, Minnesota Department of Natural Resources, Environmental Protection Agency, State Planning Agency, Minnesota Department of Highways, and Minnesota-Wisconsin Boundary Area Commission. Recent annual expenditures for water quality investigation programs averaged about \$645,000 (1969 dollars). About 26 percent of the expenditures are Federal funds, about 55 percent are State funds, about 11 percent are local funds, and about 8 percent are private funds. Expenditures could increase to about \$2,900,000 (1969 dollars) in 1985 and 2020. About 32 percent of the 1985 expenditures could be Federal funds, about 57 percent could be State funds, about 1 percent could be local funds, and about 10 percent could be private funds.

Certain appropriators of water are required to file a report on water use annually with the Minnesota Department of Natural Resources. About 25,000 such reports were processed and filed by the Department in 1970.

Recent (1953-70) annual State expenditures for this program averaged about \$3,000 (1969 dollars). Assuming a 20 percent increase per year in the number of reports by 1985 and an additional 50 percent increase by 2020, annual State expenditures could be about \$47,000 (1969 dollars) in 1985 and \$115,000 (1969 dollars) in 2020.

The U.S. Geological Survey in cooperation with the Minnesota Department of Natural Resources desires to conduct during the period 1970-85 investigations in connection with a water use survey. Information could be obtained on water use in relation to cost and State economy. Annual expenditures for this program could be about \$1,700 (1969 dollars) Federal funds and \$1,700 (1969 dollars) State funds in 1985.

The Minnesota Department of Economic Development has two recreation data collection programs. In 1970, a Canoe Directory - Water Trails in Minnesota report prepared. The State expenditures for this report were \$2,000 (1969 dollars). During the period 1970-72, a "Accommodations Director and Water Access in Minnesota" report will be prepared. The State expenditures for this report could be \$30,000 (1969 dollars).

The organizations having recreation investigation programs in Minnesota ranked in order of organization expenditures are: Minnesota Department of Natural Resources, Metropolitan Council, Army Corps of Engineers, U.S. Bureau of Outdoor Recreation, U.S. Department of Housing and Urban Development, Ramsey County Park Department, University of Minnesota, Minnesota Resources Commission, City of St. Paul Parks, Minnesota State Planning Agency, U.S. Economic Research Service, U.S. Economic Development Administration, and Minnesota Department of Economic Development. Recent annual expenditures for recreation investigation programs averaged about \$417,000 (1969 dollars). About 37 percent of the expenditures are Federal funds;

about 36 percent are State funds; and about 27 percent are local funds. Annual expenditures in 1985 and 2020 could be about \$300,000 (1969 dollars). About 48 percent of the 1985 expenditures could be Federal funds; about 37 percent could be State funds; and about 15 percent could be local funds.

The organizations having fish and wildlife data collection programs in Minnesota ranked in order of organization expenditures are: Minnesota Department of Natural Resources and U.S. Fish and Wildlife Service. Recent annual expenditures for fish and wildlife data collection programs averaged about \$94,000 (1969 dollars). About 71 percent of the expenditures are State funds and about 29 percent are Federal funds. Annual expenditures in 1985 and 2020 could be about \$151,000 (1969 dollars) and \$89,000 (1969 dollars), respectively. About 69 percent of the 1985 expenditures could be Federal funds and about 31 percent could be State funds.

The organizations having fish and wildlife investigation programs in Minnesota ranked in order of organization expenditures are: U.S. Fish and Wildlife Service, Minnesota Department of Natural Resources, U.S. Army Corps of Engineers, and U.S. Soil Conservation Service. Recent annual expenditures for fish and wildlife investigation programs averaged about \$280,000 (1969 dollars). About 72 percent of the expenditures are Federal funds and about 28 percent are State funds. Annual expenditures could be about \$300,000 (1969 dollars) in 1985 and 2020. About 83 percent of the 1985 expenditures could be Federal funds and about 17 percent could be State funds.

The Soil Conservation Service, U.S. Department of Agriculture is primarily engaged in various projects related to soil and water conservation, watershed protection and flood protection. The Service also has administrative responsibility for activities in resource conservation and development projects and the National Inventory of Soil and Water Conservation needs. The files of each project contain basic hydrologic data records and evaluation of the data relative to land treatment procedures and structures. The data is collected under cooperative agreements with the U.S. Geological Survey, the U.S. Army Corps of Engineers, and the U.S. Public Health Service. A major data collection activity of the Soil Conservation Service is soil survey mapping for the State in cooperation with the University of Minnesota. Maps for 18 million acres have been completed for an additional 32.5 million acres. Recent expenditures for this program averaged about \$400,000 (1969 dollars). No expansion in the program is anticipated.

The organizations conducting land use, treatment and drainage investigation programs in Minnesota ranked in order of organization expenditures are: Minnesota Pollution Control Agency, Minnesota Department of Highways, U.S. Soil Conservation Service, Minnesota State Planning Agency, and Metropolitan Council. Recent annual expenditures for land use, treatment and drainage investigation programs averaged about \$78,000 (1969 dollars). About 15 percent of the expenditures are Federal funds, 84 percent are State funds, and 1 percent are local funds. Annual expenditures could increase to about \$270,000 (1969 dollars) in 1985 and 2020. About 57 percent of the 1985 expenditures could be Federal funds, 40 percent could be State funds, and 3 percent could be local funds.

The organizations having climate data collection programs in Minnesota ranked in order of organization expenditures are: National Weather Service, University of Minnesota, Future Farmers of America, Northern States Power Company, and Watershed Districts. Recent annual expenditures for climate data collection programs averaged about \$66,000 (1969 dollars). About 90 percent of the expenditures are Federal funds; about 3 percent are State funds; about 3 percent are local funds; and about 4 percent are private funds. Annual expenditures could increase to about \$128,000 (1969 dollars) in 1985 and about \$160,000 (1969 dollars) in 2020. About 91 percent of expenditures in 1985 could be Federal funds; about 1 percent could be State funds; about 7 percent could be local funds; and about 1 percent could be private funds.

The organizations having climate investigation programs in Minnesota ranked in order of organization expenditures are: University of Minnesota and National Weather Service. Recent annual expenditures for climate investigation programs averaged about \$7,600 (1969 dollars). About 50 percent of the expenditures are Federal funds and about 50 percent are State funds. Expenditures could increase to about \$20,000 (1969 dollars) in 1985 and 2020. About 50 percent of 1985 expenditures could be Federal funds and about 50 percent could be State funds.

The organizations having streamflow and lake level data collection programs in Minnesota ranked in order of organization expenditures for these programs are: U.S. Geological Survey, Minnesota Department of Natural Resources, U.S. Army Corps of Engineers, Northern States Power Company, Taconite Industries, Watershed Districts, Ramsey County, Washington County, and Minnesota Power and Light Company. Recent annual expenditures for streamflow and lake level data collection programs averaged about \$461,000 (1969 dollars). About 71 percent of the expenditures are Federal funds; about 19 percent are State funds; about 4 percent are local funds; and about 6 percent are private funds. Annual expenditures could increase to about \$700,000 (1969 dollars) in 1985 and about \$1,000,000 (1969 dollars) in 2020. About 48 percent of 1985 expenditures could be Federal funds; about 30 percent could be State funds; 16 percent could be local funds; and about 6 percent could be private funds.

The organizations conducting surface water investigations in Minnesota ranked in order of organization expenditures for these investigations are: Minnesota Department of Natural Resources, U.S. Geological Survey, and U.S. Soil Conservation Service. Recent annual expenditures for surface water investigations have averaged about \$340,700 (1969 dollars). About 82 percent of the expenditures are State funds and about 18 percent are Federal funds. Expenditures could increase to about \$450,400 (1969 dollars) in 1985 and \$551,600 (1969 dollars) in 2020. About 86 percent of 1985 expenditures could be State funds and about 14 percent could be Federal funds.

The organizations having flood data collection programs in Minnesota ranked in order of organization expenditures are: National Weather Service, U.S. Geological Survey, Minnesota Department of Highways, and Watershed Districts. Recent annual expenditures for flood data collection programs averaged about \$106,000 (1969 dollars). About 66 percent of the expenditures are Federal funds, about 33 percent are State funds, and about 1 percent are local funds. Expenditures could increase to about \$151,000 (1969 dollars) per year in 1985 and \$156,000 (1969 dollars) per year in 2020. About 70 per

cent of the 1985 expenditures could be Federal funds, about 23 percent could be State funds, and about 7 percent could be local funds.

The organizations conducting flood investigation program in Minnesota ranked in order of organization expenditures are: U.S. Army Corps of Engineers, Minnesota Department of Natural Resources, U.S. Department of Housing and Urban Development, U.S. Geological Survey, and National Weather Service. Recent annual expenditures for flood investigation programs averaged about \$403,000 (1969 dollars). About 74 percent of the expenditures are Federal funds and about 26 percent are State funds. Annual expenditures could increase to about \$1,003,000 (1969 dollars) in 1985 and \$201,000 (1969 dollars) in 2020. About 57 percent of the 1985 expenditures could be Federal funds and about 43 percent could be State funds.

The U.S. Geological Survey has published 7 1/2-minute (1:24,000-scale---1 inch equals 2,000 feet) topographic maps for more than one-fourth of the area of the State. This mapping covers principally the urban areas of Minneapolis, St. Paul, Mankato, Rochester, Austin, and Duluth, and also the northeastern part of the State. The maps provide basic data for urban planning, mineral and water resource studies, and preliminary engineering investigations. In addition, much of the State is covered by 15-minute (1:62,500-scale 1 inch equals 1 mile) topographic maps. These maps are useful for less intensive land-use studies and for resources development. Almost 60 percent of the State is covered by 15-minute or 7 1/2-minute maps. The entire State is covered by maps of the 1:250,000-scale (1 inch equals about 4 miles) series. A State topographic map at 1:500,000-scale (1 inch equals about 8 miles) was published in 1963.

Most of the mapping in Minnesota at this time is being done in cooperation with the Minnesota Department of Administration under a program in which the cost is shared equally by the State and Federal governments. The pace of the program was recently increased significantly with the aim of completing 7 1/2-minute topographic map coverage of the State by 1975. Maps covering about 29,700 square miles are in the Minnesota program. Of this total, mapping of 26,800 square miles is financed under the cooperative agreement. The balance of the program is financed by Federal funds and includes revising of existing maps covering 1,200 square miles in the Minneapolis area. As more 7 1/2-minute topographic maps in the State are completed, the emphasis of the mapping program will shift to maintaining and revising these maps to keep them up to date and to insure their maximum usefulness.

The 1965 Legislature, appropriated funds for the first phase of a program to complete topographic mapping in the State, subdivided into 11 regions, at scales of 1:24,000 and 1:62,500 within a 10-year period. The status in 1970 of the topographic mapping program is as follows: percent of State covered by published topographic maps:

1:24,000 scale (7 1/2-minute quadrangles)-34
1:62,500 (15-minute quadrangles)-31
percent authorized and in progress-29
percent unmapped and not in program-6

Cumulative expenditures during the period 1890-1949 for topographic mapping programs are \$10,264,000 (1969 dollars) Federal funds and \$5,695,000 (1969 dollars) State funds. Recent (1964-70) annual expenditures for this

program averaged about \$610,000 (1969 dollars) Federal funds and \$540,000 (1969 dollars) State funds. Completion of 7 1/2-minute quadrangle coverage during the period 1971-75 will require the expenditure of \$1,815,000 (1969 dollars) Federal funds and \$1,815,000 (1969 dollars) State funds. Annual expenditures for up-dating and revision could be about \$210,000 (1969 dollars) Federal funds and \$210,000 (1969 dollars) State funds in 1985, and \$310,000 (1969 dollars) Federal funds and \$310,000 (1969 dollars) State funds in 2020.

