BIENNIAL REPORT

JULY 1, 2017 - JUNE 30, 2019

NORTH Dakota | Water Commission

Be Legendary.™

December 1, 2019

Governor Doug Burgum
600 East Boulevard Avenue
Bismarck, ND 58505-0001

Secretary of State Al Jaeger
600 East Boulevard Avenue
Bismarck, ND 58505-0001

RE: 2017-2019 Biennial Reports, N.D.C.C. § 54-06-03; N.D.C.C. § 54-06-04; and other applicable laws.

Dear Governor Burgum and Secretary of State Jaeger:

On behalf of the State Water Commission and the Office of the State Engineer, I am pleased to present our Biennial Report for the period of July 1, 2017, through June 30, 2019.

This report highlights key events, accomplishments, and other pertinent activities of the State Water Commission and Office of the State Engineer during the last biennium, for your information and consideration.

Respectfully submitted,

Garland Erbele, P.E.
Chief Engineer-Secretary and State Engineer

TABLE OF CONTENTS

HISTORY & MANDATES

The Office of the 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 Engineer and Secretary to the Commission.

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.

ORGANIZATION

The State Water Commission (SWC or Commission) consists of the Governor as chairman, the Commissioner of Agriculture as an ex-officio member, and eight members who are appointed by the Governor to serve staggered terms of six years each. The terms of office for appointees are arranged such that two terms and not more than three terms shall expire on the first day of July of each odd numbered year. The Commission appoints a Secretary (the State Engineer) as its executive officer, who employs a staff as needed to carry out the work of the Commission.

The State Water Commission is located at 900 East Boulevard Avenue near the State Capitol in Bismarck, North Dakota. In addition, the Commission has field offices in Fargo, Minot, and Minnewaukan.

AGENCY POLICIES

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

- Administer the water laws of the state.
- Prepare and maintain a comprehensive plan for future growth and development, and to direct project development in accordance with that plan.
- Conduct studies to determine the availability and occurrence of the ground and surface waters of the state for the purpose 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 of water resources.
- Assist in the organization of various legal entities through which water resource projects can be sponsored and operated.
- Administer water information/education programs to enhance understanding of the state's water resources.
- Coordinate with federal, state, and local entities in water resources management and development.
- Represent the interests of the state in water resource matters in national, state, regional, and international forums.
- Conduct commissioner-hosted meetings in the Upper Red River, Lower Red River, James River, Mouse River, Upper Missouri River, Lower Missouri River, Little Missouri River, and Devils Lake drainage basins. At those meetings, commissioners and staff may outline cost-share and project prioritization policy modifications or requirements, State Water Plan and budgeting requirements, cost-share policy updates, and project inventory procedures as necessary. Commissioners may also request supplemental information or presentations from project sponsors who have submitted projects as part of the State Water Plan and budget development process.

PRINCIPAL AGENCY ACTIVITIES

- Develop Missouri River water in ways that will secure North Dakota's share of Missouri River flows for our current and future needs.
- Implement plans for the distribution of Missouri River water through regional water supply systems such as the Southwest Pipeline Project, Northwest Area Water Supply Project, and Red River Valley Water Supply Project.
- Manage and develop North Dakota's water resources to facilitate economic development and improve quality of life for current and future generations.
- Promote and provide water supplies needed for the expansion and diversification of North Dakota's agricultural industry.
- Complete detailed studies and research that more precisely define the nature and occurrence of water to optimize its conservation and development throughout the state.
- Maintain a water development project inventory to promote efficiency in meeting North Dakota's future water development and funding needs.
- Continue to implement the state's three-pronged approach to solving the Devils Lake area's flooding problems.
- Develop policies and initiatives that will stimulate progress toward developing flood control measures wherever feasible.
- Pursue cooperative efforts with neighboring states and provinces to plan for beneficial water management of shared water resources.
- Cooperate with agencies that have regulatory authority over North Dakota's waters to protect and enhance the quality of North Dakota's water resources and related ecosystems.
- Enforce weather modification standards, conduct research, and supervise operational cloud seeding programs for hail suppression and rainfall enhancement.
- Provide water education for North Dakota's teachers, youth, and general public.
- Promote expanded development of North Dakota's water-based recreation resources.
- Collect water resource data for the purpose of identifying the location, condition, and temporal changes of the water resources of the state.
- Disseminate water resource information to the general public, businesses, and government agencies.
- Manage state water resources and sovereign lands within the framework of North Dakota's Century and Administrative Codes.
- Conduct or review economic and life cycle cost analyses as required by policy and statute.

WATER RESOURCES LEGISLATION

HOUSE BILL NO. 1085

Removed limitations on the cost reimbursement amount an applicant can submit for the drought disaster livestock water assistance program. The bill was declared to be an emergency measure and became effective March 6, 2019.

HOUSE BILL NO. 1087

Added agricultural dikes less than two feet [0.61 meters] in height to the list of structures exempted from the requirement that the plans submitted with an application for a permit to construct or modify a dam, dike, or other device have to be completed by a professional engineer.

HOUSE BILL NO. 1202

Defined navigable waters in the state and provided a process for the State Engineer to follow to make navigability determinations.

HOUSE BILL NO. 1377

Amended the state board of water well contractors' composition to include monitoring well contractors; and amended the continuing education requirements to include six hours of board-approved continuing education every two years, and requires two hours of board-approved continuing education for certification renewal as a water well pump and pit-less unit installer. The bill was declared to be an emergency measure and became effective March 28, 2019.

HOUSE BILL NO. 1383

- Amended the requirements of the composition of the Federal Environmental Law Impact Review Committee to remove appointments by the Lignite Energy Council and Petroleum Council. Further, it added appointments by the North Dakota Farm Bureau, the North Dakota Famers Union, the chairman of the Public Service Commission or chairman's designee, the State Engineer or State Engineer's designee, the director of the Game and Fish Department or the director's designee, the director of the Department of Transportation or the director's designee, the director of the Department of Environmental Quality or the director's designee, a representative of an investor-owned utility company, a representative from the North Dakota Association of Rural Electric Cooperatives, and two individuals from the energy community appointed by the Agriculture Commissioner.
- Created an environmental impact mitigation fund and continuing appropriation of $5,000,000 to the Agriculture Commissioner to provide grants to political subdivisions for the mitigation of environmental impacts.
- Amended exclusion and avoidance areas to include prime farmland, unique farmland or irrigated land, and factors to consider in evaluating applications and designations of sites, corridors, and routes to prohibit the Commission from conditioning the issuance of a certificate or permit on the applicant providing a mitigation payment assessed or requested by another state agency or entity to offset a negative impact on wildlife habitat.
- Created a new section on payment to mitigate direct environmental impacts.
- Set the deadline for agencies to present their positions to at least thirty days before the public hearing on the application.

WATER RESOURCES
LEGISLATION

SENATE BILL NO. 2020

- Provided an appropriation to the Water Commission of $968,154,091 and reduced the authorized employees from 93 to 90.
- Allocated funding buckets for water supply, rural water supply, flood control, and general water projects.
- Provided legislative direction on the use of appropriated funds for: the Fargo area flood control (including the Fargo Moorhead diversion), Fargo flood control project downstream impact mitigation, Mouse River flood control, Red River Valley water supply project, and flood control projects other than Fargo area flood control.
- Provided for a pilot project involving implementation of a basin wide plan for flood control projects other than the Fargo area flood control beginning August 1, 2019 and ending June 30, 2021, and requiring the State Water Commission to report to Legislative Management on the results of the pilot project by August 1, 2020.
- Amended the interest rate for loans made from the infrastructure loan fund to be the same rate as the revolving loan fund established under N.D.C.C. § 61-28.1 and § 61-28.2.

SENATE BILL NO. 2090

Amended definitions and added definitions of assignment, conditional water use permit, fossil byproduct water, party of record, perfected water permit, permitholder, point of diversion, priority date, and water right. Created a new subsection requiring a property interest to hold a water permit, and amended permit requirements for water appropriation and appeals of permit application rejections.

SENATE BILL NO. 2091

Amended permissible uses within the flood fringe.

SENATE BILL NO. 2139

Amended State Water Commission cost-share policy requirements; clarified that snagging and clearing projects are eligible for cost-share; amended the composition of the State Water Commission to include an additional member to include the Little Missouri River, upper Heart River, and upper Cannonball River basins; and amended the Commission's powers and duties.

SENATE BILL NO. 2211

Amended ownership of riverbed segments subject to inundation by the Pick-Sloan project. Defined requirements for State Engineer ordinary high watermark determinations for delineating sovereign lands boundaries. The bill was declared to be an emergency measure and became effective May 1, 2019.

SENATE BILL NO. 2295

Created a new section establishing limits on the creation and jurisdiction of irrigation districts, and amended language regarding irrigation districts' ability to assess lands requiring drainage as a result of irrigation.

SENATE BILL NO. 2358

Allows contracts to purchase water from the Red River Valley Water Supply project to exceed 40 years and removed voter approval requirements.

SENATE CONCURRENT RESOLUTION NO. 4009

Directed Legislative Management to consider studying whether water resource boards should evaluate projects on a basin-wide basis.

LEGAL ACTIONS

NAWS Litigation (Manitoba v. Norton/Salazar/Zinke) - In 2005, the Province of Manitoba sued the Secretary of the Department of Interior and officials of the Bureau of Reclamation (Bureau), challenging their compliance with the National Environmental Policy Act (NEPA) in approving a project to transfer water between river basins for the Northwest Area Water Supply (NAWS). North Dakota intervened as a defendant. The United States District Court for the District of Columbia, Government of Manitoba v. Norton, remanded to the Bureau and subsequently entered an order partially granting Manitoba's motion for permanent injunction but allowing certain project-related activities to proceed. Following the Bureau's NEPA analysis, Missouri filed a separate challenge, alleging that the Bureau's Environmental Impact Statement (EIS) did not properly account for cumulative effects of water withdrawal from the Missouri River. Following consolidation of Missouri's and Manitoba's cases, the district court, Government of Manitoba v. Salazar, again remanded to the Bureau. After completion of further NEPA review, the district court granted the Bureau and North Dakota's motions for summary judgment, holding that the supplemental EIS work was adequate, Government of Manitoba v. Zinke. The district court also held that Missouri lacked standing as parens partriae to bring an action against the federal government challenging the NEPA work. Both Manitoba and Missouri appealed, but a settlement was reached with Manitoba. In April 2019, the D.C. Circuit affirmed the District Court's decision that Missouri did not have standing.

Yellowstone Compact Litigation (Montana v. Wyoming and North Dakota) - Montana alleged that Wyoming violated the terms of the Yellowstone River Compact. North Dakota was a party to the action because it is a party to the Yellowstone River Compact. In May 2011, the U.S. Supreme Court issued its opinion on Montana's first exception to the Special Master's report. The Court ruled that Montana's increased-efficiency allegation, failed to state a claim for breach of the Yellowstone River Compact, thereby confirming the Special Master's earlier ruling. In March 2016, the Court ordered and adjudged that Wyoming's motion for partial summary judgment on the notice requirement for damages was granted for the years 1982, 1985, 1992, 1994, and 1998; Wyoming is not liable to Montana for the years 1981, 1987, 1988, 1989, 2000, 2001, 2002, and 2003; Wyoming is liable to Montana for reducing the volume of water available in the Tongue River at the state line between Wyoming and Montana, by 1,300 acre-feet in 2004; Wyoming is liable to Montana for reducing the volume of water available in the Tongue River at the state line between Wyoming and Montana, by 56 acre-feet in 2006; and the case was remanded to the Special Master for determination of damages and other appropriate relief. A summary judgment opinion of the Special Master on Remedies was issued in December 2016. Wyoming's motion for summary judgment regarding damages was granted, subject to Montana's right to pursue a water remedy instead of money, and the right to propose an alternative method of prejudgment interest calculation. Wyoming's summary judgment motion for declaratory relief was denied. Montana's motion for summary judgment was granted – Montana holds an appropriative right under Article V(A) of the Yellowstone River Compact to store up to the pre-1950 capacity of the Tongue River reservoir. Wyoming's motion denying injunctive relief was granted. Wyoming's motion for summary judgment on costs was granted in part, that Montana should not recover any costs subsequent to the filing of the first interim report. Final judgement was entered February 20, 2018.

WOTUS Litigation (State of North Dakota, et al. v. EPA and the Corps of Engineers) - North Dakota has challenged the Waters of the United States (WOTUS) final rule promulgated by the Environmental Protection Agency (EPA) and the U.S. Army Corps of Engineers (Corps) in the June 29, 2015 Federal Register (Clean Water Rule: Definition of "Waters of the United States"). After jurisdictional questions were resolved by the United States Supreme Court, the case is fully briefed and pending in the U.S. District Court for the District of North Dakota. The Corps and EPA plan to repeal the June 2015 rule and propose a new WOTUS definition.

LEGAL ACTION

ACE American Insurance Co. v. James W. Fowler Co. and North Dakota State Water Commission - ACE filed a complaint for declaratory judgment in U.S. District Court, District of North Dakota, regarding payout of insurance proceeds on the collapse incident on the State Water Commission's Southwest Pipeline Project water intake. A settlement was reached between all the parties in January 2019.

Olander Contracting Co. v. North Dakota State Water Commission and Tank Connection, LLC - The Commission entered into a contract with Olander for the Southwest Pipeline Project, New Hradec tank project. The project was not completed within the contract time. Litigation was resolved through mediation.

Fisketjon v. State of North Dakota – Plaintiffs filed a quiet title action to clear title to property located adjacent to the Missouri River. The ordinary high watermark (OHWM) study in the location of the property indicated that the State claimed less property than the Plaintiffs believed the State claimed. The State disclaimed title to the property below the OHWM and the case was dismissed.

North Dakota Office of the State Engineer and North Dakota Board of University and School Lands v. Bureau of Land Management - The Bureau of Land Management (BLM) resurveyed land along the Missouri River to locate the boundary between public domain land owned by the United States and the riverbed owned by the State of North Dakota. The State Engineer and Board of University and School Lands appealed to the U.S. Department of Interior Board of Land Appeals (IBLA) over the BLM's decision to officially file the Supplemental Plats of Survey posted as described in the Federal Register on July 8, 2014. The land is located in Fifth Principal Meridian, Township 154 North, Range 98 West. The appeal remains pending with the IBLA.

Sovereign Lands and Minerals cases – In addition to the BLM case previously discussed, there are a number of on-going cases challenging the state's determination of the Missouri River's ordinary high watermark and ownership of land and minerals beneath the Missouri River.

Administrative cases – The State Engineer was also involved in several administrative cases regarding water appropriation permits, appeal of an order establishing a drain, and appeal of a watercourse determination.

STATE WATER COMMISSION MEMBERS AS OF JUNE 30, 2019

NAME	POSITION	APPOINTED	TERM ENDS
Doug Burgum	Governor-Chairman		
Doug Goehring	Department of Agriculture		
Katie Hemmer	James River Basin	August 10, 2017	June 30, 2019*
Michael Anderson	Lower Red River Basin	August 10, 2017	June 30, 2021
Richard (Dick) Johnson	Devils Lake Basin	August 10, 2017	June 30, 2019*
Dr. Leander McDonald	Lower Missouri River Basin	August 10, 2017	June 30, 2019
Mark Owan	Upper Missouri River Basin	August 10, 2017	June 30, 2021
Matthew Pedersen	Upper Red River Basin	August 10, 2017	June 30, 2023
Jason Zimmerman	Mouse River Basin	August 10, 2017	June 30, 2023

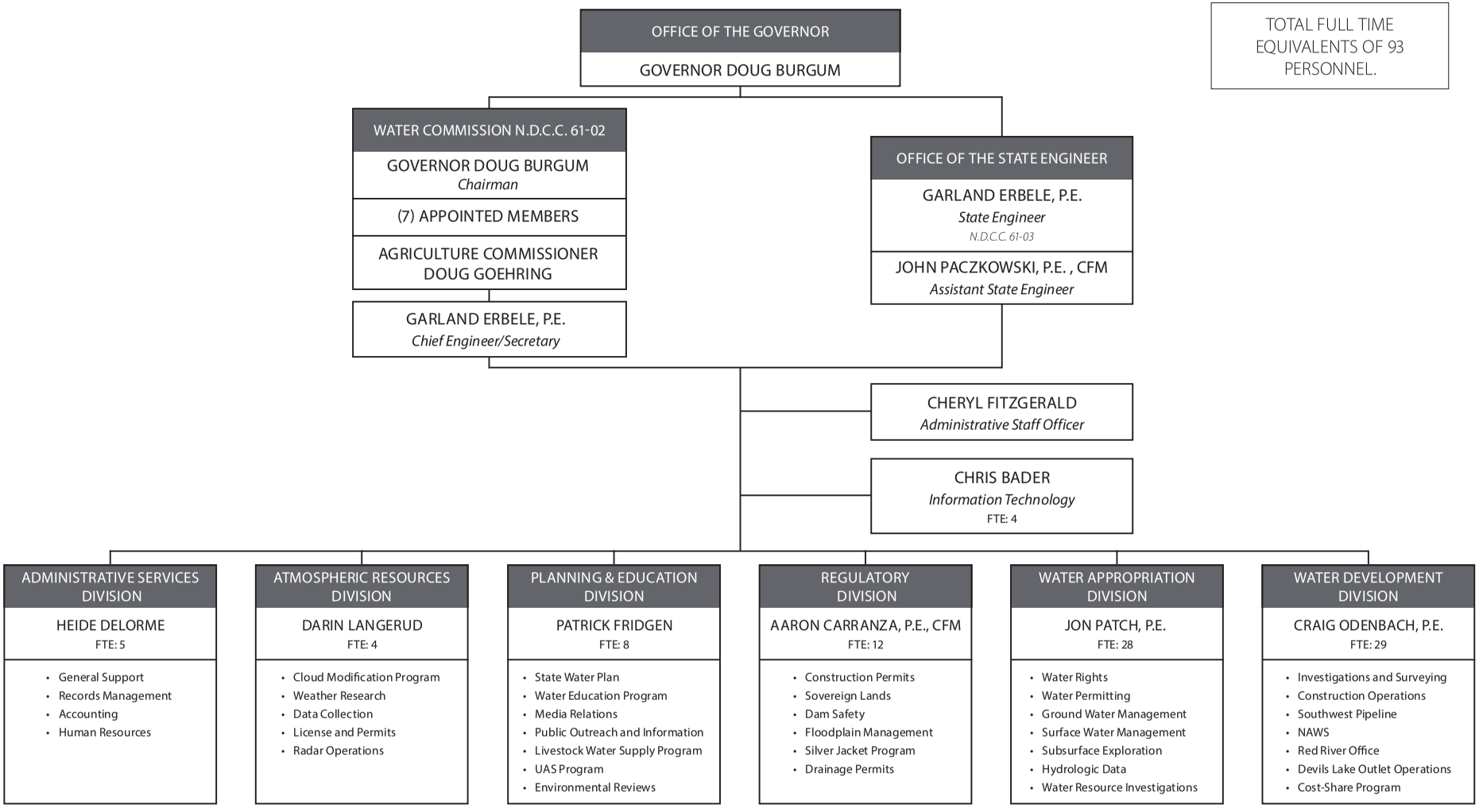
*Reappointed

STATE WATER COMMISSION MEETINGS JULY 1, 2017 THROUGH JUNE 30, 2019

DATE	LOCATION
July 20, 2017	Bismarck
August 23, 2017	Bismarck
October 12, 2017	Bismarck
December 8, 2017	Bismarck
January 11, 2018	Bismarck
February 8, 2018	Bismarck
April 12, 2018	Bismarck
June 14, 2018	Bismarck
August 9, 2018	Bismarck
October 11, 2018	Bismarck
December 7, 2018	Bismarck
February 14, 2019	Bismarck
April 9, 2019	Bismarck
June 19, 2019	Bismarck

NORTH DAKOTA STATE WATER COMMISSION

TOTAL FULL TIME EQUIVALENTS OF 93 PERSONNEL.



STATE WATER COMMISSION EMPLOYEES

ADMINISTRATIVE SERVICES DIVISION

State Engineer: Garland Erbele

Assistant State Engineer: John Paczkowski

Administrative Staff Officer: Cheryl Fitzgerald

Director of Administrative Services: Heide Delorme

Account/Budget Specialist: Sarah Felchle

Human Resource Officer: John Brintnell

Paralegal: Vacant

Records Management Specialist: Karen Heinert

IT Administrator: Christopher Bader

Data Processing Coordinator: Paul Moen

Data Processing Coordinator: Travis Stramer

GIS Specialist: Rodney Bassler

ATMOSPHERIC RESOURCE BOARD

Division Director: Darin Langerud

Executive Staff Officer: Kelli Schroeder

Environmental Sciences Administrator: Mark Schneider

Environmental Scientist: Daniel Brothers

WATER APPROPRIATION DIVISION

Division Director: Jon Patch

Administrative Assistant: Courtney Evoniuk

Hydrologist Managers:
Rex Honeyman, Andrew Nygren, Scott Parkin, Kimberly Fischer, Abigail Franklund, David Hisz

Hydrologists:
Bryce Klasen, Mark Potucek, Bassel Timani Jennifer Martin, Braden Rambo, Alexis Steiner, Vacant

Water Resource Program Administrator:
Chris Colby, Andrew Gorz

Water Resource Engineer: Darin Schepp

Water Resource Senior Manager: James MacArthur

Water Resource Project Manager: Vacant

Engineering Technicians: Kelvin Kunz, Albert Lachenmeier, Neil Martwick, Terry McCann

Rotary Drill Operator: Terry Olson

Equipment Operator: Dan Bahm

PLANNING AND EDUCATION DIVISION

Division Director: Patrick Fridgen

Administrative Assistant: Dawn Martin

Water Resource Education Program Manager:
Tina Harding

Water Resource Planners: Steve Best, Jared Huibregtse

Natural Resource Economist: Duane Pool

Public Information Specialist: Jessie Wald

Graphic Artist: Sheila Fryer

REGULATORY DIVISION

Division Director: Aaron Carranza

Water Resource Engineer Managers:
Karen Goff, Matthew Lindsay

Water Resource Engineers:
Brian Mager, Jordan Woroniecki, Kelsey Huber

Engineer Tech: Chance Nolan

Water Resource Program Administrators:
Dionne Haynes, Gerald Heiser, Laura Horner, Ashley Persinger

Silver Jackets Program Coordinator: Michael Hall

WATER DEVELOPMENT DIVISION

Division Director: Craig Odenbach

Administrative Assistant: Patty Power

Water Resource Engineer Managers:
Laura Ackerman, Timothy Freije, Randy Gjestvang, Jonathan Kelsch, Jeffrey Mattern, David Nyhus, Sindhuja S. Pillai-Grinolds

Water Resource Engineers:
Tim Dodd, Damon Grabow, Jesse Kist, Chris Korkowski, Alexis Faber

Engineering Technicians:
Clint Cogdill, Tom Engberg, Dan McDonald, James Ternes, Bryan Hanson, Jeremy Berreth

Realty Officer: Roger Kolling

Water Resource Senior Managers:
Dale Binstock, Perry Weiner

Maintenance Supervisor: Jeff Trana

General Trades Worker: Del Nordrum

Water Resource Project Manager: Darron Nichols

Water Resource Program Administrator: Beth Nangare

ADMINISTRATIVE SERVICES DIVISION

The Administrative Services Division provides the overall direction of agency powers and duties as described in the state's water laws.

