

North Dakota



# State Water Commission and Office of the State Engineer

Biennial Report  
for the period July 1, 2015 to June 30, 2017

Governor Doug Burgum - Chairman  
Garland Erbele, P.E. - Chief Engineer-Secretary and State Engineer





# North Dakota State Water Commission

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December 1, 2017

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

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

RE: 2015-2017 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, 2015, through June 30, 2017.

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

Respectfully submitted,

A handwritten signature in blue ink that reads "Garland Erbele". The signature is fluid and cursive, with a large initial "G" and "E".

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





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# North Dakota State Water Commission

## MISSION

To improve the quality of life and strengthen the economy of North Dakota by managing the water resources of the state for the benefit of its people.

## PHILOSOPHY & VALUES

In the delivery of services to the citizens of North Dakota, we, the employees of the State Water Commission and the Office of the State Engineer value fairness, objectivity, accountability, responsiveness, and credibility. We pledge to use professional and scientific methods to maintain only the highest of standards in our delivery of services to our constituents.

## AGENCY GOALS

- To regulate the use of water resources for the future welfare and prosperity of the people of North Dakota.
- To develop water resources for the future welfare and prosperity of the people of North Dakota.
- To manage water resources for the future welfare and prosperity of the people of North Dakota.
- To educate the public regarding the nature and occurrence of North Dakota's water resources.
- To collect, manage, and distribute information to facilitate improved management of North Dakota's water resources.
- To conduct research into the processes affecting the hydrologic cycle to improve the management of North Dakota's water resources.



Governor Doug Burgum  
Chairman



Garland Erbele P.E.  
Secretary & State Engineer

## ORGANIZATION

The State Water Commission (SWC or Commission) consists of the Governor as chairman, the Commissioner of Agriculture as an ex-officio member, and seven 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 near Minnewaukan.



**HISTORY AND 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.

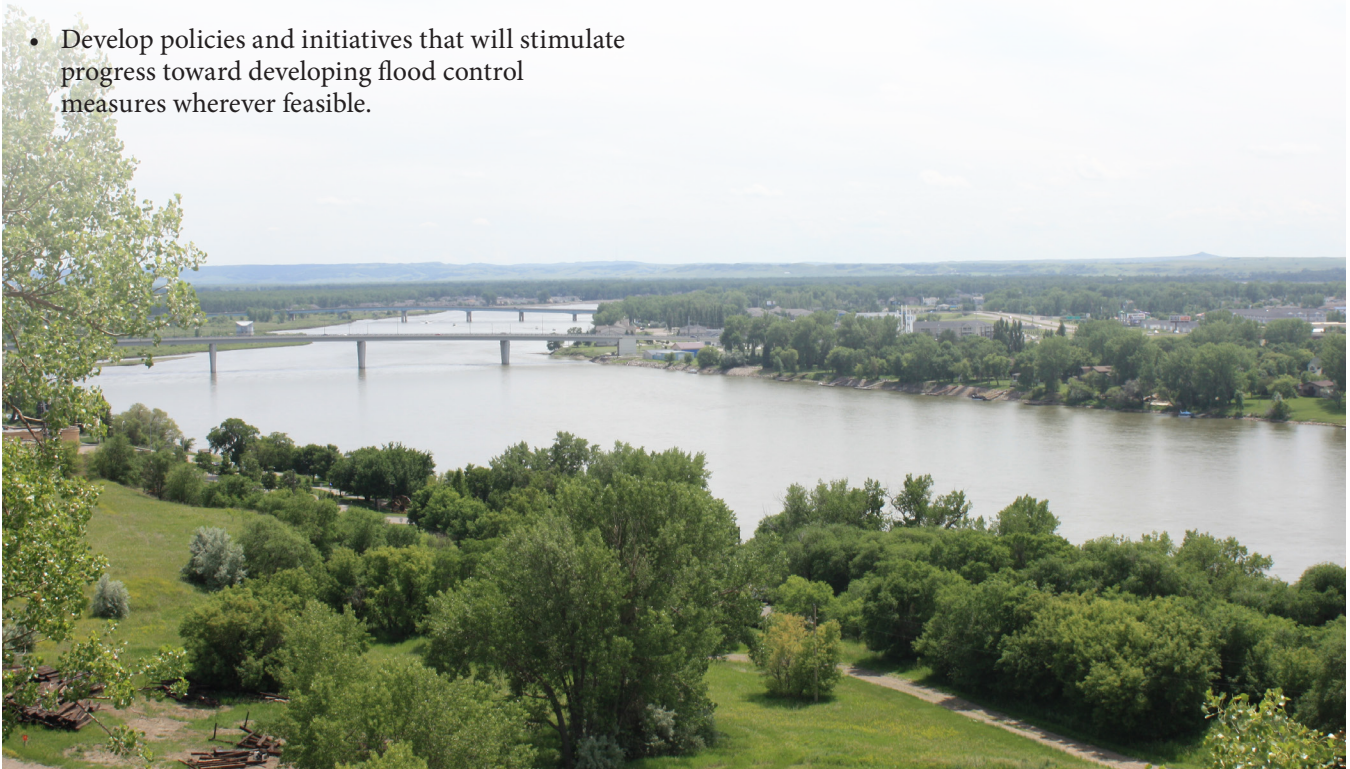


**AGENCY POLICIES** - The State Water Commission and the Office of the State Engineer have developed procedures and policies based upon the comprehensive legislation contained in Title 61 of North Dakota's Century Code to:

- 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, 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, 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 defines the nature and occurrence of water to optimize its conservation and development throughout the state.
- Maintain a water management plan 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.