The organizations having groundwater level data collection programs in Minnesota ranked in order of organization expenditures for these programs are: U.S. Geological Survey, Minnesota Department of Natural Resources, Northern States Power Company, Minnesota Geological Survey, and Watershed Districts. Recent annual expenditures for groundwater data collection programs average about \$99,000 (1969 dollars). About 21 percent of the expenditures are Federal funds; about 45 percent are State funds; about 4 percent are local funds; and about 30 percent are private funds. Expenditures could increase to about \$360,000 (1969 dollars) per year in 1985 and about \$422,000 (1969 dollars) per year in 2020. About 21 percent of expenditures in 1985 could be Federal funds; about 46 percent could be State funds; about 24 percent could be local funds; and about 9 percent could be private funds.

The organizations conducting groundwater investigation programs in Minnesota ranked in order of organization expenditures are: U.S. Geological Survey, Minnesota Department of Natural Resources, Minnesota Geological Survey, Metropolitan Council, and Minnesota Iron Range Resources and Rehabilitation Commission. Recent annual expenditures for groundwater investigation programs averaged about \$714,000 (1969 dollars). About 39 percent of the expenditures are Federal funds, about 54 percent are State funds and about 7 percent are local funds. Expenditures could increase to about \$2,139,000 (1969 dollars) in 1985 and \$1,846,000 (1969 dollars) in 2020. About 6 percent of the 1985 expenditures could be Federal funds and about 94 percent could be State funds.

Data on waterborne transportation through harbors on Lake Superior and the Upper Mississippi river is collected by the Army Corps of Engineers in cooperation with Port Authorities. The Army Corps of Engineers desires to systematically collect data on the beach and littoral environment of Lake Superior during the period 1970-85. Recent annual Federal expenditures for programs averaged about \$20,000 (1969 dollars). Annual expenditures could be about \$25,000 (1969 dollars) in 1985 and 2020.

The organizations having water-borne transportation investigation programs in Minnesota ranked in order of organization expenditures are: St. Paul Port Authority, St. Paul Planning Board, Army Corps of Engineers, Minnesota State Planning Agency, Metropolitan Council, Duluth City Planning Board, Duluth Seaway Port Authority, Upper Great Lakes Regional Development Commission, and U.S. Fish and Wildlife Service. Recent annual expenditures for water-borne transportation investigation programs averaged about \$86,000 (1969 dollars). About 35 percent of the expenditures are Federal funds; about 16 percent are State funds; and about 49 percent are local funds. Annual expenditures could increase to about \$100,000 (1969 dollars) in 1985 and about \$70,000 (1969 dollars) in 2020. About 73 percent of the 1985 expenditures could be Federal funds; about 19 percent could be State funds; and about 8 percent could be local funds.

The organizations conducting comprehensive studies in Minnesota ranked in order of organization related expenditures for these investigations in Minnesota are: Souris-Red-Rainy River Basins Commission, Upper Mississippi River Comprehensive Basin Study Coordinating Committee, Minnesota State Planning Agency, Great Lakes Basin Commission, U.S. Soil Conservation Commission and Missouri Basin Inter-Agency Committee. Recent annual expenditures for comprehensive studies have averaged about \$666,000 (1969 dollars). About 76 percent of the expenditures are Federal funds and about 24 percent are State funds. Taking into account the desire by Federal and State agencies to conduct several Type II studies in the Upper Mississippi River Basin, Red River Basin, and Great Lakes Basin, annual expenditures during the period 1970-85 could be about \$600,000 (1969 dollars). About 67 percent of 1985 expenditures could be Federal funds and 33 percent could be State funds.

Summary

Recent annual expenditures for data collection, investigations, and comprehensive studies programs in Minnesota total about \$6,939,000 (1969 dollars). In 1970, about \$100,000,000 (1969 dollars) was expended for all water and related land resources programs in Minnesota. Thus, expenditures for data collection, investigations, and comprehensive studies programs constitute about 7 percent of the total expenditures for water and related land resources programs. Recent annual expenditures for data collection, investigations, and comprehensive studies programs were \$3,301,000, \$2,972,000, and \$666,000 (1969 dollars), respectively, (see table below). About 55 percent of total expenditures were Federal funds, 35 percent were State funds, 6 percent were local funds and 4 percent were private funds. About 56 percent of data collection program expenditures were Federal funds, about 32 percent were State funds, 5 percent were local funds and 7 percent were private funds. About 48 percent of investigations program expenditures were Federal funds, about 41 percent were State funds, 9 percent were local funds and 2 percent were private funds. About 76 percent of comprehensive studies program expenditures were Federal funds and 24 percent were State funds.

Estimated Annual Expenditures (100,000 1969 dollars)

<u>Functional Area</u>	<u>Recent</u>	<u>Potential Programs</u>	
		<u>1985</u>	<u>2020</u>
Water Quality	15.15	52.06	55.00
Water Use	0.03	0.50	1.15
Recreation	4.49	3.32	3.32
Fish and Wildlife	3.74	4.51	3.89
Land Use, Treatment and Drainage	4.78	6.70	6.70
Climate	0.74	1.48	1.80
Surface Water	8.02	11.50	15.52
Floods	5.09	11.54	3.57
Topographic Mapping	11.50	4.20	6.20
Groundwater	8.13	24.99	22.68
Water-Borne Conservation	1.06	1.25	0.95
Comprehensive Studies	6.66	6.00	6.00
Total	69.39	128.05	126.78

Program

Data Collection	33.01	47.20	56.19
Investigations	29.72	74.85	64.59
Comprehensive Studies	6.66	6.00	6.00

Judging from expressions concerning desired programs, annual expenditures for data collection, investigations, and comprehensive studies programs could total about \$12,805,000 (1969 dollars) in 1985 and \$12,678,000 (1969 dollars) in 2020 or about 1.8 times recent expenditures. In 1985, annual expenditures for data collection, investigations, and comprehensive studies programs could be about \$4,720,000, \$7,485,000, and \$600,000 (1969 dollars), respectively. About 36 percent of total expenditures could be Federal funds, about 55 percent could be State funds, about 5 percent could be local funds and about 4 percent could be private funds. About 40 percent of data collection program expenditures could be Federal funds, about 43 percent could be State funds, about 11 percent could be local funds, and about 6 percent could be private funds. About 31 percent of investigations program expenditures could be Federal funds, about 64 percent could be State funds, about 1 percent could be local funds, and about 4 percent could be private funds. About 67 percent of comprehensive studies program expenditures could be Federal funds and about 33 percent could be State funds.

Functional areas ranked in order of recent expenditures are: Water Quality, Topographic Mapping; Groundwater; Surface Water; Comprehensive Studies; Floods; Land Use, Treatment, and Drainage; Recreation; Fish and Wildlife; Water-Borne Transportation; Climate and Water Use. The largest desired percentage increases in expenditures are in the following functional areas: Water Quality, Water Use, Climate, Surface Water, Floods, and Groundwater.

Most data collection and investigations programs of State agencies are appendages to regulatory, enforcement, and monitoring programs. Most State agencies do not have separate and strong data collection and investigation programs.

PROGRESS MADE DURING 1971 AND 1972 IN ADOPTING A STATE ENVIRONMENTAL POLICY REORGANIZING STATE AGENCIES AND REACTING TO PLANNING POLICY QUESTIONS

A State Environmental Policy Bill passed the House on May 21, 1971. A companion bill was introduced in the Senate but never came up for vote. About 415 environmental bills were introduced in the Regular 67th Session of the Legislature; 107 environmental bills considered by both the Senate and the House passed. During the Special Session of 67th Legislature, 5 environmental bills were initially introduced in the Senate and 12 environmental bills were initially introduced in the House; 4 environmental bills considered by both the Senate and the House passed. The State Soil and Water Conservation Commission was transferred into the Department of Natural Resources.

In general, available information indicate the greatest response to water and related land resources planning policy questions posed by the State Planning Agency resulted from the introduction of a State Environmental Policy Act bill in the House of Representatives. This bill addressed itself to many of the planning policy questions as did a report approved by the Land and Water Resources Committee, House of Representatives on November 30, 1970. Considerable attention was given to the planning policy questions by the Citizens League as expressed in a report dated January 13, 1971. The response of the Executive Branch and the Senate to the planning policy questions did not result in any formally prepared reports or any legislative actions which could be documented. Private citizens expressed their response to the planning policy questions on a limited basis in part through committee hearings pertaining to the State Environmental Policy Act bill.

During 1971 and 1972, several Subcommittees of Committees of the State Senate and House held joint hearings on water and related land resources issues. Governor Anderson in April 1972 established an Environmental Quality Council with a Citizens Advisory Committee. These actions could lead to the passage of a State Environmental Policy Act during the 1973 Session of the Legislature and to the further improvement of government for water and related land resources programs in Minnesota.

State Environmental Policy Bill
Passed by the House During the
67th Session of the Legislature

A State Environmental Policy Bill, H.F. No. 2405, introduced by Messrs. Dunn, Norton, Becklin, Munger, and Knutson passed the House on May 21, 1971 with a vote of yeas 117 and nays 12. A companion bill, S.F. 2048, introduced by Messrs. Gage, Gustafson, and Popham and referred to the Committee on Civil Administration was not reported out-of-Committee. H.F. No. 2405, passed by the House, was introduced in the Senate on May 22, 1971. The bill was never read for the third time, thus, it never came up for vote in the Senate. The State Environmental Policy Bill is given below.

1072

STATE OF MINNESOTA
HOUSE OF REPRESENTATIVES

Sixty-Seventh
Session

H. F.

No. 2405

Introduced by Messrs. Dunn, Norton, Becklin, Munger, and Knutson.
Read First Time Apr. 13, 1971, and Referred to the Committee on
Environmental Preservation
Committee Recommendations to Pass as Amended and Re-referred to
the Committee on Governmental Operations May 7, 1971; to Pass
as Amended and Re-referred to the Committee on Appropriations
May 18, 1971.
Committee Report Adopted May 7, 1971; May 18, 1971.
Reported Back to Pass as Amended May 19, 1971.
Read Second Time May 19, 1971.

When existing law is changed, matter in italics is new; matter in capitals when in () is old law to be omitted.

A bill for an act establishing a state environmental policy; establishing an environmental council and an environmental quality commission; appropriating money.

Be it enacted by the Legislature of the State of Minnesota:

Section 1. [PURPOSE.] The purposes of this act are: to declare a state policy which will encourage productive and enjoyable harmony between man and his environment; to promote efforts which will prevent or eliminate damage to the environment and biosphere and stimulate the health and welfare of man; to enrich the understanding of the ecological systems and natural resources important to the state and to the nation; to establish an environmental council in the office of the governor; and to establish an environmental quality commission.

Sec. 2. [DECLARATION OF STATE ENVIRONMENTAL POLICY.] Subdivision 1. The legislature, recognizing the profound impact of man's activity on the interrelations of all components of the natural environment, particularly the profound influences of population growth, high density urbanization,

industrial expansion, resources exploitation, and new and expanding technological advances and recognizing further the critical importance of restoring and maintaining environmental quality to the overall welfare and development of man, declares that it is the continuing policy of the state government, in cooperation with federal and local governments, and other concerned public and private organizations, to use all practicable means and measures, including financial and technical assistance, in a manner calculated to foster and promote the general welfare, to create and maintain conditions under which man and nature can exist in productive harmony, and fulfill the social, economic, and other requirements of present and future generations of the state's people.

