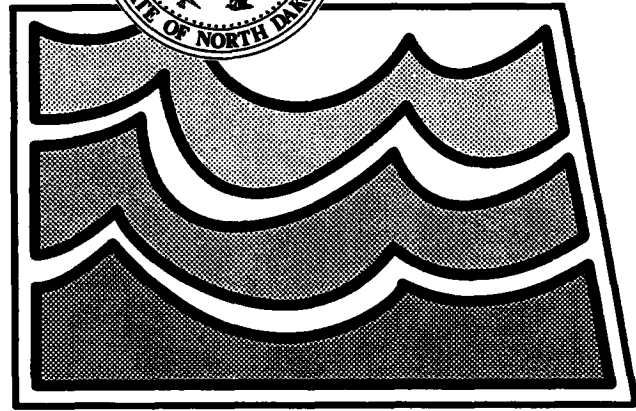


NORTH DAKOTA STATE AGENCY
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NORTH DAKOTA
State Water Commission

**BIENNIAL REPORT
FOR THE PERIOD
July 1, 1993 to June 30, 1995**

TC824.N9 A32 B1E



Office of the State Engineer

December 1, 1995

The Honorable Edward T. Schafer
Governor of North Dakota
State Capitol
Bismarck, ND 58505

RE: 1993-1995 Biennial Report

Dear Governor Schafer:

The Biennial Report of the State Engineer and State Water Commission for the period July 1, 1993, to June 30, 1995, is transmitted for your information and consideration.

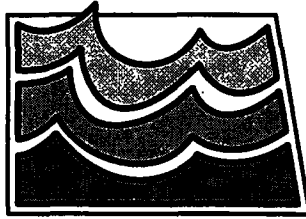
Respectfully submitted,

David A. Sprynczynatyk
Secretary and State Engineer

DAS:rp
Enclosure

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NORTH DAKOTA STATE WATER COMMISSION

Mission

The mission of the State Water Commission and the State Engineer is to improve the quality of life and strengthen the economy of North Dakota by managing the water resources of the state for the benefit of its people.

Agency Goals

- To regulate the use of water resources for the future welfare and prosperity of the people of North Dakota.
- To develop the use of water resources for the future welfare and prosperity of the people of North Dakota.
- To educate the public regarding the nature and occurrence of North Dakota's water resources.

Organization

The State Water Commission consists of the Governor as chairman, the Commissioner of Agriculture as an ex-officio member, and seven members who are appointed by the chairman to serve terms of six years each. The terms of office for appointees are so arranged that two terms and not more than three terms shall expire on the first day of July of each odd numbered year. Executive Order 1994-08 allows for the Lieutenant Governor to serve as chairman of the Commission in the absence of the Governor or as otherwise directed. The Commission appoints a Secretary-State Engineer as their executive officer, who employs a staff as needed to carry out the aims of the Commission.

The State Water Commission is located primarily in the State Office Building near the State Capitol in Bismarck, North Dakota. In addition, the Commission has field offices in Dickinson and West Fargo.

Statutory History and Mandates

The State Water Commission was created by legislative action in 1937 as a result of the drought of the 1930s for the specific purpose of fostering and promoting water resources development throughout the state.

The Office of State Engineer was created in 1905 to regulate and administer matters concerning allocation of the state's water and related land resources in compliance with article XI, § 3 of the North Dakota Constitution which declares all waters to be property of the state for public use. In 1937, additional duties were added to this office when the State Engineer was designated chief technical advisor to the Commission. Subsequently, in the years following, the State Engineer was assigned responsibilities for regulation of drainage, control of dikes and dams, and management of development in the floodplains of the state.

Agency Policies

The State Water Commission and the State Engineer have developed procedures and policies based upon the comprehensive legislation contained in Title 61 of the North Dakota Century Code to:

- Administer the water laws of the state and its interest in federal and international waters.
- Prepare and maintain a comprehensive plan for future growth and development of the state, and to direct project development in accordance with that plan.
- Conduct studies to determine availability and occurrence of the ground and surface waters of the state for the purposes of allocation and management.
- Assist local entities of government in the development and construction of water resource projects.
- Assist local entities of government in management and maintenance of water resource projects.
- Assist in the organization of various legal entities through which water resource projects can be sponsored and operated.
- Prepare and maintain a state-wide communications plan which identifies communication deficiencies with regard to water resources management and to assist in water information/education programs to overcome these deficiencies.
- Coordinate activities of federal, state, and local entities in water resources development.
- Represent the interests of the state in water resources matters in national, state, and international forums.

Many of the policies in effect have evolved as a result of the agency's financial participation in project development along with local government sponsors. The amount of financial participation varies with the project purposes. The contract fund is the source of funds for assistance to local sponsors and is controlled by the Commission.

Principal Agency Activities

- Implementing the procedures for claiming this state's share of the flows of the Missouri River for our future needs as reflected in comprehensive water management planning documents and the Pick-Sloan Plan.
- Managing and developing North Dakota's water resources to enhance the economic future of North Dakota and its quality of life.
- Continued efforts for funding of the Garrison Diversion Project to provide for water distribution throughout North Dakota in return for the land given up for early development of the Pick-Sloan Plan.
- Implementing plans for the distribution of Missouri River water through regional water supply systems such as the Southwest Pipeline Project and the Northwest Area Water Supply Project.
- Planning for an inlet and an outlet, including the delivery of Missouri River water, to stabilize Devils Lake.
- Developing international flood control with the Province of Saskatchewan and Canada for solving the flood problems along the Souris River.
- Refining legislation and policies for administering the constitutional Resources Trust Fund through which needed water facilities can be constructed.
- Periodic discussions with Indian representation regarding tribal reserved water rights in North Dakota. The intent being to negotiate water rights to avoid litigation.
- Developing policies and initiatives that will stimulate progress in solving flooding problems along the Sheyenne, Pembina, and Red Rivers.
- Joint administration with the Garrison Conservancy District of the federally authorized municipal, rural and industrial (MR&I) water supply program of the 1986 Garrison Diversion Reformulation Act.
- Continued funding by the legislature for advanced water resource studies. Completion of detailed studies that more precisely define the nature and occurrence of the resource is essential in order to optimize its development.

- Pursuing cooperative efforts with neighboring states and provinces for planning for mutual beneficial water management on shared water resources.

- Enforcing weather modification standards, conducting research, and supervising operational cloud seeding programs for hail suppression and rainfall enhancement.

- Continued efforts to enhance the Water Education for Teachers (WET) and the North Dakota Watercourse programs.

Agency Legislation

House Bill No. 1026 makes the separation and submission of biennial reports by the State Engineer and Atmospheric Resource Board discretionary, and changes the agency that receives the reports, in addition to the Governor, from the Office of Management and Budget to the Secretary of State.

House Bill No. 1113 changes the meeting requirement of the sovereign lands advisory board from four times per year to once a year or at the call of the State Engineer or two or more members of the board.

House Bill No. 1114 requires the Legislative Assembly to approve funding before the state assumes from the federal government the section 404 program. The section 404 program requires permits to discharge dredged or fill materials into water.

House Bill No. 1115 increases the maximum votes of irrigators in irrigation districts that receive water from a federal reclamation or irrigation project by allowing votes to be based on 960 acres, which is the number of acres that the irrigator is entitled to irrigate under federal law.

House Bill No. 1305 repeals the requirement to replace drained wetlands.

House Bill No. 1317 allows for the establishment of water districts for the purpose of supplying water to residents of the district and requires the State Engineer to receive petitions for water districts to organize, hold a hearing, make findings, and determine whether the water district should be formed. This bill also requires the

State Engineer to receive petitions and conduct hearings to determine whether property should be included in or excluded from a water district.

Senate Bill No. 2025 increases the allocation of the oil extraction tax revenues to the resources trust fund from 10 percent to 20 percent for the 1995-1997 biennium.

Senate Bill No. 2145 authorizes the State Engineer to refund a water permit application fee, upon the request of the applicant, if the application is withdrawn and the State Engineer has not published notice of the application or it is determined that other good and sufficient cause exists to refund the application fee.

Senate Bill No. 2146 authorizes the State Water Commission to sell property not needed for the Southwest Pipeline Project.

Senate Bill No. 2148 authorizes the Industrial Commission to issue bonds to finance the costs of the Northwest Area Water Supply Project.

Senate Bill No. 2157 removes the State Engineer from the State Historical Board.

Senate Bill No. 2203 distinguishes operation and maintenance funds and reserve funds for replacement and extraordinary maintenance received by the State Water Commission for the Southwest Pipeline Project from similar funds received by the Southwest Water Authority by establishing separate funds for money received by the Southwest Water Authority; authorizes the State Water Commission to transfer equipment acquired by the state for the Southwest Pipeline Project to the Southwest Water Authority; authorizes the transfer of ending balances in the operation and maintenance fund and the reserve fund for replacement from the State Water Commission to the Southwest Water Authority on the date the State Engineer certifies to the State Treasurer that the Southwest Water Project has been transferred to the Southwest Water Authority.

Senate Bill No. 2204 updates, clarifies, and deletes unnecessary language in the existing revenue bonding authority of the State Water Commission; and provides that any bond issuance over \$2 million must have legislative approval.

Senate Bill No. 2330 clarifies that the 20 percent of oil extraction tax allocated for education by Article X, section 24 of the North Dakota Constitution is to be taken, in part, out of the allocation of the tax revenues allocated to the resources trust fund.

Senate Bill No. 2450 authorizes the State Water Commission to include as part of the Southwest Pipeline Project the delivery of water from Southwest Pipeline Project facilities to areas in Dunn County, Mercer County, and Oliver County.

Senate Bill No. 2463 directs the State Engineer to develop contingency plans to contain and minimize the anticipated flood damage in the Devils Lake basin; establishes a State Water Commission office in Devils Lake; and requires various state agencies and other entities to develop a comprehensive statewide water development program.

Senate Concurrent Resolution No. 4031 urged the Governor to declare an emergency concerning the impending flood disaster in the Devils Lake basin and to recognize the impending flood disaster facing property owners adjacent to Devils Lake.

Senate Concurrent Resolution No. 4034 urged the Governor to declare an emergency concerning the impending flood disaster in the Devils Lake basin and urged the Governor to mobilize the National Guard to combat the flood emergency developing in the Devils Lake basin.

Senate Concurrent Resolution No. 4040 urged the U.S. Army Corps of Engineers to include provisions for the protection of recreation, municipal, industrial, irrigation, and other interests on the Missouri River in North Dakota in developing a revised master manual for the future operation of the Pick-Sloan project.