Specific staff responsibilities include:

- The State Engineer and Water Commission's operations;
- Accounting;
- Information Technology;
- Records Management;
- Support services for all agency programs;
- Budget and fiscal control work;
- Agency accounting through the keeping of 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;
- Coordinating water resource programs with federal agencies and other state and local entities; and
- Coordinating contracts and agreements.

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 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. He is on the Board of Directors for the Red River Basin Commission, the Red River Retention Authority, the Upper Missouri Water Users Association, the North Dakota Water Education Foundation, chairman of the Devils Lake Outlet Advisory Board, and the High-Level Radioactive Waste Advisory Council. He also serves as an executive council member of the Western States Water Council, Board of Director's Ex-Officio member of the North Dakota Water Users Association, and a member of the Association of Western States Engineers.

INFORMATION TECHNOLOGY (IT) SECTION

The State Water Commission utilizes IT in almost all aspects of water resource management. The primary responsibility of the IT Section is to provide the technology infrastructure required to support the scientific and regulatory functions, as well as the routine office and back-office automation functions the agency utilizes to meet its stated mission.

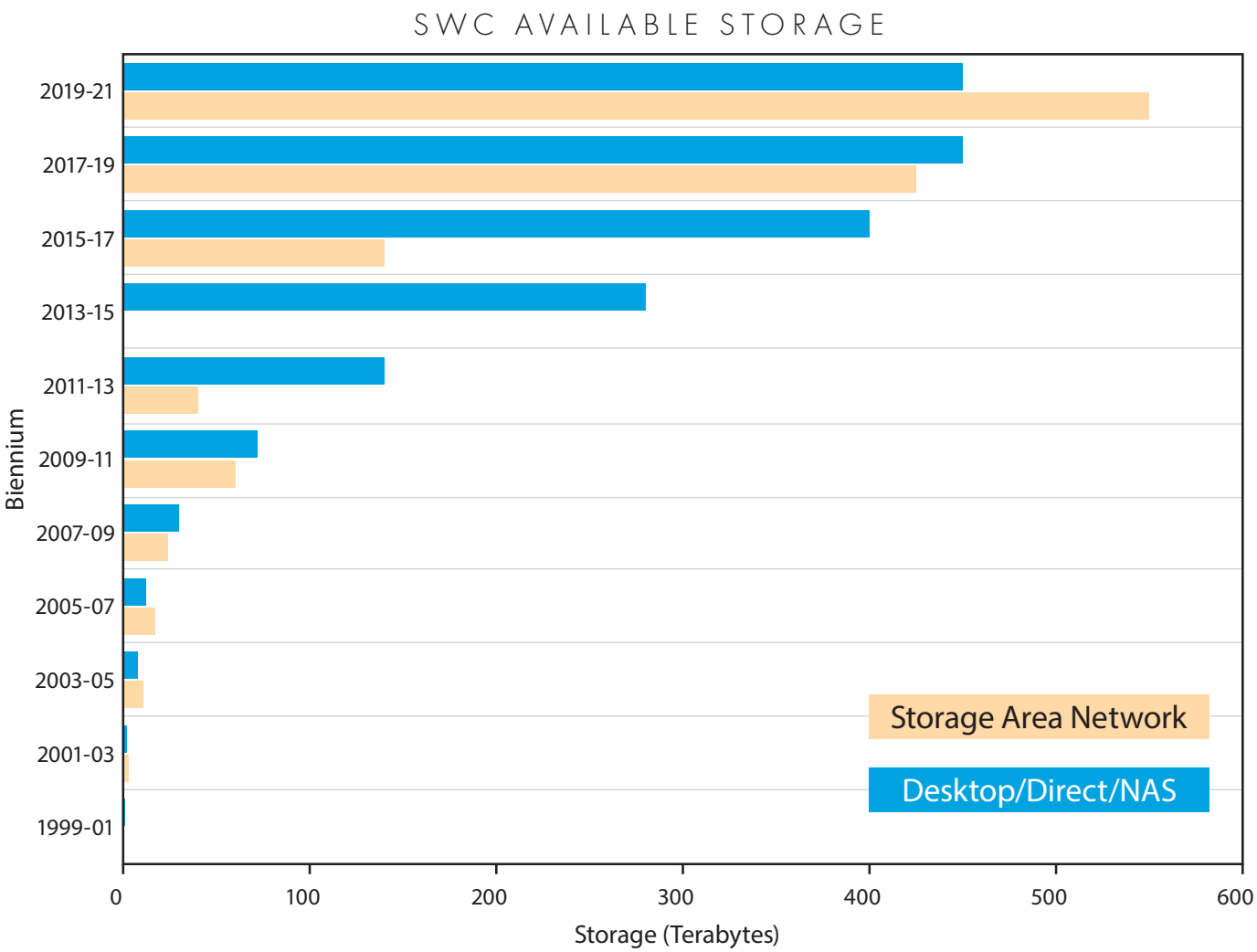
As the demands on the state's water resources continue to grow and evolve, the State Water Commission is faced with additional challenges to provide more and better information to the residents of North Dakota. These challenges continue to place an increasing emphasis on both the spatial and temporal relationships that are inherent to managing water resource systems. In order to address these challenges, the agency has developed and deployed additional spatial and graphical tools to address the complex relationships within the water resource data. In many cases, tools have been integrated directly into the data management applications in order to address these complexities within the data development and data management processes.

With increasing demands for water related to oil activity in western North Dakota, the State Water Commission faced additional challenges associated with monitoring water withdrawals from both surface and ground water sources. The State Water Commission developed and deployed Simple Object Access Protocol (SOAP) services for real-time reporting, using available industry telemetry solutions to address oil-related industry reporting requirements. The service, designed by the State Water Commission, utilizes open standards protocols that can be adapted to any commercial telemetry solution. These web services provide a simple, accessible solution that can now be scaled beyond the limited scope of the industrial applications related to recent oil activity in western North Dakota.

The State Water Commission is currently in the process of developing additional remote telemetry solutions that will accommodate remote data collection for many of the monitoring wells and staff gages located throughout North Dakota. These efforts are intended to improve real-time access to critical water resource data and to reduce costs associated with data collection programs. During the 2017-2019 biennium, the State Water Commission completed the design, development, and early testing of the PRESENS (Pushing REmote SENSors) devices that were designed by agency staff. Early deployment of limited devices began in summer and fall 2018, with more wide scale deployment beginning in spring and summer 2019. It is anticipated that several hundred PRESENS devices will be installed at selected data collection sites through the 2019-2021 biennium.

Beyond the basic requirements and demands for better tools and management capabilities, the agency has also been faced with significant demands for additional bandwidth and capacity. As more and more data are collected to support an array of management initiatives, additional demand is placed on the IT infrastructure to provide the necessary storage, bandwidth, and computational capabilities to store, process, and analyze these data. Increasing needs for aerial imagery and Light Detection and Ranging (LiDAR) data have placed tremendous demands upon the agency infrastructure for data storage, and for the associated tools to maintain and disseminate these data. The State Water Commission storage infrastructure has grown from just under 1 terabyte (TB) in 2002 to over 500 TB in 2015, and exceeded 1 petabyte in 2019.

All of the water resource data for North Dakota are made available through the State Water Commission website (www.swc.nd.gov). This includes all of the site information that is used for monitoring ground water resources in the state, which includes sub-surface lithology, water levels,



Changes in data storage volumes at the State Water Commission starting in 1999, and projected into 2021.

water chemistry, and associated site information. The agency website also includes data on precipitation, dams, drains, dikes, and other retention structures that are monitored by the State Water Commission. In addition to the wide range of data resources that are integrated into the agency's web services, the State Water Commission maintains a site dedicated to the surveying community, that includes more than 2,800 Government Land Office plat maps, along with all of the first and second order benchmarks (survey.swc.nd.gov). During the 2011-2013 biennium, the State Water Commission developed map services originally designed to address the storage and dissemination of the massive amounts of LiDAR data collected in North Dakota (lidar.swc.nd.gov). This site has grown, and now includes LiDAR data from more than a dozen different projects, which includes approximately 45 TB of raw data. During the 2013-2015 biennium, the State Water Commission added an image map service designed to catalog all existing historic aerial photography available within the agency. This site has grown to include approximately 200 TB of raw image data, and could exceed 300 TB by the end of the 2019-2021 biennium.

Data available for public use:

- Government Land Office Plats
- Precipitation and Hail Data
- Survey Horizontal and Vertical Control
- Water Permit Data
- Various Ground-Water Studies
- Drainage Permit Data
- Well and Site Location Data
- Stream Flow Data
- Lithologic Data
- Construction Permit Data
- Water Chemistry Data
- Retention Structure Data
- Water Level Data
- Digital Map Data
- Lidar
- Well Drillers Reports

ATMOSPHERIC RESOURCE BOARD

The Atmospheric Resource Board (ARB) is a quasi-judicial, quasi-legislative advisory and rule-making board under the supervision of the State Water Commission. ARB is co-located with the State Water Commission, and functions as one of its divisions.

The ARB is comprised of ten members: seven are appointed by the Governor, with ex-officio members including the State Engineer, the Director of the State Aeronautics Commission, and a representative from the Department of Environmental Quality.

Specific staff responsibilities include:

- Carrying out the administrative procedures required for the licensing of weather modification contractors and the permitting of cloud seeding operations and research activities;
- Developing and maintaining a system for the collection of data and records of all operational weather modification activities;
- Conducting research into atmospheric precipitation processes to assess and improve the effectiveness of cloud seeding technology;
- Promulgating rules and regulations governing cloud seeding activities to ensure environmental and public safety;
- Monitoring and evaluating cloud seeding activities and reporting back to sponsoring entities; and
- Monitoring, collecting, and disseminating accurate precipitation and climate data.

NORTH DAKOTA CLOUD MODIFICATION PROJECT

The North Dakota Cloud Modification Project (NDCMP) served seven western counties during the 2017-2019 biennium. Those counties were Bowman, Burke, McKenzie, Mountrail, Ward, Williams, and a portion of Slope. At the conclusion of the biennium, the project target area covered 6.6 million acres of western North Dakota.

The NDCMP has two goals:

1) Suppression of damaging hail.
2) Enhancement of rainfall.

Suitable clouds over two multi-county operational districts were treated during June, July, and August of each summer of the biennium. Eight, twin-engine aircraft operated by Weather Modification International of Fargo, were deployed under contract to the ARB and participating counties. Operations were directed by project meteorologists from radar operations centers based at the Bowman and Stanley airports.

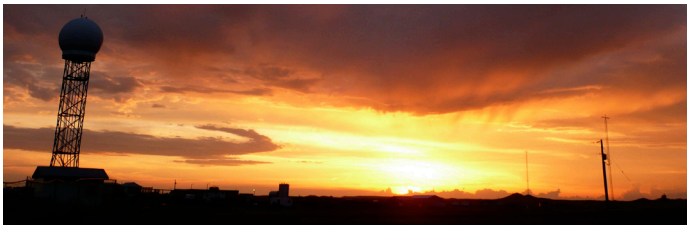
A recent study from the NDSU Department of Agribusiness and Applied Economics (Bangsund and Hodur, 2019) describes the significant economic benefits cloud seeding provides to agricultural production in western North Dakota. Rainfall enhancement effects were evaluated at 5 and 10 percent, which are the lower and upper bounds of typical results, while hail suppression was evaluated at 45 percent reduction in crop loss. Results of the study show the NDCMP is strongly economic, even with its most conservative estimates. The value of added growing season

rainfall at 5 percent enhancement is estimated at $21.2 million annually, or $9.19 per planted acre. When evaluating rain enhancement at 10 percent, the number jumps to $41.9 million, or $18.15 per planted acre. The addition of hail suppression adds another $6.9 million annually, or $3.00 per planted acre.

Rainfall enhancement at 10 percent and crop-hail reduction of 45 percent yields estimated economic returns of more than $53 dollars for every $1 spent on the program. Viewed more conservatively, using rainfall enhancement of 5 percent, results are still impressive, yielding nearly $31 dollars of benefit for every dollar spent.

Enhanced agricultural production from cloud seeding is also reflected elsewhere in the economy. Tax revenue from increased crop yields is estimated to range between $576,000 to $999,000 annually, which is more than the State provides yearly in cost-share funding with participating counties.

WEATHER RADAR OPERATIONS



The ARB continued to operate two WSR-74C weather radars during the biennium. Radars were located in facilities at the Bowman and Stanley airports, and continued to operate at approximately one-quarter the cost of previously-leased systems. Images from both radars are available and updated every five minutes on the State Water Commission website during the operational season.

The Bowman radar is sited at the coverage limits of the National Weather Service (NWS) radars located at Bismarck, Billings, Glasgow, and Rapid City, and thus provides lower atmosphere coverage of southwestern North Dakota, southeastern Montana, and northwestern South Dakota.

In 2011, ARB partnered with eight counties in the area, who pledged $24,000 to operate the Bowman radar year-round. They are: Billings, Bowman, Dunn, Golden Valley, Slope, Stark (North Dakota), Fallon (Montana), and Harding (South Dakota) counties. Bowman radar continued to operate year-round throughout the biennium in partnership with these regional counties, at the same $24,000 annual cost. Real-time radar images and raw data were provided on the State Water Commission website.

STUDENT INTERN PROGRAMS

Seventeen intern copilots from the University of North Dakota's (UND) John D. Odegard School of Aerospace Sciences participated in the NDCMP during the last biennium. Training at UND includes a 4-credit course on applied weather modification. Students must also meet flight certification requirements prior to participation. Since the board's inception in 1975, 387 intern pilots have logged approximately 30,000 hours of flight time in the conduct of NDCMP operations in North Dakota's skies. In addition to recording the time, location, duration, and meteorological conditions during all seeding and reconnaissance missions, the pilots are fully qualified to fly the aircraft, providing an additional safety margin. Because of the experience they gain, many intern copilots have returned to the NDCMP as Pilots-in-Command (PICs) in subsequent project seasons. Interns are paid an hourly wage, and are considered temporary employees of the ARB during the summer months.

The weather modification pilot training program is the only one of its kind in the United States, and it provides a significant number of qualified cloud seeding pilots for projects elsewhere in the country and around the world.

ARB also retained undergraduate students majoring in atmospheric science as intern meteorologists during the 2017-2019 biennium. A total of six interns assisted NDCMP radar meteorologists at radar-equipped operations centers in Bowman and Stanley, and at the ARB office in Bismarck, raising the total to 62 since the program's inception. Like the intern pilots, intern meteorologists continue to demonstrate their enthusiasm and dedication to the NDCMP and provide a pool of better-qualified persons to serve future projects as radar meteorologists.

STATEWIDE PRECIPITATION OBSERVATIONS

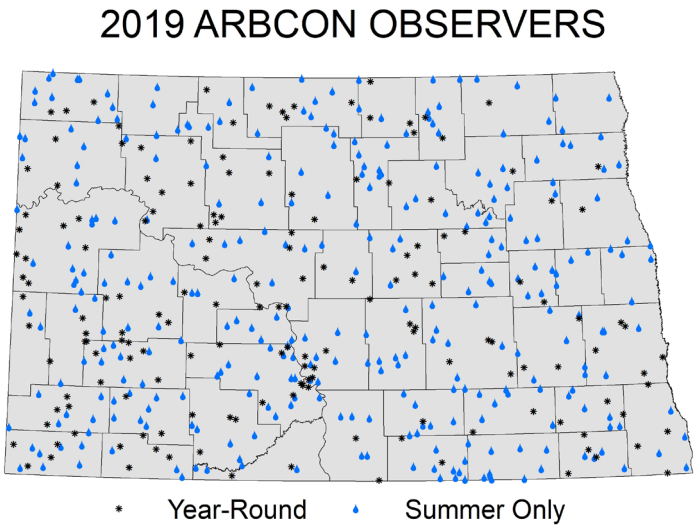
The ARB Cooperative Observer Network (ARBCON) continued reporting precipitation in North Dakota during the biennium. ARBCON observers numbered about 500 volunteers statewide, building on a database dating back to 1977. The network has logged more than five million daily observations since the network began.

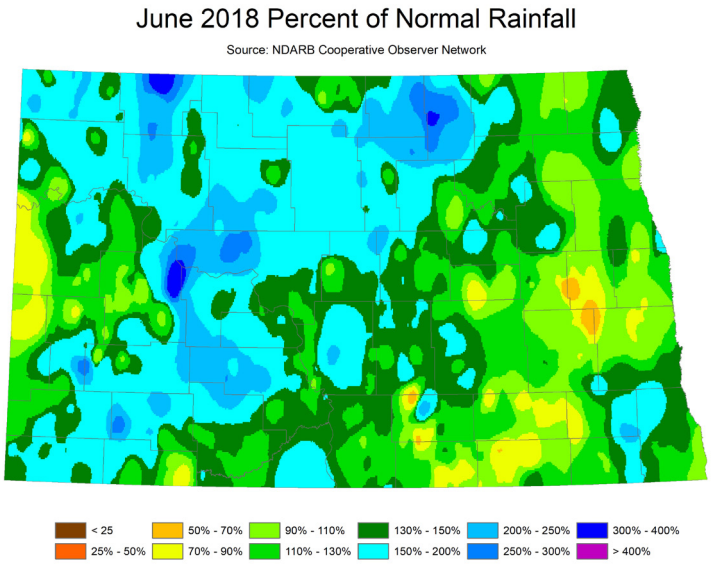
In response to the increased need for snow and snow water equivalent data in the state to assist in flood forecasting and water management, ARBCON began measuring and reporting snowfall in October 2010. Initial observer participation more than doubled the number of local snow reporting stations previously in the state. Currently, year-round ARBCON observers number approximately 200.

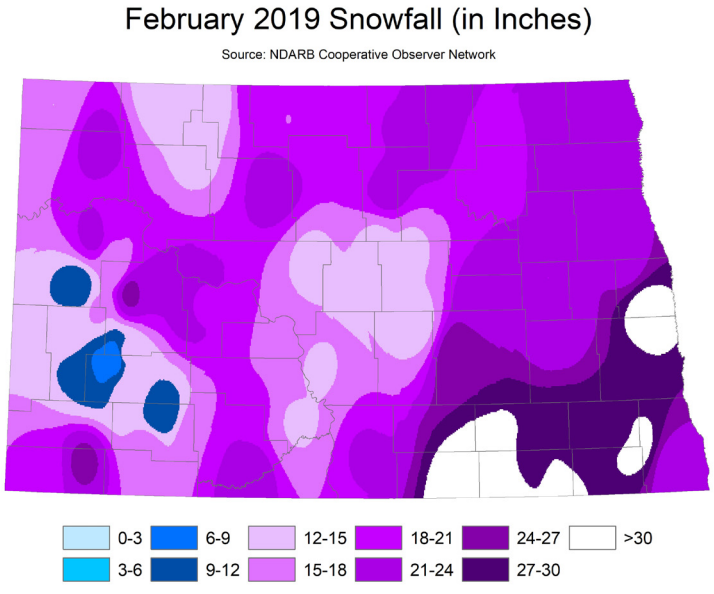
Internet-capable reporters enter their daily reports directly through the State Water Commission website, after logging in with a unique username and password, making the data available sooner than those submitted on monthly reporting cards. About one third of ARBCON observers are utilizing online reporting, a number which should continue to grow in future years.

Rain, hail and snow data, as well as color maps depicting monthly and growing season precipitation, departure from normal, and 30-year averages can be publicly accessed and downloaded directly through the State Water Commission website. The data have proven to be very helpful in the assessment of excess rain, snow and attendant flooding, as well as in the monitoring and delineation of drought in North Dakota.