Subd. 2. In order to carry out the policy set forth in this act, it is the continuing responsibility of the state government to use all practicable means, consistent with other essential considerations of state policy, to improve and coordinate state plans, functions, programs, and resources to the end that the state may:

(1) Fulfill the responsibilities of each generation as trustee of the environment for succeeding generations;

(2) Assure for all people of the state safe, healthful, productive, and aesthetically and culturally pleasing surroundings;

(3) Attain the widest range of beneficial uses of the environment without degradation, risk to health or safety, or other undesirable and unintended consequences;

(4) Preserve important historic, cultural, and natural aspects of our national heritage, and maintain, wherever possible, an environment which supports diversity, and variety of individual choice;

(5) Achieve a balance between population and resource use which will permit high standards of living and a wide sharing of life's amenities;

(6) Enhance the quality of renewable resources and obtain the maximum attainable recycling of depletable resources;

(7) Develop and manage water resources to assure a supply adequate to meet long range seasonal requirements for domestic, municipal, industrial, agricultural, fish and wildlife, recreational, power, navigation, and quality control purposes from surface or ground water sources, or from a combination of these two;

(8) Reduce flood damages through flood plain management, stressing nonstructural measures such as flood plain zoning and flood proofing, and flood warning practices;

(9) Implement land resource-use practices that effectively reduce siltation and loss of the land base through activities associated with farming, mining, construction, forestry, and other activities of man;

(10) Improve water quality by stressing advanced waste treatment;

(11) Improve air quality by promoting in all ways possible the use of energy sources and waste disposal methods which produce or emit the least air contaminants;

(12) Promote and implement effective land use planning to achieve an orderly development of the land resources and protection of scenic, historic, wilderness, recreational and open space areas;

(13) Control and abate noise and thereby enhance the environment and the quality of life; and

(14) Apply the multi-use concept to natural resources in a way that will permit utilization of the resource base in an efficient and balanced manner to serve the greatest number of people in the state.

Subd. 3. The legislature recognizes that each person has a right to a healthful environment and that each person has a responsibility to contribute to the preservation and enhancement of the environment.

Sec. 3. Subdivision 1. The legislature authorizes and directs that, to the fullest extent possible the policies, regulations, and public laws of the state shall be interpreted and administered in accordance with the policies set forth in this act.

Subd. 2. All departments and agencies of the state government shall:

(a) Utilize a systematic, interdisciplinary approach which will insure the integrated use of the natural and social sciences and the environmental design arts in planning and in decision making which may have an impact on man's environment;

(b) Identify and develop methods and procedures, in consultation with the environmental council established by sections 9 through 12 of this act, which will insure that presently unquantified environmental amenities and values may be given equal consideration in decision making along with economic and technical considerations;

(c) Upon the request of the environmental council, furnish the council with a detailed statement by the responsible official in connection with any specific project or program of the department or agency setting forth:

(1) The environmental impact of the proposed action;

(2) Any adverse environmental effects which cannot be avoided should the proposal be implemented;

(3) Alternatives to the proposed action;

(4) The relationship between local short term uses of a man's environment and the maintenance and enhancement of long term productivity;

(5) Any irreversible and irretrievable commitments of resources which would be involved in the proposed action should it be implemented;

(6) The impact on state government of any federal controls associated with proposed actions; and

(7) The multistate responsibilities associated with proposed actions.

Prior to making any detailed statement, the responsible state official shall consult with and obtain the comments of all state and local agencies which have jurisdiction by law or special expertise with respect to any environmental impact involved. Copies of such statement and the comments and views of the appropriate federal, state, and local agencies, which are authorized to develop and enforce environmental standards, shall be made available to the governor, the environmental council and to the public, and shall accompany the proposal through the existing agency review processes;

(d) Study, develop, and describe appropriate alternatives to recommended courses of action in any proposal which involves unresolved conflicts concerning alternative uses of available resources;

(e) Recognize the worldwide and long range character of environmental problems and, where consistent with the policy of the state, lend appropriate support to initiatives, resolutions, and programs designed to maximize interstate, national and international cooperation in anticipating and preventing a decline in the quality of mankind's world environment;

(f) Make available to the federal government, counties, municipalities, institutions, and individuals, advice and information useful in restoring, maintaining, and enhancing the quality of the environment, and in meeting the policies of the state as set forth in this act;

(g) Initiate and utilize ecological information in the planning and development of resource oriented projects; and

(h) Assist the environmental council established by sections 9 through 12 of this act.

Sec. 4. All agencies of the state government shall review their present statutory authority, administrative regulations, and current policies and procedures for the purpose of determining whether there are any deficiencies or inconsistencies therein which prohibit full compliance with the purposes and provisions of this act and shall propose to the governor not later than July 1, 1972, such measures as may be necessary to bring their authority and policies into conformity with the intent, purposes, and procedures set forth in this act.

Sec. 5. Nothing in sections 3 or 4 shall in any way affect the specific statutory obligations of any state agency (1) to comply with criteria or standards of environmental quality, (2) to coordinate or consult with any federal or state agency, or (3) to act, or refrain from acting contingent with the recommendations or certification of any other state agency or federal agency.

Sec. 6. The policies and goals set forth in this act are supplementary to those set forth in existing authorizations of state agencies.

Sec. 7. It is hereby declared to be the policy of the state to:

(a) Encourage the construction, improvement, maintenance, and operation of water supply treatment systems, works, and facilities to assure the provision of safe and potable water supplies. Recognize known health hazards in water supplies and unknown dangers posed by radioactive contaminants, new and existing detergents, pesticides, chemicals, and other contaminants, and foster action to prevent, reduce or eliminate health hazards;

(b) Classify waters and adopt standards of purity and quality to achieve a reasonable degree of purity of water resources of the state consistent with the maximum enjoyment and use thereof in furtherance of the welfare of the people of the state. Prohibit or direct the abatement of any discharge of sewage, industrial waste, or other wastes, into any waters of the state where the same will be in conflict with established classifications and standards of purity. Make and alter reasonable orders requiring the discontinuance of the discharge of sewage, industrial waste or other wastes into any waters of the state resulting in pollution in excess of the applicable classifications and standards.

(c) Provide for the prevention, control, and abatement of pollution of all waters and the air of the state, so far as feasible and practical, in furtherance of conservation of such waters and protection of the public health and in furtherance of the development of the economic welfare of the state by:

(1) Preventing any new pollution;

(2) Abating pollution giving due consideration to the establishment, maintenance, operation, and expansion of business, commerce, trade, industry, traffic and other economic factors and other material matters affecting the feasibility and practicability of any proposed action, including, but not limited to, the burden on a municipality of any tax which may result therefrom and shall take or provide for such action as may be reasonable, feasible and practical under the circumstances;

(3) Promote adequate and efficient systems and means of collecting, conveying, pumping, treating and disposing of domestic sewage and garbage and industrial wastes. Control and regulate privies, cesspools, septic tanks, toilets, and other facilities and devices for the reception or disposal of human excreta and/or other domestic wastes; and

(4) Control and regulate emission of air contaminants from all sources. Control and regulate noise producing operations and machines.

(d) Promote pollution control and prevention programs and projects by:

(1) Authorizing state grants-in-aid for political subdivisions of the state for the acquisition and betterment of public lands and buildings and other public improvements of a capital nature needed for the purposes of the control of air, noise and water pollution;

(2) Providing tax credits for equipment to prevent, control or abate pollution of air or water, including noise pollution;

(3) Exempt from taxation real and personal property used for the prevention, abatement or control of water or air, including noise, pollution;

(4) Encourage waste treatment, including advanced waste treatment, instead of stream lowflow augmentation for dilution purposes to control and prevent pollution;

(5) Encouraging cooperation between two or more governmental subdivisions or municipalities to prevent, control, or abate pollution;

(e) Promote solid waste disposal control by encouraging the updating of collection systems, elimination of open dumps, and improvements in incinerator practices;

(f) Control possible adverse environmental effects of mining and provide for the reclamation of lands and water subjected to mining processes, while at the same time promoting the orderly development of mining;

(g) Acquire, develop, maintain and improve state parks; state public campgrounds; boat launching facilities; state recreation reserves; trails; state monument sites; wildlife sanctuaries; forests and other reserves; botanical gardens; and means for public access to historic sites; and to lakes, rivers, and streams and to other natural phenomena; lands and waters for wildlife habitat purposes; and public portages;

(h) Encourage the provision of adequate recreational facilities and environmental improvements in and near urban areas. Promote the acquisition and preservation of historic sites, buildings, structures, and antiquities of state and national significance for the inspiration, use, and benefit of the people of the state. Provide guidance for the wise development of shorelands of public waters and thus preserve and enhance the quality of surface waters, and preserve the economic and natural environmental values of lands. Encourage the preservation of shorelines, rapids, waterfalls, and other natural features. Provide for the management of fishing in lakes. Encourage and promote the use of privately owned lands and waters by the public for beneficial outdoor recreational purposes;

(i) Guide expansions in natural resources development and management using the following order-of-priority list of broad investment areas:

(1) Provision of adequate high quality water supplies;

(2) Environmental quality improvement, including pollution control and prevention within the fiscal capability of the state;

(3) Provision of additional water oriented recreation facilities and protection of natural resources;

(4) Soil and water management; and

(5) Flood damage reduction.

(j) Provide for the state to remain water rich by requiring that any plans for future water resources development and management involving diversions of water from the state shall reach conclusions as to the availability of surplus water beyond the next 50 years, and that the state shall not export water without retaining the "use rights" of the water after a specified period, possibly the planned project life--50 years, if unforeseen needs arise in the future;

(k) Provide for the efficient allocation of water resources between competitive users through the state's existing modified riparian law of water rights, with its principles of reasonable and beneficial use and its permit system;

(l) Discourage the disturbance, obstruction, or interference with the natural flow or condition of public waters beyond the boundaries of the state in a manner so as to seriously affect the public welfare and interests of the state;

(m) Not to prohibit but to guide development of the flood plains of this state consistent with the enumerated legislative findings to provide state coordination and assistance to local governmental units in flood plain management; to encourage local governmental units to adopt, enforce and administer a sound flood plain management program for the state and coordinate federal, state, and local flood plain management activities in the state. Encourage the use of nonstructural measures such as flood plain zoning instead of structural measures to reduce future flood damages;

(n) Consider natural resources programs in context with all other programs of the state, such as education, transportation, welfare and economic development programs. Encourage the cooperation and assistance of the United States and any of its agencies, and of agencies of this state, in the work of special districts and local governments according to the plans and policies of the state. Require the development and management of water and related land resources by municipalities and other governmental subdivisions according to prescribed policies and regulations of the state;

(o) Conserve and utilize the natural 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. Secure and maintain a proper balance among industrial, commercial, agricultural, water supply, residential, recreational, and other legitimate uses of water and land resources in the state;

(p) Provide for the conservation of the soil and water resources of the state and for the control and prevention of soil erosion. Promote land treatment and discourage adverse drainage in soil and water management;

(q) Encourage the collection of basic data pertaining to the air and land use planning throughout, and all waters of, the state;

(r) Control and supervise, so far as practicable, the construction, reconstruction, repair, removal, or abandonment of dams, reservoirs, and all control structures in any of the public waters of the state. Encourage the restoration and control of water levels in lakes. Encourage the

conservation of groundwaters of the state by requiring owners to control wells to prevent wastes. Control the displacement of groundwaters by underground storage of gas or liquid under pressure. Promote safety for persons and property in connection with the use of waters of the state; and

(s) Promote effective land use planning throughout the state. Provide for an inventory of the lands throughout the state to identify and classify natural features to promote orderly development and to acquire and preserve scenic, historic, wilderness, recreation and open space areas.