Senate Concurrent Resolution No. 4041 urged the Congress of the United States and the U.S. Army Corps of Engineers to assume responsibility for Missouri River bank erosion downstream from all Pick-Sloan project dams, including the Garrison Dam to Oahe Reservoir reach in North Dakota, and to continue a program of annually appropriating funds for the maintenance and construction of bank protection projects.

Water Commission Members as of June 30, 1995

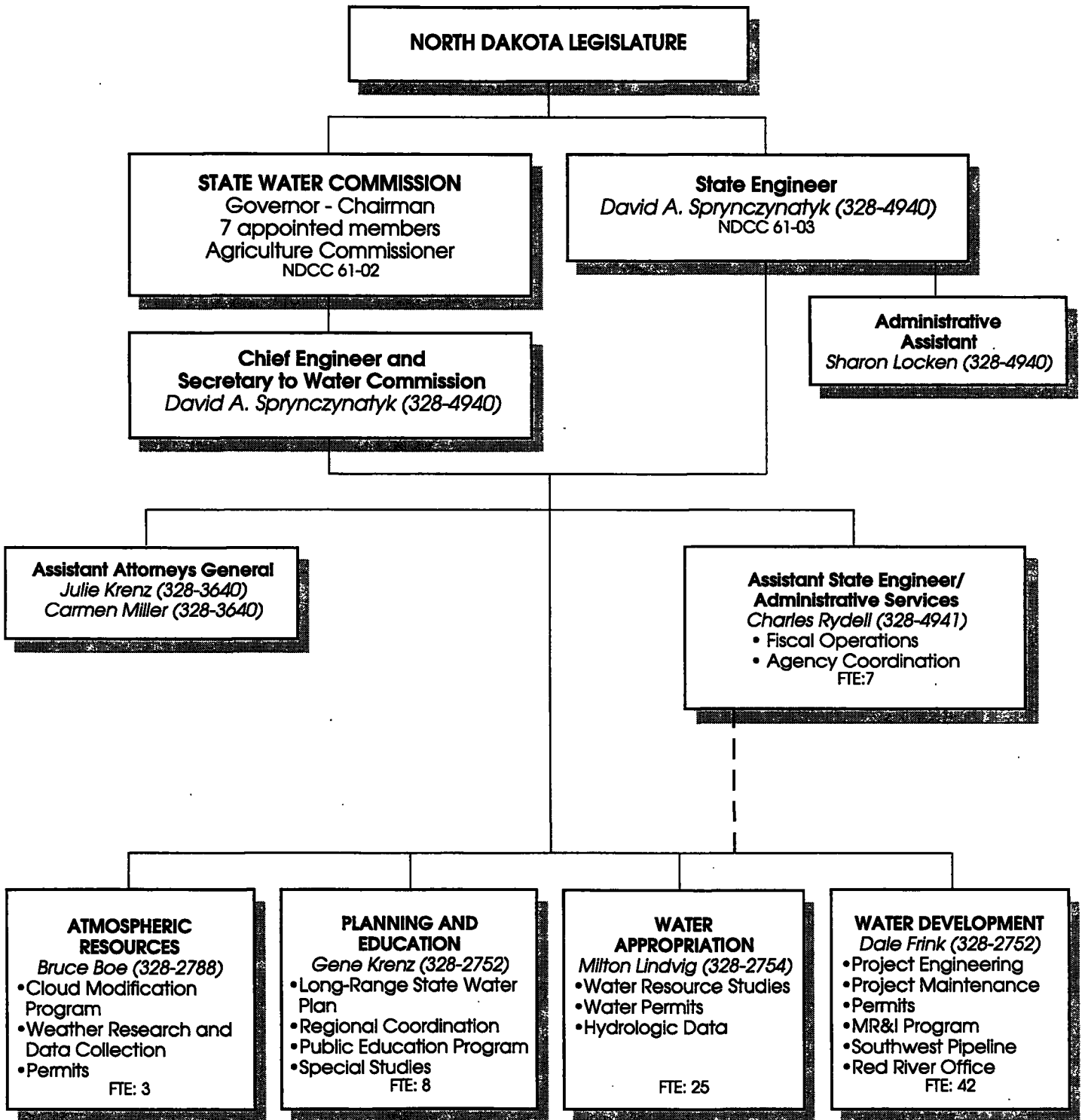
NAME	POSITION	APPOINTED	TERM ENDS
Edward T. Schafer	Governor-Chairman		
Sarah Vogel	Commissioner of Agriculture		
Elmer Hillesland	Member from Grand Forks	March 1, 1993	July 1, 1995
Robert Thompson	Member from Page	March 1, 1993	July 1, 1995
Jack Olin	Member from Dickinson	March 1, 1993	July 1, 1997
Harley Swenson	Member from Bismarck	March 1, 1993	July 1, 1997
Mike Ames	Member from Williston	July 1, 1993	July 1, 1999
Florenz Bjornson	Member from West Fargo	July 1, 1993	July 1, 1999
Judith DeWitz	Member from Tappen	July 1, 1993	July 1, 1999

Water Commission Meetings July 1, 1993 through June 30, 1995

DATE	LOCATION
July 1, 1993	(Meeting with Garrison Diversion Conservancy District) Devils Lake, ND
July 2, 1993	Devils Lake, ND
August 26, 1993	Bismarck, ND
October 26, 1993	Dickinson, ND
November 19, 1993	(Telephone Conference Call) Bismarck, ND
December 8, 1993	Minot, ND
December 29, 1993	(Telephone Conference Call) Bismarck, ND
February 17, 1994	(Telephone Conference Call) Bismarck, ND
March 9, 1994	Bismarck, ND
April 7, 1994	(Telephone Conference Call) Carrington, ND
May 24, 1994	Williston, ND
June 8, 1994	(Telephone Conference Call) Bismarck, ND
July 27, 1994	(Meeting with Garrison Diversion Conservancy District) Oakes, ND
October 14, 1994	Grand Forks, ND
December 7, 1994	Bismarck, ND
February 9, 1995	Bismarck, ND
March 16, 1995	(Telephone Conference Call) Bismarck, ND
April 26, 1995	Bismarck, ND
June 14, 1995	(Telephone Conference Call) Bismarck, ND

**North Dakota
State Water Commission**

Organizational Chart



TOTAL FULL TIME EQUIVALENTS OF 85 PERSONNEL

June 30, 1995

State Water Commission Employees as of June 30, 1995

ADMINISTRATIVE SERVICES DIVISION

State Engineer: David A. Sprynczynatyk
Assistant State Engineer: Charles Rydell
Administrative Assistant: Sharon Locken
Accounting Budget Specialist: Kay Koch
Accounting Budget Specialist: Krislyn Thompson
Legal Assistant: Rosemary Pedersen
Administrative Clerk: Karen Heinert
Temporary: Allison Wetzel

ATMOSPHERIC RESOURCE BOARD

Division Director: Bruce Boe
Business Manager: LeNor Dollinger
Environmental Scientist: Darin Langerud
Temporary: Tamara Carlson, Jessie Welch, Aaron Gilstad, Mark Redington, Paul Moen, Mike Fransen, Mark Avery, Mark Schneider

PLANNING AND EDUCATION DIVISION

Division Director: Gene Krenz
Word Processing Operator: Dawn Petersen
Water Resource Planners: LeRoy Klapprodt, Bill Sharff, Brett Hovde
Environmental Scientist: Linda Weispfenning
Research Analyst: Larry Knudtson
Graphic Artist: Brenda Bosworth

WATER APPROPRIATION DIVISION

Division Director: Milton Lindvig
Administrative Secretary: Marlene Backman
Hydrologist Managers: Royce Cline, David Ripley, William Schuh, Robert Shaver
Hydrologists: Christopher Bader, Jeffrey Olson, John Paczkowski, Scott Parkin, Jon Patch, Steve Pusc, Kevin Swanson, Alan Wanek
Water Resource Engineers: Craig Odenbach, Robert White
Water Resource Program Manager: Gordon Baesler

Engineering Technicians: Michael Hove, Kelvin Kunz, James MacArthur, Merlyn Skaley
Chemist: Garvin Muri
Laboratory Technician: Mary Osborn
Rotary Drill Operator: Gary Calheim
Equipment Operator: Albert Lachenmeier
Temporary: Robert King, Lloyd Waddingham

WATER DEVELOPMENT DIVISION

Division Director: Dale Frink
Administrative Secretary: Darlene Mund
Water Resource Engineer Managers: Cary Backstrand, Randy Gjestvang, Arland Grunseth, James Lennington, Jeffrey Mattern, Todd Sando, Ronald Swanson
Water Resource Engineers: Bradley Benson, Dwight Comfort, Bruce Engelhardt, Stan Hanson, James Lindseth, Edgar Schmidt, Gregg Thielman
Engineering Technicians: Marty Babel, Robert Bucholz, Edward Gall, Kurt Kunz, Leland Krein, Terrence McCann, Raymond Olinger, Thomas Palanuk, Tom Engberg
Water Resource Project Managers: Gary McDowall, Daniel Sauter
Planners: Jeffrey Klein, Bruce Lange
Account Technician: Winston Enyart
Data Processing Coordinator: William Miller
Temporary: Theodore DeWall, Daniel Bahm

Southwest Pipeline Project

Water Resource Engineer Manager: James Fay
Assistant Manager: Pinkie Evans-Curry
Water Resource Senior Manager: Ray Christensen
Realty Officer: Frank Johnson
Engineering Technician: Allen Balliet
Electrician: Leland Messer
Maintenance Worker: William Petersen, Dale Binstock, Daniel Roller
Administrative Secretary: Dorothy Manley
Temporary: Kenneth Rebsom, Howard White

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Administrative Services Division

The Administrative Services Division provides the overall direction of agency powers and duties as described in the state water laws. The activities include both the State Engineer's and the Water Commission's operations, as well as accounting, records, and support services for all agency programs.

Budget and fiscal control work is accomplished within the provisions of statutory law and principles or rules of that law. Agency accounting consists of keeping adequate financial records, preparation of financial statements and reports, project or program cost accounting, preparation of budgets, and proper control of various funds appropriated by the state legislature.

A considerable portion of time is spent in coordination of water resource programs with federal agencies and other state and local entities. The division works with contracts and agreements necessary to carry out investigations, planning, and cooperation with various other agencies in water resources development. A close liaison is maintained with irrigation districts, water resource districts, and the Garrison Diversion Conservancy District.