## 2017 WATER RESOURCES LEGISLATION

### House Bill No. 1020

- Provided an appropriation of \$722,173,475 and reduced the authorized employees from 97 to 93.
- Allocated blocks of funding for water supply, rural water supply, flood control, and general water projects.
- Provided legislative direction on the use of appropriated funds for the Mouse River Flood Control and Red River Valley Water Supply projects.
- Required the Bank of North Dakota to consolidate and restructure the \$115 million in loans to the Western Area Water Supply Authority (Authority), provided remedies for potential defaults by the Authority, and provided for a study of the feasibility and desirability of selling or leasing the Authority's industrial water supply assets.
- Provided for a State Engineer study of flood hazard risk management and a Legislative Management study of industrial water use in the oil and gas industry.
- Reduced the percentage of funds credited to the Resources Trust Fund to be transferred quarterly to the renewable energy development fund, reduced the amount to be transferred to the energy conservation grant fund, and required a transfer of oil extraction funds over \$26 million from the infrastructure revolving loan fund to the resources trust fund.
- Permitted the Industrial Commission to let the Authority contract at competitive, floating, market rates for industrial water depot and lateral retail sales.
- Requires the State Engineer to develop an economic analysis process for water conveyance projects and flood-related projects expected to cost more than \$1,000,000, and a life cycle analysis for municipal water supply projects.

The Governor vetoed a phrase in the bill requiring Budget Section approval of transfers of appropriated funds from one type of water project to another, and a provi-

sion requiring the State Water Commission to include certain line items in its 2019-21 biennium budget request. An Attorney General's opinion was issued addressing the vetoes. See N.D.A.G. 2017-L-04.

House Bill No. 1055 increased the total amount of revenue bonds a water resource district may issue from \$10 million to \$50 million.

House Bill No. 1144, separated siting requirements of gas and liquid energy conversion and transmission facilities from electric energy conversion and transmission facility siting, and made appropriate cross-reference revisions with respect to exemption of the Southwest Pipeline Project.

House Bill No. 1160 prohibited the State Department of Health from charging a permit or renewal fee for a licensed plumber who operates no more than one servicing unit.

House Bill No. 1339 changed requirements for notices pertaining to assessments for water resource district projects and reduced the percentage of landowner votes necessary for appealing the assessments to the State Engineer.

House Bill No. 1374 provided requirements for the composition and operation of the State Water Commission, including the intent the State Water Commission have each of the seven major drainage basins represented by a commissioner, and established criteria for water projects requesting State Water Commission funding. The bill prohibited the State Water Commission from providing cost-share for operation and maintenance costs of water conveyance projects, required the State Water Commission to review progress reports for water projects at least every four years, and allowed the State Water Commission to terminate funding for projects not making sufficient progress.

House Bill No. 1390 amended the requirements for acquiring permits to install subsurface water management systems comprising 80 acres of land area or more, and required water resource board members to attend courses on water management.

**Senate Bill No. 2047** established a negotiation process for water resource boards to follow before taking ownership rights away using quick take eminent domain, and provided for automatic termination of rights of way acquired through quick take eminent domain when a water resource district no longer needs the right of way for the original purpose.

**Senate Bill No. 2134** defined the ordinary high water mark of the Missouri River riverbed to establish state sovereign land mineral ownership, and provided a method for the Department of Mineral Resources and the Industrial Commission to review the ordinary high water mark for segments of the riverbed. The bill includes an appropriation to the Commissioner of University and School Lands for repayment of mineral lease, bonus, rent, and royalty collections from the state to other mineral owners. The bill was declared to be an emergency measure and became effective April 21, 2017.

**Senate Bill No. 2269** revised requirements for and funding options available to the Red River Valley Water Supply Project. The bill expanded the scope of the project to allow distribution of water to central as well as eastern North Dakota. The bill changed the method new mem-

bers are charged for costs incurred by the Lake Agassiz Water Authority, and revised other requirements and powers of the Lake Agassiz Authority. The bill authorized the Garrison Diversion Conservancy District to continue studying and developing a non-federal project to meet the water supply needs of eastern and central North Dakota separate from the Red River Valley Water Supply Project.

**Senate Bill No. 2270** removed the requirements for the Garrison Diversion Conservancy District to hold public hearings and publish notices for certain assessment projects.

**Senate Bill No. 2327** established a Department of Environmental Quality by transferring duties and responsibilities of the Environmental Health Section of the State Department of Health to the new department, and changed references to the new department with respect to water quality and protection issues. The bill becomes effective contingent upon the section chief certifying all necessary federal approvals for the new department have been received and all agreements requiring amendment have been amended to ensure the state continues to meet primacy requirements.







## LEGAL ACTIONS

**Manitoba v. Norton/Salazar** - Manitoba asserts that the U.S. Bureau of Reclamation (Bureau) violated the National Environmental Policy Act (NEPA) by failing to prepare an Environmental Impact Statement for the Northwest Area Water Supply (NAWS) project. The Record of Decision was issued in 2016. A motion to modify injunctions was denied. North Dakota appealed. Oral arguments were held regarding modification of injunction. The U.S. Court of Appeals overturned the District Court and remanded with instructions to lift injunction for the water treatment plant design. Parties also consented to allow upgrades required for flood protection measures in Minot, and the court signed off on the stipulation. A summary judgment hearing was held and is now waiting for the court's ruling.

**Montana v. Wyoming and North Dakota** - Montana alleges that Wyoming violated the terms of the Yellowstone River Compact. North Dakota is 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. A hearing was held on an appropriate form of final judgment. Montana and Wyoming are trading comments on the proposed wording of the final decree.