Sec. 8. [GOVERNOR, REPORT REQUIRES.] The governor shall transmit to the legislature annually beginning January 1, 1972, an environmental quality report which shall set forth (1) the status and condition of the major natural, man-made, or altered environmental classes of the state, including, but not limited to, the air, the aquatic, and the terrestrial environment, including, but not limited to, the forest, dryland, wetland, range, urban, suburban, and rural environment; (2) current and foreseeable trends in the quality, management and utilization of such environments and the effects of those trends on the social, economic and other requirements of the state; (3) The adequacy of available natural resources for fulfilling human and economic requirements of the state in the light of expected population pressures; (4) a review of the programs and activities, including regulatory activities, of the federal government in the state, the state and local governments, and nongovernmental entities or individuals, with particular reference to their effect on the environment and on the conservation, development and utilization of natural resources; and (5) a program for remedying the deficiencies of existing programs and activities, together with recommendations for legislation.

Sec. 9. [ENVIRONMENTAL COUNCIL, CREATION.] There is created in the executive office of the governor an environmental council. The environmental council shall consist of a chairman and two members who shall have combined qualifications in the following areas: natural resource management, environmental planning and governmental organization.

Sec. 10. The council may employ such administrative and clerical employees as may be necessary to carry out its functions under this act. In addition, the council may employ and fix the compensation of such experts and consultants as may be necessary for the carrying out of its functions under this act. All employees shall be in the unclassified service.

Sec. 11. [DUTY AND FUNCTIONS.] Subdivision 1. The council shall have the duties and functions contained in this section.

Subd. 2. Coordinate the various programs and activities of state agencies as they relate to state environmental policies.

Subd. 3. Assist and advise the governor in the preparation of the environmental quality report required by section 8 and all other environmental issues in which action or comment by the governor is required by law or is otherwise appropriate.

Subd. 4. Gather timely and authoritative information concerning the conditions and trends in the quality of the environment both current and prospective, to analyze and interpret such information for the purpose of determining how such conditions and trends affect the policy set forth in sections 2 to 7 of this act, and to compile and submit to the governor studies, reports or advice relating to such conditions and trends.

Subd. 5. Review and appraise the various programs and activities of the state government in the light of the policy set forth in sections 2 to 7 of this act for the purpose of determining the extent to which such programs and activities are contributing to the achievement of such policy, and to make recommendations to the governor with respect thereto.

Subd. 6. Develop and recommend to the governor state policies and to foster and promote the improvement of environmental quality to meet the conservation, social, economic, health, and other requirements and goals of the state.

Subd. 7. Make and furnish such studies, reports thereon, and recommendations with respect to matters of policy and legislation as the governor may request.

Subd. 8. Prepare and issue guidelines to state agencies for the preparation of detailed statements on program and project proposals having an impact on the environment which may be requested by the council.

Subd. 9. Review programs, projects and environmental impact statements of individual state agencies and to make recommendations to the governor.

Subd. 12. Review all major federal-state and state-interstate organizations' program and project proposals which relate to environmental quality and to make recommendations to the governor concerning the acceptability of the proposals.

Subd. 13. At its discretion convene an annual environmental quality congress including, but not limited to, representatives of state, federal and regional agencies, citizen organizations, associations, industries, colleges and universities, and private enterprises who are active in or have a major impact on environmental quality. The purpose of the congress shall be to receive reports and exchange information on progress and activities related to environmental improvement. These reports along with other information available to the council shall serve as the basis for an annual report to the governor, the legislature, and the people of the state of the environment.

Subd. 14. Provide the environmental quality commission established in section 13 of this act with such administrative, clerical and technical assistance as may be required by the commission to carry out its functions.

Subd. 15. Meet with the environmental quality commission established in section 13 of this act at least four times a year, at approximately three month intervals, to receive advice from the commission and to coordinate the activities of the council and the commission.

Sec. 12. In exercising its powers, functions, and duties under this act, the council shall:

(a) Consult with the environmental quality commission established in section 13 of this act, and with such representatives of science, industry, agriculture, labor, conservation organization, federal, state, and local governments and other groups, as it deems advisable; and

(b) Utilize, to the fullest extent possible, the services, facilities, and information, including statistical information, of public and private agencies and organizations, and individuals, in order that duplication of effort and expense may be avoided, thus assuring that the council's activities will not unnecessarily overlap or conflict with similar activities authorized by law and performed by established agencies.

Sec. 13. [ENVIRONMENTAL QUALITY COMMISSION; CREATION.] There is created an environmental quality commission. The commission shall consist of seven members from private life appointed by the governor with the advice and consent of the senate. The terms of office of members shall be for six years in duration, provided that the first council shall have two members appointed for terms ending January 1, 1973, two members appointed for terms ending January 1, 1975, and three members appointed for terms ending January 1, 1977. The chairman of the commission shall be elected by the members. He shall serve as an ex-officio member of both the environmental council and the advisory council to the Minnesota resources commission.

The members of the commission shall be paid a per diem of \$35 per day and shall be reimbursed for all reasonable expenses incurred in the performance of their duties.

Sec. 14. [DUTY AND FUNCTION.] The duties and functions of the commission shall be as follows:

(a) To review and appraise the various programs and activities of the state government in light of environmental quality concerns for the purpose of determining the extent to which such programs and activities are contributing to state environmental policies and goals,

(b) To hold meetings throughout the state as it deems necessary for the purpose of gathering information on public and private opinions concerning the adequacy of the state's environmental quality policies and the extent to which these policies are being implemented;

(c) To give advice and counsel to the environmental council; and

(d) To make recommendations to the governor, legislature and the public once each year starting January 1, 1972, regarding any needed state policy or program changes to foster and promote the improvement of environmental quality.

Sec. 15. [APPROPRIATION.] There is appropriated from the general fund in the state treasury the amount of \$100,000 for the period July 1, 1971, to July 1, 1973, to the environmental council and the environmental quality commission for the purposes of this act.

Environmental Bills Introduced in
the 67th Session of the Legislature

A review was made of proposed measures that were introduced in the Regular 1971 session of the Legislature and pertain to environmental matters. The Journals of the Senate, 67th Session of the Legislature contains information on 2817 bills of the Senate. Of the total bills introduced, 347 or 12 percent were concerned with environmental matters. The number of bills initially referred to 14 Standing Senate Committees is shown below:

<u>Number of Bills</u>	<u>Senate Committee Bill Was Initially Referred To</u>
168	Natural Resources and Environment
47	Civil Administration
17	Judiciary
27	Local Government
3	General Legislation
8	Public Highways
17	Rules and Administration
21	Agriculture
3	Education
18	Taxes and Tax Laws
13	Urban Affairs
2	Health and Welfare
1	Regulated Industries
2	Finance

The subject matter of bills initially introduced is summarized below:

<u>Number of Bills Introduced</u>	<u>Subject Matter of Bill</u>
7	Water Pollution
1	Well Drilling
63	Government
43	Game and Fish
2	Air Pollution
5	Noise Pollution
13	Drainage
15	Solid Wastes
2	Water Resources
2	Environmental Education and Information
7	Wetlands
5	Highways and Streets
56	Parks, Historical Sites and Recreation
3	Non-returnable Containers
6	Water Supply
23	Pollution Control
1	Airports

21	Special Purpose Districts
4	Environmental Civil Remedies
16	Snowmobiles
3	Channel Improvements
5	Recycling
5	Water Craft Safety
1	Environmental Policy
2	Agriculture
16	Minerals
2	Public Access
1	Resolution to Congress on Environment
5	Wild Rice
1	Power Plants
4	Forestry
3	Eminent Domain
2	Firearms
1	Land Use Planning
1	Environmental Impact

It is interesting to note that about 49 percent of all environmental bills introduced were associated with the activities of the Department of Natural Resources. About 16 percent of all environmental bills introduced were associated with the activities of the Pollution Control Agency.

The Journals of the House, 67th Session of the Legislature, 1971, contains information on 3,192 bills of House. Of the total bills introduced, 415 or 13 percent were concerned with environmental matters. The number of bills initially referred to 16 Standing House Committees is shown below:

<u>Number of Bills</u>	<u>House Committee Bill Was Initially Referred To</u>
11	Appropriations
3	Rules and Legislative Administration
3	Judiciary
4	Agriculture
10	Metropolitan and Urban Affairs
202	Natural Resources
1	Regulated Industries
27	Local Government
71	Environmental Preservation
31	Governmental Operations
12	Transportation
27	Taxes
3	Health, Welfare and Corrections
2	Commerce and Economic Development
7	City Government
1	Crime Prevention

The subject matter of bills initially introduced is summarized below:

<u>Number of Bills Introduced</u>	<u>Subject Matter of Bill</u>
65	Game and Fish
3	Air Pollution
1	Well Drilling
16	Drainage
4	Highways and Streets
4	Environmental Education
3	Water Resources
7	Water Pollution
69	Government
21	Special Purpose Districts
32	Pollution Control
11	Noise Pollution
3	Recycling
3	Channel Improvements
72	Parks, Historical Sites and Recreation
6	Non-returnable Containers
13	Solid Wastes
4	Environmental Civil Remedies
7	Wetlands
1	Airports
18	Snowmobiles
21	Minerals
4	Water Supply
4	Watercraft Safety
1	Environmental Policy
2	Power Plants
1	Lakeshores
6	Wild Rice
4	Eminent Domain
2	Public Access
4	Forestry
1	Waterways
1	Land Use Planning
1	Environmental Impacts

It is interesting to note that about 55 percent of all environmental bills introduced were associated with the activities of the Department of Natural Resources. About 18 percent of all environmental bills introduced were associated with the activities of the Pollution Control Agency.

About 35 percent or 107 of the environmental bills considered by both the Senate and the House passed. One environmental bill passed by the Legislature was pocket vetoed by the Governor. That bill was concerned with authorizing a riding and hiking trail. The subject matter of the 106 environmental bills passed by the Senate and the House and signed into law (Acts) by the Governor is summarized below:

<u>Number of Acts</u>	<u>Subject Matter of Act</u>
7	Solid Wastes
18	Game and Fish
16	Government
22	Parks, Historical Sites and Recreation
2	Agriculture
3	Eminent Domain Powers
7	Special Purpose Districts
3	Snowmobiles
6	Drainage
1	Air Pollution
2	Noise Pollution
1	Public Access
2	Highways and Streets
1	Watercraft Safety
2	Forests
1	Recycling
1	Minerals
6	Pollution Control
1	Water Supply
2	Water Resources
1	Environmental Information
1	Environmental Civil Remedies

About 41 percent of the bills passed were associated with the activities of the Department of Natural Resources. About 14 percent of the bills passed were associated with the activities of the Pollution Control Agency.

Of the total number of bills in all fields introduced in the Senate and the House, 973 bills passed together with 5 resolutions. Seven bills were vetoed by the Governor. The ratio of total bills passed and total bills introduced was about 31 percent.

The growing concern about pollution and parks and recreation is apparent based on statistics for the 66th and 67th Sessions of the Legislature. In 1969, four bills passed and pertain to pollution control, whereas, in 1971, sixteen bills passed and pertain to pollution control. In 1969, twelve bills passed and pertain to parks and recreation, whereas, in 1971, twenty-two bills passed and pertain to parks and recreation. About 1 1/2 times as many environmental bills were introduced in 1971 as in 1969. Nearly twice as many environmental bills passed in 1971 as in 1969. About 2 1/2 times as many environmentally oriented governmental arrangement bills passed in 1971 as in 1969.