The State Engineer serves as North Dakota's representative on various boards and associations. Presently the State Engineer is the United States co-chairman of the International Souris River Board of Control, board of directors member of the Missouri Basin Association, executive council member of the Western States Water Council, board of directors member of the National Water Resource Association, board of directors ex officio member of the North Dakota Water Users Association, board of directors member of the North Dakota Water Education Foundation, member of the Red River Water Resource Council, vice-president of the Association of Western State Engineers, and member of the National Project WET Advisory Committee.

During the past two bienniums the activities of the Missouri Basin Association increased considerably over previous bienniums because of water resource issues in the Missouri River Basin. The Association continued its involvement in the annual preparation for the Corps of Engineers

operating plans for the Missouri River, and the Association worked closely with the Corps on the revision of the Missouri River Master Water Control Manual.

The state brought several administrative actions against landowners who have illegally taken water from North Dakota rivers and aquifers and water permit holders who have failed to comply with statutory requirements. The state was involved in several lawsuits that impact the State Water Commission, the State Engineer, or water resource districts.

The state filed an amicus brief defending the constitutionality of a statute which places upon railroads the continuing responsibility for costs of accommodating their tracks to necessary drainage improvements made by water resource districts. The North Dakota Supreme Court upheld the constitutionality of the statute.

The state of North Dakota, in conjunction with the Sargent County Water Resource District, successfully defended a suit brought by the federal government under section 404 of the Clean Water Act. The court determined that the county's activities in conducting work on a drainage ditch originally constructed in 1917-1919 were considered maintenance of the drainage ditch, thereby exempting the county from the requirement to obtain a permit from the Corps of Engineers.

The North Dakota Supreme Court held, in a 1994 decision, that the public has an interest in and the right to use lands bordering on the state's navigable rivers and lakes.

The state is involved in a case concerning the Devils Lake Sioux Tribe's claim to the bed of Devils Lake. Settlement negotiations are underway.

The state was involved in a quiet title action regarding a tract of land at the confluence of the Yellowstone and Missouri Rivers. Part of the land appeared to have had its origins as an island, which means the state would have owned it. The district court held that the land did not form as an island but instead was formed by accretion to the main land. Consequently, it was owned by the riparian landowner.

Atmospheric Resource Board

The Atmospheric Resource Board has been a division of the State Water Commission since 1981. Although under the direction and supervision of the Water Commission, the Atmospheric Resource Board is a quasi-judicial, quasi-legislative, advisory and rule-making department. Since 1991, the Board's appropriation has been combined with that of the Water Commission, and the Board staff has functioned essentially as another division.

The primary function of the Atmospheric Resource Board is to protect the rights of the public concerning the effects of planned weather modification (cloud seeding) programs. The Board is also responsible for the licensing, permitting, and record keeping for all such operations. Research to assess and improve cloud seeding technology is also mandated by law. The Board's rules and regulations governing weather modification are periodically reviewed and updated to ensure environmental and public safety, and that the operational program and research efforts remain at the forefront of the technology. Rules and regulations promulgated by the Board define the qualifications, procedures, and conditions required for the issuance of licenses and permits.

The Atmospheric Resource Board is comprised of ten members. Seven are appointed by the Governor; the other three are ex-officio and include the State Engineer, the Director of the Aeronautics Commission, and a representative from the Environmental Health Section of the Department of Health.

North Dakota Cloud Modification Program

The North Dakota Cloud Modification Project (NDCMP), currently serves five western counties. The project has two goals: hail suppression and rainfall augmentation. However, hail suppression continues to be the primary concern of the sponsoring counties. The project seeded clouds in two multi-county operations districts during each summer of the biennium, in the process deploying a total of eight twin-engine aircraft and two weather radars each season. Independent evalua-

tions of the program have indicated a 45 percent reduction in crop hail damage, and increases in wheat yields on the order of 6 percent within the target areas. Annual economic value of the increased wheat production to the five participating counties has been placed at \$24 million by NDSU.

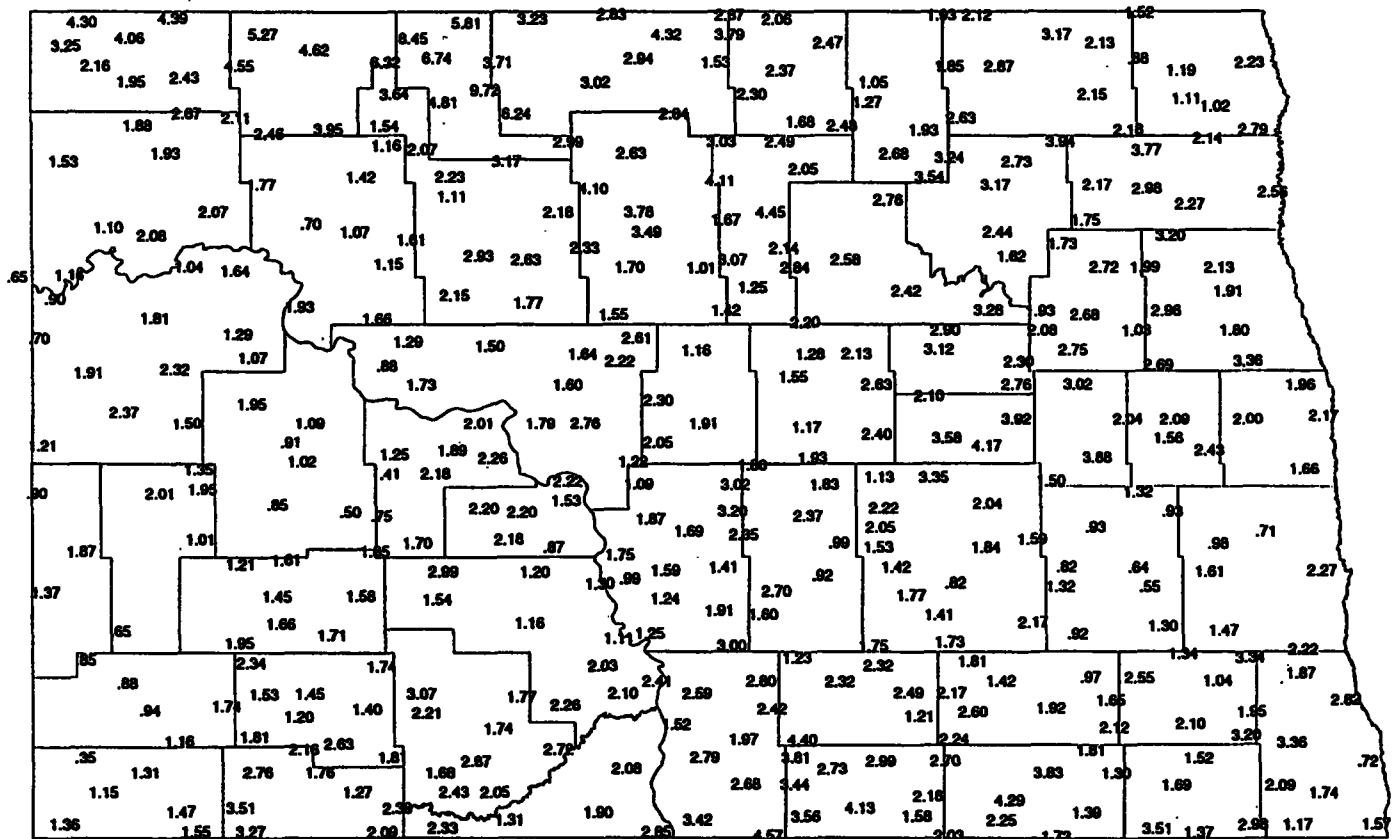
In addition to the efforts to reduce hail and stimulate rain production, the project personnel interact closely with the National Weather Service meteorologists in Williston and Bismarck, providing immediate reporting of severe weather events. Lightning-caused fires are also easily spotted and reported to local fire departments.

North Dakota Tracer Experiment

Since 1980, the Board has worked with the National Oceanic and Atmospheric Administration (NOAA), within the Atmospheric Modification Program (AMP). This program involved six states, and through the biennium funded cloud and precipitation research relating to documentation and demonstration of cloud seeding technology.

The Board coordinated the North Dakota Tracer Experiment (NDTE), a multi-agency thunderstorm research program aimed at better understanding of hail and precipitation development. This effort, funded jointly by the AMP, the State of North Dakota, and the National Science Foundation, began in the Bismarck area at the close of the previous biennium on 21 June 1993, and continued through the month of July 1993. In addition to Board staff, the NDTE involved scientists from across the nation, including UND Aerospace, the South Dakota School of Mines and Technology, Colorado State University, the NOAA National Severe Storms Laboratory, NOAA Environmental Technologies Laboratory, the National Center for Atmospheric Research, the NASA Goddard Space Flight Center, and the Atmospheric Environment Service of Environment Canada.

Experiments traced circulations and precipitation development within thunderstorms, both of which have potential impacts on the effective treatment of clouds in the county-sponsored NDCMP.



Precipitation amounts (in inches), June 1995

Source: North Dakota Atmospheric Resource Board's Cooperative Rain Gauge Network

Very active weather patterns brought an excess of severe weather and rainfall to the south-central North Dakota project area, and a very large and interesting database was compiled. Subsequent analysis of these data has been the focus of efforts for the balance of the biennium.

During the biennium, two master's theses, sixteen technical conference presentations, and eleven formal research publications resulted from the research efforts.

Cooperative Rain Gauge Network

During the growing season (April-September) the Board continues to operate a statewide network of over 900 volunteer rain gauge observers. The rainfall and hail data recorded daily are used in evaluating the operational cloud seeding program, and are distributed to interested state and federal agencies. These agencies include: the North Dakota Division of Emergency Management, the National Weather Service, the U.S. Geological Survey, the Army Corps of Engineers, and other divisions within the Water Commission. The data proved to be especially useful during the flood-ravaged month of July 1993, and

have since proven useful in monitoring short term conditions in the Devil's Lake Basin. The network affords the most detailed growing season rainfall coverage of any within the state, including that of the National Weather Service.

Intern Pilot Program

As part of the record keeping efforts associated with the county-sponsored operational cloud seeding program, the Board funds the field presence of intern copilots. These University of North Dakota-trained pilots fly along with the pilots-in-command of each seeding aircraft, gaining invaluable experience in seeding clouds while recording the times, locations, and nature of all seeding events. These interns are fully qualified to fly the seeding aircraft, and have completed two semesters course work in weather modification theory and operations prior to serving on the project. This program continued this biennium, documenting seeding activities and storm conditions, while providing the eighteen student interns flight experience in and around thunderstorms.