**State of North Dakota, et al. v. EPA and the Corps of Engineers** - North Dakota's consolidated case in the Sixth Circuit is now pending before the U.S. Supreme Court regarding jurisdictional issues on an underlying case involving review of a final rule published 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"). Though repeal of the 2015 rule has been proposed by the EPA, the U.S. Supreme Court still plans to hear the jurisdictional arguments in fall 2017.

**State of North Dakota, et al. v. EPA and the Corps of Engineers** - North Dakota filed a complaint in U.S. District Court for the District of North Dakota challenging the final rule defining “Waters of the United States.” The judge denied the EPA/Corps’ motion to dismiss, but stayed the case pending other decisions by Courts of Appeals or the Supreme Court.

**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.

**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 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.

**State Engineer v. Stacy L. Tschider/ Michael D. and Renae L. Odegaard** - Administrative Orders were sent to defendants ordering them to remove fill and other materials placed on sovereign lands. Both parties appealed. Tschider and Odegaard agreed to remove material from the Missouri river side channel.

**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 continues over contract interpretation and damages amounts.

**Richland County Water Resource District v. State Engineer** - The Richland County Water Resource District appealed the State Engineer’s grant of Construction Permit No. 2489 for the Flood Diversion Board of Authority. The parties stipulated to dismiss the action and the case was dismissed. The underlying case was pursued through the Office of Administrative Hearings.

**North Dakota State Water Commission v. Robert Braun** - Regarding condemnation of property for the Southwest Pipeline Project, Contract 7-9G, Dunn Center/Halliday Service Area. The parties signed a stipulation for dismissal and the case was dismissed.

**North Dakota State Water Commission v. Vietz Family Trust** - Regarding condemnation of property for the Southwest Pipeline Project, Contract 7-9E, West Center Service Area. Vietz Family Trust filed an Answer to the State Water Commission’s notice regarding condemnation of temporary construction and permanent easements and appurtenances for the Southwest Pipeline Project. The judge granted the State Water Commission’s motion to dismiss and judgment was entered dismissing the case.

**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 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 construction permit.



## STATE WATER COMMISSION MEMBERS AS OF JUNE 30, 2017

NAME	POSITION	APPOINTED	TERM ENDS
Doug Burgum	Governor-Chairman		
Doug Goehring	Department of Agriculture		
Robert Thompson	Member from Page	March 1, 1993	June 30, 2019
Douglas Vosper	Member from Neche	August 15, 2008	June 30, 2019
George Nodland	Member from Dickinson	October 1, 2013	June 30, 2021
Harley Swenson	Member from Bismarck	March 1, 1993	June 30, 2021
Arne Berg	Member from Starkweather	December 7, 2006	June 30, 2017
Maurice Foley	Member from Minot	December 8, 2006	June 30, 2017
Larry Hanson	Member from Williston	July 1, 1999	June 30, 2017

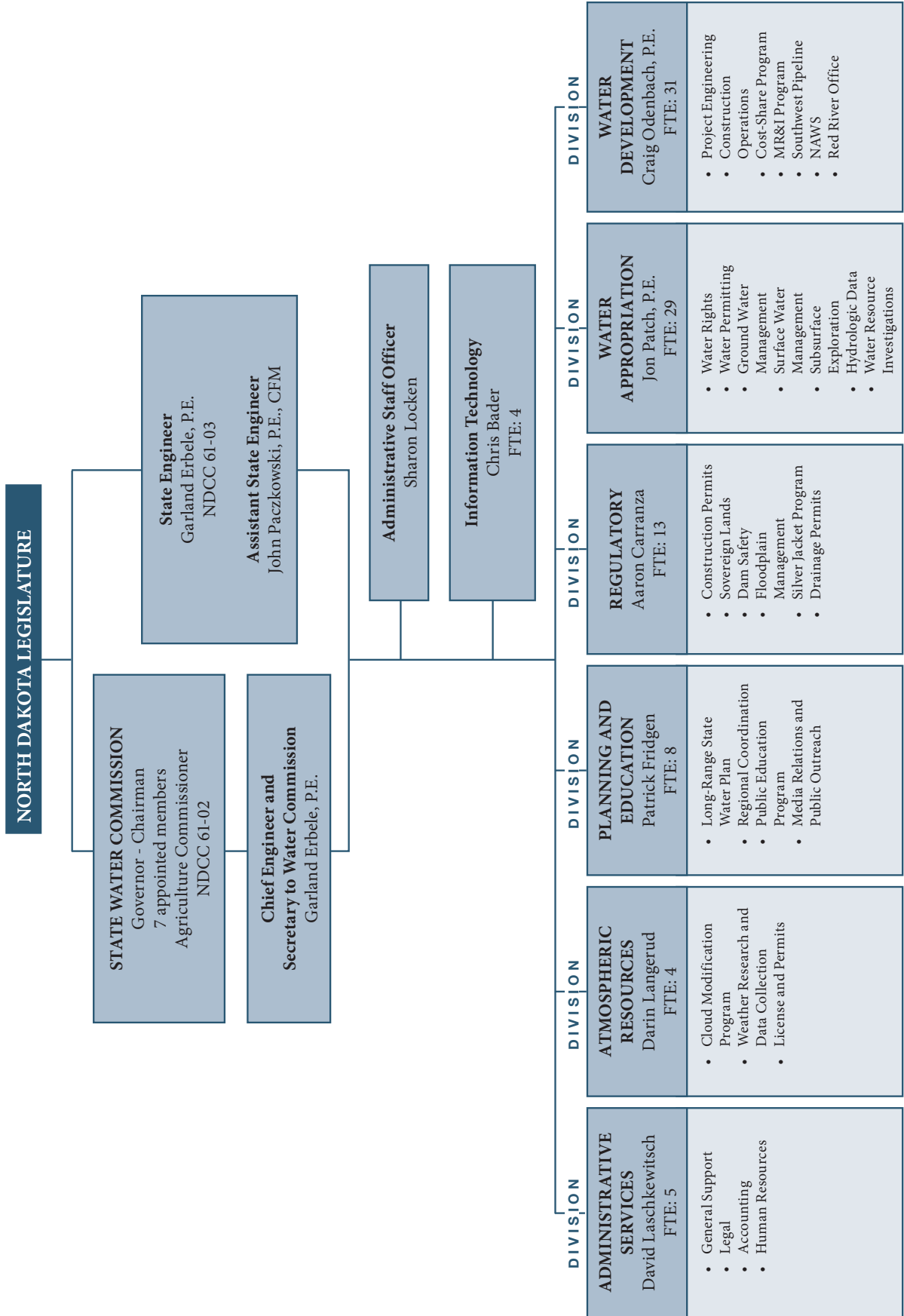
## STATE WATER COMMISSION MEETINGS JULY 1, 2015 THROUGH JUNE 30, 2017