RESEARCH AND DEVELOPMENT

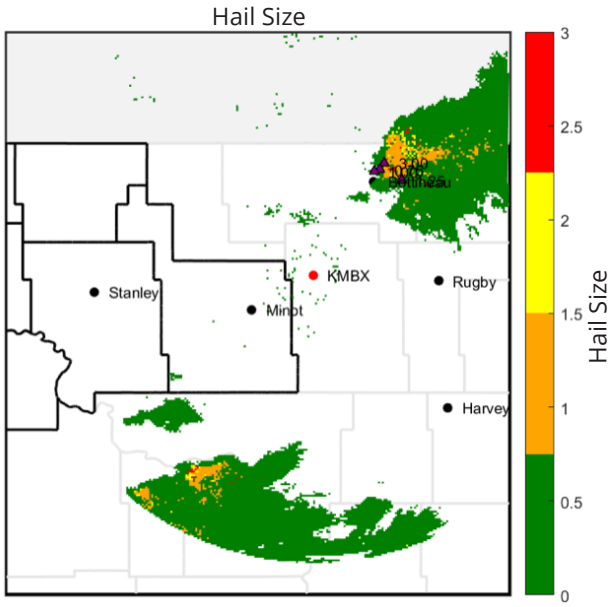






ARB continued to collaborate with the UND Department of Atmospheric Sciences to provide meso-scale numerical weather forecast modeling to the operational cloud seeding program. UND continues to develop the Weather Research and Forecasting (WRF) model, to improve convective weather precipitation forecasts supporting cloud seeding operations. The model is run twice daily at the university, and data are provided to NDCMP forecasters through a website interface.

ARB also contracted with the National Center for Atmospheric Research (NCAR) to develop a hail detection algorithm from NEXRAD WSR-88D data for use in evaluating hail suppression cloud seeding operations in North Dakota. The algorithm was delivered and identification of storm days and radar data collection and analysis is underway. Ultimately, statistical analysis of seeded and unseeded storm data will be performed as an evaluation of hail suppression effectiveness.



PLANNING & EDUCATION DIVISION

The primary responsibility of the Planning and Education Division is to maintain and update a Water Development Plan for the State of North Dakota. Division staff members also participate in numerous regional, state, local, and inter-office planning activities; manage the agency's water education programs; coordinate environmental reviews; manage the Drought Disaster Livestock Water Supply Assistance Program; and oversee public outreach and media relations efforts.

Specific staff responsibilities include:

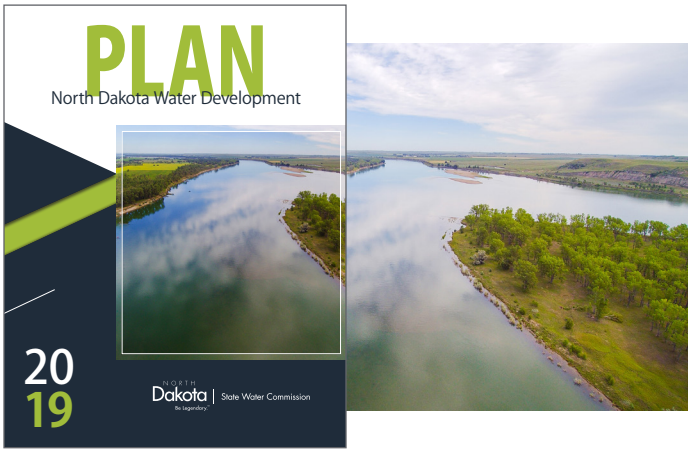
- Maintaining a water project inventory and Water Development Plan to promote efficiency in meeting North Dakota's future water development and funding needs;
- Leading or participating in special studies that result in water resource and related land management plans, at various levels of government;
- Monitoring water resource issues and advising decision makers on possible impacts to North Dakota's water management objectives;
- Representing the State Engineer and State Water Commission on regional, national, and international natural resource planning bodies, such as the Assiniboine River Basin initiative, International Water Institute, Red River Basin Commission, and Missouri River Advisory Council to name a few;
- Preparing presentations, developing and maintaining the agency's online and social media presence, and fostering public awareness of the agency and its activities;
- Assisting joint water resource management boards in the development of watershed management plans;
- Providing opportunities for adults and students to increase their understanding about North Dakota's water resources and how these resources are managed;
- Coordinating and managing interagency environmental reviews;
- Managing media outreach and media relations efforts;
- Managing the Drought Disaster Livestock Water Supply Assistance Program, when activated;
- Managing the Agency's Unmanned Aerial Systems (UAS) Program; and
- Conducting or reviewing economic and life cycle cost analyses.

STATE WATER DEVELOPMENT PLAN

By virtue of North Dakota Century Code, Section 61-02-14, Powers and Duties of the Commission; Section 61-02-26, Duties of State Agencies Concerned with Intrastate Use or Disposition of Waters; and section 61-02-01.3, Comprehensive Water Development Plan, the State Water Commission is required to develop and maintain a comprehensive, short and long-range water plan for the sound management and development of North Dakota's water resources. The plan reviews water management and cost-share policies, and recommends revisions, as circumstances require.

The most recent North Dakota State Water Development Plan was completed in January 2019. The purpose of the 2019 State Water Development Plan is to outline the planning process; provide a progress report on the state's priority water management and development efforts; provide information regarding North Dakota's current and future water development project funding needs and priorities; provide information regarding North Dakota's revenue sources for water development; serve as a formal request for funding from the Resource Trust Fund; and identify goals and objectives to meet water development challenges.

In addition, the 2019 Water Development Plan considers longer-term planning horizons. While previous plans typically focused on a funding picture two-to-four years in the future, the 2019 Plan estimates the potential financial needs of water-related infrastructure in ten years, twenty years, and beyond.



AGENCY STRATEGIC PLANNING & BIENNIAL REPORTING

In advance of the 2017 Legislative Assembly, the Planning and Education Division coordinated the development of an agency Strategic Plan for the State Water Commission and Office of the State Engineer. The purpose of the Strategic Plan is to provide the agency with an opportunity to set the bar for itself, and to more effectively measure performance in the future. This process is expected to continue on a biennial basis.

To develop the 2019-2021 Strategic Plan, project and program managers were asked to provide input regarding their expectations for future progress. As part of that effort, they were asked to provide project and/or program objectives that they will strive to accomplish during the strategic planning time frame, as well as specific tasks that will be completed to achieve their objectives.

The primary purpose of this 2017-2019 Biennial Report, which will be published in early 2020, is to highlight key events, accomplishments, and other pertinent activities of the State Water Commission and the Office of the State Engineer. The biennial reports and strategic plans work in concert, setting out agency goals, and then evaluating the agency's progress on those goals.

PUBLIC RELATIONS

Planning and Education Division staff play an active role in facilitating internal and external communications on behalf of the State Water Commission. Internal communication is provided to the staff through our employee-only intranet site. This site provides the latest agency news, information, upcoming events, and meetings. External communication efforts are disseminated via various methods to the general public, media, legislators, Commission members, organizations, and stakeholders.

The State Water Commission hosts an agency website that contains up-to-date information about departments, programs, policies, data, maps, goals, and its mission. The State Water Commission also utilizes social media outlets such as Facebook, YouTube, and other platforms to distribute current events and agency news.

The Planning and Education Division's Public Information Officer serves as a resource to the entire agency by providing communication assistance in areas such as: news releases, talking points, coordinating media interviews, public outreach campaigns, presentations, and community events.

UNMANNED AERIAL SYSTEM PROGRAM

In early 2017, the State Water Commission moved forward with an Unmanned Aerial System (Drone) program. The intent of the program was to provide aerial photographic, video, and project monitoring services to the State Water Commission. In starting the program, an employee from the Planning and Education Division became licensed through the Federal Aviation Administration to fly UAS for agency purposes.

As of 2019, the program is in its third year, and is being used for needs unforeseen at the onset of the program. The drone's diverse uses include documenting agency funded water development construction projects, monitoring and documenting flooding and ice jams, inspecting cost-share projects through the Drought Disaster Livestock Program, extensive use in monitoring state sovereign lands, as well as for general photography of the state's water resources for use in education and outreach.

The drone program has also assisted other state agencies such as Game and Fish, Parks and Recreation, and the Department of Corrections on collaborative work. An agency staff member is part of the Cabinet UAS Committee. Looking to the future, the SWC is considering adding one or two more pilots to provide more availability to meet the needs of the program, and may add additional equipment as needed.

DROUGHT DISASTER LIVESTOCK WATER SUPPLY PROJECT ASSISTANCE PROGRAM

The Drought Disaster Livestock Water Supply Project Assistance Program (Program) provides cost-share assistance to livestock producers with livestock water supply shortages caused by drought. The Program was originally created in 1991 in response to a severe statewide drought. This Program does not operate continually, but is only activated by the State Water Commission in response to severe drought conditions.

The Program was most recently activated in late June 2017, in response to record drought conditions. Throughout the summer of 2017 and 2018, eligible counties were added to the Program because of persistent drought conditions. In early summer 2019, a handful of counties, mainly in the northern region of the state, were still experiencing drought conditions and the program remained active.

Since the Program was activated in 2017, there has been nearly 500 projects completed totaling $1.4 million in cost-share funds.

INTERAGENCY PROJECT REVIEWS

Planning and Education Division staff continue to conduct and coordinate interagency environmental reviews involving projects associated with Community Development Block Grants and Loans, Hazard Mitigation Grant Program, Rural Development Loan Program, highway improvements, airport improvements, dike/levee projects, water storage impoundments, municipal and rural water supply development and treatment projects, municipal waste treatment projects, oil and gas well projects, oil and gas pipeline projects, electrical transmission line development/modification/maintenance projects, and various federal and state water, land, and wildlife management plans, studies, Environmental Assessments and Environmental Impact Statements (EIS).

In January 2017, the State Water Commission's environmental review process transitioned from paper to electronic internal routing. The new system affords agency staff greater time to review each project, while simultaneously decreasing the agency's response time to project applicants. In the 2017-2019 biennium, the agency received 552 requests for review, resulting in over 700 individual agency responses to project sponsors. Staff have a maximum of 30 days to provide comments, but on average, a signed comment letter is provided to the project sponsor in less than three weeks.

Environmental review comments address compliance requirements involving State Engineer regulatory responsibilities in issuing permits pertaining to water appropriation, floodplain management, sovereign lands, and the construction of dikes, levees, dams, drains, and water holding ponds. Staff members also provide information concerning the location of water wells, stream gages, well monitoring sites, and elevation benchmarks.

ECONOMIC & LIFE CYCLE COST ANALYSES

Legislation passed by the North Dakota Legislature in 2017 created NDCC 61-03-21.4 - requiring the State Engineer to: "develop an economic analysis process for water conveyance projects and flood-related projects expected to cost more than one million dollars, and a life cycle analysis process for municipal water supply projects. When the State Water Commission is considering whether to fund a water conveyance project, flood-related project, or water supply project, the State Engineer shall review the economic analysis or life cycle analysis, and inform the State Water Commission of the findings from the analysis and review."

To comply with the 2017 legislation, the Water Commission contracted with HDR Inc. to assist the agency in drafting Economic Analysis (EA) and Life Cycle Cost Analysis (LCCA) processes. In addition, the agency and HDR completed fillable electronic platforms that project sponsors and the agency will be able to access to assist with more efficient assessments of projects.

As noted in the statutory language above, project sponsors with the aforementioned types of projects who are coming to the Water Commission for cost-share assistance during the next budget cycle (beginning July 1, 2019), will be required to provide the results of those analyses to the State Engineer and Commission for their review and consideration.

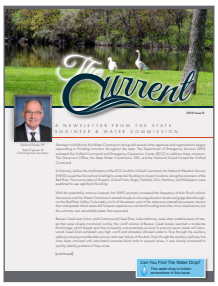
To assist with EA and LCCA completion and reviews, the Water Commission also hired a Natural Resource Economist, using an existing FTE.

OTHER GOVERNMENTAL & NON-GOVERNMENTAL ORGANIZATION INVOLVEMENT

The Planning and Education Division also participated, to varying degrees, on several other governmental and non-governmental organizations, providing input from the State Engineer and State Water Commission's perspectives. During the biennium, staff were involved with the Devils Lake Basin Joint Water Resource Board; Upper Sheyenne River Joint Water Resource Board; the International Water Institute; Little Missouri Scenic River Commission; Devils Lake Outlet Advisory Committee; North Dakota Missouri River Advisory Council; Red River Basin Commission; and Assiniboine River Basin Initiative.

THE CURRENT

The Current, which was created in early 2016, is a quarterly Water Commission and State Engineer newsletter that provides the latest agency-specific information concerning water development, regulatory and appropriation efforts, water education, policy changes, Water Commission meeting approvals, and much more. Average distribution of the newsletter is approximately 1,400.



NORTH DAKOTA WATER MAGAZINE

Since 1993, various water interests in North Dakota have pooled resources through the North Dakota Water Education Foundation to publish a magazine titled North Dakota Water. This magazine provides a broad spectrum of high-quality information about the state's water resources to the widest possible audience. Over the course of the 2017-2019 biennium, average monthly distribution of the magazine was approximately 9,000 copies. Readers include the general public, local, state and federal agencies, and elected officials.

The Planning and Education Division develops the State Water Commission's contribution; a two-page section called The Oxbow. A third page is contributed by the Atmospheric Resource Board.

NORTH DAKOTA WATER EDUCATION

In 1984, the State Water Commission took the initiative to provide water education throughout the state, with the primary goal of educating the public about the importance of water in North Dakota. When the program first started it was called Water Education for Teachers (W.E.T.). Today, W.E.T. is known as Project WET, a supplemental and interdisciplinary water education program accepted around the world. North Dakota's Project WET became the template for the program's growth, and it now involves 50 states and 60 countries.

Since 1997, North Dakota Project WET has enhanced its scope and vision with the innovative "Explore Your Watershed" Program. Now called North Dakota Water Education, it promotes the importance of water in all aspects of our lives, including: conservation, water quality, non-point source pollution, stewardship, protection, access, health, and best management practices. North Dakota Water Education develops and fosters partnerships and collaboration with schools, other agencies, and water entities to provide educational opportunities and information across the state.

North Dakota Water Education is delivered to educators, youth, communities and the general public through multi-credit watershed institutes, teacher workshops, facilitator trainings, water festivals, and special community events. K-12 students receive water education programs directly, through a variety of educational events such as youth science events, water festivals, environmental awareness events, and technology.

The North Dakota Water Education Program facilitates and promotes interactive learning, awareness, knowledge, exploration, and stewardship of North Dakota water resources, with a focus on how water interacts with both the human and natural environments within our own watersheds. Programs are based on well-developed, and time tested Project WET curriculum, through the development and dissemination of indoor, outdoor, and classroom ready experiences, teaching aids, printed materials and online resources that are hands on, user friendly, non-biased, age appropriate, adaptable, and relevant.

In recent years, the number of North Dakota's water festivals has doubled, from six to twelve annually. An estimated one out of four North Dakota students in grades 3-5 attend a water festival each year. During the 2017-2019 biennium, North Dakota Water Education served over 40,000 students and adults through water festivals and other educational events in the state.

REGULATORY DIVISION

The Regulatory Division is responsible for regulating the following areas of responsibility under North Dakota Century Code as a function of the Office of the State Engineer.

Specific staff responsibilities include:

- Administering and providing guidance on permit applications for surface drains, construction, and sovereign land projects;
- Administering FEMA's North Dakota Dam Safety Program and RiskMAP programs;
- Offering technical assistance to water resource district boards;
- Providing floodplain management assistance to communities participating in the National Flood Insurance Program through FEMA's Community Assistance Program – State Support Services Element;
- Managing North Dakota's non-mineral interests in sovereign lands, through ordinary high watermark delineations and review of projects located within navigable waters;
- Reviewing projects located within navigable waters;
- Coordinating the state's Silver Jackets Program; and
- Reviewing determination requests, complaints, and complaint appeals.

PERMITS

During the 2017-2019 biennium, the Regulatory Division processed 26 applications for permits to construct or modify dams, dikes, diversion ditches, or other water control facilities. The Division also processed permits for 111 sovereign land permit applications, and 264 applications for permits to drain, of which 238 were for tile drain systems. In addition, the staff provided assistance with the environmental reviews coordinated by the Planning Division, addressed several appeals of water resource district decisions, and dealt with numerous water-related complaints from around the state.

Division members also represented the agency at a variety of technical meetings held by such groups as the: U.S. Army Corps of Engineers, Natural Resource Conservation Service (NRCS) State Technical Committee, NRCS Interagency Watershed Committee, Association of Soil Conservation Districts, North Dakota Soil Conservation Committee, and the Natural Resources Trust.

ENGINEERING & PERMITTING

The State Engineer has several statutory requirements regarding permitting of water management projects. Construction permits are required, within certain thresholds, to construct or modify a dam, dike, or other device for water conservation, flood control regulation, watershed improvement, or storage of water. Drainage permits are required to drain a pond, slough, lake, or sheetwater, or any series thereof having a watershed area comprising eighty acres or more. The goal of the Engineering & Permitting (E&P) Section is to provide sound technical review of jurisdictional projects to support the State Engineer's mission to manage water resources of the State of North Dakota for the benefit of its people. The E&P Section reviews permit applications for these activities to ensure the projects proposed are following the state of engineering practice as well as following the state's water management rules and regulations. The E&P Section works closely with North Dakota's water resource districts and their representatives as both the construction permitting and drainage permitting processes include water resource district permitting authority. The E&P Section routinely works with other state and federal agencies, political subdivisions, and the general public regarding the permitting processes. The E&P Section also conducts reviews of complaints, complaint appeals, and assessment appeals as well as review requests for stream crossing determinations and watercourse determinations. These duties require the E&P Section to be well versed in many areas of civil engineering practice as well as in statutes, rules, policy, and case history to ensure water control and management projects are completed within the engineering and legal requirements at the time of construction.

SOVEREIGN LANDS MANAGEMENT

North Dakota's sovereign lands are those areas, including beds and islands, lying within the ordinary high watermark of the state's navigable lakes and streams. The State Engineer is responsible for determining which of those lakes and streams were navigable in fact, at the time of statehood, and therefore sovereign lands of the state; delineating the ordinary high watermark (OHWM) of those navigable water bodies; and administering and managing the state's non-mineral interests in North Dakota's sovereign lands.

The goal of the State Engineer is to manage, operate, and supervise North Dakota's sovereign land, for multiple uses, that are consistent with the Public Trust Doctrine, and are in the best interest of present and future generations. Meeting these goals can be challenging, given the increasing popularity of water-based recreation, and the draw of waterfront property for housing, business, and recreation development.

In 2007, the Office of the State Engineer completed the North Dakota Sovereign Land Management Plan. This plan outlines the State Engineer's authority to manage sovereign lands, and it includes recommendations and corresponding action strategies that are intended to improve management of this valuable resource. The Office of the State Engineer also developed the OHWM Delineation Guidelines in 2007. These guidelines are intended to provide a consistent and repeatable method for accurately delineating the OHWM, in both riverine and lake environments, in the State of North Dakota. Any OHWM delineations conducted on state sovereign lands must be done in full compliance with the State Engineer's Guidelines.

Any projects that occur, either partially or wholly upon sovereign lands, require authorization in the form of a Sovereign Land Permit, from the State Engineer, prior to any construction. The State Engineer processes approximately 50 sovereign land permits annually. Authorized projects can range in scope from boat docks to bridges; water intakes to water outfalls; and pipelines to power lines.

Originally launched during summer 2013 and spring 2014, the "Keep our Beaches Clean" campaign continued during the 2017-2019 biennium; educating recreational users about the rules and regulations for sovereign lands. The campaign mainly focuses on littering, and the illegal use of glass bottles on sovereign lands. Educational signs have been installed in popular public use areas, and floating key chains with "Keep our Beaches Clean" messages were distributed to the public at popular areas such as convenience stores, water sports retailers, boat ramps, and the North Dakota State Fair. Agency staff have also taken part in public events and media interviews to explain the rules and regulations associated with the recreational use of sovereign lands. This campaign is expected to continue, to encourage the public to keep sovereign lands clean and safe.

Because the Office of the State Engineer does not currently employ law enforcement staff, an agreement has been developed with the North Dakota Game and Fish Department to have them provide enforcement of state code on sovereign lands.

The State Engineer is also working with city, county, and other state land managers, to improve public access to sovereign lands for non-motorized recreational purposes.

DAM SAFETY PROGRAM

The purpose of North Dakota's dam safety program is to minimize the risk to life and property associated with the potential failure of dams in the state. Functions of the dam safety program include maintaining an inventory of dams in North Dakota, conducting dam inspections, determining the hazard classification of dams, and assisting with emergency preparedness activities.

There are currently 3,349 dams in North Dakota's dam inventory. Of these, 48 dams are currently classified as high hazard and 75 are classified as medium hazard. This means that there is the potential for loss of life or significant property damage downstream, if one of those dams were to fail. Updating, maintaining, and improving the state's inventory of dams is a continuous, ongoing effort of the dam safety program.

A primary function of the dam safety program is to conduct dam inspections and provide recommendations for maintenance and repair to dam owners. Dam safety program staff inspect state, local, and privately-owned high and medium hazard dams on a rotational basis. During the 2017-2019 biennium, full periodic dam safety inspections were completed on 35 high and medium hazard dams. Additional inspections are conducted following spring runoff, on request from dam owners, or when there are concerns at a dam, such as during flood events. During this biennium, 182 dam inspections were completed following the spring runoff season, as well as 28 other dam site visits.

In 2018, a project was initiated to update North Dakota's Dam Design Handbook (North Dakota State Engineer, June 1985). Much of this handbook is out-of-date, and does not reflect current design practices. This project will incorporate state-of-the-practice design standards for dam design in North Dakota, and will help clarify and strengthen North Dakota's minimum dam design standards and requirements for dam construction permits. This project is being funded by National Dam Safety Program (NDSP) grants through the Department of Homeland Security (DHS), and the Federal Emergency Management Agency (FEMA).

In 2019, the Water Commission began a study to update Probable Maximum Precipitation (PMP) values for North Dakota. Spillway design standards for dams are based on the PMP, so it is important to dam safety to have PMP values that are up-to-date using current precipitation data and state-of-the-art methods. Dam safety program staff are participating as part of the steering committee for this study, along with staff from the Silver Jackets Program and the Water Commission's Investigations Section.