Planning and Education Division

The Planning and Education Division performs a number of functions, including the development and maintenance of a State Water Management Plan. The division staff is responsible for:

- Participation in/and or coordination of studies leading to completion of local, state, regional, and national water resource and related land management plans;
- Monitoring of water resource issues to determine possible impacts on North Dakota's water resources;
- Representing the State Water Commission on regional and national planning bodies such as the Missouri River Basin Association and the Red River Water Resources Council; and
- Providing opportunities for adults and students to learn about North Dakota's water resources through a program that involves workshops, displays, and a variety of publications.

State Water Management Plan

NDCC §61-01-26 (4) provides that it is North Dakota's policy to attain benefits from the use of the state's water resources "...through the development, execution, and periodic updating of a comprehensive, coordinated, and well-balanced short-term and long-term plans and programs. . ." Specific power and authority to plan for the development of the state's water resources is provided for under the general powers and duties vested with the State Water Commission under NDCC §61-02-14.

In fulfilling its objective to wisely develop the state's water resources, the State Water Commission has periodically developed comprehensive state water management plans addressing both surface and ground-water management needs across the state. Plans were published in 1937, 1962, 1968, 1983, and 1992. The computer data base containing the 1992 plan's specific recommendations is continually updated as formal actions of the State Water Commission dictate.

Information and Education Program

First developed and implemented in North Dakota in 1984, Project WET (Water Education

for Teachers) now incorporates a national water education program for grades K-12 and pre-service teachers, youth leaders, and natural resource specialists. WET is an interdisciplinary and supplemental water education program which facilitates and promotes the learning, exploration, and stewardship of our natural resources.

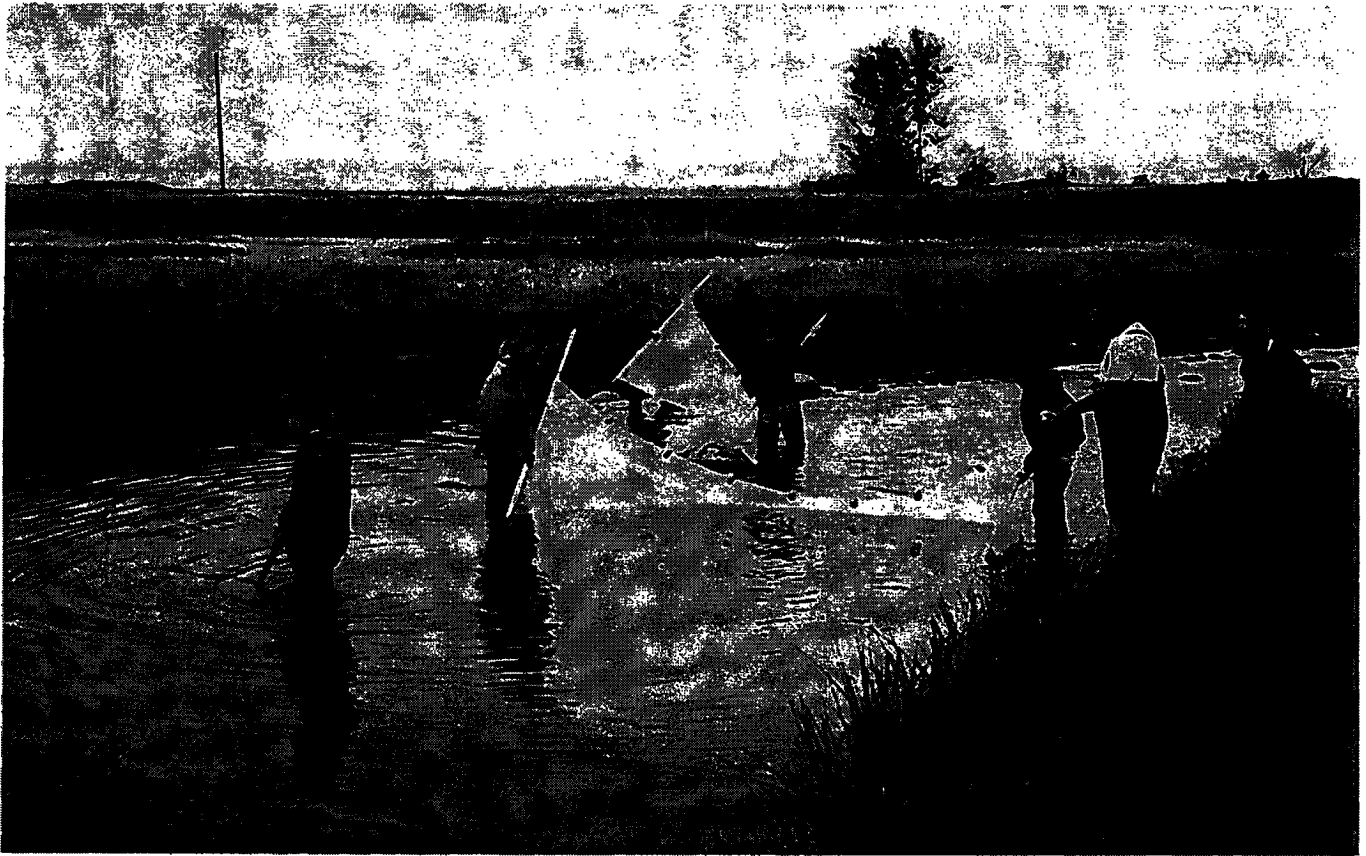
The WET K-12 Curriculum and Activity Guide is a collection of innovative water activities that incorporate a variety of formats. The guide is divided into seven thematic areas: water's chemical and physical properties, quantity and quality issues, aquatic wildlife, ecosystems, and management strategies. The activities promote critical thinking and problem solving skills.

If more detailed information is desired, research "modules" are available for groundwater, watersheds, wetlands, water conservation, and water/environmental history. In addition, water resource trunk programs on groundwater, wetlands, water pollution, and water history are available. The WET Program also sponsors a summer camp for students, an institute for teachers, and graduate credit and noncredit courses, workshops and seminars.

During the 1993-1995 biennium 325 educators and 165 other interested individuals received Project WET teaching materials through scheduled program offerings. Thousands of K-12 students were introduced to Project WET teaching materials through other agencies, organizations and individuals.

North Dakota Water Magazine

A new magazine titled *North Dakota Water* was introduced in 1993 to bring information about the many facets of water resources and water issues to the citizens of North Dakota. *North Dakota Water* is published 10 times a year by the North Dakota Water Education Foundation with support from several private, federal, state and local organizations and agencies. The State Water Commission chose to include its monthly *Oxbow* newsletter and annual *Oxbow* magazine in *North Dakota Water*. The *Oxbow* is designed to inform and educate the public about State Water Commission projects and programs as well as local, state, and national water management issues.



WET Summer Camp participants are collecting fish and macroinvertebrates to study.

As the magazine grew in scope, the Planning and Education Division also assumed responsibility for a regular feature page titled *The Water Primer*. This feature page highlights interesting or little known facts about water and related land resources.

Interbasin Water Transfer Studies Program

This program, instituted in 1986, is designed to undertake the research needed to respond to Canada's concerns about the potential transfer of certain fish species, pathogens, and parasites into Canadian waters through the operation of the Garrison Diversion Project.

To accomplish program objectives, North Dakota has assumed the leadership of a long-term, comprehensive research program involving a dozen or more state and federal agencies, scientists, and researchers from several colleges and universities (including Canadian). Funding is provided through the joint efforts of the State Water Commission, the Garrison Diversion Conservancy District, and the U.S. Bureau of Reclamation. The Division's director serves as coordinator for the program.

If Canadian concerns can be overcome through this and other research, the economic benefits that could accrue to North Dakota would be substantial. Accordingly, the program's objective is to remove the Canadian concerns by discovering new knowledge where it is now lacking, by conclusively refuting concepts based on misinformation, and by developing mitigation measures where technical and scientific objections cannot be overcome.

Ninety-six percent of the state's surface water supplies are found in the Missouri River, with approximately 16 million acre-feet flowing past Bismarck on an average annual basis. With less than 4 percent of the state's total surface water supplies, the Souris River and Red River basins lack the capability to meet the growing demands of water. The key to dealing with this problem is the transfer of water from areas of surplus to areas of shortage. Linkage between basins can be achieved through the distribution system provided by Garrison Diversion; and to achieve that linkage, the removal of Canadian concerns is essential.

Special Studies

Comprehensive Information/Education Strategy. Development of this strategy was accomplished through the work of the State Water Commission's Communications Planning Committee. The committee consisted of 16 state, federal, tribal, and local groups and agencies. Their goal was to help citizens become better informed about existing and proposed water projects and programs in their area. The committee recommended that the strategy concentrate on three areas; increased adult education efforts, implementation of a statewide communications plan, and continuation of the State Water Commission's WET Program.

Wetlands Conservation Plan. Through a grant from the U.S. Environmental Protection Agency, a comprehensive Wetlands Conservation Plan is being jointly developed by the State Water Commission and the Game and Fish Department. The purpose is to facilitate the protection, development, management and enhancement of North Dakota's wetland resources in a cooperative and reasonable manner and in partnership with private landowners and local governments. A Geographic Information System is used to create overlapping layers depicting information such as wetlands, watersheds, public land survey, and transportation facilities. The Grand Harbor Township Water Management Project, in Ramsey County, and the purchase of an air seeder to demonstrate the advantages of conservation tillage practices in the Devils Lake Basin have been funded through the grant.

Devils Lake Water Management Plan. This Plan evolved from the Devils Lake Basin Conceptual Water Management Plan published in 1991. A Devils Lake Basin Task Force, comprised of private, local, state and federal groups and agencies, was appointed by the State Engineer to build on the ideas generated by reviews of the 1991 Conceptual Plan. The basin-wide water management plan includes specific recommendations and implementation strategies. The mission is to develop a comprehensive, coordinated water management plan for the Devils Lake Basin that will protect the economic and biological values of the Devils Lake Basin while providing optimum benefits for agriculture, wildlife and fisheries, outdoor recreation, and economic development.

Cannonball River Basin Water Management Study. The Study is a cooperative effort of the U.S. Bureau of Reclamation, Standing Rock Sioux Tribe, and the State Water Commission. Several state agencies are also contributing their expertise to the study. The study is being conducted to determine the water resource related needs and desires of the residents of the Cannonball River and tributary Cedar Creek watersheds. A random sample mail survey of 1900 basin residents was conducted to assess their feelings on water management, conservation, and development. A hydrologic model is being developed to be used as a planning tool to simulate the effects of past, present, and future water development and demands on the quantity and quality of the natural streamflows in the basin. In addition, Geographic Information System databases are being used to map the water resources and various landforms in the basin.