DATE	LOCATION
July 29, 2015	Bismarck
October 6, 2015	Bismarck
December 11, 2015	Bismarck
February 9, 2016	Bismarck
March 9, 2016	Bismarck
April 27, 2016	(conference call) Bismarck
June 22, 2016	Bismarck
July 6, 2016	Bismarck
October 12, 2016	Bismarck
December 9, 2016	Bismarck
March 29, 2017	Bismarck
June 22, 2017	Bismarck



# NORTH DAKOTA STATE WATER COMMISSION ORGANIZATIONAL CHART

(Total Full Time Equivalents of 97 personnel)



## STATE WATER COMMISSION EMPLOYEES

### ADMINISTRATIVE SERVICES DIVISION

**State Engineer:** Garland Erbele  
**Assistant State Engineer:** John Paczkowski  
**Administrative Staff Officer:** Sharon Locken  
**Director of Administrative Services:**  
 David Laschkewitsch  
**Account/Budget Specialist:** Pam Jahner  
**Human Resource Officer:** John Brintnell  
**Paralegal:** Rosemary Pedersen  
**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:** Jackie Schacher  
**Hydrologist Managers:** Dan Farrell, Rex Honeyman,  
 Andrew Nygren, Scott Parkin, William Schuh,  
 Jennifer Weier, Bob White  
**Hydrologists:** Kimberly Fischer, Abigail Franklund,  
 Michael Ginsbach, David Hisz, Bryce Klasen,  
 Jennifer Martin, Braden Rambo, Chris Simmons, Vacant  
**Water Resource Program Administrator:** Mike Hove,  
 Jim Sorenson  
**Water Resource Engineer:** Darin Schepp  
**Water Resource Senior Manager:**  
 James MacArthur  
**Water Resource Project Manager:**  
 Peter Gesellchen  
**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 Huibretse  
**Natural Resource Economist:** Michael Noone  
**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,  
 Two Vacant  
**Engineer Tech:** Chance Nolan  
**Water Resource Program Administrators:**  
 Dionne Haynes, Gerald Heiser, Laura Horner,  
 Ashley Persinger, Vacant  
**Silver Jackets Program Coordinator:**  
 Michael Hall (Temporary)

### WATER DEVELOPMENT DIVISION

**Division Director:** Craig Odenbach  
**Administrative Assistant:** Patty Hess  
**Water Resource Engineer Managers:**  
 Laura Ackerman, Tim Fay, Timothy Freije,  
 Randy Gjestvang, Jonathan Kelsch, Jeffrey Mattern,  
 David Nyhus, Sindhuja S. Pillai-Grinolds, Vacant  
**Water Resource Engineers:** Tim Dodd, Damon Grabow,  
 Joon Hee Lee, Chris Korkowski, Mitchell Weier, Vacant  
**Engineering Technicians:** Thomas Banse, Clint Cogdill,  
 Tom Engberg, Dan McDonald, James Ternes, Vacant  
**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  
**Construction:** Bryan Hanson

## 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, and the North Dakota Water Education Foundation. He also serves as an executive council member of the Western States Water Council, a member of the National Water Resource Association, Board of Director's Ex-Officio member of the North Dakota Water Users Association, and a member of the Association of Western States Engineers.