Information concerning several important bills passed during the 67th Regular Session of the Legislature that pertain to water and related land resources management is given below:

Chapter 478
S.F. 1294

Provides for the creation of a sanitary sewer board to handle the collection, treatment and disposal of sewage in the lower St. Louis River Basin. The area over which the sanitary sewer board has jurisdiction shall be called the "Western Lake Superior Sanitary District" and shall include: the city of Cloquet, the villages of Carleton, Scanlon, Thomson, and Wrenshall, and the townships of Knife Falls, Silver Brook, Thomson, and Twin Lakes in the county of Carleton; the city of Duluth, the village of Proctor, and the townships of Canosia, Duluth, Grand Lake, Herman, Lakewood, Midway, Rice Lake and Solway in the county of St. Louis; and any waters of the state adjacent thereto. The sanitary sewer board shall prepare and adopt a comprehensive plan for the treatment of sewage through a system of interceptors and treatment works; taking into account the preservation and best and most economic use of water and other natural resources in the area, and the impact such a disposal system will have on present and future land use in the area affected thereby. A local government unit may specifically assess all or any part of the cost of acquisition and betterment of any project ordered by the board under the provisions of Minnesota Statutes 1969, sections 429.051 to 429.081.

Any municipality upon resolution adopted by at least a 4/5 vote of its government body may petition the sanitary sewer board for annexation to the Western Lake Superior Sanitary District.

Chapter 478 becomes effective only after its approval by a majority of the governing body of the city of Duluth and similar approval by a majority of the governing body of the city of Cloquet.

Chapter 493
S.F. 1351

Provides for the creation and establishment of the Minneapolis Lakes Pollution Control Fund to be maintained by an annual property tax levy not to exceed .5 mill. Before the commencement of the 1973 Legislative Session, the Park and Recreation Board of Minneapolis shall submit to the Legislature a comprehensive report outlining the pollution problems affecting Minneapolis Lakes and programs designed to abate such pollution problems.

Chapter 551
S.F. 2144

Authorizes design districts and a design advisory committee for land and architectural structures in Minneapolis to preserve and enhance the environmental quality of the city. It is declared public policy in Minneapolis that "...the prevention of visual pollution and sterilization is a public necessity desirable to sound community planning and development for the city, and is required in the interest of health, safety, prosperity and welfare of the people."

Chapter 794
H.F. 1138

Amends Minnesota Statutes 1969, Section 290.06 by adding a subdivision authorizing an income tax deduction of 10% of the net cost of pollution control and abatement equipment used within the state by an operator of an animal feedlot. Chapter 794 further amends Section 272.02 by adding land pollu-

tion to the real and personal property used primarily for the abatement and control of pollution, and is exempt from taxation.

Chapter 826
H.F. 584

Amends Minnesota Statutes, 1969, Section 115.33, subd. 1 by removing limitations on the taxation of water pollution control sanitary districts.

Chapter 828
H.F. 613

Provides for the classification of all water supply systems and wastewater treatment facilities within the state. The classification will be based on the degree of hazard to public health together with the type and loading of plant and the population affected. Chapter 828 also requires the examination of operators of water supply systems and wastewater treatment facilities, and certification of their competency to supervise and operate such facilities. On or after July 1, 1972, it shall be unlawful for any person, firm, or corporation operating a water supply system or wastewater treatment facility which serves the public to operate unless the competency of the operator is duly certified under the provisions of this act.

Chapter 861
S.F. 694

Prohibits watercraft from discharging waste into state waters. Marine toilets must have retention devices to store their waste for disposition on land by means of facilities constructed and operated in accordance with rules and regulations adopted by the state Board of Health and approved by the PCA. These provisions shall not apply until December 31, 1975 to watercraft that were equipped with treatment devices approved by the PCA prior to the effective date of this act, so long as such equipment continues to operate in accordance with its design capability. The requirement of retention facilities imposed by this act is effective on the Minnesota-Wisconsin boundary waters of the Mississippi and St. Croix rivers on January 1, 1972 and on other waters of the state of Minnesota on January 1, 1973.

Chapter 864
S.F. 1100

Creates a Center for Environmental Information within the Minneapolis Public Library, extending free borrowing privileges from the collection to any person or organization in the state. There is an appropriation of \$25,000 for each year of the biennium through June 30, 1973.

Chapter 884
S.F. 2752

Requires the submission of proposals for pipeline petroleum projects, exercising the power of eminent domain, to the commissioner of natural resources for review, comment and recommendations on the impact that the proposed project will have on the environment.

Chapter 887
H.F. 161

Provides that all PCA hearings shall be open to the public and the transcripts become public records. Further provides that any records or other information obtained by the PCA by the owner or operator of one or more contaminant sources which relate to "... (a) production or sales figures, (b) processes or production unique to the owner or operator, or (c) information which would tend to affect adversely the competitive position of said owner or operator, shall be only for the confidential use of the agency in discharging its statutory obligations...."

It also provides that all such information may be used by the PCA in compiling analyses or summaries relating to the general condition of the outdoor atmosphere so long as these analyses or summaries do not identify any owner or operator who is so certified.

Chapter 896
H.F. 1088

Prohibits cleaning agents and chemical water conditioners which contain certain nutrients that overstimulate the growth of aquatic life in Minnesota's waters. The prescribed nutrients and their maximum permissible concentration will be determined and regulated by the PCA. The PCA will also have authority to seize a cleaning agent or chemical water conditioner which does not meet their regulations.

Chapter 896 further provides that no manufacturer, wholesaler or retailer shall attempt to sell a household laundry or dishwashing compound unless a certified test result is filed with the PCA stating the percentage content of phosphorus by weight contained in the product. A list stating the phosphorus content by percentage of weight of the package contents shall be prominently displayed near the product display in a retail outlet. "The pollution control agency shall supply any person upon request with a current listing of household laundry and dishwashing compounds and their phosphate contents received pursuant to this act."

Chapter 904
H.F. 1574

Authorizes permit issuance by the PCA for air and land pollution control. Further provides that it is unlawful "...for any person to construct, install or operate an emission facility, air contaminant treatment facility, treatment facility, potential air contaminant storage facility, storage facility, or system of facility related to the collection, transportation or disposal of solid waste, or any part thereof...." until the plans have been submitted to the PCA, and a written permit has been granted. Chapter 904 also makes it unlawful for any person to make any change in, addition to, or extension of any existing system or facility that would alter the method of treating or disposing of any air contaminant or solid waste until plans for such have been submitted to the PCA and a written permit granted. Pertaining to the operation of any system or facility, the PCA may examine any books or records for enforcement purposes.

Chapter 916
H.F. 2035

Authorizes counties and district courts, after the receipt of a petition signed by at least 50% of the residents of an area, to make orders for and construct and maintain public water and/or sewer districts in areas of the county not organized into municipalities. Provides for hearings, appointment of an engineer, assessment of damages, issuance of bonds by counties, and the appointment of water and sewer commissions to construct and operate water and sewer systems.

Chapter 952
S.F. 418

Provides that a citizen may institute a class action for protection of the environment from violators of pollution standards. The burden of proof will be on the plaintiff in that he

shall have to make a prima facie showing that the conduct of the defendant violates or is likely to violate a pollution standard. Economic considerations alone shall not constitute a defense by the defendant.

Chapter 952 also provides for relief, remittitur, intervention, venue, and jurisdiction. Family farms, family farm corporations, and bona fide farmer corporations are exempt from the provisions of this act.

Chapter 953
S.F. 576

Establishes a \$34,750,000 state water pollution control fund for the appropriation and loan of money to municipalities for sewage treatment facilities. Authorizes the state to begin paying 25% of the cost of municipal sewage treatment facilities which reduces the local cost to 20 or 25%, with the federal payments being 50 or 55%. The PCA shall promulgate rules for the administration of grants and loans authorized to be made from the water pollution fund. "The rules of the agency (PCA) shall provide that a high priority shall be given to applications from municipalities which because of limited tax base, excessive bonded indebtedness, or critical conditions of water pollution requiring agency action pursuant to law, would face extreme financial hardship without the assistance provided by this act....."

During the Special Session convened by Governor Anderson on May 25, 1971, 5 environmental bills were initially introduced in the Senate and 12 environmental bills were initially introduced in the House. These bills were initially referred to the Senate Committee on Rules and Administration or to the House Committee on Rules and Legislative Administration. The subject matter of these bills is summarized below.

<u>Number of Bills</u>	<u>Subject Matter of Bills</u>
<u>Senate</u>	
1	Watercraft Safety
1	Water Well Contractors
1	Game and Fish
1	Environmental Education
1	Zoological Board
<u>House</u>	
3	Pollution Control
2	Parks
2	Minerals
1	Government
1	Power
1	Water Well Contractors
1	Wetlands
1	Zoological Board

Information concerning several important bills passed during the Special Session that pertain to water and related land resources management is given below:

Chapter 17 Regulates marine toilets on boats on all waters of the state.
S.F. 94

Chapter 20 Provides that the promulgated PCA rules for the administra-
H.F. 137 tion of grants and loans authorized by the state water pollu-
--shall not be applicable to the issuance of bonds by the
state auditor. Makes certain "housekeeping" changes in
Chapter 916, Laws of 1971.

Chapter 29 Requires the licensing--charging a \$50 application fee--of
S.F. 74 water well contractors in Minnesota by the State Board of
Health, to reduce and minimize the waste of ground water re-
sources; "...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, sani-
tary and reasonable manner."

Reaction to Water and Related Land Resources
Planning Policy Questions During the Period
November 1970 Through June 1971

As stated in the section of this Bulletin entitled "The Need for a State Environmental Policy" the Minnesota State Planning Agency posed ten water and related land resources planning policy questions that should be answered before a statewide framework water and related land resources plan can be prepared. The ten planning policy questions pertain largely to environmental impacts, reduction of flood damage programs, future pollution control programs and future recreation programs. These planning policy questions, together with background information, were addressed to Legislators, Executive Branch personnel, voluntary organization members and private citizens in January 1971. The explicit and implicit reactions to planning policy questions during the period November 1, 1970 through June 1971 was appraised. All bills introduced and bills passed during the 1971 Session of the Legislature pertaining to the planning policy questions were assembled and studied. Information concerning Legislative Committees, Committee hearings and registration files for lobbyists bearing on the planning policy questions were reviewed. Statements related to the planning policies made, by Governor Anderson and other key members of the present Administration and Executive Branch were assembled and studied. Documents prepared by special interest groups and pertaining to the planning policy questions were reviewed. Comments on the planning policy questions were solicited from appropriate State, Federal and local officials.

In general, available information indicate the greatest response to the planning policy questions resulted from the introduction of a State Environmental Policy Act bill in the House of Representatives. This bill addressed itself to many of the planning policy questions as did a report approved by the Land and Water Resources Committee, House of Representatives on November 30, 1970. Considerable attention was given to the planning policy questions by the Citizens League as expressed in a report dated January 13, 1971. The response of the Executive Branch and the Senate to the planning policy questions did not result in any formally prepared reports or any legislative actions which could be documented. Private citizens expressed their response to the planning policy questions on a limited basis in part through committee hearings pertaining to the State Environmental Policy Act bill.

Although important environmental laws were passed no legislation passed during the 67th Session of the Legislature and no major document released by the Executive Branch during the period January 1, 1971 through June 30, 1971 contains statements directly pertaining to the planning policy questions. Thus, the planning policy questions remain unanswered so far as formal actions by the Legislature and the Executive Branch are concerned. Any conclusions pertaining to the planning policy questions must be based largely on implicit reactions by the Legislature and the Executive Branch and on the formal actions taken by the House of Representatives.