The Red River Water Resources Council. The Red River Resources Council is a quasi-governmental, nonprofit corporation formed under North Dakota Law to facilitate cooperation and coordination on water management issues in the Red River basin involving Minnesota, Manitoba, and numerous federal agencies. The states of North Dakota and Minnesota are the council's formal members, while a board of directors consisting of three from each state, directs council activities. Administration of the council is accomplished under a chairmanship that rotates annually between the two states.

Water Appropriation Division

The responsibilities of the Water Appropriation Division is to focus on the appropriation and management of the state's water resources to serve the needs of present and succeeding generations of North Dakota citizens. The following activities are carried on to fulfill these responsibilities:

- Identify the availability and quality of the state's water resources.
- Assist municipalities and other public entities in developing solutions to particular water supply problems.



A technician from the Water Appropriation division monitors water levels in Burleigh County.

- Assess impacts of existing water-supply development on ground-water levels, streamflow, and water quality for purposes of allocation and management.
- Collect, store, and disseminate data on streamflow, ground-water levels, water quality, and water use.
- Process water permit applications and administer water permits for water resource appropriations.
- Provide recommendations to the State Engineer on water permit applications.
- Provide for the storage and retrieval of water permit records.
- Maintain a record of the utilization of each conditional water permit and water right.

Major Activities for 1993-1995

The ongoing program for collecting water resource data continued at a relatively constant level. This program consists of four components: streamflow, ground-water levels, chemical quality, and water use. The agency supports the operation of approximately 60 streamflow gages, many of which are a part of the cooperative program with the U.S. Geological Survey.

Ground-water levels are measured periodically in more than 3,000 observation wells completed in the major aquifers throughout the state. Approximately 1,000 water samples for chemical analyses are collected annually at streamflow gage stations, and from selected observation wells and production wells. The water use data is submitted annually by the holders of more than 3,100 water permits.

The 1991 Legislature directed the State Engineer and State Geologist to conduct site suitability reviews of existing municipal waste landfill sites. The program was completed on June 30, 1995. It resulted in the investigation of 47 landfill sites and the preparation of a report for each. The reports were provided to the North Dakota State Department of Health for use in site improvement, site remediation, or landfill closure.

In October 1994, the State Water Commission along with five other state and federal agencies, and universities hosted the 39th annual Midwest Ground Water Conference. The one and one-half day conference drew 125 attendees from 12 midwestern states. Twenty-seven papers were presented on hydrogeology along with 18 posters.

The spring workshop of the association of Western States Engineers was also hosted by the State Water Commission May 21 through 23, 1995. The one and one-half day workshop consisted of four technical sessions and a field trip to tour power generation, gasification facilities and a coal mine near Beulah. Thirty-nine representatives from 14 western states participated.

A cooperative study by the U.S. Geological Survey was completed which describes the severity of the 1988-1992 drought in North Dakota. It documents the drought as a climatic and hydrologic event as well as its effects on people and resources. The recent drought is also compared with droughts of the past.

Even though precipitation was above normal throughout the state during the biennium, the number of acres under irrigation continued to grow due to continued interest in high-value crops, particularly potatoes. The use of irrigation in the production of high-value crops provides a high quality product by assuring sufficient moisture during periods of inadequate precipitation. Most of the new development occurred in the eastern one-half of the state. It is estimated that during the biennium irrigated acreage increased by approximately 12,000 acres to a total of 229,000.

A cooperative water supply investigation was conducted for the city of Mohall. The purpose of the study was to locate a water source suitable for supplementing the city's existing water supply. The aquifer which had served the city's needs for many years did not provide an adequate water supply during the drought period. The study resulted in the definition of an aquifer with an adequate quantity of good quality water. The city is now using water from that source.

During the 1993-95 biennium the following investigations were commenced, continued or completed.

- Hydrologic investigation of the West Fargo aquifer system in Cass County.
- Study of the hydrologic systems in east-central McLean County.
- A documentation of the severity of the 1988-92 drought.

Water Permit Summary	
July 1, 1993 Through June 30, 1995	
WATER USE	ACRE-FEET
Irrigation	
Applications filed: 138	
Acres requested: 35,064.4	
Acres granted:	
(includes backlog): 23,382.4	
Water granted (includes backlog)	30,876.1
Ground water	22,632.3
Surface water	8,243.8
Flood Control	
Applications filed: 1	
Water granted (includes backlog)	0
Industrial	
Applications filed: 24	
Water granted (includes backlog)	10,395.8
Livestock	
Applications filed: 3	
Water granted (includes backlog)	0
Municipal	
Applications filed: 8	
Water granted (includes backlog)	7,816.0
Recreation, Fish, and Wildlife	
Applications filed: 34	
Storage granted (includes backlog)	7,375.3
Annual use granted (includes backlog)	2,836.3
Rural Domestic	
Applications filed: 4	
Water granted (includes backlog)	1,205.0
TOTAL APPLICATIONS FILED: 212	
TOTAL WATER GRANTED	
	45,635.5
<i>Note: Backlog includes permits applied for in previous bienniums.</i>	

- Water supply investigation for the city of Mohall.
- The assessment of municipal solid waste disposal sites.
- The study of agricultural impacts on ground-water quality.

- A study of the water resources of the James River basin in cooperation with the U.S. Geological Survey.
- Evaluation of chemical reactions and iron bacteria occurrence as related to injection well failure at Oakes Public School in Oakes.

The following reports were published during the biennium:

- Investigation to Identify a Supplemental Water Supply in Bottineau County, North Dakota for the City of Mohall
- The Hydrologic System of East-Central McLean County, North Dakota: Water Resources Data
- Investigation to Identify a Water Supply for the City of Westhope, Bottineau County, North Dakota
- Hydrogeology of the Minot Aquifer, Ward County, North Dakota
- Hydrogeology of the Minot Aquifer, Ward County, North Dakota: Water Resources Data
- Climatic and Hydrologic Aspects of the 1988-1992 Drought and the Effect on People and Resources of North Dakota
- Hydrology of the Devils Lake Area, North Dakota
- An Evaluation of Injection Well Plugging from the Oakes School Heat Pump/Passive Cooling System, Dickey County, North Dakota
- Agricultural Impact on Water Quality in a Shallow Confined Aquifer and in the Overlying Saturated Glacial Till in Eastern North Dakota: Movement of Water and Tracers
- Investigation of Vertical Nitrate Gradients in a Shallow Unconfined Aquifer in North Dakota
- Distribution of Oxygen-18 and Deuterium in Precipitation, Ponds, Sloughs, and Ground Water in the Oakes Aquifer Study Area, Southeastern North Dakota
- Agricultural Impact on Water Quality in a Shallow Confined Aquifer and in the Overlying Saturated Glacial Till in Eastern North Dakota: Movement of Pesticides

Water Development Division

The Water Development Division provides technical review and guidance in water management project design, and in regulating project construction. The division staff has several responsibilities.

- Preparing engineering and feasibility reports and designs for the construction, maintenance, and major repair of water resource projects;
- Reviewing and making recommendations on permit applications for drains, dikes, and dams;
- Providing technical assistance to water resource district boards;
- Inspecting and reporting on the safety of dams;
- Assisting communities in developing floodplain management capabilities pursuant to the National Flood Insurance Program;
- Providing joint coordination of the Municipal, Rural, and Industrial Water Supply Program; and
- Managing the design, construction, and operation of the Southwest Pipeline Project.

The Water Development Division is divided into six sections: 1) Regulatory; 2) Investigations; 3) Design and Construction; 4) Municipal, Rural, and Industrial Water Supply; 5) Red River Office (located in West Fargo); and 6) Southwest Pipeline Project (includes an office in Dickinson). The following is a summary of the biennial activities of each of these sections.

Regulatory

During the 1993-95 biennium, the Regulatory Section processed 214 applications for construction or modification of dams and dikes. These applications consisted of 73 for fish and wildlife purposes, 17 to prevent flooding of agricultural land, 5 to prevent flooding of municipalities, 8 for surface water and sediment control, 92 for livestock watering, 7 for irrigation, 4 for recreation projects, 2 for waste-water storage, and 6 for mining operations. The previous biennium, the Section processed 306 applications.

The Regulatory Section processed 43 applications to drain. Last biennium, the Section processed 11 applications to drain.

The Regulatory Section also processed 48 nesting island applications and 63 sovereign land permit applications. The Section also reviewed 6 new mining permits, and 13 revisions to existing mining permits.

During the biennium, the Section processed 66 applications to restore wetlands, 117 applications to create new wetland areas, and reviewed 17 wetland areas determined to be converted wetlands. The Section also provided comments to the Corps of Engineers, on 45 Clean Water Act (Section 404), permits.

The Regulatory Section is also responsible for floodplain management in the state and coordination of the National Flood Insurance Program. The floodplain management staff assists 238 communities in the administration of its floodplain management responsibilities. Each community designates an individual as the floodplain administrator to oversee all development. The State Water Commission staff works closely with these individuals in providing technical assistance. The floodplain management staff visits the communities on a pre-determined basis of need, and during the 1993-95 biennium, over 80 communities were visited and assisted. Approximately 75 percent of the floodplain management costs are paid through the Community Assistance Program. This program is developed annually by the State Water Commission and the Federal Emergency Management Agency.

Investigations

During the 1993-95 biennium, the Investigations Section conducted investigations for 19 projects. Sixteen investigations were completed and three are still underway. As a result, five projects were constructed and six were recommended for continued work. Five investigation projects were tabled.

Devils Lake - Significant flooding has occurred throughout the Devils Lake basin during the last two years. The level of Devils Lake rose over 12 feet from elevation 1423.24 msl on July 1, 1993, to elevation 1435.58 msl on June 30, 1995. The volume of water in Devils Lake more than doubled from 590,000 acre-feet to 1,325,000 acre-feet, and the surface area of the lake increased from 46,800 acres to 73,700 acres. Record flows occurred on several tributaries to Devils Lake. State Water Commission staff spent a large

amount of time providing technical assistance to local officials during this time period.

State Water Commission staff developed a number of emergency alternatives for the Devils Lake flood situation. These include water storage within the basin, an outlet to Stump Lake, and outlet alternatives to the Sheyenne River.

The federal government, along with the Water Commission, was involved in several other activities in the Devils Lake basin during the biennium. The U.S. Army Corps of Engineers and the Bureau of Reclamation developed a scope of work for a feasibility study for the stabilization of Devils Lake. The Corps of Engineers and the Federal Emergency Management Agency provided emergency assistance during the flooding. The Federal Emergency Management Agency also led an interagency task force, involving federal, state, and local officials. The task force prepared a report to outline action items to deal with the flooding.