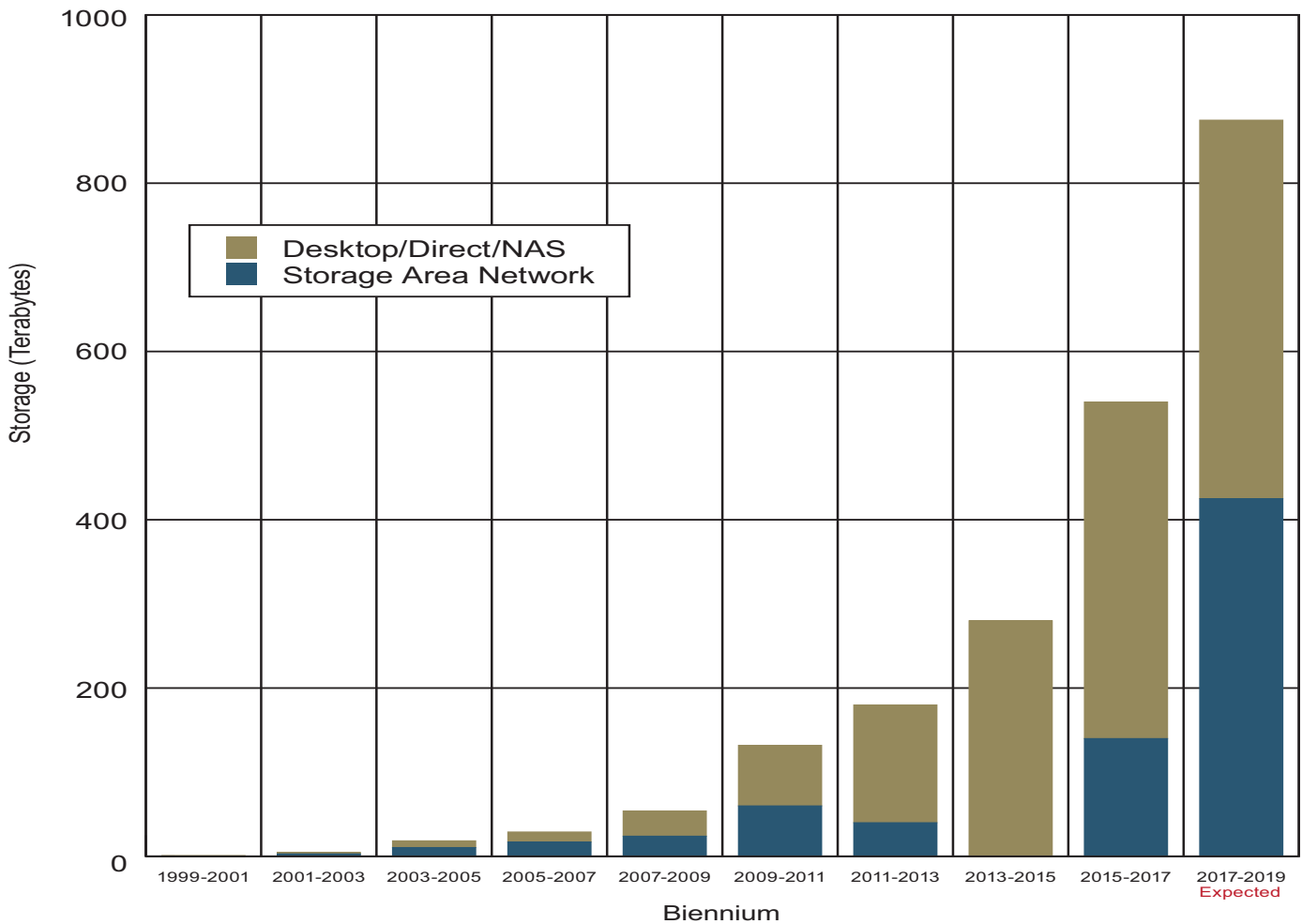
## INFORMATION TECHNOLOGY (IT) SECTION

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 that 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 related to the state's water resources. 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, these 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

### SWC Available Storage



Changes in data storage volumes at the State Water Commission starting in 1999, and projected into 2019.

can be adapted to any commercial telemetry solution, which provides North Dakota water users with the ability to select a telemetry solution based upon their needs. 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 similar 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 these data collection programs. During the 2017-2019 biennium, the State Water Commission will have completed the early testing phases of installing remote telemetry solutions at selected data collection sites.

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 will approach 1 petabyte by the end of 2017.

All of the water resource data for North Dakota are made available through the State Water Commission website ([www.swc.nd.gov](http://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, 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 of the existing historic aerial photography that is available with the agency. This site has grown to include approximately 100 TB of raw image data, and is expected to approach 120 TB by the end of the biennium as more of the legacy image resources available within the agency are digitized and made available for use.

#### 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 Environmental Section of the North Dakota Department of Health.

Specific staff responsibilities include:

- Carry out the administrative procedures required for the licensing of weather modification contractors and the permitting of cloud seeding operations and research activities;
- Develop and maintain a system for the collection of data and records of all operational weather modification activities;
- Conduct research into atmospheric precipitation processes to assess and improve the effectiveness of cloud seeding technology;
- Promulgate rules and regulations governing cloud seeding activities to ensure environmental and public safety;
- Monitor and evaluate cloud seeding activities and report back to sponsoring entities; and
- Monitor, collect, and disseminate accurate precipitation and climate data.

## NORTH DAKOTA CLOUD MODIFICATION PROJECT

The North Dakota Cloud Modification Project (NDCMP) served seven western counties during the 2015-2017 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 7.4 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.

The most recent evaluations of the program indicate a 45 percent reduction in crop-hail losses, a six percent increase in wheat yields, and a 5 to 10 percent increase in rainfall.

Bangsund and Leistritz (2009) evaluated the direct economic impact of rainfall enhancement from cloud seeding at two intervals, five and ten percent. This range reflects the results of long-term evaluations of cloud seeding on rainfall in the target areas. Under the five percent scenario, the value of increased crop production is estimated to yield \$8.4 million annually, while under the ten percent scenario the value of increased production is estimated to yield \$16 million annually.





The analysis of hail reduction or hail suppression shows the average crop value saved through cloud seeding is \$3.7 million annually. Including hail suppression benefits, the total direct impact in the five percent rainfall scenario is \$12 million annually, while the total direct impact in the ten percent scenario is \$19.7 million. These results yield a benefit-to-cost ratio of 12 to 1 for the five percent scenario, and 20 to 1 under the ten percent scenario relative to 2017 project costs.

Under the five percent rainfall scenario, total direct impacts from the NDCMP were estimated to average \$12 million annually. This additional net revenue would generate secondary economic activity of \$25 million annually, resulting in gross business volume of over \$37 million, or \$15.87 per planted acre.

Under the ten percent rainfall scenario, total direct impacts from the NDCMP were estimated to average \$19.7 million annually. This additional net revenue would generate secondary economic activity of \$40.9 million annually, resulting in gross business volume of \$60.5 million, or \$25.89 per planted acre.