Reaction to Environmental Quality, Protection and Impact Planning Policy Questions

The reaction to the environmental quality, protection and impact planning policy questions is summarized below. These planning policy questions are:

1. Should the State endorse Federal-State plans in which the impacts of programs and projects on the State's environment have not been adequately identified and analyzed?
2. Should the State postpone acceptance or rejection of Federal-State plans until impacts on the environment of recommended programs and projects are carefully analyzed?
3. Should the statewide framework water and related land resources plan be predicated on the following planning policies?
 - A. Declare environmental quality and protection as the number 1 priority in selecting programs and projects.
 - B. Keep unfavorable impacts on the environment to a minimum in selecting programs and projects.

The growing concern about environmental quality problems and the urgent need to enhance environmental conditions has been expressed. However, concern is also expressed about related economic considerations.

There is a consensus that the environmental impact should be a major consideration in public and private decision-making. To what extent and how environmental impacts of programs and projects should be identified and considered is not clear. In light of economic concerns expressed it is clear that environmental quality is not the only consideration in selecting programs and projects. There is evidence to suggest that unfavorable impacts on the environment should be kept to a minimum in selecting programs and projects. The meaning of minimum can not be clearly defined but is certainly something less than what has been acceptable in the past.

No statements were recorded which answer the planning policy questions concerning acceptance or rejection of Federal-State plans (i.e., plans being prepared by the Souris-Red-Rainy River Basins Commission, Upper Mississippi River Coordinating Committee, Great Lakes Basin Commission and Missouri Basin Inter-Agency Committee) until the environmental impacts of the plans have been identified and analyzed. In light of the reaction to other planning policy questions, it seems reasonable to conclude that the State should at least convey its increasing concern about environmental aspects of Federal-State plans.

To summarize, the answers to environmental quality, protection and impact planning policy questions are not evident at this time. Additional debate, focusing on emerging broad State policies concerning the balance between economic and population growth and the quality of the environment, is necessary to crystallize the State's position concerning these planning policy questions.

Reaction to Flood Damage Reduction Planning Policy Questions

The reaction to the flood damage reduction planning policy questions is summarized below. The planning policy questions are:

1. Should the State endorse Federal-State plans which are predicated on the planning policy that further development of both urban and rural flood plain areas is to be encouraged by constructing dams and other structures to reduce existing and potential flood-plain damages?
2. Should the statewide framework water and related land resources plan be predicated on the following planning policy?
 - A. Solve existing and future flood damage problems chiefly through non-structural measures such as reasonable flood plain zoning, flood proofing, etc., and by constructing local protection works such as levees, floodways, and channel improvement.

Concern was expressed about the urgent need for improved flood plain management. There is consensus that greater attention should be directed towards non-structural flood plain management measures such as flood plain zoning. However, there is considerable reluctance to endorse a planning policy predicated on the assumption that flood damage reduction will be accomplished chiefly through non-structural measures and by local protection works. The desirable mix between non-structural and structural measures is unknown, but there is the feeling on the part of many that structural measures have been overemphasized in the past. What constitutes a reasonable regional responsibility for the State to assume with respect to out-of-State downstream flood damage reduction is questionable.

To summarize, there is widespread acceptance of the need for stressing non-structural flood plain management measures but not to the point where structural measures are not given due consideration.

Reaction to Water Quality Planning Policy Questions

The reaction to the water quality planning policy questions is summarized below. These planning policy questions are:

1. Should the State endorse Federal-State plans which are predicated on the planning policy that secondary treatment of wastes will be deemed adequate during the next 50 years and that most future water-quality problems will be solved by providing low-streamflow augmentation through dams and reservoirs constructed by the U.S. Army Corps of Engineers and U.S. Soil Conservation Service?
2. Should the statewide framework water and related land resources plan be predicated on the following planning policy?
 - A. Solve existing and future pollution problems chiefly through construction of advanced waste treatment plants and limited low-streamflow augmentation.

Actions have been taken to increase funding for secondary waste treatment plants and to solve as rapidly as possible existing and carry over water quality problems. However, relatively little attention has been given to the level of waste treatment which will be deemed adequate 20 or 30 years hence when water quality standards can no longer be met through secondary treatment of wastes. There is considerable support for stressing advanced waste treatment plants and limiting low-streamflow augmentation in solving future water quality problems. However, there is appreciable opposition to the suggestion that future water quality problems be solved chiefly through the construction of advanced waste treatment plants. The desirable mix between advanced waste treatment programs and low-streamflow augmentation programs is unknown, but there is a feeling on the part of many that low-streamflow programs have been overemphasized in Federal-State plans.

To summarize, there is considerable acceptance of the need for stressing advanced waste treatment programs to partly solve future water quality problems. However, many feel that due consideration should be given to low-streamflow augmentation programs.

Reaction to Irrigation Planning Policy Questions

The reaction to the irrigation planning policy questions is summarized below. The irrigation planning policy questions are:

1. Should the State endorse Federal-State plans which are predicated on the planning policy that the U.S. Bureau of Reclamation should divert water from Minnesota and the Rainy River to irrigate large tracts of land in North Dakota and to dilute, from authorized irrigation projects in North Dakota, return flows which will discharge into the Red River and cause a serious water-quality problem?
2. Should the statewide framework water and related land resources plan be predicated on the following planning policy?
 - A. Do not accept regional responsibilities associated with diverting water from the State to irrigate lands in North Dakota.

There is little support for the potentially feasible project to irrigate large tracts of lands in North Dakota by diverting water from Minnesota and the Rainy River. Strong opposition to the project is expressed in the following statement which is contained in H.F. No. 2405 "Provide for the State to remain water rich by requiring that any plans for future water resources development and management involving diversions of water from the State shall reach conclusions as to the availability of surplus water beyond the next 50 years, and that the state shall not export water without retaining the "use rights" of the water after a specified period, possibly the planned project life--50 years, if unforeseen needs arise in the future."

Reaction to Water Supply Planning Policy Questions

There was no reaction to the water supply planning policy question except concern was expressed that appropriate actions be taken as soon as possible to prevent projected future water supply shortages especially in the Twin Cities Metropolitan area. The water supply planning policy question is:

1. Should the State endorse Federal-State plans which are predicated on the planning policy that most future water-supply problems will be solved by utilizing surface water impounded behind Federal dams?

Reaction to Federal Influence on State Policies Planning Policy Questions

Reaction to the Federal influence on State policies planning policy questions is summarized below. The Federal influence on State policies planning policy questions are:

1. Should the State endorse and promote Federal-State regional framework water and related land resources plans which have been prepared largely by Federal agencies acting as representatives of the Souris-Red-Rainy River Basins Commission, Great Lakes Basin Commission, Upper Mississippi River Comprehensive Basin Study Coordinating Committee, and Missouri River Inter-Agency Committee?
2. Should the statewide framework water and related land resources plan be predicated on the following planning policy?
 - A. Keep Federal influence on State policies to a minimum in selecting programs and projects.

Concern has been expressed about the inadequacy of the State's participation in the preparation of Federal-State plans. There is strong evidence to suggest that Federal-State plans in their present form are not fully acceptable to the State. There is considerable support for minimizing Federal influence on State policies in selecting future water and related land resources programs and projects.

Reaction to Navigation Planning Policy Questions

There was little reaction concerning the navigation planning policy questions. Support for navigation improvements on the upper Mississippi river and lower Minnesota river seems limited. The navigation planning policies are:

1. Should the State endorse Federal-State plans which are predicated on the planning policy that water-borne transportation should be further subsidized and expanded, in part, by deepening the navigation channel in the Upper Mississippi River from 9 to 12 or possibly 15 feet and extending the navigation channel with a 9-foot depth up the Minnesota River to Mankato?
2. Should the statewide framework water and related land resources plan be predicated on the following policy?

- A. Restrict navigation improvements within the State on the Upper Mississippi River to maintenance and improvement of existing 9-foot channel and associated structures.

- E. Degree of control that will be determined appropriate under lake-shore development zoning regulations that are recommended by the Department of Natural Resources to be adopted by the Counties.
- F. Fragmentation of responsibility for recreational navigation and the unclear role of the state in this area.

Reaction to Regional Responsibilities Planning Policy Questions

Many people feel the State should accept a reasonable amount of regional multi-state responsibilities. What constitutes a reasonable amount of regional responsibility is questionable. The regional responsibilities planning policy questions are:

- 1. Should the State endorse Federal-State plans which are predicated on the planning policy that Minnesota will store flood waters behind a series of large dams on the Mississippi and Minnesota Rivers, thereby,
 - A. Permitting further development of flood-plain areas along the mainstem of the Mississippi River downstream from the State?
 - B. Providing low-streamflow augmentation for pollution control along the mainstem of the Mississippi River downstream from the State?
 - C. Providing low-streamflow augmentation for navigation purposes on the Mississippi River beyond the border of the State?
- 2. Should the statewide framework water and related land resources plan be predicated on the following planning policy?
 - A. Do not fully accept regional responsibilities for reducing, by structural means, flood damages beyond the boundaries of the State; providing low-streamflow augmentation for pollution control and navigation purposes beyond the boundaries of the State; and diverting water from the State to irrigate lands in North Dakota.

- 3. Whether the State should accept Federal criteris involving "Latent Demand" in Outdoor Recreation.

As stated earlier, no specific legislative enactments passed during the 67th Session of the Legislature which could be used as a policy guideline for the preparation of a statewide water and related land resources plan. Thus, the only available policy guidelines are the policies enunciated by previous Legislatures as formal declarations, statements and resolutions, and, to a much lesser extent, the reactions to planning policy questions. Unfortunately, these policies when viewed on a comprehensive basis and in light of recent policy concerns offer only limited guidelines for the preparation of a statewide plan.

Reaction to Recreation Planning Policy Questions

There was little reaction to the following recreation planning policy:

- 1. Select recreation programs and projects tailored to the State's landscape regions.
- 2. Other issues prevalent over the past years which are unresolved are:
 - A. The definition of the respective roles of various levels of government and the private sector in outdoor recreation, specifically the role of the State in serving the needs of urban areas.
 - B. Conflicts in recreation surface water use, particularly in or near urban areas.
 - C. The extent of protection of unique natural waterways.
 - D. Differences in viewpoints on criteria for aesthetic protective purposes.

Senate and House Committee Hearings During 1971 and 1972

During 1971 and 1972 the following Subcommittees of Committees of the Minnesota Senate and House of Representatives held hearings on matters pertaining to water resources administration:

Senate

Agricultural Committee - Subcommittee on Drainage
Natural Resources and Environmental Committee - Subcommittee on Water Permits, Subcommittee on Registration of Mineral Rights, Subcommittee on Snowmobiles and All-Terrain Vehicles
Civil Administration Committee - Subcommittee on Department of Natural Resources, Subcommittee on Recycling of Waste Products.

House

Natural Resources Committee - Subcommittee on Waters and Drainage, Subcommittee on Snowmobiles and All-Terrain Vehicles.
Environmental Preservation Committee - Subcommittee on Environmental Policy and Organization, Subcommittee on Recycling and Solid Waste Disposal
Committee on Environmental Preservation - Subcommittee on Monitoring and Enforcement
Committee on Judiciary - Subcommittee on Statutes Pertaining to Environmental Law.

Several Senate and House Subcommittees held joint meetings. Some of the policy questions witnesses were requested to address themselves to are listed below:

State Environmental Policy and Organization

Is legislation needed or can the objective of sound state decisions on environmental matters be made in context of present laws and administrative structure?

What should new legislation contain in terms of state environmental policy?

--collection of existing statutory general policy statements?

--new specific policy statements that will affect action?

--only general statement awaiting development of specific policies to be incorporated later?

What should be specific duties of an environmental policy body, if created?