Survey Crew - The survey crew spent 14 percent of its survey time on flood studies, 11 percent on construction staking, 45 percent on wells, 4 percent on regulatory investigations, 24 percent on investigation surveys, and 2 percent on Southwest Pipeline Project surveys.

McKenzie County Irrigation Project - The purpose of the investigation was to determine the feasibility of developing irrigation in McKenzie County. The reconnaissance report is completed and no areas were identified as feasible.

Williams County Irrigation Project - The purpose of the investigation was to determine the feasibility of developing irrigation in Williams County. The reconnaissance report was completed on the Nesson Valley area. A feasibility study is scheduled for the 1995-97 biennium.

Missouri River Bank Stabilization Project - State Water Commission staff continued to work with the Corps of Engineers on Missouri River Bank Stabilization. The Corps of Engineers scheduled some bank stabilization work for the 1995-97 biennium.

Salt Lake, Walsh County - The purpose was to evaluate the feasibility of storing additional floodwaters from the Park River in Salt Lake. Two alternatives were considered. Alternative 1 involved construction across the outlet of Salt Lake. It provided 8,400 acre-feet of storage at

approximately \$2,000,000. Alternative 2 involved constructing an embankment across the Park River. It provided 15,500 acre-feet of storage at approximately \$2,600,000. The report, which was completed in July 1995, recommended against implementation due to the high costs.

Lower Mauvais Coulee Improvements, Ramsey and Benson Counties - The purpose of the study was to identify areas of restriction and propose corrective measures to reduce flooding. Three alternatives were looked at. Alternative 1 looked at reducing vegetation at a cost of \$10,000; Alternative 2 included installing four new bridges and a control structure at Lake Irvine, at a cost of \$706,000; and Alternative 3 looked at Alternative 1 and Alternative 2, as well as improvements from structure 4 to Little Coulee, at a cost of \$930,000. Alternative 2 was selected. Construction was scheduled for late 1995.

Silver Lake, Sargent County - The report investigated raising Silver Lake by 2 feet, and constructing a fish barrier between the lake and the Wild Rice River. The report recommended raising the lake 2 feet at a cost of \$73,000. The county is pursuing the project.

Lake Elsie, Richland County - The purpose of the investigation was to establish the outlet elevation and give guidance on how to stabilize the water table at Hankinson. The survey and report were completed, and project development is pending land acquisition by the water resource district.

Sykeston Dam, Wells County - An investigation was completed on improving the Sykeston Dam recreation area by increasing the depth of a portion of the reservoir. Total project cost was estimated at \$80,000, and project construction is scheduled for late 1995.

Sawyer Flood Control, Ward County - The purpose was to find alternatives to reduce the flooding from a coulee. It was recommended that they construct a combination drop inlet for approximately \$40,000 and utilize upstream storage.

English Coulee, Grand Forks County - A hydraulic model study was completed to verify that the diversion channel met federal design standards for flood insurance purposes. Approximately \$200,000 of modifications were recommended.

Danzig Dam, Morton County - The purpose was to increase the recreational opportunities and reduce fishkill. Estimated costs of dredging were in excess of \$1,000,000, and Morton County decided against proceeding.

West Peterson Coulee, Ward County - The purpose was to reduce flooding from the coulee located in northwest Minot. Two alternatives were investigated. The first looked at diverting water from the watershed at a cost of \$500,000; and the second looked at diverting approximately one-half of the watershed at a cost of \$250,000.

Design and Construction

During the 1993-95 biennium, major construction-maintenance activities were performed at the following water resource facilities by the Commission's force account crew:

Braddock Dam, Emmons County, June-July 1993 - A low-level drawdown system was installed by using the existing irrigation system. Total project costs of \$11,262 were shared equally by the State Game and Fish Department, the State Water Commission, and the Emmons County Water Resource District.

Welk Dam, Emmons County, June-July 1993 - The entire structure was resurfaced with gunite. Total project costs of \$23,112 were shared equally by the State Game and Fish Department, the State Water Commission, and the Emmons County Water Resource District.

Augustadt Dam, Traill County, August 1993 - Installed a low-level drawdown system. Total project costs of \$13,480 were shared equally by the Traill County Water Resource District and the State Water Commission.

Armourdale Dam, Towner County, August-Sept 1993 - Installed a low-level drawdown system. Total project costs of \$36,474 were shared by the State Game and Fish Department, the State Water Commission, and the Towner County Water Resource District.

Sykeston Dam, Wells County, October 1993 - Installed a low-level drawdown system. Total project costs of \$35,220 were shared equally by the State Game and Fish Department, the State Water Commission, and the Wells County Water Resource District.

Belfield Dam Rehabilitation, Stark County, October 1993 - June 1994 - Belfield Dam was originally constructed just after the turn of the century by the railroad as a source of water for steam locomotives. After the conversion to diesel engines, the dam was turned over to the city. As time progressed, the reservoir partially filled with sediment and the dam was abandoned.

In May of 1990, the Stark County Water Resource District requested the State Water Commission to investigate the feasibility of reconstructing the dam. After a geotechnical investigation of the site and other study results in 1992, the District asked the Commission to proceed with final design and construction. Construction operations began October 18, 1993, and the project was completed June 3, 1994.

The city of Belfield has recently announced its intentions to develop the site into a public recreation area. Recreation features include a 9-hole golf course, two miles of bicycle and walking paths, an archery range, and rodeo grounds. The total project costs of \$91,116 were shared equally by the State Game and Fish Department, the State Water Commission, and the Stark County Water Resource District.

Clausen Springs Dam, Barnes County, July 1994 - Installed a low-level drawdown system with a mid-operation of new experimental stop log feature. Total project costs of \$15,850 were shared equally by the State Game and Fish Department, the State Water Commission, and the Barnes County Water Resource District.

Dead Colt Creek Dam, Ransom County, August-September 1994 - Installed a seep water pumpback system. Total project costs of \$38,766 were shared equally by the State Game and Fish Department, the State Water Commission, and the Ransom County Water Resource District.

McGregor Dam, Williams County, September 1994 - Performed emergency repairs to the outlet-end of the principal spillway pipe. Total project costs of \$5,217 were shared equally by the State Game and Fish Department, the State Water Commission, and the Williams County Water Resource District.

Kota-Ray Dam, Williams County, September-October 1994 - Performed repairs and modifications to the downstream slope and plunge pool. Total project costs of \$26,856 were shared equally by the State Game and Fish Department, the State Water Commission, and the Williams County Water Resource District.

Braddock Dam, Emmons County, June 1995 - A new sheet piling dissipator structure was installed downstream of Braddock Dam. Total project costs of \$13,448 were shared equally by the State Game and Fish Department, the State Water Commission, and the Emmons County Water Resource District.

Minor Maintenance Activities

In addition to the aforementioned projects, the Commission's force account crew performed maintenance and minor repairs to the following projects. The crew also repaired and modified several USGS gaging stations.

Project Name	County	Date Work Performed	SWC Costs
Kota Ray Dam	Williams	11/93	\$835
Warsing Dam	Eddy	11/93	\$3,042
Strawberry Lake	McLean	6/94	\$570
Kota Ray Dam	Williams	6/94	\$1,010
Epping Dam	Williams	6/94	\$685
Hungry Gulch	Williams	9-10/94	\$11,400
Pheasant Lake	Dickey	6/95	\$924
Wilson Dam	Dickey	6/95	\$645
L. Darling Gag. Sta.	Ward	7/93	\$4,500
Antelope Gag. Sta.	Grant	9/94	\$770
Sheyenne Gag. Sta.	Barnes	11/94	\$2,005
Wintering River Gaging Station	McHenry	11/94	\$3,220

Snagging and Clearing Projects

Beaver Creek Snagging and Clearing, Emmons County - Bids were opened January 30, 1992, for snagging and clearing 10.35 river miles on Beaver Creek in Emmons County. After several years of open water and poor ice conditions within the channel banks, field operations had to be suspended before contract work was completed. Construction began in March of 1992, and the final inspection was conducted March 28, 1994.



Construction at Braddock Dam in Emmons County.

Sheyenne River Snagging and Clearing, Barnes and Ransom Counties - State Water Commission staff provided engineering and construction inspection of Sheyenne River snagging and clearing projects in Barnes and Ransom Counties. The Natural Resources Conservation Service provided construction funding through the Emergency Watershed Protection Program. Two reaches were completed in Barnes County for a total length of 10.5 river miles. Six reaches were completed in Ransom County for a total length of 14.1 miles.

Wild River Snagging and Clearing, Cass County (Winter of 1994-95) - The State Water Commission also provided the engineering for snagging and clearing along the Wild Rice River in Cass County. The construction cost was \$32,400 for the 4-mile reach. The project was completed in February 1995.

Dam Safety Inspections

Under the state's dam safety program, a total of 59 dams were inspected and reports were prepared. Of the 59 dams, 12 were considered to be high hazard; 29 were medium hazard; and the remaining 18 dams were considered to be low hazard.

Project Name	County	Hazard
Sweetbriar Creek Dam	Morton	Medium
Daub Dam	Oliver	Medium
Bourbanais Dam	Cavalier	Medium
Herzog Dam	Pembina	Medium
Sykeston Dam	Wells	Medium
Upper Turtle River No. 9	Grand Forks	High
Vigness Dam	Walsh	Low
Sweetbriar Creek Dam	Morton	Medium
Sheep Creek Dam	Grant	Low
Daub Dam	Oliver	Medium
Queen City Dam	Stark	Medium
Burlington Dam No. 1	Ward	High
McGregor Dam	Williams	High
Tioga Dam	Williams	High
Blacktail Dam	Williams	Medium
Arnegard Dam	McKenzie	Low
Armourdale Dam	Towner	Low
Neché Dam	Pembina	Medium
Hunter Dam	Cass	High
Clausen Springs Dam	Barnes	High
Camel Butte Dam	Morton	Medium
Odland Dam	Golden Valley	Low
North Lemon Lake Dam	Adams	Medium
Big Coulee Dam	Towner	Medium
White Earth Dam	Mountrail	Medium
Epping Dam	Williams	Medium
Short Creek Dam	Burke	Low
Mott Watershed Dam	Hettinger	High
Nelson Lake Dam	Oliver	High
McVile Railroad Dam	Nelson	Medium
Jund (Zeeland) Dam	McIntosh	Low
Dead Colt Creek Dam	Ransom	Medium
LaMoure City Dam	LaMoure	Low
Lake LaMoure	LaMoure	Medium
Lisbon Dam	Ransom	Medium
Glen Ullin RR Dam No. 1	Morton	Medium
Glen Ullin RR Dam No. 2	Morton	Medium
Clausen Springs Dam	Barnes	High
Crown Butte Dam	Morton	Medium
Big Coulee Dam	Towner	Medium
Senator Young Dam	Cavalier	High
Jamestown Dam	Stutsman	High
Pipestem Dam	Stutsman	High
Grand Forks Riverside Dam	Grand Forks	Medium
Knodle Dam	Wells	Low
Sellie Dam	Wells	Low
Valley City Mill Dam	Barnes	Medium
Tolna Dam No. 1	Nelson	Medium
Kota Ray Dam	Williams	Low
Metigoshe Lake Clean Out	Bottineau	Low
Iverson Dam, Marvin	Williams	Low
Williams Creek Dam	Golden Valley	Low
Danzig Dam	Morton	Medium
Stewart Lake Dam (Exist)	Slope	Low
Stewart Lake Auxiliary	Slope	Low
Belcourt Dam (BIA)	Rolette	Medium
Baukol-Noonan Dam	Divide	Low
Porsborg Dam	Morton	Medium
Williams Dam, Roger	Burleigh	Low