## 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, because these areas were not available through NWS radars. 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

Eighteen 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, 370 intern pilots have logged over 25,000 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 2015-2017 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. 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 506 volunteers statewide, building on a database dating back to 1977. The network logged its five-millionth daily observation in 2017.

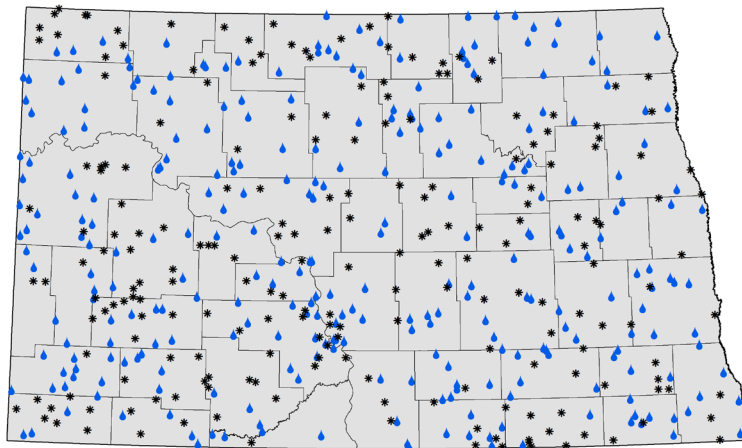
In response to the increased need for snow and snow water equivalent data in the state to assist in flood forecasting and water management, ARBCON began measuring and reporting snowfall in October 2010. About 200 observers participated in the first year, more than doubling the number of local snow reporting stations previously in the state. Currently, year-round ARBCON observers now number 212.

Observers continued to transition to online reporting during the biennium. 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 33 percent of 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.

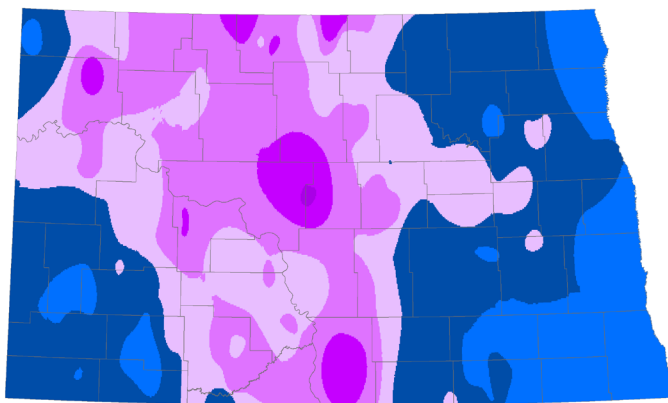


### 2017 ARBCON OBSERVERS



\* Year-Round    ◆ Summer Only

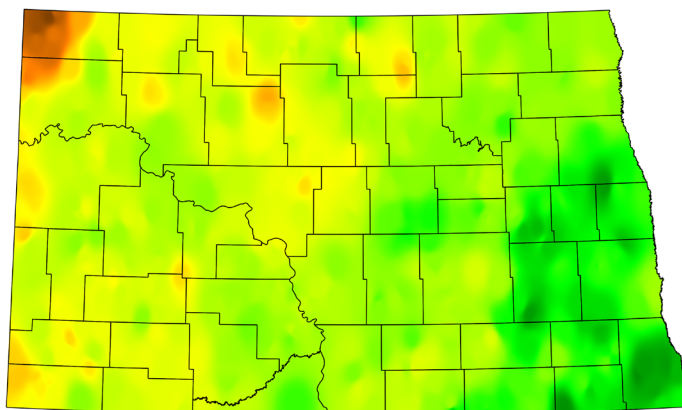
### Oct 2016 - Mar 2017 Snowfall (in Inches)



0-10	20-30	40-50	60-70	80-90	>100
10-20	30-40	50-60	70-80	90-100	

### April – September 2017 Rainfall

Source: NDARB Cooperative Observer Network



Precipitation in Inches

3.14	4.51	5.88	7.26	8.64	10.01	11.38	12.76	14.13	15.51	16.88	18.26	19.63	21.00	22.38	23.75	25.13	26.50	27.88	29.25	30.63	32.00	33.37	34.75	36.12
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### RESEARCH AND DEVELOPMENT

Research during the 2015-2017 biennium focused on a cooperative program between ARB, the UND Atmospheric Science Department, National Center for Atmospheric Research, Fargo-based Weather Modification International, and Ice Crystal Engineering in Kindred, North Dakota. The Polarimetric Cloud Analysis and Seeding Test (POLCAST), is designed to evaluate the effectiveness of hygroscopic cloud seeding in North Dakota. The POLCAST experiments were successful in demonstrating the usefulness of polarimetric radar in evaluating hygroscopic seeding impacts. While the number of randomized cases were limited (a total of 31 good quality randomized cases were evaluated), they collected enough data to provide some indication that a hygroscopic seeding signal could be detected in the polarimetric observables or derived fields. The selected targeted randomized storms were representative of the population of storms observed by NorthPol for all three POLCAST field campaigns. The polarimetric retrievals of hydrometeors (HID) and bulk microphysical analysis of the median volume diameter (D0) and liquid water content (LWC) showed indications of a positive impact of hygroscopic seeding. Because the randomized sample size was too small, the results are not statistically significant.

ARB also collaborated 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.