One of the objectives of the dam safety program is to increase awareness of dam safety issues among dam owners and the public. In spring 2018, dam safety program staff participated in a public awareness campaign regarding public safety at low-head dams in conjunction with the Water Commission's Planning and Education Division and the North Dakota Game and Fish Department.

Another ongoing focus of the dam safety program is emergency preparedness. Emergency Action Plans (EAPs) are required for high and medium hazard dams. During the biennium, the dam safety program received 13 new EAPs from dam owners, and dam owners submitted updates to the EAPs for 15 dams. EAPs are reviewed, tracked, and copies are maintained. In an effort to encourage development of EAPs for remaining high hazard dams without an EAP, a hydrologic analysis of one high hazard dam was completed using funding from an NDSP grant through DHS and FEMA. The results of the hydrologic analysis were made available to the dam owner to assist them with preparing the detailed inundation maps required for a dam EAP.

NORTH DAKOTA SILVER JACKETS PROGRAM

The North Dakota Silver Jackets is an Army Corps of Engineers (Corps) sponsored program to establish a joint Federal/State Flood Risk Management Team with a mission of enhancing and promoting Flood Risk Reduction efforts throughout the State. The North Dakota Silver Jackets Team is comprised of the North Dakota State Water Commission, the Omaha Corps District, the St. Paul Corps District, FEMA Region VIII, the National Weather Service, the Natural Resources Conservation Service, the United States Geological Survey, United States Fish and Wildlife Service, and the North Dakota Geological Survey.

The North Dakota Silver Jackets Team was active in several flood risk reduction projects and studies during the 2017-2019 biennium.

The James River Corps Feasibility Study

The James River Basin Corps Feasibility Study was an initial North Dakota Silver Jackets effort that was completed in fall 2014. This study provided updated hydrology and hydraulics for the James River from the headwaters in the north to the North Dakota/South Dakota border. Ongoing projects from that study led to new FEMA Flood Insurance Rate Maps (FIRMs) in several of the James River Basin counties in 2017 and 2018. In addition, the North Dakota Silver Jackets conducted flood focused Emergency Action Plan workshops for Stutsman County and the City of Jamestown, and Lamoure County and the City of Lamoure in February 2018. These workshops were designed to help the city/county prepare and develop plans for flood fighting specific to their needs while identifying requirements and resources to support them.

Corps Section 22 Flood Risk Reduction Studies

The Corps and Water Commission completed the Linton/Emmons County Section 22 Flood Risk Reduction Study and presented the study and findings to local officials at a public meeting March 2019. This was in addition to previously conducted non-structural flood prevention workshops and flood specific Emergency Action Plan workshops conducted in 2016 and 2017. The Beulah/Mercer County Corps Section 22 Flood Risk Reduction Study is still ongoing with completion expected in spring 2020.

Souris (Mouse) River Basin Inundation Mapping Project

In fall 2015, the Souris River Joint Board requested North Dakota Silver Jackets support for a Mouse River Basin Inundation Mapping Project. This project will develop inundation mapping to be provided through the National Weather Service's Advanced Hydrological Prediction Service (AHPS) Flood Forecast website. There are 10 National Weather Service forecast gages that support these AHPS sites, and each will be supported with their own set of inundation maps – comprising the entire North Dakota portion of the Mouse River. This project was approved in January 2016 and broken into three phases. With all three phases recently completed, the data is currently being reviewed for submission to the National Weather Service for implementation and fielding on their AHPS sites in summer 2020. In summer 2019 a new request to include the Des Lacs River (Phase IV) was approved and will start in spring 2020.

LiDAR Collection (Light Detection and Ranging)

In collaboration with our other state and federal partners, the Silver Jackets have been involved in collecting LiDAR data, starting with the James River basin, and moving west since late 2010. This LiDAR collection was completed in fall 2016; and in spring 2017 the new LiDAR was posted to the Water Commission website. For the first time, LiDAR coverage is available for the entire state, and is available for local, state, and federal agencies, and the general public.

In 2018, the State Water Commission and Natural Resources Conservation Service (NRCS) pooled funding to collect new LiDAR data for the entire North Dakota portion of the Red River Basin, to include the Devils Lake Basin. This collection effort started in fall 2018 and will continue until completed over the next couple of years. In addition, this LiDAR will be collected and processed at "LiDAR Quality Level II," one step higher than our current LiDAR, and in keeping with the United States Geological Survey's new federal standard for LiDAR collections.

North Dakota Statewide Probable Maximum Precipitation (PMP) Analysis

With funding approved by the North Dakota State Water Commission in October 2018, the Office of the State Engineer developed a Request for Proposal (RFP) for a Statewide Probable Maximum Precipitation Analysis. The purpose of this study is to develop updated, more comprehensive PMP estimates for use when evaluating flood safety, dam safety and construction criteria, and for calibrating event specific hydrological models. The current PMP data covering North Dakota was published by the National Oceanic and Atmospheric Administration (NOAA) in the late 70s and early 80s and was in need of updating. With the support of the North Dakota Silver Jackets, a Comprehensive State and Federal PMP Steering Committee was developed to lead, and review the PMP analysis. This team consists of the North Dakota State Water Commission, the Grand Forks and Bismarck offices of the National Weather Service, the NRCS, the Omaha Corps District, and the North Dakota State Climatologist. A firm was selected in March 2019, and the PMP analysis officially began in May 2019 with a two day public "kick off" meeting in Bismarck. This analysis is scheduled to take 18-24 months for completion.

FLOODPLAIN MANAGEMENT

Two staff members work with FEMA funded floodplain programs within the Regulatory Division. These programs include Risk Mapping, Assessment, and Planning (Risk MAP), and the Community Assistance Program – State Support Services Element (CAP-SSSE).

The Risk MAP program was initiated for the purpose of identifying, assessing, communicating, and mitigating flood hazard risks, with the goals of delivering high quality data that will increase public awareness and lead to actions that will reduce the risk to life and property. The Risk MAP program is 100 percent FEMA funded.

The Risk MAP Coordinator oversees the selection of engineering consultants chosen annually to do the work tasks of Flood Insurance Rate Map (FIRM) creation and subsequent contract management. The State Water Commission is currently managing nine countywide floodplain mapping contracts. During the 2018 and 2019 FEMA grant cycle, the State Water Commission allocated an additional $3,555,000 to be used for LiDAR acquisition in North Dakota.

As explained in the State Hazard Mitigation Plan, North Dakota's history is colored with many significant flood events. From 1965 to 2019, North Dakota received 35 Presidential Disaster Declarations, four Emergency Declarations, and one state level declaration due to flood events.

The CAP-SSSE is a federal program that provides 75% funding to the state in order to provide technical assistance to communities in the National Flood Insurance Program (NFIP) and to evaluate community performance in implementing NFIP floodplain management activities. The State NFIP Coordinator provides assistance to the 331 participating communities in North Dakota. Through local participation, roughly $3 billion in flood insurance coverage is provided, with over 10,000 active policies.

Each community designates a representative as their Floodplain Administrator to oversee floodplain development within flood prone or identified high-risk floodplains. Regulations that meet the minimum federal and state standards are outlined within their local floodplain development ordinance. N.D.C.C. § 61-16.2 explains the higher state floodplain standards that communities are expected to follow, including the one-foot of freeboard requirement for new or substantially improved structures.

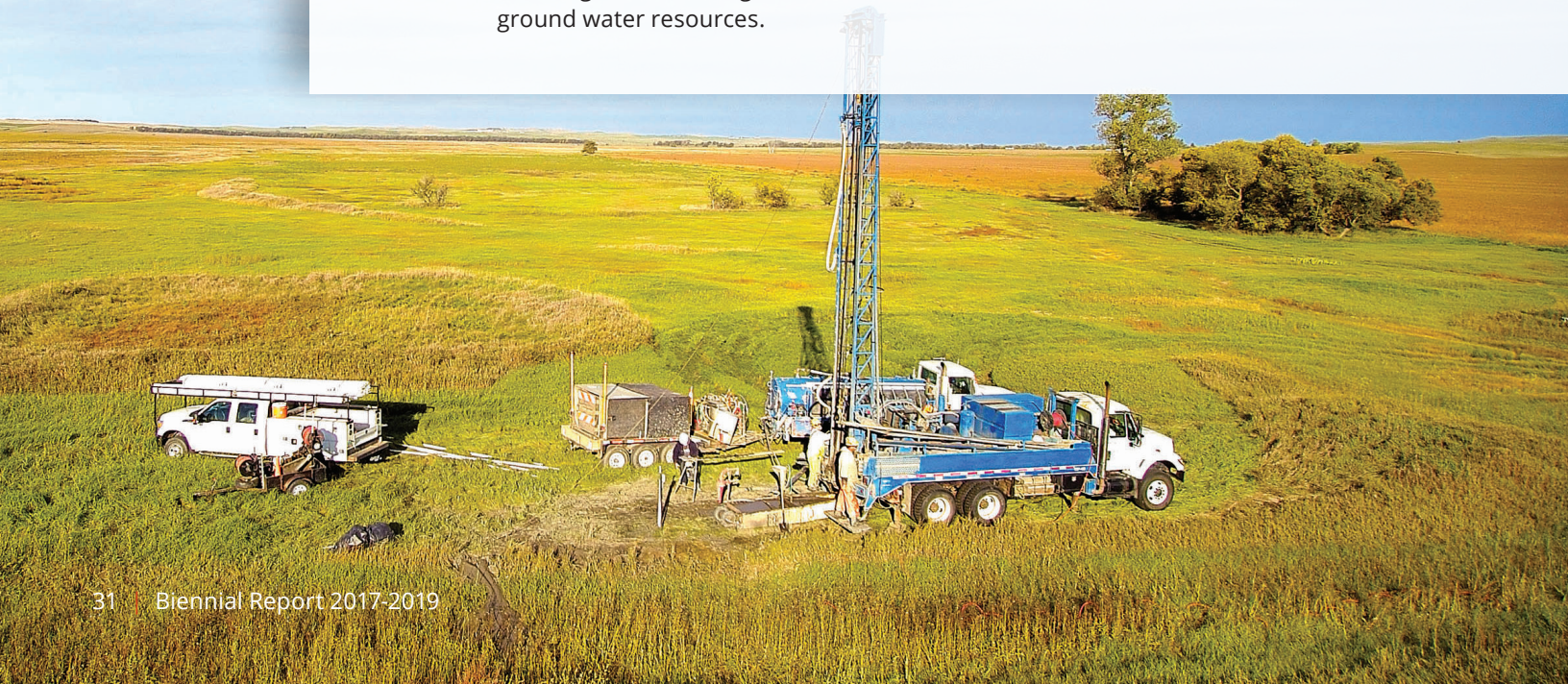
For communities that go above and beyond the minimum requirements, the Community Rating System (CRS) was developed to recognized those efforts. Twelve North Dakota communities are currently enrolled in the CRS, which gives NFIP flood insurance policy holders a discount on their premium. The current total annual savings statewide is estimated to be approximately $241,000.

WATER APPROPRIATION DIVISION

The Water Appropriation Division is responsible for the appropriation and management of the state's water resources in accordance with Article XI of the North Dakota Constitution and Chapter 61 of the North Dakota Century Code. The laws are based on the Doctrine of Prior Appropriation.

Specific staff responsibilities include:

- Identifying the availability and chemical quality of the state's water resources;
- Assisting municipalities and other public entities in developing solutions to particular water supply problems;
- Assessing the impacts of existing water use on ground water levels, stream flow, and chemical quality of water for the purposes of future allocation and management;
- Collecting, storing, and disseminating data on stream flow, spring flow, ground water, lake levels, water quality, and water use;
- Carrying out the administrative procedures required for water permit applications, water permits, and water rights;
- Conducting analyses and providing recommended decisions to the State Engineer on water permit applications;
- Developing and maintaining a system for the storage and retrieval of water permit records;
- Monitoring the utilization of each conditional and perfected water permit through annual water use reports, and maintaining a permanent record;
- Participating in committees and task forces pertaining to water quantity and/or quality issues as required; and
- Investigating and employing new technologies and strategies to improve the understanding and knowledge of the occurrence and movement of the state's surface and ground water resources.



DATA ACQUISITION

The Water Appropriation Division Drilling Program drilled 244 test holes during the 2017-2019 biennium, and installed 161 monitoring wells. Two airborne electromagnetic (AEM) surveys were completed in the West Fargo aquifer system, the Wahpeton Buried Valley complex, and the Spiritwood aquifer in LaMoure, Dickey, and Sargent Counties. Realtime remote monitoring was done on several streams and creeks in the west, including the Little Missouri River. Division staff continued to measure water levels at about 4,000 sites on a monthly, quarterly, annual, or continuous basis in monitoring wells and at surface water locations. Continuous water-level data is collected and stored for onsite retrieval from about 80 locations across the state.

Development and deployment of the PRESENS (Pushing REmote SENSors) initiative began with the deployment of several units in the Bismarck-Mandan area as well as in the Little Missouri River Valley between Medora and the Long-X bridge. This remote data acquisition program allows low-cost, rapid deployment, real-time collection of a number of sensor types, including water-level (pressure transducer), temperature, atmospheric pressure, and soil moisture, to continuously record and provide data to the public via the internet. Water samples were collected from 2,200 ground water and surface water locations for analysis of major constituents, trace elements and nutrients. The division continues to partner with the USGS to collect real-time stream gage information from river locations throughout the state.

DATA MANAGEMENT

With the large volume of water resource data collected by the agency, management of that data is essential for its efficient use. These management efforts involve processes related to the collection, storage, analysis, and dissemination of a wide range of data including: well inventory information, water levels, water chemistry analyses, water permits, water depots, water use, dams, drains, and precipitation. Because of the unique nature of much of the data, State Water Commission IT staff have developed the necessary data management tools to access the data for internal and public use through web access.

A preliminary real-time data acquisition platform has been developed and tested to push hydraulic information (water level, atmosphere pressure, temperature, and others) from the field to the Office of the State Engineer database. This platform provides a pathway to integrate current hydraulic conditions into real-ime management of the waters of the state.

RESEARCH, STUDIES, & REPORTS

During the 2017-2019 biennium, the Water Appropriations Division was involved in numerous studies that were completed or are in progress. Descriptions of these studies follow.

- Airborne Electromagnetic (AEM) surveys were flown over the West Fargo and Wahpeton aquifer systems and over portions of the Spiritwood aqiufers in LaMoure, Dickey, Benson, Eddy and Nelson Counties. The results of the work on the AEM project (co-authored by Appropriations Division staff) have been presented at several international conferences.
- The PRESENS (Pushing REmote SENSors) system was developed for real-time collection of data from a multitude of environmental sensors, especially water-level (head) data.
- The State Water Commission has initiated a plan of intensive monitoring of the Little Missouri River at five sites between Medora and the Long-X bridge. Real-time head monitoring was accomplished through the use of the PRESENS prototypes that needed to be adapted for satellite communications due to the lack of cellular service at these locations deep within the badlands.
- A report on the Water Quality Assessment for the North Dakota National Guard Camp Grafton (South Unit), Eddy County, was completed in 2018.

DATA MANAGEMENT

- A water permit routing and review system was implemented in the Water Appropriations Division that has dramatically improved the efficiency of administrative actions that must take place in the management of water permits and water rights.
- Advanced software for the use of AEM data analysis was purchased by the Water Appropriations Division.
- Ongoing laboratory support was provided for Dr. Xinhua Jia, Agricultural Engineering Dept., NDSU, for monitoring of crop yield, salinization and sodicity monitoring, and water quality monitoring on an experimental project related to irrigating crops using ground water through tile drains.
- The Water Appropriations Division entered into a cooperatively funded streamflow statistics study with the USGS. The project will develop the North Dakota extension of a nationally developed application, known as StreamStats. The application will be able to provide hydrologic information that can be accessed on-line to provide scientifically defensible stream data in a uniform and non-biased manner. The StreamStats study is still being refined, and Appropriations surface water hydrologists are working with adapting its application to surface water management, particularly on small un-gaged streams.

PERMITTED WATER USE SUMMARY

JULY 1, 2017 - JUNE 30, 2019

WATER USE	ACRE-FEET
Irrigation	
Applications Filed: 64	
Acre-Feet Requested: 29,203	
Acres Granted*: 5,030	
Storage Granted*	22.8
Water Granted*	6,246
Ground Water Granted*	4,885
(Ground Water Acres) 3,370	
Surface Water*	1,361
(Surface Water Acres) 1,660	
Flood Control	
Applications Filed: 0	
Storage Granted*	55
Water Granted*	0
Industrial	
Applications Filed: 59	
Water Granted*	27,292
Livestock	
Applications Filed: 0	
Water Granted*	0
Storage Granted*	0
Municipal	
Applications Filed: 1	
Water Granted*	0
Recreation, Fish & Wildlife	
Applications Filed: 2	
Storage Granted*	4,750
Annual Use Granted*	2,363
Rural-Domestic	
Applications Filed: 2	
Water Granted*	0
Total Applications Filed	128
Total Water Granted	35,902

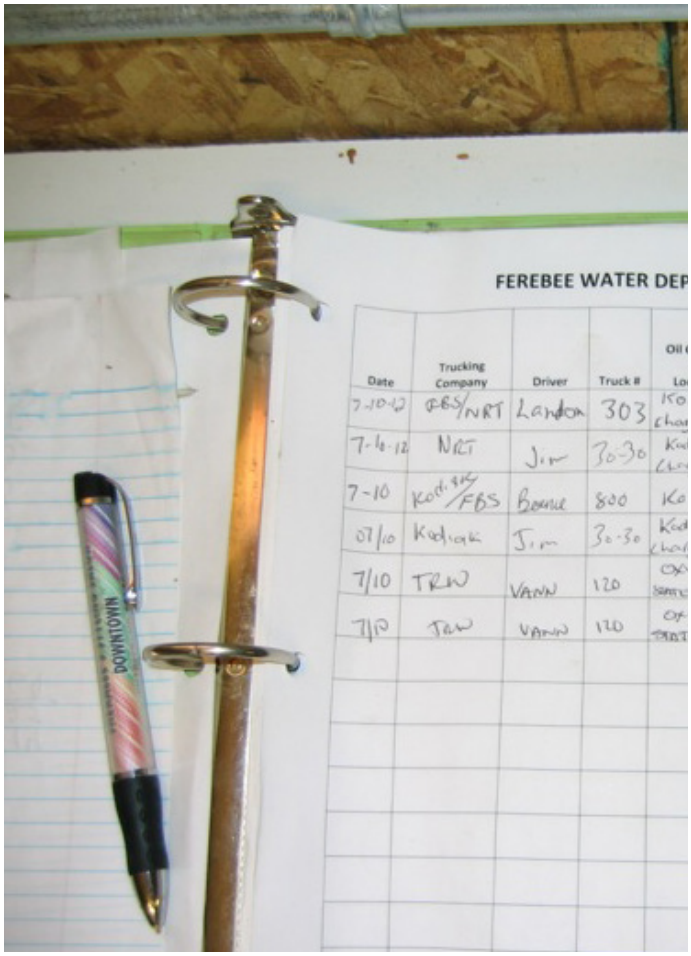
* Includes backlog-permits applied for in previous bienniums.

TEMPORARY WATER PERMITS

JULY 1, 2017 - JUNE 30, 2019

Type of Use	Number of Permits	Authorized Volume (Acre-Feet)
Construction	332	4,014
Fire Protection	3	3
Industrial	23	1,365
Industrial-Water Depot	812	195,732
Irrigation	64	11,928
Livestock	1	20
Resource Planning	12	36
Rural Water	0	0
Total	1,249	213,098
Voided or Denied	131	13,000

Note: The count of permits acted upon include approved, expired and denied permit applications.



- A Hydrologist Manager of the Appropriations Division served as the Co-Secretary of the International Souris River Board (ISRB), and also serves on the Hydrology Committee and the Flow Forecasting Liaison Committee of the ISRB. He also serves as the State Engineer's representative on the Hydrology Committee for the International Red River Board. Both boards advise the International Joint Commission (IJC).
- A focused sampling regime of the major public water supplies from ground water in Grand Forks County was continued during the 2017-2019 biennium. The four major public water supplies (Grand Forks-Traill Rural Water, Tri-county Rural Water, Agassiz Rural Water, and the City of Larimore) obtain their water from the Inkster and Elk Valley aquifers. Twenty seven wells were sampled at least once annually with an in-depth monitoring program, which began several years ago. This was done to detect any seasonal or long- term trends with respect to water quality changes, specifically nitrate.
- Monitoring the Forest River Colony Artificial Recharge Project was continued during the 2017-2019 biennium. The project involves pumping water from the Forest River during high flow times in the spring, into a basin overlying the Inkster Aquifer. Water is then withdrawn from the aquifer later in the season for irrigation purposes. Without artificial recharge, the aquifer would not be able to support the number of acres being irrigated. Mandatory sampling and water level monitoring protocols are given to the permit holder each year before artificial recharge begins. In addition, the Colony has filed a new water permit application to irrigate more acres and expand the artificial recharge facilities.
- Appropriations Division hydrologists and technicians continued to monitor and analyze nitrate contamination and remediation of the Karlsruhe Aquifer, in cooperation with the North Dakota Health Department (Health Department). The project consists of an annual evaluation of stratified nitrate concentrations at more than 70 sites, and an assessment of total nitrate loading.