Municipal, Rural, and Industrial Water Supply

The Garrison Diversion Municipal, Rural, and Industrial (MR&I) water supply program in federal fiscal years 1994-95, received \$31.1 million of federal funds for the development of water supply facilities in the state. This brought the total received from the federal government to \$114.1 million, since the program was authorized in 1986. A total of 132 applicants have requested assistance through the MR&I program. Of these, 31 projects have been approved for MR&I funding by the Garrison Diversion Conservancy District and the State Water Commission.

Twenty-three projects have been completed, including Abercrombie, Agassiz Water Users, Cavalier, Crown Butte, Englevale, Garrison Rural Water, Grandin, Gwinner, Hankinson, Kindred, Langdon Rural Water, McLean-Sheridan Rural Water, Minto, Missouri West Water Phase I, New Town, North Valley Water Association, Ramsey Rural Water, Riverview Heights, Riverside Park Dam, Rugby Phase I, Stanley, Tolna, and Tri-County Water Users. Seven more projects were in the design and/or construction at the end of the biennium, including Fargo, Burleigh Water Users, Grand Forks, Langdon, Dickey Rural Water, Missouri West Phase II, and Southwest Pipeline Project.

The total estimated cost of the 132 projects is \$480 million. This cost includes \$120 for the Northwest Area Water Supply Project and \$150 million for the Southwest Pipeline Project.

Red River Office (West Fargo)

During the 1993-95 biennium, the one-person Red River office coordinated State Water Commission activities in eastern North Dakota, and provided the following specific services:

1) Provided engineering for the construction of snagging and clearing projects. Contracts were awarded for 4.0 river miles on the Wild Rice River in Cass County, 14.7 river miles on the Sheyenne River in Barnes County, and 14.1 river miles on the Sheyenne River in Ransom County.

2) Provided technical assistance to the Red River Joint Water Resource District in pursuing flood control projects in the Red River watershed. Reconnaissance level studies of potential dams were completed. The office also assisted various water resource boards on drainage problems and other water related issues. Inspections were also

made on various projects that the State Water Commission had approved for cost-sharing.

3) Represented the State Water Commission on the hydrology and hydraulics work committee for the cumulative EIS being developed for flood control impoundments with the Red River watershed in Minnesota; and the technical committee overseeing the Corps of Engineers UNET analysis of potential flood damage reduction projects consisting of a levee system along the Red River and tributaries extending downstream from Grand Forks.

Southwest Pipeline Project

During the biennium, the Southwest Pipeline served as Dickinson's water supply, while construction efforts continued to expand it into a truly regional resource. By December 1994, the project had extended service to Golden Valley, Dodge, Halliday, Dunn Center, Richardton, Taylor, Gladstone, New England, Regent, and Mott. Of these 10 cities, 7 had been under orders from the U.S. Environmental Protection Agency to correct their water supply's excessive fluoride content. Achieving timely compliance with those orders was a major goal of the project's development plan.

Project development beyond that point has included a large effort to serve rural users. By the end of the biennium, construction contracts were in place to serve 4 more communities (Belfield, South Heart, New Hradec, and Manning), and approximately 1,100 rural users.

Rural water construction also included a pilot project under the PL-566 authority of the Natural Resources Conservation Service. This project involved a rural water distribution system around the city of Taylor, with a special emphasis on livestock watering. This system was nearing completion during the 1995 construction season, and when complete, will serve approximately 120 users. The Natural Resources Conservation Service provided 38.5 percent of the construction costs, and all the design and construction phase engineering.

Capital repayments into the Resources Trust Fund for the biennium totaled \$515,141.

The 1993 and 1994 annual operating reports for the project are available from the State Water Commission.

During the biennium, detailed planning began on the process of transferring the operation and maintenance functions of the project to the Southwest Water Authority. January 1, 1996, was chosen as the target date for the transfer. This will involve transferring the current operations staff and operating funds from the State Water Commission to the Southwest Water Authority. After the transfer, all operations and maintenance actions will be performed by the Authority's staff, and O&M expenses will be paid by the Authority with fees collected directly from the users. Ultimately, this will result in a highly responsive and efficient management arrangement. The State of North Dakota will, however, maintain ownership of the project works.

Northwest Area Water Supply Project (NAWS)

During the biennium, the Northwest Area Water Supply (NAWS) project prefinal design was completed. The final report, in two volumes, was received after the end of the biennium. The total expenditure on the prefinal design during the biennium was \$568,555.

In the fall of 1994, the 38 communities and 10 rural water systems which had signed NAWS Agreements of Intent to Receive Water, were offered a NAWS Water Service Agreement. The agreement specified the terms and conditions for receiving water from the project. A total of 15 signed agreements were received by the deadline in January of 1995. Fourteen of these were from cities and one was from a rural water system. Other rural water systems have also indicated that they would like to sign the agreements and

may eventually do so. The total population represented by these signed agreements is approximately 63,000 persons. The estimated cost to serve these communities and rural water systems is approximately \$110 million.

In September 1994, the Garrison Diversion Consultative Group met in Ottawa, Ontario, Canada, to discuss requirements of the Boundary Waters Treaty as they relate to the NAWS project. Acting upon a recommendation by an Engineering and Biology Task Force of the Garrison Joint Technical Committee, (made up of representatives of Canada and the United States), the Consultative Group stated that the NAWS project would be potentially acceptable to Canada, from the standpoint of biota transfer, if it could be shown that pretreatment of the Missouri River water within the Missouri River Basin would meet the 1994 disinfection standards of the Environmental Protection Agency's Surface Water Treatment Rule. This rule requires 4 log (99.99 percent) inactivation of virus, and 3 log (99.9 percent) inactivation of *Giardia* cysts.

A series of tests was commissioned to determine whether the requirements set by the Consultative Group were achievable. Water samples were collected from both Lake Sakakawea and Audubon in November of 1994, and January, March, May, and August of 1995. The samples were tested for survival of virus and *Giardia* cysts after exposure to both chloramine and ozone. Preliminary results indicate that these requirements can be met. Final design is scheduled to begin in 1996.

Page 24 is a blank page in the original report.

State Water Commission

Funding Sources
for Biennial Period Ending June 30, 1995

FUNDING SOURCE	APPROPRIATION	EXPENDITURES	BALANCE
General Fund	\$5,566,618	\$5,517,228	\$ 49,390
Federal Fund	32,775,404 ¹	16,905,602	15,869,802
Special Fund	15,983,490 ²	10,758,473	5,225,017
TOTAL	\$54,325,512	\$33,181,303	\$21,144,209

1 Actual federal revenue was \$16,031,312.

2 Actual special fund revenue was \$11,108,631.

State Water Commission

Program Budget Expenditures for Biennial Period Ending June 30, 1995

AGENCY PROGRAM	SALARIES & WAGES	INFORMATION SERVICES	OPERATING EXPENSE	EQUIPMENT	CONTRACTS	PROGRAM TOTAL
ADMINISTRATIVE SERVICES						
Budget	\$622,340	\$75,792	\$293,465	\$11,600	\$0	\$1,003,197
Expended	\$608,677	\$74,046	\$281,119	\$11,390	\$0	\$975,232
Percentage	98	98	96	98	0	97
PLANNING AND EDUCATION						
Budget	\$613,608	\$0	\$142,264	\$17,550	\$25,000	\$798,422
Expended	\$588,573	\$0	\$124,266	\$17,413	\$25,000	\$755,252
Percentage	96	0	87	99	100	95
WATER APPROPRIATION						
Budget	\$2,178,891	\$3,955	\$408,500	\$49,600	\$660,000	\$3,300,946
Expended	\$2,180,279	\$300	\$385,361	\$49,424	\$618,333	\$3,233,697
Percentage	100	8	94	100	94	98
WATER DEVELOPMENT						
Budget	\$2,509,384	\$2,500	\$316,700	\$82,100	\$8,612,509	\$11,523,193
Expended	\$2,496,947	\$0	\$304,145	\$81,296	\$5,411,720	\$8,294,108
Percentage	100	0	96	99	63	72
ATMOSPHERIC RESOURCES						
Budget	\$393,452	\$2,500	\$1,700,701	\$10,500	\$3,050,000	\$5,157,153
Expended	\$363,456	\$1,611	\$909,836	\$8,704	\$927,692	\$2,211,298
Percentage	92	64	53	83	30	43
SOUTHWEST PIPELINE						
Budget	\$727,047	\$9,000	\$4,617,020	\$55,000	\$26,600,000	\$32,008,067
Expended	\$690,297	\$9,351	\$3,714,724	\$52,228	\$12,710,581	\$17,177,180
Percentage	95	104	80	95	48	54
CONTRACT CARRYOVER						
Budget	\$0	\$0	\$0	\$0	\$500,000	\$500,000
Expended	\$0	\$0	\$0	\$0	\$500,000	\$500,000
Percentage	0	0	0	0	100	100
RISK MANAGEMENT PREMIUM						
					\$34,534	\$34,534
AGENCY TOTALS						
Budget	\$7,044,722	\$93,747	\$7,478,650	\$226,350	\$39,447,509	\$54,290,978
Expended	\$6,928,228	\$85,308	\$5,719,451	\$220,456	\$20,227,860	\$33,181,303
Percentage	98	91	76	97	51	61