## PLANNING AND EDUCATION DIVISION

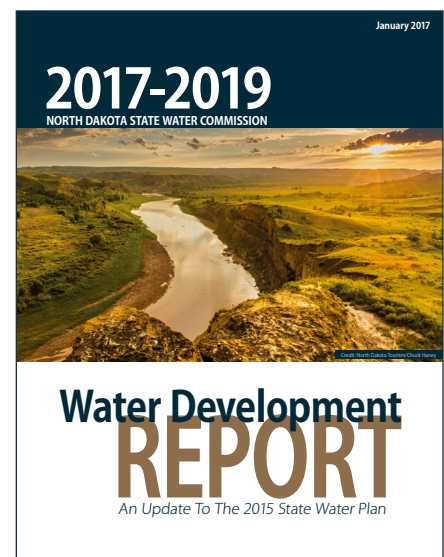
The primary responsibility of the Planning and Education Division is to maintain and update a Water Management Plan for the State of North Dakota. Division staff members also participate in numerous regional, state, local, and inter-office planning activities; manage the agency’s water education programs; 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 management 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 web 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; and
- Managing the Drought Disaster Livestock Water Supply Assistance Program, when activated.

## STATE WATER MANAGEMENT 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 Management Plan was completed in January 2015. The purpose of the 2015 State Water Management Plan is to outline the planning process; provide an overview of North Dakota’s water resources – including characteristics and extent, and factors affecting availability for beneficial uses; provide an overview of water appropriation responsibilities and evolving challenges associated with increasing demand for water; 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; provide information regarding water management and development special topics; and identify goals and objectives to meet water management and development challenges.

## AGENCY STRATEGIC PLANNING AND 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 2017-2019 Strategic Plan, project and program managers were asked to provide input regarding their expectations for future progress through June 30, 2019. 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 2015-2017 Biennial Report, which will be published in early 2018, 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 in various aspects 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 the department, its 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 late 2016, the Planning and Education Division started researching the viability of starting an Unmanned Aerial System (Drone) program. The intent of the program is to provide aerial photographic, video, and project monitoring services to the State Water Commission. The State Water Commission moved forward with the program in early 2017, with an employee of the Planning and Education Division becoming licensed through the Federal Aviation Administration to fly UAS for agency purposes.





Since beginning this program, the uses have been diverse. Examples of uses include, documenting the construction of the Southwest Water Authority's new water reservoir near Dickinson, monitoring the removal of abandoned property from sovereign lands, inspecting cost-share projects through the Drought Disaster Program, as well as, for general photography of the state's water resources, for use in education and outreach materials.

### **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, but it is only activated by the State Water Commission in response to severe drought conditions.

The Program was activated in late June, 2017, in response to record drought conditions. The program was ongoing at the end of the biennium.

### **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. The agency receives 32 projects for review in an average month. Once a review is completed, a formal comment letter is sent to the project applicant within 30 days of the agency receiving the original request for review.

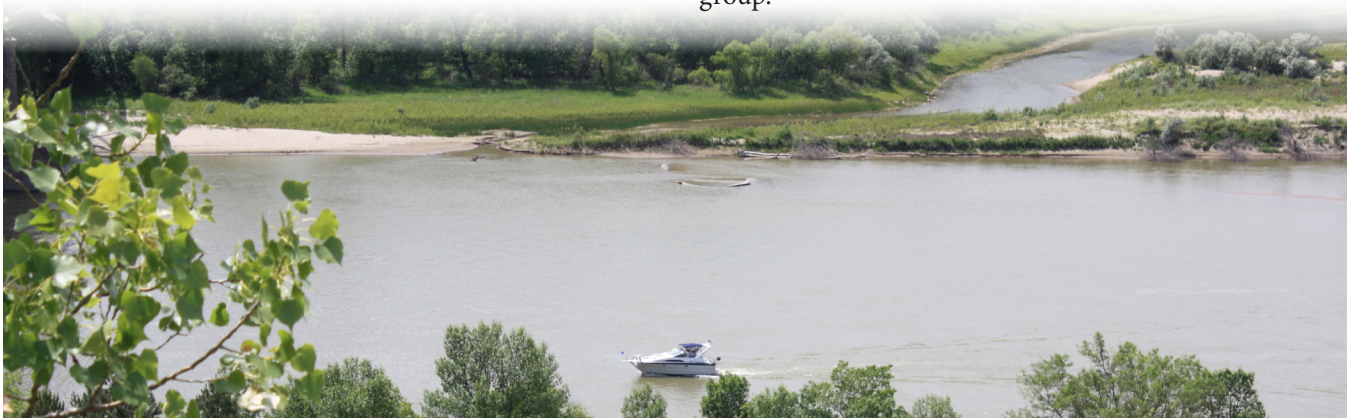
Environmental review comments address compliance requirements involving State Engineer regulatory responsibilities in issuing permits pertaining to water appropriation, floodplain management, sovereign lands, and the construction of dikes, levees, dams, drains, and water holding ponds. Staff members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

### **NORTH DAKOTA MISSOURI RIVER ADVISORY COUNCIL (NDMRAC)**

The State Water Commission assisted the NDMRAC in various ways throughout the biennium. From August 2015 through June 2017 the State Engineer held the role of Interim Chairman of NDMRAC, while much of the work that allowed the group to stand alone was being completed. On June 14, 2017, NDMRAC elected Michael Gunsch to be the group's first chairman.

Throughout the biennium, the Planning and Education Division provided technical and administrative support to NDMRAC. Administrative responsibilities included keeping and transcribing meeting minutes, coordinating communications amongst the board members and membership, and scheduling meetings.

Late in the biennium, the NDMRAC was in the process of finalizing its bylaws, tax status paperwork, as well as other documents needed to be an officially recognized group.