AGENCY REPRESENTATION

The Water Appropriation Division represents the State Engineer and the State Water Commission on state, regional, and national, natural resource organizations. Members of the division have provided soils, ground, or surface water assistance in meetings or reviews pertaining to: Section 319 Task Force; Working Committee of the State Pesticide in Ground Water Protection Plan; Technical Committee of the State Pesticide in Ground Water Protection Plan; Northern Great Plains Management Consortium; North Dakota Board of Water Well Contractors; Midwest Ground Water Conference; North Dakota Water Resources Research Institute; North Dakota Public Service Commission Mining Plans; North Dakota State University Extension Irrigation Workshops; Red River Valley Water Supply Project; Federal reserve water rights negotiations; Yellowstone River Compact review meetings; the International Red River Board; and the International Souris River Board; North Dakota Water Quality Planning Committee; and the Williston Area Model Consortium.

LANDFILL & MINE PERMIT REVIEWS

The Water Appropriation Division cooperates with the Department of Environmental Quality (DEQ) in reviewing ground water aspects of landfill applications. From July 1, 2017 through June 30, 2019, five landfill pre-applications were reviewed for the Health Department.

The Ground Water Section of the Water Appropriations Division reviews coal mining permits and revisions with regard to ground water and wells. The Water Appropriations Division performed 20 mine-related environmental reviews during the 2017-2019 biennium. The mine-related environmental reviews range from quarterly reviews of continuations of nationwide permits to reviews of plans for mine expansion. The reviews consider ground water and surface water resources in the area and evaluate potential impacts of mine-related activities to these resources. Comments from the Water Appropriations Division staff are passed on to mine staff and other regulatory agencies.

In addition, about five reviews per week of water appropriation requirements for public works projects are conducted during the construction season.

ECONOMIC DEVELOPMENT

Economic development is a major state initiative. In most instances, water is needed to serve new enterprises. The Appropriations Division provides information to the North Dakota Department of Commerce and local economic development organizations regarding the availability and chemical quality of water to serve a proposed enterprise.

The Appropriations Division assisted a major petrochemical facility with locating a potential water supply. The Appropriations Division also initiated exploratory projects using AEM surveys to provide better definition of ground water availability in areas of high economic demand for water.

OTHER TECHNICAL ASSISTANCE

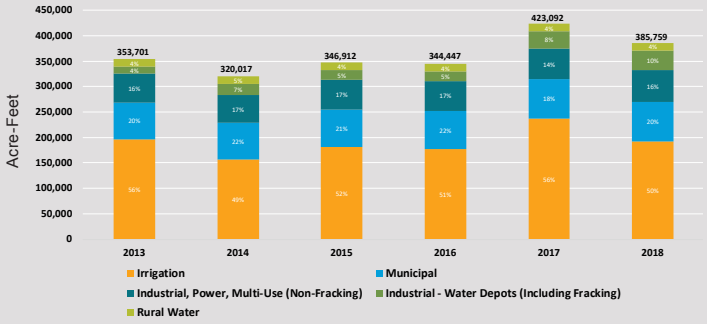
The Water Appropriations Division is also tasked with assisting and advising the public on the availability of water for all purposes of use. Considerable time and resources were expended to provide technical assistance for the development of water supplies for oil field development (brine dilution and hydro-fracturing).

WATER USE MANAGEMENT

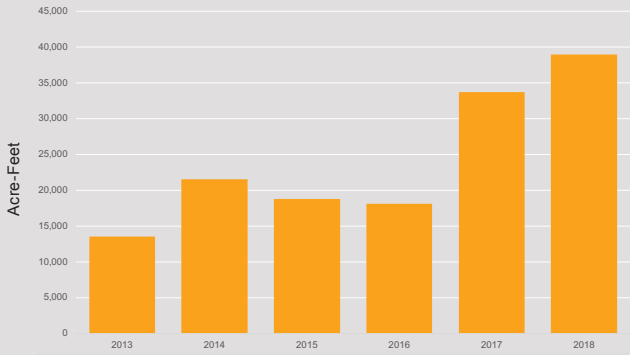
Consumptive water use rose to an all-time high in 2017 mainly from the increase in per-acre irrigation application due to the dry conditions that year. Water use by the oil industry in western North Dakota also increased to a record high level of about 39,000 acre-feet in 2018. High water use was sustained through the 2017-2019 biennium after a rebound from the downturn in oil field development and the increase in water volume needed on a per frack basis. Authorized water use to the oil industry is given through conditional and temporary permits. A total of 1,160 temporary industrial water permits were issued during the 2017-2019 biennium.

All water supply depots are required to install and operate telemetry, and transmit pumping data to the water commission in real time using a state-determined protocol. Violations of water permit limitations and conditions are heavily fined to assure compliance. Fines for unpermitted pumping are profit based to assure that illegal pumping is not profitable. The division uses administrative consent agreements (ACAs) as the preferred method to resolve water use violations to avoid lengthy and costly court processes. In the 2017-2019 biennium, 29 violations were resolved through administrative consent agreements, resulting in total fines of $700,000, with $129,000 paid, and the remainder suspended. Monies collected in fines through ACAs are deposited in the state's general fund.

2013-2018 NORTH DAKOTA CONSUMPTIVE WATER USE PER YEAR

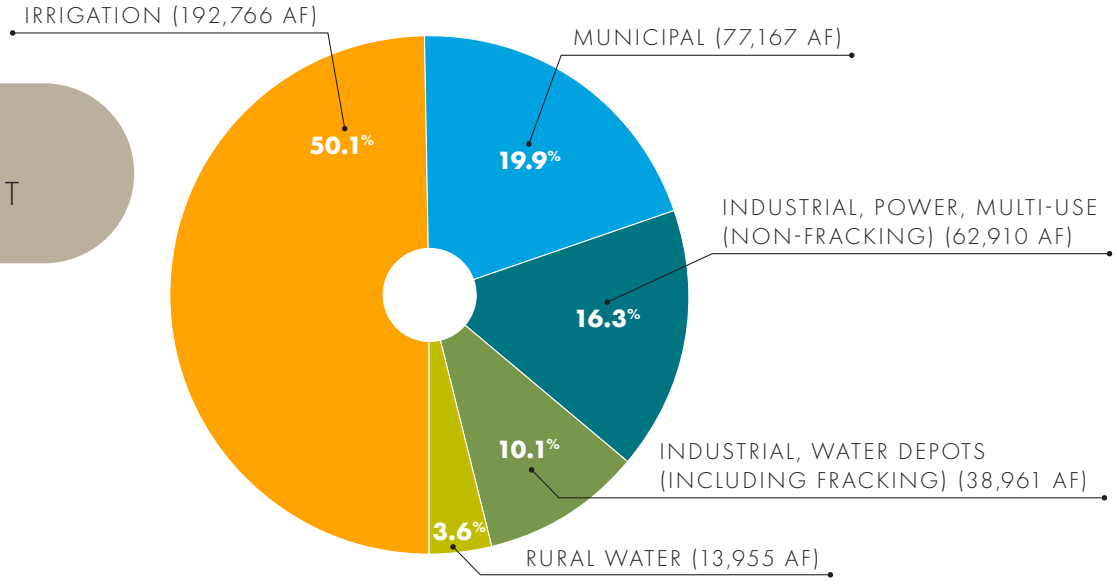


INDUSTRIAL WATER DEPOT ANNUAL WATER USE



2018 NORTH DAKOTA CONSUMPTIVE WATER USE

385,759
ACRE-FEET

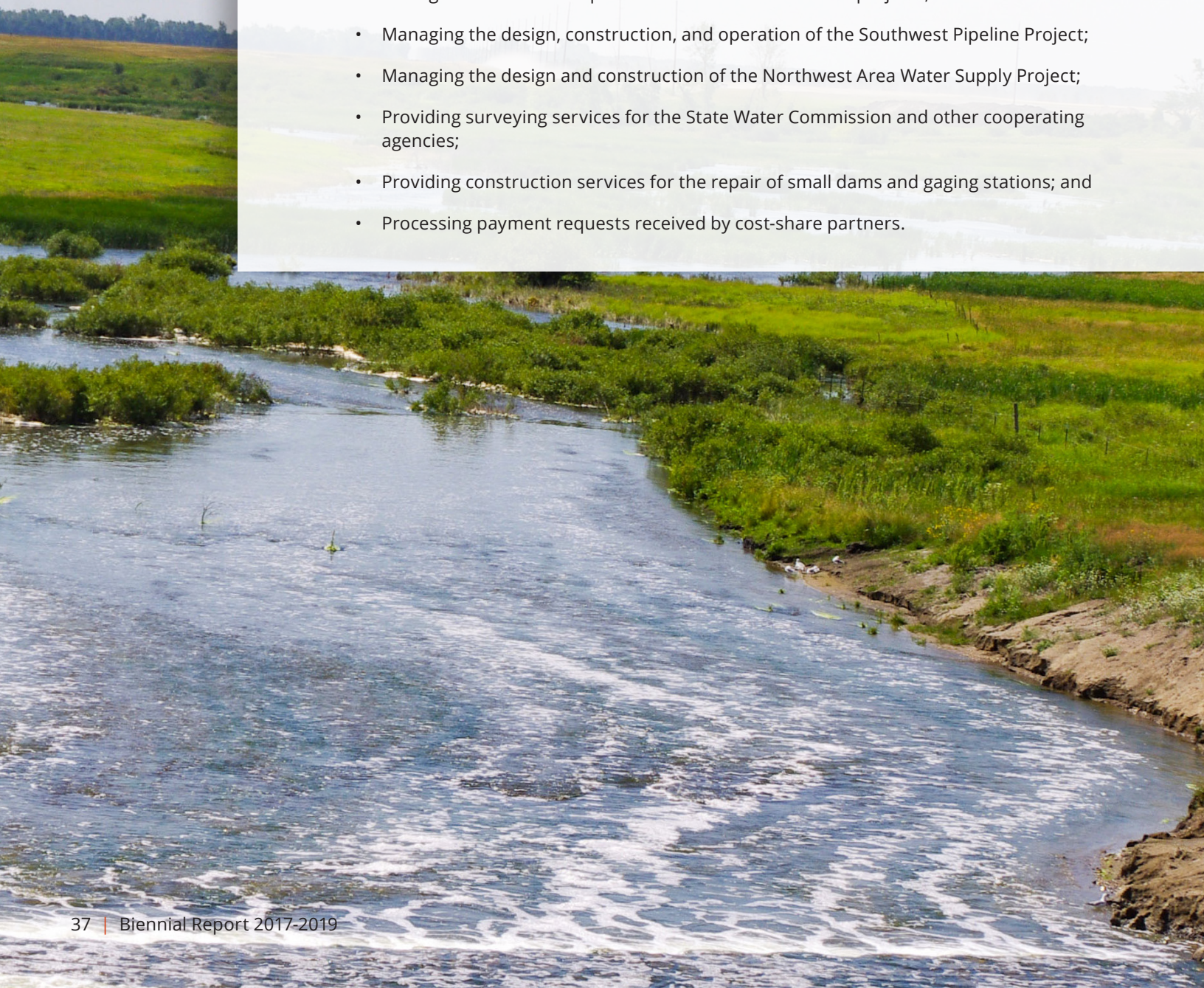


WATER DEVELOPMENT DIVISION

The Water Development Division supports the responsibilities of the State Water Commission by providing technical expertise through its management of various projects and programs.

Specific staff responsibilities include:

- Preparing engineering and feasibility reports and designs for the construction, maintenance, and major repair of water resource projects;
- Providing technical assistance to water resource district boards;
- Management of cost-share programs;
- Management and development of the Devils Lake outlet projects;
- Managing the design, construction, and operation of the Southwest Pipeline Project;
- Managing the design and construction of the Northwest Area Water Supply Project;
- Providing surveying services for the State Water Commission and other cooperating agencies;
- Providing construction services for the repair of small dams and gaging stations; and
- Processing payment requests received by cost-share partners.



INVESTIGATIONS SECTION

During the 2017-2019 biennium, the Investigations Section provided support on a number of projects and studies, which are described below. Activities related to the Mouse River, Missouri River, and Survey Crew are described in more detail in separate sections of this report.

Mercer County Study

As part of a Planning Assistance to States study agreement between the U.S. Army Corps of Engineers and the Mercer County Water Resource District, staff completed a hydraulic model of the Knife River through the City of Beulah, an alternatives analysis of flood risk reduction measures for the City of Beulah, and a preliminary dry dam analysis on West Tributary.

Emmons County Study

As part of a Planning Assistance to States study agreement between the U.S. Army Corps of Engineers and the Emmons County Water Resource District, staff completed a hydraulic model of Beaver Creek through the City of Linton and an alternatives analysis of flood risk reduction measures for the City of Linton.

McGregor Dam

The condition and hydraulic capacity of the principal and emergency spillways were of particular concern for McGregor Dam, located in Williams County. The State Water Commission, entered into an investigation agreement with the ND Game and Fish Department to conduct a dam safety analysis. Staff completed a hydrology and hydraulics analysis, and investigated several alternatives that would bring the dam into compliance with dam safety standards.

Probable Maximum Precipitation Study

This study's purpose is to develop more representative Probable Maximum Precipitation (PMP) estimates for the State of North Dakota for evaluating flood safety, assessing flood risk, and calibrating event-specific hydrologic models.

The current PMP dataset covering North Dakota was derived in the 1970s and 1980s as part of Hydrometeorological Reports (HMRs) completed by the National Oceanic and Atmospheric Administration (NOAA). HMR-51 consisted of the continental US east of the 105th meridian, while HMR-48 was done specifically for the Red River of the North and the Souris River. HMR-48 PMP values include influences attributable to snowmelt, which has proven to influence runoff and flooding. HMR-52 covered methodology for using PMP values found in HMR-51.

Since the completion of the HMRs, North Dakota has experienced a wet-cycle that was not prevalent during the climate record used in previous studies. This period consisted of a number of large spring floods and precipitation events. Many of the historic flooding events in North Dakota occurred due to melting snow or rain on snow events, most recently in 1997, 2009, 2010, and 2011.

The study was initiated in winter 2019 and is expected to be complete in two years. Section staff have assisted in coordinating study activities and chairing the Steering Committee, which is comprised of state and federal agencies knowledgeable in the sciences and methods involved in a PMP analysis. The Steering Committee provides guidance, participates in meetings to maintain analysis integrity, and reviews deliverables and final products.

Closed-Basin Lake Monitoring

In an effort to understand the dynamics of the numerous land-locked lakes throughout the state, Section staff monitored lake levels at the following locations:

- Twin Lakes, LaMoure County
- Boom Lake (Lake Marion), LaMoure County
- McKenna Lake (north and south lakes), Logan County
- Lake Laretta, Nelson County
- McHugh Slough, Nelson County
- Tolley Slough, Renville County

COST-SHARE PROGRAM

The State Water Commission has been fortunate to have access to significant funding for project support in recent years. However, that funding has come at a time of serious water resource challenges across the state, with major flood control, water supply, and other projects facing serious funding needs. During the 2017-2019 biennium, the Development Division processed almost 1,000 cost-share requests and payments. There were approximately 136 total projects, totaling over $290 million in approved funds.

MUNICIPAL, RURAL & INDUSTRIAL WATER SUPPLY

In federal fiscal years 2018, and 2019, the Municipal, Rural, and Industrial (MR&I) Water Supply Program received $26.6 million in federal grant funds for the development of water supply facilities in the state. This brought the total received from the federal government to $398.6 million since the program was authorized in 1986.

The federal funds were allocated to the Northwest Area Water Supply (NAWS) Project for development of the biota water treatment plant, intake, and water transmission pipelines. The State Water Commission also provided funding toward project development.

SURVEY CREW

The State Water Commission has employed a Survey Crew and engineering technicians since the creation of the agency. The Survey Crew collects survey data statewide for a variety of purposes: survey of water bodies for hydraulic and hydrologic modeling, aquifer monitoring, high water marks, construction survey, drainage issues, geomorphic changes, and lake level monitoring. The Survey Crew completes many surveys for the State Water Commission, water boards, cities, counties, other agencies, and the public. The Survey Crew also conducts snowpack monitoring in coordination with the Corps in the Missouri River basin.

Several bathymetric surveys of the Missouri River were completed, with emphasis on the confluence of the Heart and Missouri Rivers. Additional bathymetric surveys were also completed at areas of concern throughout the state. Several water surface profiles were surveyed each field season on the Missouri River, from near Sundown Acres to Graner Bottoms.

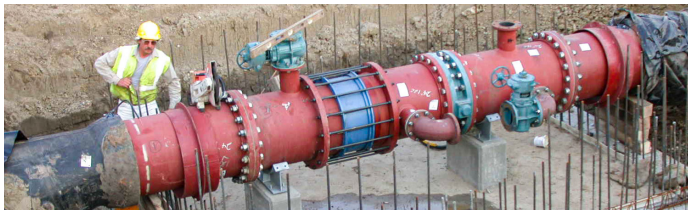
NORTHWEST AREA WATER SUPPLY

On August 10, 2017 the honorable Rosemary Collyer of the District Court for the District of Columbia issued summary judgment granting the motions for summary judgement filed by the United States Department of the Interior and the State of North Dakota, denying the motion for summary judgement filed by the Province of Manitoba, dismissing the complaint filed by the State of Missouri for a lack of standing in the case, rendering their motion for summary judgement moot, and vacating the injunction on the Northwest Area Water Supply project.

Both plaintiffs filed appeals in October 2017, and initial filings were due November 27, 2017. The court issued a briefing schedule January 3, 2018, with appellant's briefs due February 12, 2018, appellee's briefs due March 14, 2018, and appellant's reply briefs due March 28, 2018. A joint motion was filed and approved by the court to hold the case in abeyance for 90 days to allow settlement negotiations between appellant Manitoba and the appellees. Another joint motion was filed and approved by the Court to extend the abeyance further to allow further discussions.

A joint motion by North Dakota, Department of Interior, and Province of Manitoba, moving to dismiss Manitoba's appeal was filed June 22, 2018, and granted by the Circuit Court the following week. The State of Missouri continued their appeal of the District Court's decision briefing only on the issue of their standing in the case. Oral arguments were held November 8, 2018, in the District of Columbia Circuit Court of Appeals. On May 3, 2019, the Circuit Court affirmed the District Court's August 2017 ruling, thus ending sixteen years and seven months of litigation on the project. Missouri did not appeal the decision to the Supreme Court.

With the litigation resolved, progress resumed on construction of the project. Work was underway to replace the softening basins and associated systems at the Minot Water Treatment Plant, and the first two of four pipeline contracts to get water to Bottineau were bid with one under construction prior to the end of the biennium. Design work was also initiated for the remaining pipeline contracts, intake modifications to the Snake Creek Pumping Plant, Biota Water Treatment Plant at Max, Lansford Reservoir and pump station, and South Prairie Reservoir and hydraulic control structure.



SOUTHWEST PIPELINE PROJECT

The main objective for the Southwest Pipeline Project (SWPP) in the 2017-2019 biennium was increasing the capacity of the project to meet the growing need for water in southwest North Dakota. This objective has three components: intake capacity, raw water transmission capacity, and treatment capacity.

A major accomplishment to meet this goal was the addition of another water treatment plant (WTP). The Southwest Water Treatment Plant (SWTP), with 6 Million Gallons per Day (MGD) treatment capacity, became operational. The SWTP is located east of the SWPP's existing Dickinson WTP, which is owned by the City of Dickinson and operated by Southwest Water Authority. The completion of the SWTP brings the total treatment capacity at Dickinson for the SWPP to 18 MGD, which is the projected treatment capacity need for the SWPP at Dickinson.

The construction of the Residual Handling Facility (RHF) to dewater the lime sludge and other process residuals generated in the water treatment processes was also mostly completed in the biennium. Because of the RHF, the lime sludge cake generated has the ability to be land applied for adjusting the pH of crop land. Before the completion of the RHF, the lime sludge and other process residuals were pumped to the sludge ponds located south of the WTPs.

Two raw water reservoirs located north of the City of Richardton and east of the City of Dickinson also became operational in conjunction with existing reservoirs at both locations. The capacity of these two reservoirs are 1.3 million gallons and 4.8 million gallons, respectively. The reservoir north of Richardton is a glass fused bolted steel tank, while the reservoir east of Dickinson is a partially buried cast-in-place concrete tank. The added storage capacity of these two reservoirs provides for redundancy and resiliency to the SWPP.

The first 4-mile raw water parallel pipe segment from the intake to the Oliver Mercer North Dunn WTP located north of the City of Zap was also completed. This raw water parallel piping provides for increased raw water transmission capacity. A contract for pump station upgrades at Dodge and Richardton for increasing the raw water transmission capacity was awarded. This contract involves equipment with long lead times, so most of the construction is expected to happen in the 2019-2021 biennium.

The supplemental intake project under construction suffered a significant setback because of cracks which developed on the intake pipe installed along the 2nd alignment. The contractor had to abandon the 2nd alignment and is currently working on a plan for installing the intake through a Horizontal Directional Drilling method.

Capital repayment collected from July 2017 through June 2019 was $10,266,745.16. All of that was deposited into the Resources Trust Fund.

An independent study to determine the merits and demerits of the State of North Dakota owning the SWPP, along with a comparative analysis of the other regional water systems in North Dakota, was authorized and is currently ongoing.

DESIGN & CONSTRUCTION SECTION

During the 2017-2019 biennium, the State Water Commission's Design and Construction Section conducted repairs and modifications to water resource structures throughout the state, as well as assisting in the operations of the Devils Lake outlets.

DEVILS LAKE WEST END OUTLET STANDPIPE MODIFICATION, BENSON COUNTY

The Devils Lake West End Outlet, owned by the State Water Commission, discharges a maximum of 250 cubic feet per second of water from Devils Lake through a system of canals and pipes to an outfall structure along the Sheyenne River 14 miles away. The project consists of two pump stations. Each pump station has a standpipe that maintains a constant pressure on the pumped portions of the system. In past operating seasons, the standpipes would develop foam that would build up to the point of blowing out of the vents at the tops of the tanks.