--review of major environmental impact statements and supervise environmental impact reviews?

--make recommendations to Governor on major power plant siting?

--make recommendations to Governor on state-federal environmental conflicts and relationship?

--resolve conflicts between competing state and local agencies about environmental matters?

--develop policy recommendations to Governor and legislature?

What should be the structure of an environmental policy body?

--special assistant to Governor?

--interdepartmental group (i.e., cabinet)?

--no departmental membership (outside membership only)?

--no special interest membership?

--should it have quasi-judicial powers (i.e., such as Water Resources Board possesses)?

--should it be advisory to Governor or have substantive power?

What should be relation of the policy body to governmental agencies?

--merely advisory to Governor?

--independent with Governor veto?

--completely autonomous?

--review authority over state grant-in-aid programs?

--relationship to SPA?

--relationship to legislature?

How should such a body be staffed and funded?

--independent staff?

--power to recruit departmental staff?

--Governor's staff only?

--what level of funding?

How can private environmentally oriented organizations be involved with work of the policy body?

--direct access on case-by-case basis?

--a separate environmental commission to take public testimony?

--a representative advisory council?

How can elements of a state environmental policy be developed for inclusion in basic act?

--what are respective roles of 1) council, 2) legislature, 3) Resources Commission, 4) state agencies, 5) local government, 6) public?

How can the concept of environmental concern be made manageable and what is the scope of that concern by the state?

--resource protection?

--resource management and development?

--transportation?

--economic development?

--rural-urban balance?

--those activities which have a measurable impact on the quality and quantity of beneficial natural resources?

Water Supply

What should be the respective roles of the DNR, State Planning Agency, the Health Department, the Water Resources Board and the Minnesota Municipal Commission in reviewing the water supply projects of local agencies? Who should decide whether a project is permitted? Who should decide how much state and federal aid it gets? Who should set the construction and performance standards it must meet?

What are the necessary elements of a statewide system to gather information on the amount of public water available and how much would such a system cost?

How can the Legislature have greater input into state participation in Federal - State basin planning organizations? How should the state's representative to these organizations be chosen?

Why did the House Water Resources and Pollution Subcommittee of the 1969 Interim not recommend the adoption of only one permit for all water projects?

Does any other state impose a fee for the appropriation and use of public waters? What is the fee based upon?

What are the necessary elements of a program to adequately enforce water use permits once they have been granted? What personnel would carry out the program? How much would such a program cost?

Polution Control

What should be the respective roles of the Soil Conservation Committee, the Department of Natural Resources, the Department of Agriculture and the PCA in providing state supervision for a comprehensive program of erosion and sedimentation control? Who should have primary respon-

sibility for enforcing erosion control regulations? What personnel should be used?

What are the respective roles of the Department of Natural Resources, State Planning Agency, and the Minnesota Resources Commission in deciding how funds for lake improvement projects are spent? What policies, plans or programs have been developed to govern the expenditure of these funds?

Should the state require municipalities to finance construction, operation and maintenance of sewage systems through user charges without resort to property tax revenues?

What are the causes of lake pollution? Is there any disagreement as to the causes? How much does each cause contribute to the problem?

What are the respective roles of the PCA, the DNR and the Department of Agriculture in preventing lake pollution? What state or local agency has primary responsibility for enforcement of lake pollution abatement requirements?

Recreation

What is the proper local vehicle for undertaking lake improvement projects? What powers must an agency have in order to undertake such projects?

Why is the administrative procedure involved in getting a permit for work in beds of public waters from the DNR so complicated? What changes can be made at the state level in order to simplify the procedure? What assistance can be furnished by counties or watershed districts in the processing of these permits?

What is the purpose of the fee charged by the DNR for excavating in beds of public waters?

What are the necessary elements of an effective program to enforce permits for work in beds of public waters? What personnel would do the enforcement? How much would such a program cost?

How does the DNR decide which wetlands to purchase under its wetlands preservation program? What is the relationship of the DNR program to federal programs for wetlands preservation?

Does the DNR ever act to change the level of a lake? How does it decide what the proper level should be? What criteria govern the levels of the federal reservoirs in the headwater lakes of the Mississippi?

What standards does the DNR use to decide when to issue a permit for water week control? Did the Department of Agriculture develop these standards? If not, are they consistent with Agriculture standards? Should they be?

Should a fee be charged for permits for removal of water weeds? What should such a fee be based upon?

What are the necessary elements of an effective program of enforcement of water weed removal permits? What personnel would enforce such requirements? How much would such a program cost?

Flood Control

Is the memorandum describing the current operations of conservancy districts up to date? Should present conservancy district projects be transferred to watershed districts or to county boards or to some other agency?

Who has the primary responsibility for maintenance or removal of emergency flood levies constructed during prior floods? Why are they a problem?

What agencies are now empowered to seek funds for planning of flood control projects under PL 566? What agencies should be empowered to construct projects for flood control using PL 566 financial assistance?

Should the state establish a system of flood control planning at the regional level? How would the planners be chosen? How would the planning be financed?

What should be the respective roles of the DNR, State Planning Agency, and Water Resources Board in reviewing local flood control projects? Who should decide whether a project is permitted? Who should decide how much state and federal aid it gets?

Does every flood control project in the state actually get a permit from the DNR? What percentage of applications has been denied? What standards determine which applications are granted and which are denied?

How can the state more effectively participate in federal plans for flood control?

Navigation

What agency is primarily responsible for undertaking local channel improvement projects? What agency should be primarily responsible?

How should local channel improvement projects be financed?

Does every channel improvement project undertaken in the state actually get a permit from the DNR? What percentage of applications has been denied?

What is the present DNR policy governing which channel improvement permits are granted and which are denied?

What is the present DNR policy on development of the state's waterways for transportation?

How can the state more effectively participate in federal plans for navigation projects?

The writer presented testimony during several of the Subcommittee hearings and distributed copies of Bulletins and Information Circulars prepared by the Water Resources Research Center to Subcommittee members.

Governor Anderson's Environmental Quality Council

An Environmental Quality Council was established by Governor Anderson on April 5, 1972. Creation of the Environmental Quality Council is a recognition of the necessity in state government to provide continuous, comprehensive evaluation of the impact of social activity and technological change on the human and physical environment. Because of the multitude of institutions, public and private, that variously affect the quality of human life and the natural environment, no single State department or agency exerts a major influence in environmental policy and planning. It is therefore appropriate to establish an interdepartmental structure to consider the policies and planning of the State of Minnesota on matters pertaining to environmental protection and enhancement.

Members of the Environmental Quality Council (pursuant to Executive Order #25, of April 5, 1972) are the Governor, the director of the State Planning Agency, the Director of the Pollution Control Agency, the Commissioner of the Department of Natural Resources, and the Commissioner of Highways. Chairman of the Council is the State Planning Director.

The Environmental Quality Council has the following purposes:

1. Provide guidance and recommendations to the Governor and State departments and agencies in policy matters pertaining to the environment, particularly those matters that are interdepartmental in nature.
2. Recommend State policy on significant environment issues.
3. Provide a forum for governmental bodies and the public to identify and discuss issues of environmental concern.

The Council will operate with the following considerations:

1. Any powers of the Council are those vested in the respective State agencies on the Council.
2. The Council's operating agenda will be agreed upon by a consensus of its members. Any and all agenda item deliberations will be based on the need to:
 - a. identify policy where no policy may exist or where conflicting policies exist, and
 - b. define and recommend policy when such action will be helpful or necessary to enhance and/or protect the quality of human life and the natural environment of Minnesota.
3. The Council will assess those provisions of Minnesota Statutes that tend to affect environmental quality and determine the necessary administrative and substantive revisions or additions and recommend these legislative proposals to the Governor.
4. The Council will encourage the involvement of all governmental and community groups in its operations and will be structured to be a forum for public discussion of issues being considered by the Council.

The Council's method of operation will be determined by a consensus of the members. Research and other operations necessary to serve the Council will be conducted by the Council staff at the direction of the members. Members of the Council will designate a staff person to coordinate all research and other activities in their department pursuant to the request of the Council. All State departments and agencies will designate a Staff person as liaison for the respective department with the Council. The Council is authorized by the Governor to establish single-purpose task forces as the situation warrants.

The Council will meet at the call of the chairman. All meetings will be open to the public. Discussion and agenda items will be limited first to Council members and then open to those in attendance at the meeting.

The Council will hire an Executive Secretary and other immediate staff deemed appropriate. Each member of the Council will designate a representative to a Technical Committee. Each department and agency of State government will designate a liaison person to the Council. Other governmental agencies will be requested to designate a contact person to the Council.

The Council will establish a system to refer for comment the agenda and minutes of each Council meeting. This system will encompass a current listing of all governmental agencies, interest and citizen groups and individuals. Comments by said organizations or individuals will be incorporated into the records of the Council. A reasonable time limit will be imposed for those desiring to comment on the Council agenda and minutes.

Those governmental agencies, citizen or other groups, wishing to make presentations to the Environmental Quality Council must request time of the Executive Secretary at least two weeks before a scheduled meeting. Members of the Council will determine whether said request will be honored; the Citizens Advisory Committee will be asked to hear presentations on occasion and recommend action to the Council.

The Environmental Quality Council, as an interdepartmental advisory body to the Governor, will center its operations on those programs and policies of state government pertinent to more than one department or of long-term consequence to the State of Minnesota. Matters within the province of a single department or other level of government will be referred to that organization for its attention.

A Citizens Advisory Committee to the Environmental Quality Council was established on April 13, 1972. The Citizens Advisory Committee is appointed as a broadly representative group of citizens with a wide range of backgrounds and expertise. The Committee will advise the Council regarding its deliberations, suggest items for consideration, react to Council proposals, and act as a communication device with the various geographical interests and professional groups it represents. The Committee will meet periodically and receive staff assistance from the Executive Secretary of the Council. The Committee will, at the request of the Council, hear presentations by community and interest groups and conduct outstate hearings on questions of environmental concern. When deemed appropriate by the Council and to assist in the investigation of a matter

before the Council requiring particular expertise or interest, the Council, in consultation with the Committee, will appoint single-purpose task forces to consider a particular matter. Each task force will report to the Council which will forward said reports to the Committee for review and comment. The individual expertise of Committee members will be utilized by the Council when appropriate.

The following people are Committee members:

Dean E. Abrahamson - Minneapolis
Mel Bates - Minneapolis
John P. Borchert - Scandia
Harold Butler - Austin
Lawrence Carlson - Anoka
Richard E. Carman - Wadena
George Daley - Lewiston
Charles K. Dayton - Minnetonka
Janet Garrison - Minneapolis
Burton C. Genis - Minneapolis
Joseph F. Grinnel - Edina
Lowell D. Hanson - New Brighton
James Jack - Mankato
Sue Meister - Scandia
Louis More - Minneapolis
Gladys Morton - St. Paul
Charles Reinert - Garvin
Russell Schwandt - Sanborn
Glen A. Sherwood - Pine River
Barbara Sysson - Moorhead
Steve Thal - Watertown
Richard L. Towey - Rochester
William C. Walton - Minneapolis
Dave Zentner - Duluth

WATER RESOURCES RESEARCH CONDUCTED IN MINNESOTA

A report entitled "Water Resources Research Conducted in Minnesota, 1963 through 1968," Bulletin 12, Water Resources Research Center, University of Minnesota summarizes information on number and nature of projects, expenditures, man-years of effort, and organizations conducting water resources research in the State during the period 1963-68. The following definition was used in preparing this report:

1) all research efforts by individuals residing in Minnesota were classified as water resources research regardless of whether or not the results of the research would be used in the State when the primary objective of the research was to improve knowledge concerning: a) the character, occurrence, and movement of water resources; or b) the technology of water resources development and management including the physical, socio-economic, and institutional aspects of the technology.