State Water Commission

1993-1995 Grants Summary

PROGRAM/ PROJECT	RESOURCES TRUST FUND	GENERAL FUNDS	FEDERAL FUNDS	OTHER FUNDS	CARRYOVER	TOTALS
Inter Basin Transfer Studies		\$25,000				\$25,000
Hydrologic Investigations	600,000			\$60,000		\$660,000
MR&I Program	\$3,106,110				\$500,000	\$3,606,110
EPA Wetlands Grant			\$564,299			\$564,299
NAWS	\$50,000					\$50,000
Devils Lake Feasibility Study	\$500,000					\$500,000
Maple River Dam	\$326,610					\$326,610
Southwest Pipeline	\$1,525,678					\$1,525,678
General Projects	\$2,417,811		\$26,000	\$96,000		\$2,539,811
SWC GRANTS TOTAL	\$8,526,209	\$25,000	\$590,299	\$156,000	\$500,000	\$9,797,508

State Water Commission

Grants Programs/Projects Authorized July 1, 1993 - June 30, 1995

SWC PROJ. NO.	NAME	DATE APPROVED	AMOUNT APPROVED	PAYMENTS	BALANCE
PLANNING AND EDUCATION DIVISION					
1828	Inter Basin Transfer Studies		<u>\$25,000</u>	<u>\$25,000</u>	<u>\$0</u>
	PLANNING AND EDUCATION DIVISION TOTALS		\$25,000	\$25,000	\$0
WATER APPROPRIATION DIVISION					
1395	Hydrologic Investigations USGS Data Collections: FY '94 & FY '95		\$656,000	\$614,333	\$41,667
1389	High Value Irrigated Crop Development		<u>4,000</u>	<u>4,000</u>	<u>0</u>
	WATER APPROPRIATION DIVISION TOTALS		\$660,000	\$618,333	\$41,667
WATER DEVELOPMENT DIVISION					
MR&I PROGRAM					
237-5	Ramsey County Rural Water	9-15-92	\$1,094,259	\$1,094,259	\$0
237-27	Missouri West	9-15-92	1,473,949	1,427,623	46,326
237-36	Stanley	10-21-91	513,672	311,578	202,094
237-42	Garrison Rural Water	9-15-92	<u>524,230</u>	<u>522,130</u>	<u>2,100</u>
	MR&I SUBTOTAL		\$3,606,110	\$3,355,590	\$250,520
SPECIAL PROJECTS					
237-4	NAWS	2-4-92	\$50,000	\$0	\$50,000
416-1	Devils Lake Flood Control	2-4-92	438,000	76,512	361,488
1712	Frequency Analysis Devils Lake	10-26-93	62,000	0	62,000
1344	Maple River Flood Control	2-4-92	326,610	72,001	254,609
1736	Southwest Pipeline Project	2-4-92	<u>1,525,678</u>	<u>1,525,678</u>	<u>0</u>
	SPECIAL PROJECTS SUBTOTAL		\$2,402,288	\$1,674,191	\$728,097
EPA WETLANDS GRANT					
1489-5	Wetlands Education	9-15-92	\$65,821	\$65,821	\$0
	Technical Services		8,873	8,873	0
	Water Quality Analysis		14,325	14,325	0
	Grand Harbor		57,587	57,587	0
	Private Lands		26,955	26,955	0
	Devils Lake Basin (Conservation Plan)		22,738	22,738	0
	Adopt-a-Pothole		25,000	25,000	0
1489-9	Devils Lake Basin (Midwest Flood)		50,000	49,823	177
1489-7	Health Dept.		27,000	27,000	0
	Water Education Foundation		50,000	50,000	0
	Game & Fish (CRP)		16,389	10,470	5,919
	Game & Fish (Private Lands)		34,611	34,611	0
1500	Devils Lake		45,000	26,250	18,750
	Water Education Foundation		63,000	51,891	11,109
	Game & Fish		<u>57,000</u>	<u>0</u>	<u>57,000</u>
	EPA WETLANDS GRANT SUBTOTAL		\$564,299	\$471,344	\$92,956

SWC PROJ. NO.	NAME	DATE APPROVED	AMOUNT APPROVED	PAYMENTS	BALANCE
WATER DEVELOPMENT DIVISION (continued)					
GENERAL PROJECTS					
237	Garrison Consultant (91-93) (F)	8-22-91	\$7,842	\$7,842	\$0
1803	Belfield Flood Control (Stark)	12-20-91	38,800	0	38,800
662	Park River Snagging & Clearing (Walsh)	4-2-92	10,117	0	10,117
662	Park River #2 Snagging & Clearing (Walsh)	5-23-92	4,625	0	4,625
1496	Lake Elsie (Richland) (F)	8-5-92	11,500	2,811	8,689
1292	Willow Road Floodway (Morton) (F)	8-26-93	32,641	32,641	0
300	Baldhill Dam Safety Project (Barnes)	9-15-92	184,000	140,000	44,000
1311	Bingham CAT (Traill)	9-15-92	4,900	0	4,900
1311	Elm CAT (Traill) (F)	9-15-92	5,590	5,590	0
237	ND Water Coalition (F)	12-9-92	10,000	10,000	0
1815-4	Sheyenne River Snagging & Clearing (Ransom)	12-9-92	4,836	0	4,836
1842-4	Wild Rice Snagging & Clearing (Richland)	12-9-92	725	0	725
1751-H	Lower Forest River FP (Walsh)	1-26-93	5,200	0	5,200
1751-C	Williston Floodplain (Williston) (F)	2-24-93	1,000	1,000	0
1804	Grand Harbor #1 (Ramsey)	4-6-93	20,640	0	20,640
237	Garrison Consultant (93-95)	7-2-93	40,000	38,645	1,355
1832	Hammer-Sullivan (Ramsey)	7-2-93	21,231	0	21,231
1840	North Loma (Cavalier)	7-9-93	7,960	0	7,960
543	North Lemmon Lake Dam (Adams) (F)	7-8-93	9,933	9,933	0
263	Patterson Lake Management (Stark) (F)	8-24-93	500	500	0
266	Tolna Dam (Nelson)	9-28-93	2,000	0	2,000
1588-1	International Coalition (F)	10-26-93	10,000	10,000	0
1392	Missouri River Master Manual Review (F)	10-20-93	1,413	1,413	0
1865	Belfield Dam (Stark)	11-19-93	62,000	60,999	1,001
1577	Langdon Floodplain Mgmt Study (Cavalier)	12-20-93	4,100	0	4,100
1245	Nelson Drain (Traill)	12-8-93	37,627	0	37,627
1826	Wetlands Trust (F)	12-8-93	3,330	3,330	0
1545	Drain #72 Lat C (Richland)	12-8-93	10,017	9,844	173
1816-5	Sheyenne River Snagging & Clearing (Barnes)	1-19-94	8,500	0	8,500
1868-4	Wild Rice Snagging & Clearing (Cass)	1-25-94	5,875	0	5,875
1346	Mt Carmel Dam (Cavalier)	3-9-94	370,000	12,580	357,420
222	Buford-Trenton Irrigation (Williams)	4-7-94	39,240	17,328	21,912
1270	Hay Creek Watershed (Burleigh)	4-22-94	9,750	9,750	0
1875	Castle Rock (Hettinger)	5-3-94	6,000	0	6,000
820	Oak Creek Snagging & Clearing (Bottineau)	5-17-94	475	475	0
1701-2	Red River UNET Study (Walsh) (F)	5-23-94	6,250	2,917	3,333
1614	Lower Mauvais Coulee (Benson-Ramsey)	7-27-94	41,800	0	41,800
1730	Sec 22 COE St Paul (Phase I Statewide) (F)	10-5-94	5,200	5,200	0
AOC/TIC	International Coalition (F)	10-14-94	10,000	10,000	0
870	Crown Butte Dam (Morton) (F)	11-9-94	6,838	6,838	0
1272	Wenegeler WPA (Cavalier) (F)	11-25-94	2,000	2,000	0
1826	Wetlands Trust (F)	12-7-94	15,000	15,000	0
1730	Section 22 (UNET FY 95) (F)	12-7-94	11,600	11,600	0
AOC/WEF	ND Water Magazine	12-7-94	18,000	9,000	9,000
300	Baldhill Dam (Barnes)	1-27-95	10,000	2,799	7,201
237	Garrison Consultant (95-97)	2-9-95	25,000	12,672	12,328
1132	McHugh Slough (Nelson)	6-5-95	10,000	0	10,000
1351	English Coulee (Grand Forks)	4-26-95	<u>100,000</u>	<u>0</u>	<u>100,000</u>
GENERAL PROJECTS SUBTOTAL			\$1,254,055	\$452,707	\$801,349
Shortfall in Projected Revenue			1,239,343	0	1,239,343
Unallocated Balance (Projected-Approved-Shortfall)			46,413	0	46,413
WATER DEVELOPMENT DIVISION TOTALS			\$9,112,508	\$5,953,831	\$3,158,677
ALL FUNDS TOTALS			\$9,797,508	\$6,597,164	\$3,200,344

State Water Commission

Object Expenditures for Biennial Period Ending June 30, 1995

Permanent Salaries	\$ 4,934,341
Temporary Salaries and Overtime Salaries	525,826
Fringe Benefits	1,468,061
Data Processing Service	85,308
Intergovernmental Services	23,816
Payments to State Motor Pool	240,495
Employee Travel	297,532
Utilities	237,998
Postage	31,299
Telephone Services	15,375
Leases/Rental	113,694
Dues and Professional Development	107,889
Operating Fees and Services	1,019,266
Repair Services - Non-Contract	32,824
Repair Services - Contract	12,065
Professional Services (Includes Southwest Pipeline)	3,026,185
Insurance	14,497
Risk Management Premium	34,534
Office Supplies	22,478
Data Processing Supplies	84,484
Printing	54,802
Resource and Reference Materials	46,654
Scientific Supplies	119,377
Building/Equipment Supplies	204,795
Equipment Maintenance/Other Supplies	13,926
Office Equipment/Furniture	149,786
Machinery, Implements and Tools	47,745
Scientific Equipment	22,925
Land/Buildings/Other	70,212
Contract Payments (Includes Southwest Pipeline)	12,869,074
Water Resources Grants	6,326,348
Cooperative Research	<u>927,692</u>
TOTAL	\$33,181,303

Resources Available from the Agency

Minutes of meetings held may be obtained by writing to:

ND State Water Commission
State Office Building
900 East Boulevard Avenue
Bismarck, ND 58505-0850

Data available for public use includes:

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| <ul style="list-style-type: none"> • Government Land Office Plats • Survey Horizontal and Vertical Control • Various Ground-Water Studies • Growing Season Rainfall Data | <ul style="list-style-type: none"> • Water Permit Data • Drainage Permit Data • Stream Flow Data |
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