In 2017, work was done to try to reduce or eliminate the foam buildup. This work consisted of cutting holes in the center core of each standpipe to change the turbulence at each operating water level. This initial effort was mostly successful in reducing the foam build up. However, it was found that additional holes were needed in the Round Lake standpipe at the maximum water level elevation. In February 2018, the SWC construction crew, along with the outlet operations staff, erected scaffolding and cut the additional holes at the max water level. The standpipe operated without any foam issues throughout the 2018 pumping season.

DEVILS LAKE EAST END OUTLET OUTFALL REPAIR, NELSON COUNTY

The Devils Lake East End Outlet, owned by the State Water Commission, discharges a maximum of 350 cubic feet per second of water from Devils Lake through an 8-foot diameter concrete pipe to an outfall structure in the Tolna Coulee five miles away. The outfall structure consists of a reinforced concrete spillway structure, an area of articulated concrete block for energy dissipation, and a sheet pile wall as the final stage. Over the previous several pumping seasons, the impact of the discharge spilling onto the concrete block displaced the block, causing soil at the base

of the outfall structure to erode away. In 2018, repairs were required at two separate areas of the outfall structure to prevent undermining of the structure.

The first repair took place prior to the start of the 2018 pumping season and consisted of driving sheet piling along the toe of the reinforced concrete spillway structure; then flowable concrete was used to fill the space behind the piling and under the structure to replace the eroded soil and prevent future erosion.

The second repair took place in August and was required after a separate area of erosion formed at the sheet pile wall which was placed during original construction in 2012. For this repair, the outlet was shut down for twenty days, the area was excavated, and a separation in a seam of the sheet pile wall was observed.

This separation of the seam was likely caused by a large rock encountered during initial construction and resulted in a seepage path which eventually led to the damaging erosion. For this repair, both sides of the wall were excavated, a secondary wall was driven, and the hole was filled with concrete to prevent future erosion. The wall was then backfilled with rock to provide additional energy dissipation. With these repairs completed, the East End Outlet was able to provide reliable operation for the remainder of 2018 and is prepared to serve the region into the future.

KULM-EDGELEY DAM, LaMOURE COUNTY

Kulm-Edgeley Dam is a small recreational fishing reservoir located in LaMoure County seven miles west of Edgeley. The dam is an earth embankment dam constructed in 1968. The principal outlet consists of a concrete riser structure and 30-inch reinforced concrete pipe (RCP) conduit. The outlet work also included a valve to release water from the bottom of the lake to improve water quality.

The RCP separated from the concrete riser at the first joint downstream from the structure, resulting in a sinkhole at the face of the structure. In 2017, the LaMoure County Water Resource District requested cost-share, along with technical and construction support from the Water Commission to repair the inlet pipe joint.

The repairs began in July 2017, with the construction of an earthen coffer dam. This was followed by excavation of the riser and conduit. Forms were then placed around the existing RCP conduit to create a reinforced concrete collar around the separated joint. The structure was then back-filled and the cofferdam was removed. The borrow site was reclaimed and seeded.

SCHLECT-THOM DAM, LaMOURE COUNTY

Schlect-Thom Dam is a small recreational fishing reservoir located in LaMoure County six miles west of Edgeley. The dam is an earth embankment dam constructed in 1968.

The principal outlet consists of a 42-inch corrugated metal pipe (CMP) riser and 30-inch CMP conduit. The outlet works also include a valve to release water from the bottom of the lake to improve water quality.

The CMP riser developed leaks leading to loss of water from the reservoir. The riser had developed several rust holes, allowing water and soil to leak through the opening, resulting in a sinkhole around the riser. The valve for the low-level outlet was also heavily rusted. In 2017, the LaMoure County Water Resource District requested cost-share, along with technical and construction support from the Water Commission, to repair the principal spillway.

The repairs began in August 2017, with the construction of an earthen coffer dam. This was followed by excavation of the riser. Forms were then placed around the existing CMP riser to create a reinforced concrete drop structure, using the CMP as the inside form. New fittings for the low-level outlet were cast into the new concrete, and a new valve and operator stem were installed in the riser. The structure was then backfilled and the cofferdam was removed. The borrow site was reclaimed and seeded.

SCHLENKER DAM, LaMOURE COUNTY

Schlenker Dam is a small recreational fishing reservoir located in LaMoure County ten miles east of Gackle. The dam is an earth embankment dam constructed in 1970.

The principal outlet consists of a 48-inch corrugated metal pipe (CMP) riser and 30-inch CMP conduit. The outlet works also included a valve to release water from the bottom of the lake to improve water quality.

The CMP riser developed leaks leading to loss of water from the reservoir. The joint at the riser to conduit connection had ruptured, allowing water and soil to leak through the opening resulting in a sinkhole around the riser. The valve for the low-level outlet was also heavily rusted. In 2017, the LaMoure County Water Resource District requested cost-share, along with technical and construction support from the Water Commission to repair the principal spillway.

The repairs began in June 2018, with the construction of an earthen coffer dam. This was followed by excavation of the riser. Forms were then placed around the existing CMP riser to create a reinforced concrete drop structure, using the CMP as the inside form. New fittings for the low-level outlet were cast into the new concrete and a new valve and operator stem were installed in the riser. The structure was then backfilled and the cofferdam was removed. The borrow site was reclaimed and seeded. With these repairs, Schlenker Dam will continue to provide a place for anglers to enjoy the North Dakota outdoors for years to come.

DAUB DAM, MERCER COUNTY

Daub Dam forms the embankment of ND Highway 200A and creates two small recreational fishing reservoirs divided by a narrow isthmus. The reservoirs may be better known as East and West Arroda Lakes and are 11 miles west of Washburn. The dam is two earth embankments built in 1971 as part of improvements to Hwy 200A. The dam is owned by the state, with responsibility for the dam functions falling under the Game and Fish Department.

The dam has two low-level drawdown systems, used primarily for water quality improvement in the reservoirs, one in each embankment. The low-level drawdown systems consisted of 12-inch ductile iron pipe (DIP) conduits with gate valves at the downstream end. Outlet works with

valves at the downstream end, referred to as "downstream control" were once popular in dam construction because they are easier to construct and cost less than upstream control systems. However, downstream control presents a risk of dam failure if the pipe full of water near the downstream toe of the dam starts to leak. A possibility made more likely by the fact the conduit is made of iron. That is what happened at the west embankment of Daub Dam in spring 2018. Fortunately, it was found quickly by Game and Fish staff before significant damage to the embankment occurred. The west reservoir was quickly drained to prevent further damage to the embankment.

The Game and Fish Department requested cost-share along with technical and construction support from the Water Commission to mitigate the risk of the downstream control on both embankments, and install a new low-level outlet on the west reservoir for water quality.

Late in fall 2018, the State Water Commission construction crew filled the existing low-level conduits with a cement grout to seal them and eliminate the risk caused by the high-pressure water near the toe of the dam. In spring 2019, the new low-level outlet conduit with control on the upstream side of the dam into the west embankment's principal spillway was installed.

DAVIS DAM, SLOPE COUNTY

During the 2019 spring runoff, a sinkhole was discovered over the principal spillway at Davis Dam, an embankment dam in rural Slope County. The dam is owned by the Game and Fish Department. Subsequent investigation found the first joint upstream of the downstream end had separated, allowing embankment material to be washed away and leading to the sinkhole. The principal spillway conduit is a 36-inch diameter corrugated metal pipe (CMP).

The Game and Fish Department requested cost-share, and technical and construction support from the Water Commission to repair the conduit.

The Water Commission construction crew excavated and removed the displaced piece of conduit. Sheet pile was driven into the support soil, and the salvaged piece of CMP was reinstalled with a new connecting band. Concrete saddles where constructed at the joint with the next upstream CMP, and at the downstream end where the conduit discharges into a plunge pool. The pile supported saddles will prevent future movement of the conduit and opening of the joint between the pieces of CMP.

INDIAN CREEK DAM, HETTINGER COUNTY

Indian Creek Dam is a 42-foot high embankment dam constructed in 1979 in rural Hettinger County. The dam is owned by the Game and Fish Department. The principal outlet consists of a 36-inch diameter reinforced concrete pipe (RCP) through the embankment. The RCP conduit is supported on a concrete cradle through the dam, with the final 24 feet cantilevering out to a plunge pool. The cantilevered cradle also supports the toe-drains which are suspended on each side. The concrete in the cantilevered portion of the cradle had deteriorated to the point where the toe-drains were falling off, and gaps had formed between the cradle and the RCP conduit. The gaps allowed water to enter, creating the opportunity for further damage of the cradle and possibly the RCP due to ice forming in the gaps.

The Game and Fish Department requested cost-share, and technical and construction support from the Water Commission to repair the cradle.

The Water Commission construction crew excavated and demolished the cantilevered portion of the cradle, approximately 24 feet, while salvaging the RCP conduit sections for reuse. The salvaged RCP was then reset, forms and reinforcing steel installed, and concrete placed to form a new cradle. The toe-drain conduits were then reinstalled with new support brackets along each side of the cradle.

US GEOLOGIC SURVEY

The Water Commission continued to cooperate with the US Geological Survey (USGS) on the maintenance and improvement of the USGS's stream gaging sites throughout the state.

DEVILS LAKE OUTLETS

Flood relief for the Devils Lake Basin continued to demand significant resources from the State Water Commission over the past biennium. In 2017, the Devils Lake water surface elevation rose to 1451.7 feet, approximately 2.6 feet below the peak elevation that was experienced in 2011. Relatively dry conditions in 2017 and 2018 resulted in lower inflow volumes and the lake level has slowly approached 1448.0 feet for the first time since 2009.

Unlike the riverine flooding of the state where each flood event is typically distinct, the flooding of Devils Lake is a result of long-term climate conditions. Over the past three decades, wetter-than-normal conditions have resulted in a historically high lake level, and potential future lake level rise continues to be a major concern for those that have been impacted by Devils Lake flooding.

The Devils Lake Outlets are regional flood mitigation projects which have slowly and steadily contributed to lake level decline by discharging water to the Sheyenne River throughout the ice-free months. The summer of 2019 was the fourteenth year of operation for the West Outlet and the eighth for the East Outlet. The outlets discharged over 225,000 acre-feet during the past biennium, and overall, they have combined to discharge over 1.2 million acre-feet of floodwater. Without the outlet discharge, it is estimated that the lake would be over five and a half feet higher than the current elevation.

Over the past several years, as the lake level has declined, there has been an ongoing discussion over the elevation at which the discharge operation should be shut down. The high lake levels have provided a wide variety of recreational benefits, and many in the Devils Lake Basin would prefer to keep the lake high.

Alternatively, there are many who continue to be impacted by the high lake level, arguing that the outlets should be used to provide as much of a buffer as possible from potential future flooding. Operationally, the outlets are capable of pumping down to 1445 feet (West) and 1446 feet (East). Overall, the demonstrated potential for the lake to rise several feet each spring has resulted in continued support of outlet operation with special consideration of the downstream water quality and quantity. At a meeting of the Devils Lake Outlet Management Advisory Committee in May 2019, a goal of reducing the lake to 1448 feet before reevaluating outlet operating parameters was recommended.

If the lake level continues to decline, the outlets will eventually be able to cease operation after successfully contributing to a monumental flood mitigation effort. However, if wet conditions persist, the outlets will continue to serve the region by tipping the scales in favor of lake level reduction.

DEVILS LAKE OUTLET OFFICE

The Devils Lake outlets are crucial pieces of infrastructure that require continual maintenance and monitoring to provide the expected level of service. To maintain the outlets, the State Water Commission employs two Devils Lake Outlet Operators in the Devils Lake region. The operators are primarily responsible for operating, maintaining, and monitoring all of the outlet works. They perform weed control operations, collect water quality samples, and provide immediate response to any outlet operational challenges.

MISSOURI RIVER ISSUES

Surplus Water and Reallocation

In 2008, the Corps issued Real Estate Guidance Letter No. 26, in which it was stated that no easement could be issued across Corps land without a water storage agreement.

The water supply issue came to a head in North Dakota in May 2010, when the Corps denied all access for the withdrawal of water out of the Missouri River system's reservoirs. At that time, a moratorium was placed on all water withdrawals out of the reservoirs. The Corps argued that because there was no allocation for Municipal and Industrial (M&I) water in the Missouri River system, water could not be withdrawn until that issue was resolved. According to the Corps, an allocation study would take at least seven years. Because there was pressure to access water immediately, the Corps determined they could use Section 6 of the 1944 Flood Control Act in order to enter into temporary contracts for water supply, or surplus water storage.

In January and February 2011, the Corps took public comment on the Draft Surplus Water Report for Lake Sakakawea. The State Engineer submitted comments in opposition to the study because the Corps claimed that all water in the reservoirs was stored water. There was no recognition of the flow of water that would exist without the presence of the dams (natural flow), which is solely under the jurisdiction of the state to appropriate without interference from the federal government.

The Final Surplus Water Report for Lake Sakakawea was released in March 2011, with a Finding of No Significant Impact (FONSI) released in July 2012. The final report states that 100,000 acre-feet/year of surplus water is available for M&I water supply needs.

In August 2012, the Corps took public comment on the Draft Surplus Water Reports for the five other Missouri River mainstem reservoirs (Fort Peck, Oahe, Big Bend, Fort Randall, and Gavins Point). Also at this time, the Corps took public comment on the scoping for a Reallocation Study. The State Engineer again went on record in opposition to these efforts, asserting that the natural flow that existed prior to the construction of the dams is sufficient to meet the needs of North Dakota, and that these actions by the Corps represent an effort to usurp North Dakota's ability to appropriate the water that rightfully belongs to its people.

In December 2016, the Corps released for public comment their proposed Water Supply Rule. The proposed rule pertains to the use of Corps reservoirs for domestic, municipal, and industrial water supply. It attempts to define how the Corps would require users to enter into storage contracts and be charged for the use of water for those purposes. The state submitted comments that primarily centered around the issue that the proposed rule is fundamentally flawed because of the Corps' misunderstanding of state versus federal jurisdictions, with respect to water appropriation and western water law, and its interpretation of the 1944 Flood Control Act. The proposed rule does not recognize states' rights to allocate water and interferes with states' sovereign rights.

During the 2017-2019 biennium, progress was stalled on resolving the states' concerns. The five remaining Surplus Water Reports, Reallocation Study, and Water Supply Rule all remain unfinished and the Corps continues to refuse to consult with the states.

Missouri River Recovery Implementation Committee

The Water Commission has been involved in the Missouri River Recovery Implementation Committee (MRRIC) since the end of 2011. MRRIC is a group comprised of nearly 70 members, representing a broad array of local, state, tribal, and federal interests through the Missouri River Basin. The purpose of MRRIC is to provide guidance and recommendations to the Corps and the USFWS on actions taken to recover the threatened least tern and endangered piping plover and pallid sturgeon.

During the past biennium, the Corps issued a Record of Decision for the Final Missouri River Recovery Management Plan and Environmental Impact Statement (MRRMP-EIS). The MRRMP-EIS involved the development and evaluation of a range of alternatives for the purposes of avoiding jeopardy for the piping plover, least tern, and pallid sturgeon due to operation of the Missouri and Kansas River reservoir systems, and operation and maintenance of the Missouri River Bank Stabilization and Navigation Project.

The selected alternative includes mechanical construction of habitat for the piping plover, least tern, and pallid sturgeon. In North Dakota, this would include the construction of new, or maintenance of, existing Emergent Sandbar Habitat (ESH) on the Garrison reach. The alternative also includes a one-time flow test of a pallid sturgeon spawning cue, if naturally high flow does not occur on the Missouri River within about the next ten years. This one-time flow test would require a deviation from, or change in, the Master Manual.

A primary concern resulting from this effort is ensuring that the Corps consults with the State of North Dakota, and other affected states, prior to consideration of flow modifications or deviations outside the bounds of the current Master Manual.

Water Commission staff continue to be involved in MRRIC to protect the interests of the citizens of the state and to also collaborate with the MRRIC members and federal agencies on how best to recover the species and manage the river.

SURPLUS WATER

PURPOSE OF SURPLUS WATER STUDY

To determine if, and how much, surplus water exists in the Missouri River mainstem reservoirs. Once a Surplus Water Determination is complete, the Corps asserts that Section 6 of the 1944 Flood Control Act will allow it to enter into temporary water storage agreements with water users.

CORPS DEFINITION OF SURPLUS WATER

Water stored in a Department of Army reservoir, that is not required because the authorized need for the water never developed, or the need was reduced by changes that have occurred since authorization or construction.

Water that would be more beneficially used as M&I water, than for the authorized purpose that, when withdrawn, would not significantly affect authorized purposes over some specified period.

PURPOSE OF THE REALLOCATION STUDY

To examine whether some amount of storage originally included for all authorized project purposes may be permanently allocated to M&I water supply.

To examine the effects of such reallocation on the authorized purposes and operations of the mainstem reservoirs. When the Reallocation Study is complete, the Corps affirms that the 1958 Water Supply Act allows it to enter into permanent water storage agreements with water users.

MISSOURI RIVER POST-2011 FLOOD

USGS Study

In 2011, record flows on the Missouri River resulted in significant geomorphic changes to the river channel. The USGS, in coordination with the State Water Commission, Corps, Health Department, North Dakota Department of Transportation, Game and Fish, Burleigh and Morton Counties, the Lower Heart River Water Resource District, and the cities of Bismarck and Mandan, initiated a geomorphic assessment of the Missouri River in North Dakota.

The assessment will provide insight on how dam management has affected the river, determine impacts to the river channel from the 2011 flood, and will result in a numerical model that can be utilized to predict channel evolution and sediment transport under flooding conditions. The USGS continued to make progress on certain parts of the study during the last biennium. The only remaining unfinished piece is the aeolian transport analysis.

Missouri-Heart River Confluence

The 2011 flood enlarged the existing sandbar island that is located at the confluence of the Missouri and Heart Rivers, blocking a previously existing backwater channel. This raised concerns about the obstruction of ice flows from the Heart River, and consequently, future ice jams. Due to these concerns, the State Water Commission and Lower Heart River Water Resource District constructed a pilot channel in 2012 through the sandbar, in an effort to restore the previous backwater channel and help divert Missouri River flows to erode sediment further downstream of the confluence.

Monitoring of the site revealed that the pilot channel has widened, and caused erosion of much of the sandbar left by the 2011 flood. Meanwhile, sedimentation has persisted downstream of the Heart River mouth. The State Water Commission continued to monitor this site for further geomorphic change during the past biennium.

RED RIVER

The Red River Office was established in 1984, at the request of the Red River Joint Water Resource District (RRJWRD). Originally located in West Fargo, the office was moved to Fargo in 2014. The RRJWRD provides 50 percent cost-share for the office expense, which consists of one full-time position. During the 2017-2019 biennium, Red River Office personnel took part in various State Water Commission activities in eastern North Dakota.

Technical assistance was provided to the RRJWRD in pursuing flood control projects in the Red River watershed, including;

- Co-chair of the technical committee overseeing work for the Corps' Red River Watershed Feasibility Study;
- Assisted in ongoing development of Regional Detention Analysis for the Red River watershed;
- Assisted with reconnaissance level studies of potential dams;
- Technical assistance on various committees that were formed as a result of the Red River basin's flooding problems;
- Assisted in development of the RRJWRD 2018-2022 Watershed Management Strategy report; and
- Assistance provided to individual water resource boards on several water-related issues.

In addition, office personnel provided technical assistance for other efforts, including:

- The International Red River Board (IRRB);
- Subcommittee member of IRRB for development of Pembina River Visualization Tool;
- Member of the Hydrology Committee for the International Red River Board;
- Technical advisor for the Pembina River Basin Advisory Team organized in 2019 by Governor Burgum;
- Attended various meetings concerning the proposed Fargo-Moorhead Diversion project;
- Worked with the Red River Retention Authority (RRRA), Natural Resource Conservation Service (NRCS), and local sponsors to pursue completion of watershed protection studies through the Regional Conservation Partnership Program (RCPP);
- Attended meetings of task teams for 8 watershed studies in North Dakota;
- Provided information on other partner projects for inclusion in 6-month reports; and
- Served as a member of the technical task team for the Oslo area hydraulic analysis study.

SOURIS (MOUSE) RIVER ISSUES

Flood risk reduction in the Souris River Basin continued to proceed in several different initiatives during the biennium.

Mouse River Enhanced Flood Protection Project

The Souris River Joint Board-sponsored Mouse River Enhanced Flood Protection Project (MREFPP) is a basin-wide project designed to reduce flood risk in the Mouse River Basin within North Dakota. Ground-breaking ceremonies for Phases MI-1, MI-2, and MI-3 occurred in March 2018. Progress was made on all three of these phases during the biennium, along with progress on the Broadway Pump Station, Perkett Ditch Pump Station, and Colton Avenue Bridge (Burlington Bridge).

Integrated Feasibility Study

The Integrated Feasibility Study with the Corps was conducted to determine if there was a federal interest in the MREFPP. On April 16, 2019, Senator John Hoeven and Lieutenant General Todd Semonite met in Minot to discuss the MREFPP, and at the conclusion of the meeting, the Lieutenant General signed the Chief's Report, which finalizes the study. The study's selected plan, also known as the Maple Diversion, ties into the current MREFPP. The signed Chief's Report will go to Congress for authorization of the project and appropriation of funds.

International Souris River Study

Water Commission staff have committed significant time and effort to the International Joint Commission's (IJC) study of the operating plan established in the 1989 International Agreement for Water Supply and Flood Control (Agreement). Unprecedented flooding in the Souris River Basin in 2011 focused attention on the International Souris River Board (ISRB) to review the Agreement, with specific emphasis on flooding and water supply in the basin. The ISRB previously completed a Plan of Study in 2013, which proposed how to evaluate the Agreement and submitted it to the IJC, the intergovernmental agency under which the ISRB was formed.