2) the following types of effort were not considered research: equipment development projects which might be undertaken by equipment suppliers; activities that appeared to be predominantly data gathering, such as projects dealing with yields of water from different land areas, or dealing with water resources in a particular type of terrain; however, non-duplicative data collection which is an integral part of a well-planned research effort was eligible for consideration; and projects that constitute mere tabulations or analyses of data already existent without being an integral part of a research effort.

3) both basic and applied research was considered. Basic research is that type of research which is directed toward increase of knowledge in science. It is research where the primary aim of the investigator is a fuller knowledge or understanding of the subject under study, rather than as is the case with applied research, which is concerned with a practical application thereof.

It is difficult to express research effort in quantitative terms. One measure of effort is that of number of ongoing projects, however, this measure cannot be used alone because the magnitude of research input varies considerably from project to project. Dollar expenditure is another useful measure, however, this measure cannot be used alone because a given sum of expenditure represents less research input in the case where the project requires sophisticated equipment or other unusual expenditures than in the case where the project requires little or no expensive equipment. Man-years of effort is still another useful measure, however, this measure cannot be used alone because the magnitude of research input varies considerably depending upon the qualifications of the researcher. Because of inadequacy of any one measure to reflect the quantity of research effort, three measures - number of ongoing projects, expenditures, and man-years were used to express research effort in quantitative terms. In addition, research efforts in the 10 water resources research categories used by the Committee on Water Resources Research, Federal Council for Science and Technology (FCST) were identified to provide information on the nature of research projects.

Research effort in sub-categories has been greatest in the approximate order given below: VIII-A. Engineering Works - Design; VIII-C. Engineering Works - Construction and Operation; V-A. Water Quality Management and Protection - Identification of Pollutants; V-B. Water Quality Management and Protection - Sources of Pollution; V-C. Water Quality Management and Protection - Effects of Pollution; V-D. Water Quality Management and Protection - Waste Treatment Processes; V-G. Water Quality Management and Protection - Water Quality Control; II-F. Water Cycle - Ground Water; II-G. Water Cycle - Water in Soils; II-H. Water Cycle - Lakes; II-I. Water Cycle - Water and Plants; II-J. Water Cycle - Erosion and Sedimentation; and IV-A. Water Quantity Management and Control - Watershed Protection.

There has been little or no research effort in the following subcategories: IV-C. Water Quantity Management and Control - Effects of Man's Related Activities on Water; V-E. Water Quality Management and Protection - Ultimate Disposal of Wastes; V-F. Water Quality Management and Protection - Water Treatment; VI-C. Water Resources Planning - Cost Allocation, Cost Sharing, Pricing, and Repayment; VI-D. Water Resources Planning - Water Demand; VI-F. Water Resources Planning - Nonstructural Alternatives; VII-B. Resources Data - Data Acquisition; and VII-C. Resources Data - Evaluation, Processing, and Publication.

Only a small amount of research effort has been applied to the following subcategories: I-A. Nature of Water - Properties of Water; I-B. Nature of Water - Aqueous Solutions and Suspensions; II-A. Water Cycle - General; II-B. Water Cycle - Precipitation; II-C. Water Cycle - Snow, Ice, and Frost; II-D. Water Cycle - Evaporation and Transpiration; II-E. Water Cycle - Streamflow; IV-B. Water Quantity Management and Control - Groundwater Management; V-G. Water Quality Management and Protection - Water Quality Control; VI-A. Water Resources Planning - Techniques of Planning; VI-B. Water Resources Planning - Evaluation Process; VI-E. Water Resources Planning - Water Laws; VI-G. Water Resources Planning - Ecologic Impact of Water Development; VII-A. Resources Data - Network Design; VIII-B. Engineering Works - Materials; IX-A. Manpower, Grants and Facilities - Education-Extramural; and IX-B. Grants and Facilities - Education-in-House.

Water resources research effort subdivided by conducting organizations (University of Minnesota, Federal Agencies, State Agencies, and others) is shown in the table below. Other organizations include local agencies, State and Private Colleges, and private enterprises. Because of the confidential nature of research by private enterprises, it is suspected that only a small portion of private enterprise research has been reported.

During the period 1963-1968, the University of Minnesota was the organization conducting the greatest amount of research with Federal Agencies, others, and State Agencies following in that order. Since research is a primary mission of the University, this would be expected. It is also to be expected that the research effort by Federal Agencies will be greater than by State Agencies for at least 2 reasons: 1) State Agencies are traditionally charged with executing programs and policy and they must devote most of their capability to matters other than research, and 2) many research projects have wide application and therefore are the logical responsibility of Federal rather than State Agencies. While the University of Minnesota conducts the largest amount of research, much of this research is funded by Federal and State Agencies. For example, in 1968 funding of research projects conducted at the

Water Resources Research Effort in Minnesota, 1963 through 1968.
Subdivided by Organization Conducting Research

Organization Conducting Research	Number of Ongoing Projects				Estimated Expenditures (Actual Dollars)				Estimated Man-Years of Effort										
	63	64	65	66	67	68	63	64	65	66	67	68							
University of Minnesota	38	51	73	76	61	52	384,632	491,574	763,284	881,941	769,916	656,896	29,08	34,38	51,49	58,87	49,28	47,40	
Federal Agencies	12	13	14	18	19	15	223,174	387,174	361,174	643,897	678,807	505,807	12,69	24,24	24,41	35,81	40,19	26,69	
State Agencies	2	0	1	0	1	1	19,593	0	1,090	0	46,456	46,456	1,26	0	2,25	0	7,75	7,75	
Others	1	1	1	2	4	5	2,337	2,337	2,337	2,337	291,017	303,568	17	17	17	17	2,98	5,48	8,85
Totals	53	65	89	96	85	73	628,736	881,065	1,147,795	1,599,715	1,782,896	1,492,427	43,20	58,79	76,32	97,66	95,70	80,09	

Federal Agency Water Resources Research Effort in Minnesota, 1963 through 1968.

Federal Agency	Number of Ongoing Projects				Estimated Expenditures (Actual Dollars)				Estimated Man-Years of Effort									
	63	64	65	66	67	68	63	64	65	66	67	68						
U.S. Department of Agriculture	9	8	9	7	6	6	156,389	183,389	184,389	178,389	133,389	133,389	5,69	6,24	6,91	5,83	5,21	5,21
U.S. Department of the Interior	1	3	3	9	11	8	20,623	157,833	150,833	419,166	496,166	361,166	2,50	13,50	13,00	24,64	29,64	18,64
Department of Defense	2	2	2	2	2	1	48,982	48,982	48,982	48,982	48,982	0	4,80	4,80	4,80	4,80	4,80	0
Totals	12	13	14	18	19	15	223,174	387,174	361,174	643,897	678,807	505,807	12,69	24,24	24,41	35,81	40,19	26,69

University of Minnesota was about as follows: Federal - \$525,000 and State \$95,000. Both State and Federal agencies perform many useful and necessary functions of a data gathering nature. These data are important for many purposes, including necessary inputs for research effort.

Federal Agency water resources research effort in Minnesota subdivided by agency is summarized in the table above. The Department of Agriculture and the Department of the Interior are the Federal Agencies carrying on the bulk of water research programs in Minnesota, followed by the U.S. Army Corps of Engineers in the Department of Defense. The Soil Conservation Service and Forest Service account for the major share of research in the Department of Agriculture. The Geological Survey and the Federal Water Pollution Control Agency account for the major portion of research by the Department of the Interior in Minnesota.

Within the University of Minnesota, water resources research has been carried on in 16 different divisions representing the biological, physical and social sciences. The St. Anthony Falls Hydraulic Laboratory has led in research effort followed by the Department of Agricultural Engineering, and the Department of Entomology, Fisheries and Wildlife. A significant increase in Research Effort over the period 1963-1968 has occurred in the Limnological Research Center. This increase again reflects the growing public concern for water quality, especially as related to Minnesota's lakes. A relatively small proportion of research effort has centered around the social sciences. The Department of Agricultural Economics appears to dominate in this area.

The total University of Minnesota water resources research effort is compared to the research support provided by the Water Resources Research Center in the table below. The percentage of the total University water resources research effort supported by the Center has steadily increased from about 7 percent in 1965 to about 25 percent in 1968. The Center research expenditures in 1968 exceeded the expenditures of all other individual divisions of the University. The Center supported about 11 percent of the total water resources research conducted in Minnesota in 1968.

Considering total State and Federal outlays in 1970 for water and related land resources programs in Minnesota, the percentages of total outlays for functional activities were as follows: works of improvement and development of resources - 43 percent; operation, maintenance, and management of resources 30 percent; technical assistance - 8 percent; loans - 7 percent; data collection, investigations, planning, and information - 7 percent; regulation, enforcement and surveillance - 3 percent; and research - 2 percent.

There should be a coordinated statewide scientific research program on water and related land resources. The Water Resources Research Center, University of Minnesota could be charged with the responsibility of reviewing ongoing research activities in the field of water and related land resources and to determine ways to strengthen the total research effort.

Comparison of Expenditures by Water Resources Research Center and by all Divisions of the University of Minnesota

	No. of Ongoing Projects				Estimated Expenditures (Actual Dollars)				Estimated Man-years of Effort									
	63	64	65	66	67	68	63	64	65	66	67	68						
University of Minnesota Water Resources Research Effort	138	51	73	76	61	52	384,637	491,574	763,284	881,941	769,916	636,896	29,08	34,38	51,49	58,87	49,28	47,40
Water Resources Research Center Program	0	0	7	14	13	14	0	0	53,297	134,351	152,380	157,711	0	0	.80	9.13	8.58	11.49
Percent of University of Minnesota Water Resources Research Effort Supported by Water Resources Research Center	63	64	65	66	67	68												
	0	0	9.58				0	0	7.10	15.23	19.79	24.76	0	0	1.55	18.50	17.41	34.24
	18.12	21.51	26.92															

An advisory Water Resources Research Coordinating Committee could be established with representatives from the University of Minnesota; State Colleges; Private Colleges; private research organizations; Minnesota Department of Natural Resources; Pollution Control Agency; State Planning Agency; Geological Survey; Metropolitan Council; Agricultural Research Service; U.S. Department of Agriculture; National Oceanic & Atmospheric Administration; U.S. Department of Commerce; Army Corps of Engineers, U.S. Department of Defense; Geological Survey, Bureau of Sport Fisheries & Wildlife, U.S. Department of the Interior; and Environmental Protection Agency. The Director, Water Resources Research Center could serve as Chairman of the Committee. The Committee could establish a Citizens Advisory Council consisting of representatives from the following organizations: Association of Minnesota Counties, Environmental Science Center, Izaak Walton League, League of Minnesota Municipalities, Minnesota Association of Commerce and Industry, Minnesota Association of Soil and Water Conservation Districts, Minnesota Association of Watershed Districts, Minnesota Conservation Federation, Minnesota Environmental Control Citizens Association, Minnesota Public Interest Research Group, Northern Environmental Council, and Sierra Club.

The Water Resources Research Coordinating Committee could: identify the applied problems in Minnesota in water and related land resources planning, development and management that require research; prepare an inventory of research programs in terms of their relevance to these applied programs, develop policy considerations for an expanded research program, and generally facilitate interagency communication. The Committee could prepare and keep up-to-date a long-range plan for water and related land resources research. To facilitate coordination, to insure research efforts are relevant to statewide problems, and to insure gaps in research are filled the Water Resources Research Center could be provided with continuing State funds to support needed research identified by the Committee.

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