In September 2017, after a series of meetings and task force initiatives between the governments of Canada and the United States, the IJC formed the International Souris River Study Board (Study Board) to complete the Plan of Study proposed by the ISRB, with specific emphasis on flooding and water supply in the Souris River Basin. The IJC can create temporary study boards such as this for the purpose of completing studies; while permanent river boards, like the ISRB, handle the day-to-day aspects of river management. The Water Commission, through the Investigations Section, entered into a Planning and Assistance to States Agreement with the Corps to fund and provide technical work-in-kind assistance on the study.

The IJC established a Public Advisory Group (PAG) to increase public engagement and incorporate public information into the Study. Rather than reporting to the Study Board, the PAG reports directly to the IJC on the progress of the study from the public's perspective. This creates a check on the Study Board, to ensure it is working in the public's interest.

The Study Board established the Resource and Agency Advisory Group (RAAG) to act as a conduit for Federal, Provincial, State, and municipal agency input, as well as industry input. The RAAG is in the process of soliciting feedback from all necessary agencies in order to obtain the best possible results for modeling. This information will then be used in models to evaluate alternatives for the study. Water Commission staff participate on the RAAG, in addition to co-chairing the group.

The Study Board and IJC are also engaging with First Nations, Tribes, and Metis in Canada and the United States to understand their interests in the Souris River Basin and management of the river. There is also the goal of understanding the interest in establishing a longer-term relationship with the ISRB and IJC.

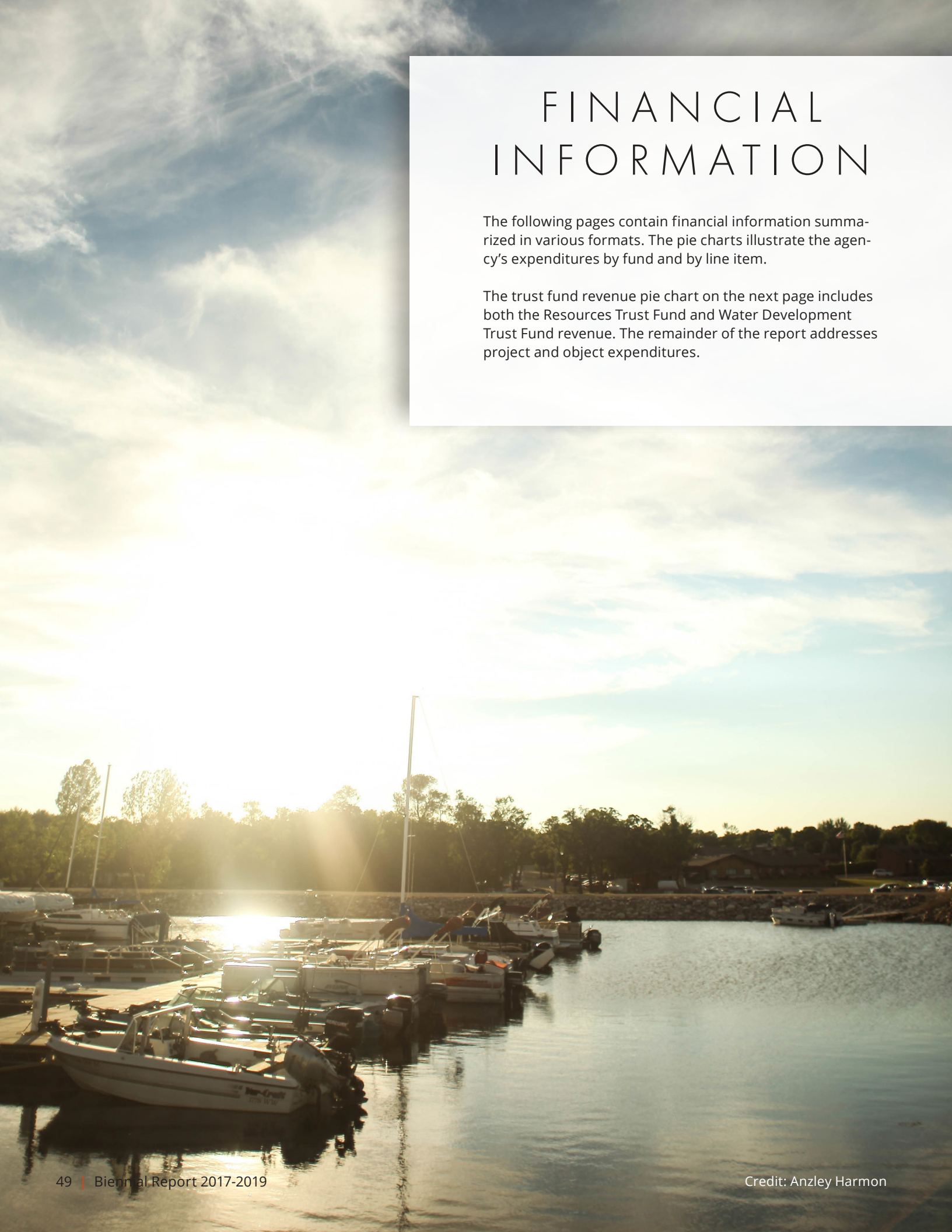
The Study Board is in the process of developing alternatives to the current operating plan. Alternatives are being developed in five modeling phases, and the Study Board's technical teams are currently wrapping up the third phase and moving into the fourth phase. Modeling scenarios from the first three phases have been presented to both the RAAG and PAG. Once modeling results are completed for the fourth phase, the Study Board intends to obtain feedback from its advisory groups in a series of workshops being set up in November 2019.

Earlier this year, the study received a one-year extension to the timeline, with the final report now due in February 2021, rather than February 2020. Upon the study's completion, the Study Board will submit its recommendation to the IJC. The IJC will then submit the plan to the governments of Canada and the United States for their consideration and approval.

FINANCIAL INFORMATION

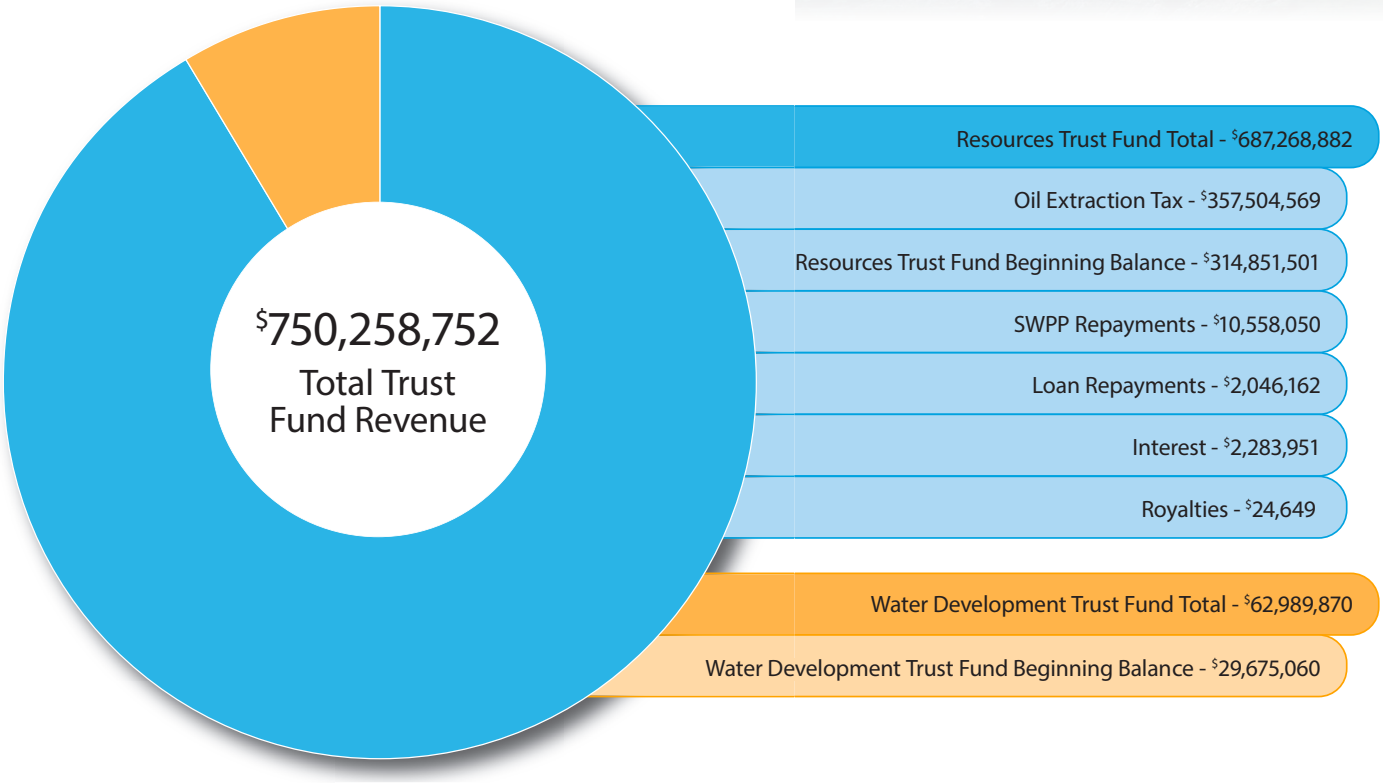
The following pages contain financial information summarized in various formats. The pie charts illustrate the agency's expenditures by fund and by line item.

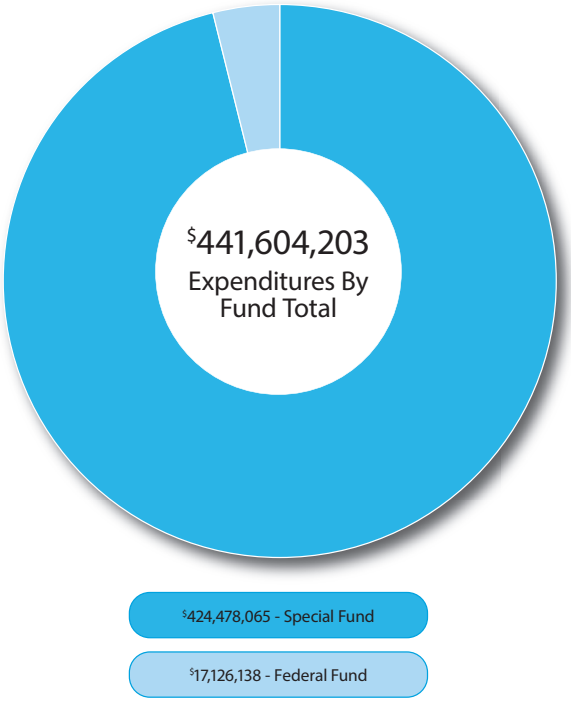
The trust fund revenue pie chart on the next page includes both the Resources Trust Fund and Water Development Trust Fund revenue. The remainder of the report addresses project and object expenditures.

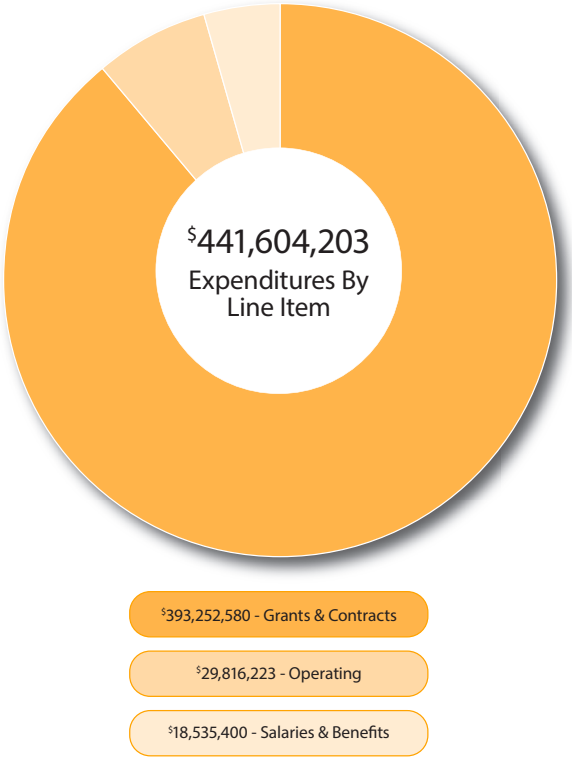


Credit: Anzley Harmon

STATE WATER COMMISSION APPROPRIATIONS
2017-2019 BIENNIUM







PROGRAM BUDGET EXPENDITURES
FOR BIENNIAL PERIOD ENDING JUNE 30, 2019

AGENCY PROGRAM	SALARIES/ BENEFITS	OPERATING EXPENSES	GRANTS & CONTRACTS	PROGRAM TOTALS
ADMINISTRATION				
Allocated	2,846,720	2,786,466		5,633,186
Expended	2,850,272	2,582,877		5,433,149
Percent	100%	93%		96%
ATMOSPHERIC RESOURCE				
Allocated	1,145,550	723,382	4,830,212	6,699,144
Expended	1,085,962	517,945	1,721,547	3,325,455
Percent	95%	72%	36%	50%
PLANNING AND EDUCATION				
Allocated	1,528,016	352,990		1,881,006
Expended	1,426,930	204,909		1,631,839
Percent	93%	58%		87%
REGULATORY				
Allocated	2,578,537	5,051,235		7,629,772
Expended	2,383,775	4,762,859		7,146,634
Percent	92%	94%		94%
WATER APPROPRIATION				
Allocated	5,796,920	1,146,300	1,450,319	8,393,539
Expended	5,251,634	1,088,521	1,162,273	7,502,427
Percent	91%	95%	80%	89%
WATER DEVELOPMENT				
Allocated	4,484,807	9,713,800	3,600,000	17,798,607
Expended	4,264,526	6,430,901	2,363,853	13,059,280
Percent	95%	66%	66%	73%
NORTHWEST AREA WATER SUPPLY				
Allocated	617,717	15,232,150	52,476,255	68,326,122
Expended	683,874	8,773,522	13,753,342	23,210,738
Percent	111%	58%	26%	34%
SOUTHWEST PIPELINE				
Allocated	653,118	3,696,356	59,532,187	63,881,661
Expended	588,428	5,177,425	30,691,777	36,457,630
Percent	90%	140%	52%	57%
STATEWIDE WATER PROJECTS				
Allocated			605,089,057	605,089,057
Expended			343,837,051	343,837,051
Percent			57%	57%
PROGRAM TOTALS				
Allocated	19,651,385	38,702,679	726,978,030	785,332,094
Expended	18,535,400	29,538,958	393,529,844	441,604,203
Percent	94%	76%	54%	56%

PROJECTS/GRANTS/CONTRACT FUND - PROJECT OBLIGATIONS
JULY 1, 2017 - JUNE 30, 2019

SWC PROJ. NO.	NAME	INITIAL APPROVAL	AMOUNT APPROVED	PAYMENTS	BALANCE
FLOOD CONTROL					
1928-01	Fargo Flood Control Project	4/19/16	20,001,131	20,001,131	0
1928-05	Fargo Metro Flood Diversion Authority 2015-2017	2/14/19	124,874,956	19,139,344	105,735,612
1771-01	Grafton Flood Control Project	10/12/16	32,175,000	19,890,873	12,284,127
1974-06	Development of 2011 Flood Inundation Maps	12/18/15	1,522	0	1,522
1974-09	Mouse River Flood Control Design Engineering	4/12/18	276,696	276,696	0
1974-11	Funding of 2014 Agreement Between SRJB & USACE	12/5/14	31,500	31,500	0
1974-12	Maple Diversion Design MI-4	4/12/18	1,345,000	978,303	366,697
1974-13	Tierrecita Villejo Levee Design	4/12/18	1,170,000	517,034	652,966
1974-14	StARR Program (Structure Acquisition, Relocation, or Ring Dike)	3/9/16	5,895,975	4,481,108	1,414,867
1974-15	Perkett Ditch Improvements	12/2/16	404,593	286,594	117,999
1974-16	Corps of Engineers Feasibility Study MREFPP	4/12/18	505,546	446,394	59,152
1974-18	Rural Reaches, Preliminary Engineering	10/12/16	236,941	22,877	214,064
1974-19	4th Avenue Tieback Levee & Burlington Levee - Design Engineerng	4/12/18	2,854,240	2,666,221	188,019
1974-20	Utility Relocations	10/12/16	422,034	422,034	0
1974-21	Highway 83 Bypass & Bridge Replacement	10/12/16	1,983,623	1,079,526	904,097
1974-22	Broadway Pump Station Phases MI-1	3/29/17	35,271,200	11,290,463	23,980,737
1974-23	Peterson Coulee Outlet	3/29/17	1,427,022	0	1,427,022
1974-25	Flood Specific Emergency Action Plan for Ward County	7/20/17	182,000	181,485	515
1974-26	Phases MI-2, MI-3 Construction	8/23/17	29,348,843	20,634,565	8,714,278
1974-27	Corps of Engineers Section 408 Review Through Section 2145	8/23/17	74,750	74,750	0
1974-28	Burlington Bridge Construction	4/12/18	2,535,000	568,801	1,966,199
1974-29	Outlaw Creek Construction	4/12/18	1,397,500	0	1,397,500
1974-30	Mouse River Park Bridge Design	4/12/18	390,000	86,572	303,428
1974-31	Sawyer Bridge Design Project	4/12/18	260,000	129,291	130,709
1974-32	Velva Bridge Design Project	4/12/18	260,000	90,341	169,659
2107-02	SWIF 2018 Outfall Pipe Project	10/11/18	970,490	90,069	880,421
2122	Development of Comprehensive Plan for Souris Basin	9/5/17	302,500	221,072	81,428

PROJECTS/GRANTS/CONTRACT FUND - PROJECT OBLIGATIONS
JULY 1, 2017 - JUNE 30, 2019

SWC PROJ. NO.	NAME	INITIAL APPROVAL	AMOUNT APPROVED	PAYMENTS	BALANCE
1344-04	Sheyenne River Valley Flood Control Project PHII (Valley City)	8/29/16	58,414	53,883	4,531
1504-01	Permanent Flood Protection Project (Valley City)	5/1/15	477,445	427,889	49,556
1504-03	Permanent Flood Protection PH III (Valley City)	12/9/16	13,157,600	10,773,195	2,384,405
1504-06	Permanent Flood Protection PH III & PH V (Valley City)	12/8/17	914,175	760,443	153,732
1504-07	Permanent Flood Protection PH III Construction (Valley City)	10/11/18	1,786,179	0	1,786,179
1504-08	Permanent Flood Protection Erosion Sites (Valley City)	4/9/19	480,283	0	480,283
1344-02	Sheyenne River Valley Flood Control Project (Lisbon)	8/8/16	1,000,582	896,611	103,971
1991-01	Permanent Flood Protection - Levee A Project (Lisbon)	5/29/14	0	0	0
1991-03	Permanent Flood Protection - Levee C Project (Lisbon)	3/11/15	6,989	6,989	0
1991-06	Permanent Flood Protection - Levee E Project (Lisbon)	3/9/16	52,000	52,000	0
1991-08	Permanent Flood Protection - Levee D Project (Lisbon)	4/12/18	2,639,562	2,639,562	0
1991-10	Permanent Flood Protection - Levee F Project (Lisbon)	4/12/18	4,264,000	3,806,827	457,173
1991-13	Permanent Flood Protection - Levee C & E Extension (Lisbon)	2/14/19	1,036,877	186,905	849,972
2079-01	West Williston Flood Control	12/9/16	3,655,517	1,183,262	2,472,255
2131	Flood Risk Reduction Project (Lower Heart)	6/14/18	280,000	54,084	225,916
1059	Bottineau County WRD Baumann Legal Drain	12/7/18	391,742	12,766	378,976
1180	Richland County WRD Legal Drain #7 Channel Improvements	12/7/18	274,541	73,729	200,812
2008	Mapleton Recertification of Flood Control Levee System Project	4/12/18	314,770	314,770	0
2111	Davenport Flood Risk Reduction	7/20/17	35,000	34,999	1
2118	Sheldon Subdivision Levee	10/11/18	370,200	0	370,200
2124	Heart River & Tributaries Flood Control Study	11/6/18	27,000	0	27,000
620	Mandan Flood Control Protective Works (Levee)	6/22/17	14,855	14,855	0
1932	Michigan Spillway Rural Flood Assessment	3/9/16	67,903	67,903	0

PROJECTS/GRANTS/CONTRACT FUND - PROJECT OBLIGATIONS
JULY 1, 2017 - JUNE 30, 2019

SWC PROJ. NO.	NAME	INITIAL APPROVAL	AMOUNT APPROVED	PAYMENTS	BALANCE
1705	Red River Joint WRD Watershed Feasibility Study - Phase 2	9/21/11	0	0	0
2073	Oslo Area Ag Levee Feasibility Study	7/6/16	71,683	71,683	0
FLOODWAY PROPERTY ACQUISITIONS					
1993-05	Minot Phase - Floodway Acquisitions	4/12/18	14,093,720	13,970,443	123,277
1523-05	Ward County - Floodway Acquisitions	1/27/12	6,015,347	6,015,347	0
1504-05	Valley City - Floodway Acquisitions	12/8/17	3,406,947	2,731,774	675,173
2000-05	Sawyer Phase - Floodway Acquisitions	6/13/12	135,844	135,844	0
1991-05	Lisbon - Floodway Acquisition	5/8/19	668,072	646,404	21,668
1987-05	Mouse River Enhanced Flood Plan Property Acquistion	5/10/17	2,166	2,166	0
DRAIN & CHANNEL IMPROVEMENTS					
1056	Bottineau County WRD - Stead Legal Drain	2/16/17	14,738	11,670	3,068
1059	Bottineau County WRD - Baumann Legal Drain	3/7/18	41,427	0	41,427
1070	Maple River WRD - Drain No. 14 Channel Improvements	3/29/17	741,562	413,573	327,990
1071	Maple River WRD - Cass County Drain No. 15 Channel Improvements	3/9/16	282,561	193,028	89,533
1222	Sargent County WRD - Drain No. 11 Channel Improvements	10/12/16	1,378,376	3,780	1,374,596
1311	Traill County WRD - Buxton Township Improvement District No. 68	3/9/16	110,418	81,285	29,133
1314	Wells County WRD - Hurdsfield Legal Drain	3/29/17	644,292	0	644,292
1331	Richland County WRD - Drain No. 14 Reconstruction	12/9/16	252,738	179,852	72,886
1413-01	Traill County WRD - Camrud Drainage Improvement District No. 79	4/11/19	20,250	5,693	14,557
1486	Griggs County WRD - Thompson Bridge Outlet No. 4 Project	10/6/15	621,661	31,515	590,146
1520	Walsh County WRD - Drain 30-1	3/29/17	282,307	190,109	92,198
1520	Walsh County WRD - Drain 30-2	10/11/18	328,042	26,541	301,501
1951	Maple River WRD - Lynchburg Channel Improvements	7/6/16	1,131,338	16,001	1,115,337
1951	Maple River WRD - Lynchburg Channel Improvements	7/6/16	23,412	23,412	0
1978	Richland-Sargent WRD Legal Drain No. 1 Extension & Channel Improvements Phase II	3/29/17	378,000	307,578	70,422

PROJECTS/GRANTS/CONTRACT FUND - PROJECT OBLIGATIONS
JULY 1, 2017 - JUNE 30, 2019

SWC PROJ. NO.	NAME	INITIAL APPROVAL	AMOUNT APPROVED	PAYMENTS	BALANCE
1990	Mercer County WRD - Lake Shore Estates High Flow Diversion Project	3/7/12	43,821	0	43,821
2016	Pembina County WRD - Establishment of Pembina County Drain No. 80	4/10/17	74,965	50,356	24,609
2049	Grand Forks County WRD - Grand Forks Legal Drain No. 58	3/29/17	1,481,850	706,864	774,986
2068	Traill County WRD - Stavanger-Belmont Drain No. 52 Channel Improvement	10/12/16	414,652	294,513	120,139
2069	Center Township Bank Stabilization	6/28/19	3,720	0	3,720
2087	Walsh County WRD - Drain No. 87/McLeod Drain	3/29/17	5,273,586	2,853,625	2,419,961
2088	Pembina County WRD - Drain No. 79	12/9/16	875,428	791,026	84,402
2101	Walsh County WRD - Drain No. 90	4/11/19	70,603	0	70,603
2108	Walsh County WRD - Drain No. 22	6/22/17	266,086	184,910	81,176
2112	Pembina County WRD - Drain No. 81	7/30/17	56,000	0	56,000
2133	Burleigh County WRD - Missouri River Section 32 Bank Stabilization Projects	4/11/19	22,500	0	22,500
2093/ 1427	Bottineau County WRD - Moen Legal Drain	9/6/16	18,542	1,130	17,412
SNAGGING & CLEARING					
662	Park River Snagging & Clearing	2/17/17	51,435	25,827	25,608
2095	Sheyenne River Snagging & Clearing	4/10/17	19,700	0	19,700
2110	Meadowbrook Snagging & Clearing	6/21/17	33,000	0	33,000
MUNICIPAL WATER SUPPLY					
2050-13	Mandan - New Raw Water Intake	10/7/13	2,922,672	594,467	2,328,205
2050-15	Washburn - New Raw Water Intake	10/7/13	2,281,927	392,216	1,889,711
2050-18	Grafton - Water Treatment Plant Phase 3	10/7/13	48,822	48,822	0
2050-20	Dickinson - Capital Infrastructure	10/6/15	1,731,926	0	1,731,926
2050-21	Watford City - Capital Infrastructure	8/1/15	536,627	536,627	0
2050-26	Fargo Water System Regionalization Improvements	7/29/15	4,131,788	2,160,502	1,971,286
2050-28	Mandan Water Systems Improvement Project	10/6/15	1,812,123	1,812,123	0
2050-29	Minot Water Systems Improvement Project	10/6/15	3,478,647	2,879,346	599,301
2050-30	Watford City Water Systems Improvement Project	10/6/15	5,374,639	559,779	2,400,000
2050-31	West Fargo Water Systems Improvement Project	10/6/15	392,388	392,388	0

PROJECTS/GRANTS/CONTRACT FUND - PROJECT OBLIGATIONS
JULY 1, 2017 - JUNE 30, 2019

SWC PROJ. NO.	NAME	INITIAL APPROVAL	AMOUNT APPROVED	PAYMENTS	BALANCE
2050-32	Williston Water Systems Improvement Project	10/6/15	7,857,010	0	7,857,010
2050-36	Dickinson Water Systems Improvement Project	10/6/15	0	0	0
2050-37	Dickinson State Avenue South Water Main	12/11/15	963,920	0	963,920
2050-44	Beulah Water Treatment Plant	3/9/16	1,639,813	1,639,813	0
2050-49	Grand Forks Water Treatment Plant	8/23/17	50,645,520	43,556,149	7,089,371
2050-51	Mercer Connect to McLean-Sheridan	8/23/17	0	0	0
2050-52	New Town Water Transmission Storage	10/11/18	1,940,000	1,196,523	743,477
2050-53	West Fargo - Brooks Harbor Water Tower	8/23/17	1,950,000	1,152,665	797,335
2050-54	West Fargo North Loop Connection	8/23/17	510,000	0	510,000
2050-55	West Fargo West Loop Connection	8/23/17	1,110,000	0	1,110,000
2050-56	Williston - US Highway 2 Water Main	8/23/17	434,400	434,400	0
2050-66	Lincoln Water System Improvement Project	2/8/18	1,459,100	43,313	1,415,788
2050-67	Williston Water System Improvements	2/8/18	2,336,000	0	2,336,000
2050-68	Valley City Membrane Replacement Project	2/8/18	586,350	518,530	0
2050-69	Mandan - Sunset Reservoir Water Transmission Line	4/12/18	3,135,000	1,091,521	2,043,479
2050-70	Wing Water Tower Repair	4/12/18	72,000	72,000	0
RURAL WATER SUPPLY					
2050-17	Barnes Rural Water Improvements	3/11/15	1,096,634	1,096,634	0
2050-23	SW Nelson County Expansion	8/23/17	1,323,874	1,323,874	0
2050-25	Bottineau County Extension, Phase I	7/29/15	299,358	57,503	241,855
2050-33	Stutsman Rural - Phase V Storage & Pipeline Expansion Project	10/6/15	1,172,760	1,172,760	0
2050-34	North Prairie Storage and Water Main	10/6/15	1,968,086	955,232	1,012,854
2050-35	Southeast Water Users District System Wide Expansion Feasibility Study	8/23/17	13,159,145	9,910,769	3,248,377
2050-38	Dakota Rural Water Reservoir C Expansion	12/11/15	52,601	52,601	0
2050-41	Northeast Regional Water - City of Devils Lake Water Supply Project	12/11/15	12,789,020	12,789,020	0
2050-42	Walsh Rural Water Phase 1 & 2 System Expansion	12/11/15	1,639,753	1,634,862	4,891
2050-43	All Seasons System 4 Connection to System 1	12/11/15	4,900,000	0	4,900,000

PROJECTS/GRANTS/CONTRACT FUND - PROJECT OBLIGATIONS
JULY 1, 2017 - JUNE 30, 2019

SWC PROJ. NO.	NAME	INITIAL APPROVAL	AMOUNT APPROVED	PAYMENTS	BALANCE
2050-45	Garrison Rural Water System Expansion Project	3/9/16	1,271,241	1,271,241	0
2050-50	Grand Forks/Traill Rural Water - Eastern Expansion & TRWD Interconnect Feasibility	8/23/17	126,000	126,000	0
2373-39	North Central Rural Water - Carpio Berthold Phase 2	4/1/15	2,425,167	1,498,285	926,882
2373-41	North Central Rural Water - Granville-Deering Area	10/24/16	1,831,540	1,372,403	459,137
2050-57	North Central Rural Water - Mountrail Expansion Phase II	8/23/17	3,086,000	51,713	3,034,288
2050-58	North Central Rural Water - Mountrail County Water Phase III	8/23/17	3,430,000	0	3,430,000
2050-59	Cass Rural Water - Horace Storage Tank	10/11/18	1,846,000	509,363	1,336,637
2050-60	North Prairie - Reservoir 9 Water Supply	6/12/18	1,114,620	715,623	398,997
2050-61	North Prairie - Surrey/Silver Spring	6/12/18	107,430	69,141	38,289
2050-62	Traill Rural Water Expansion/ Interconnect	8/23/17	150,880	150,880	0
2050-63	Walsh Rural Water System Expansion Project	4/12/18	1,300,000	632,371	667,629
2050-64	McLean-Sheridan - Turtle Lake Water Tower	8/9/18	2,378,450	1,532,385	846,065
2050-65	Tri-County Rural Water System Expansion Project	8/9/18	2,803,250	1,487,246	1,316,004
2050-71	East Central Rural Water - Grand Forks/Traill Project	12/7/18	6,091,545	4,087,517	2,004,028
2050-72	Stutsman Rural Water - Phase 6 Pettibone Project	4/12/18	2,100,000	1,577,764	522,236
2050-73	Northeast Regional Water - Master Plan	10/11/18	107,000	51,078	55,922
2050-74	Walsh Rural Water - Drayton Long-Term Water Supply Feasibility Study	5/8/19	37,500	0	37,500
REGIONAL WATER SUPPLY					
1736-05	Southwest Pipeline Project	7/1/17	52,249,989	36,457,630	15,792,359
2374	Northwest Area Water Supply (NAWS)	2/8/18	27,108,462	4,859,605	22,248,857
1973-02	Western Area Water Supply Authority (WAWSA)	9/15/14	155,603	155,603	0
1973-05	WAWSA Phase IV	10/6/15	8,888,823	5,886,855	3,001,967
1973-06	WAWSA Phase V	12/8/17	20,000,000	13,773,360	6,226,640
325-105	RRVWSP Garrison Diversion	8/23/17	17,000,000	13,000,000	4,000,000

PROJECTS/GRANTS/CONTRACT FUND - PROJECT OBLIGATIONS
JULY 1, 2017 - JUNE 30, 2019

SWC PROJ. NO.	NAME	INITIAL APPROVAL	AMOUNT APPROVED	PAYMENTS	BALANCE
GENERAL WATER MANAGEMENT					
160	Painted Woods Lake Flood Damage Reduction & Habitat	8/9/18	284,768	0	284,768
269	Fordville Dam Rehabiliation	6/19/19	122,595	0	122,595
390	Beaver Lake Dam Rehabilitation Feasibility Study	6/8/16	16,076	13,936	2,140
391	Silver Lake Dam Improvements	12/20/18	74,625	46,019	28,606
394	Odland Dam Rehabilitation Project	12/7/18	110,055	0	110,055
399	Kathryn Dam Project	8/9/18	754,875	0	754,875
420	Mirror Lake Dam Emergency Action Plan	12/2/16	24,400	12,827	11,573
460	Ueland Dam Rehabilitation Feasibility Study	5/20/16	17,500	0	17,500
477	Mill Dam Rehabilitation Feasibilty Study	6/8/16	15,073	12,136	2,937
512	Nieuwsma Dam Emergency Action Plan	11/28/16	7,532	812	6,720
531	Bouret Dam Rehabilitation	12/20/18	79,352	47,509	31,843
531	Bouret Dam Rehabilitation	4/9/19	591,750	0	591,750
551	Buffalo Lodge Lake Outlet	6/22/17	134,915	73,375	61,540
561	Tioga Dam EAP	5/20/16	40,000	0	40,000
667	Northgate Dam 2 Emergency Action Plan	9/5/17	26,396	0	26,396
688	Larimore Dam Rehabilitation	6/19/19	91,800	0	91,800
848	Brummond/Lubke Dam	10/11/18	317,111	37,068	280,043
849-01	Goschke Dam Spillway Gate Retrofit	4/9/19	119,010	0	119,010
980	Rush River Watershed Detention Study	1/7/16	127,697	28,440	99,257
980	Upper Maple River Watershed Detention Study	1/11/16	128,039	57,340	70,699
1264	Little Dam Repurposing Feasibility Study	6/17/15	12,385	0	12,385
1270	Wilton Pond Dredging Recreation Project	12/29/15	35,707	0	35,707
1289	McKenzie County Weed Board Control of Noxious Weeds on Sovereign Land	4/10/17	44,010	16,461	27,549
1296	Tongue River NRCS Watershed Plan	3/9/16	104,703	40,369	64,334
1301	North Branch Antelope Creek NRCS Small Watershed	3/9/16	113,400	59,461	53,939
1303	Gwinner Dam Improvement Feasibility Study Program	4/17/15	20,181	0	20,181
1303	Shortfoot Creek Watershed Planning Program	3/9/16	109,047	24,572	84,475
1389	BND AgPace Program	12/13/13	170,365	140,000	30,365

PROJECTS/GRANTS/CONTRACT FUND - PROJECT OBLIGATIONS
JULY 1, 2017 - JUNE 30, 2019

SWC PROJ. NO.	NAME	INITIAL APPROVAL	AMOUNT APPROVED	PAYMENTS	BALANCE
1401	International Boundary Roadway Dike Pembina	7/20/17	294,528	46,209	248,319
1431	Rapid Deployment Gage on the James River at Adrian	3/20/19	4,900	0	4,900
1444	City of Pembina Flood Protection System Certification	4/19/16	1,657	0	1,657
1453	Karey Dam Rehabilitation Feasibility Study	5/23/16	6,853	0	6,853
1453	Karey Dam Rehabilitation Design & Planning	12/14/18	67,916	19,632	48,284
1453	Karey Dam Rehabilitation Project	4/9/19	971,325	0	971,325
1851-01	Drought Disaster Livestock Water Supply Assistance	2/8/18	2,025,000	1,368,017	656,983
1859	ND Department of Health NPS Pollution	8/23/17	200,000	199,371	629
1878-02	Upper Maple River Dam Outlet Channel Improvements	4/9/19	82,320	0	82,320
1968	Garrison Diversion - MM 15 Irrigation Project	3/29/17	321,781	228,166	93,615
1968	Garrison Diversion - MM 42L Irrigation Project	8/23/17	937,207	888,547	48,660
1968	Garrison Diversion - MM 0 and MM 0.4 Irrigation Project	12/7/18	1,673,793	0	1,673,793
2055	Lower Red Basin Regional Detention Study	7/17/15	45,500	0	45,500
2059	North Branch Park River NRCS Watershed Study	10/6/15	81,200	0	81,200
2060	Forest River Watershed Study	4/10/17	154,012	0	154,012
2060	Matejcek Dam Rehabilitation	10/11/18	279,750	85,405	194,345
2070	Garrison Diversion Conservancy District Mile Marker 42 Irrigation Project	5/20/16	29,741	0	29,741
2071	Alkali Lake High Water Feasibilitly Study	4/19/16	4,830	0	4,830
2072	Ten Mile Lake Flood Risk Reduction Project	6/8/16	36,812	0	36,812
2074	City of Wahpeton - Flood Control Levee Certification	7/6/16	247,500	0	247,500
2074	City of Wahpeton - Breakout Easements	7/6/16	265,000	0	265,000
2075	Second Larson Coulee Detention Pond	7/6/16	602,307	0	602,307
2083	Herzog Dam Gate & Catwalk Retrofit - Construction	10/12/16	114,632	8,444	106,188
2085	Orange Dam Rehabilitation Feasibility Study	10/13/16	10,770	1,930	8,840

PROJECTS/GRANTS/CONTRACT FUND - PROJECT OBLIGATIONS
JULY 1, 2017 - JUNE 30, 2019

SWC PROJ. NO.	NAME	INITIAL APPROVAL	AMOUNT APPROVED	PAYMENTS	BALANCE
2089	Tower Township Improvement District No. 77 Study	12/19/16	28,175	11,717	16,458
2090	International Water Institute River Watch Program	1/12/17	24,150	18,916	5,234
2090-02	International Water Institute River of Dreams Program	6/6/18	23,275	14,944	8,331
2096	Sheyenne-Maple Flood Control Dist No. 2 Improvements	3/29/17	1,035,358	712,741	322,617
2013	Bylin Dam Rehabilitation	6/19/19	131,370	0	131,370
2109	McKenna Lake Feasibility Study	6/21/17	2,247	0	2,247
2109	McKenna Lake Hydrologic Study	9/12/18	72,167	16,206	55,961
2115	(PMP) Probable Maximum Precipitation Estimates	10/11/18	600,000	0	600,000
2120	SWPP Transfer of Ownership Study	4/9/19	176,579	5,670	170,909
2121	Senator Young Dam Rehabilitation	6/19/19	129,210	0	129,210
2123	Airborne Electromagnetic (AEM) 2018	8/9/18	850,000	422,646	427,354
1396-01	Missouri River Recovery Program	11/17/15	46,785	275	46,510
PS/IRR/ LOW	Lower Yellowstone Irrigation District - Lateral W Irrigation Project	6/14/18	692,500	326,055	366,445
AOC/ RRC	Red River Basin Commission	6/22/17	200,000	200,000	0
AOC/ ASS	Assiniboine River Basin Initiative	6/22/17	100,000	100,000	0
PS/ WRD/ UPP	Upper Sheyenne River Joint Water Board Operational Costs	6/20/17	6,000	6,000	0
PS/ WRD/ MRJ	MRRIC Terry Fleck	6/7/17	45,000	39,522	5,478
PS/ WRD/ MRJ	Missouri River Joint Board Operational Costs	6/7/17	10,000	10,000	0
PS/ WRD/ LOW	Lower Heart Flood Control Study	5/10/17	21,140	0	21,140
DEVILS LAKE BASIN DEVELOPMENT					
416-10	Devils Lake Outlet Operations	4/9/19	12,527,973	8,767,841	3,760,132
REVOLVING LOAN FUND					
2077-16	Valley City Flood Protection - Phase II Construction (LOAN)	12/9/16	3,289,400	3,289,400	0
2077-15	Valley City Pre Design & Eng & Phase III Buyouts (LOAN)	12/9/16	1,392,500	1,392,500	0

PROJECTS/GRANTS/CONTRACT FUND - PROJECT OBLIGATIONS
JULY 1, 2017 - JUNE 30, 2019

SWC PROJ. NO.	NAME	INITIAL APPROVAL	AMOUNT APPROVED	PAYMENTS	BALANCE
2077-14	Lisbon Permanent Flood Control (LOAN)	8/23/17	900,000	900,000	0
2077-13	Carpio Berthold Phase 2 (LOAN)	10/12/16	215,000	215,000	0
2077-12	Granville-Surrey-Deering Water Supply Project (LOAN)	10/12/16	139,000	139,000	0
HYDROLOGIC INVESTIGATIONS					
1400	Document Conversion (Water Permit Scanning)	3/28/18	21,125	23,002	(1,877)
2041	Stream Gage Joint Funding Agreement	12/7/18	895,296	281,914	613,382
TOTAL PROJECTS/GRANTS/CONTRACT FUND - PROJECT OBLIGATIONS			668,623,039*	358,903,758	309,719,281

*Includes $381,246,045 in carryover funding from previous biennia.

OBJECT EXPENDITURES
FOR BIENNIAL PERIOD ENDING JUNE 30, 2019

Permanent Salaries	$12,584,700.57
Temporary Salaries	$414,891.33
Overtime Salaries	$279,615.15
Fringe Benefits	$5,256,193.42
Travel	$1,088,232.69
Supplies - IT Software	$198,757.50
Supplies/Materials - Professional	$349,333.53
Food & Clothing	$4,617.66
Building, Grounds, Vehicle Supply	$249,541.06
Misc. Supplies	$49,400.51
Office Supplies	$23,800.05
Postage	$51,237.16
Printing	$33,334.13
IT Equipment Under $5,000	$207,890.99
Other Equipment Under $5,000	$49,605.85
Office Equipment & Furniture Under $5,000	$39,075.27
Utilities	$6,637,564.77
Insurance	$33,748.46
Rentals/Leases - Equipment & Other	$2,809.75
Rentals/Leases - Building & Land	$580,421.49
Repairs	$1,041,445.92
IT - Data Processing	$410,730.73
IT - Communications	$152,583.31
IT - Contractual Services	$807.36
Professional Development	$171,319.16
Operating Fees & Services	$42,604,769.90
Professional Fees & Services	$17,975,755.46
Land & Buildings	$2,494,372.68
Other Capital Payments	$44,012,537.36
Extra Repairs/Deferred Maintenance	--
Equipment Over $5,000	$122,333.70
IT Equipment/Software Over $5,000	$120,116.23
Grants, Benefits, & Claims	$303,992,159.57
Transfers Out	$370,500.00
TOTAL	$441,604,202.72

RESOURCES AVAILABLE FROM THE AGENCY

Meeting minutes may be obtained by writing to:
ND State Water Commission
State Office Building Dept 770
900 East Boulevard Avenue
Bismarck, ND 58505-0850

Or, via the Internet:
http://www.swc.nd.gov

DATA AVAILABLE FOR PUBLIC USE:

- Government Land Office Plats
- Precipitation, Hail & Radar Data
- Survey Horizontal & Vertical Control
- Water Permit Data
- Various Ground-Water Studies
- Drainage Permit Data
- Well & Site Location Data
- Stream Flow Data
- Lithologic Data
- Construction Permit Data
- Water Chemistry Data
- Retention Structure Data
- Water Level Data
- Digital Map Data
- Lidar
- Well Drillers Reports

ADDITIONAL INFORMATION

http://www.swc.nd.gov

NORTH Dakota | Water Commission

Be Legendary.™

900 East Boulevard Ave
Bismarck ND 58505