## OTHER GOVERNMENTAL AND 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 to some degree 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; Voices for Oahe; Devils Lake Outlet Advisory Committee; Aquatic Nuisance Species Task Force; Friends of Lake Sakakawea; 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 Office of the State Engineer newsletter that provides the latest agency-specific information concerning water development, regulatory and appropriation efforts, water education, policy changes, State Water Commission meeting highlights, and much more. The average distribution for The Current is approximately 1,400 copies.

## 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 2015-2017 biennium, average monthly distribution of the magazine was approximately 13,000. 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 three-page section called The Oxbow, and an occasional feature page titled The Water Primer. The former is designed to inform readers about agency projects and programs as well as local, state, and national water management issues. The latter highlights interesting or little-known facts about water and related land resources.

## 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 in state 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, technology and youth/adult water action projects.

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 2015-2017 biennium, North Dakota Water Education program 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 through the National Flood Insurance Program to interested and participating communities;
- Managing North Dakota's non-mineral interests in sovereign lands, through ordinary high-water mark delineations and review of projects located within navigable waters;
- Reviewing projects located within navigable waters;
- Coordinating the state's Silver Jackets Program; and
- Review determination requests, complaints, and complaint appeals.



## PERMITS

During the 2015-2017 biennium, the Regulatory Division processed 38 applications for permits to construct or modify dams, dikes, diversion ditches, or other water control facilities. The Division also processed permits for one wetland creation, 111 sovereign land permit applications, and 281 applications for permits to drain, of which 197 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, 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.

## 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 water mark (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.

During the summer of 2013 and the spring of 2014, the Office of the State Engineer launched an ongoing campaign of educating recreational users about the rules and regulations for sovereign lands. This campaign mainly focused 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. There are currently 3,155 dams in North Dakota's dam inventory. Of these, 48 dams are currently classified as high hazard and 82 are classified as medium hazard. This means that there is the potential for the loss of life, or significant property damage downstream, if one of those dams were to fail.

The primary function of North Dakota's Dam Safety Program is to conduct dam inspections, and identifying deficient dams in need of maintenance or repair. Dam Safety Program staff inspect state and privately-owned high and medium hazard dams on a rotational basis. Additional inspections are conducted following the spring runoff, on request from dam owners, or when there are concerns at a dam, such as during flood events. During the 2015-2017 biennium, full periodic dam safety inspections were completed on 19 high hazard dams and 21 medium hazard dams. In addition, 232 cursory dam inspections were completed following the spring runoff season (23 high hazard dams, 87 medium hazard dams, and 122 low hazard dams). Staff also made 29 other dam site visits during this biennium (14 high hazard dams, ten medium hazard dams, and five low hazard dams). These site visits included inspections made at the request of the public or other agencies, and other site visits as needed.

One of the objectives of the Dam Safety Program, is to increase awareness of dam safety issues among dam owners and the public. During the biennium, the Dam Safety Program hosted a seminar for the local engi-





neering community entitled “Fundamentals of Dam Engineering.” This seminar included topics related to basic dam design issues, past dam failures, and lessons learned. The seminar had 53 attendees. The Dam Safety Program is also currently developing a dam maintenance manual to provide to North Dakota dam owners, to educate and assist them with proper maintenance of their dams. Work on this manual was started during the 2015-2017 biennium, but has not yet been completed. Both of these projects are funded by National Dam Safety Program (NDSP) grants through the Department of Homeland Security (DHS), and the Federal Emergency Management Agency (FEMA).

An ongoing focus of the Dam Safety Program has been the development of Emergency Action Plans (EAPs) for high and medium hazard dams. North Dakota Century Code, Section 61-03-25, became effective August 1, 2015, which required that an EAP be developed for all medium and high hazard dams in the state. During the biennium, dam owners submitted final versions of new EAPs for one high hazard dam, and two medium hazard dams. In an effort to assist owners of high hazard dams with preparing EAPs, hydrologic analyses of two high hazard dams were completed, and a third analysis was begun, using funding from NDSP grants through DHS and FEMA. The results of these hydrologic analyses were made available to the dam owners, to assist them with preparing the detailed inundation maps required for an EAP for a high hazard dam.

An ongoing project to review and update the hazard classifications of many dams in the state was begun during the 2013-2015 biennium. This was an effort to identify those dams with the greatest potential downstream impacts, in order to better identify existing issues and to help allocate limited dam safety resources in the most effective way. The review of 51 dams was completed during the 2015-2017 biennium. The Dam Safety Program is currently working to develop new guidelines for determining the hazard classification of dams in North Dakota. Both the hazard classification review and development of hazard classification guidelines are being completed, using funding from NDSP grants through DHS and FEMA.

## NORTH DAKOTA SILVER JACKETS PROGRAM

The North Dakota Silver Jackets (Silver Jackets) program was active in several Flood Risk Reduction projects and studies in the state during the 2015-2017 biennium:

### The James River Corps Feasibility Study

Completed in fall 2014, and provided to each of the counties in the James River Joint Water Resource District, this study also provided James River Corps floodplain maps from the James River Reservoir to the South Dakota/North Dakota state border. This study led to a FEMA Region VIII Risk MAP (Risk MAP) Project, with new FEMA Flood Insurance Rate Maps (FIRM) completed and effective in June 2017 for Eddy, Foster and Stutsman Counties. Wells County’s new FIRM is projected for May 2018. The study also led to a Section 205 Flood Risk Reduction Project for the City of LaMoure, with Phase 1 (Reconnaissance phase) completed in 2016, and currently pending a decision from Lamoure for moving forward. In addition, both Jamestown and Lamoure have requested Corps Emergency Action Plan Workshops to be conducted in 2018.

### Corps Section 22 Flood Risk Reduction Studies

Developed for Mercer County (Beulah) and Emmons County (Linton) as a result of flooding in 2009 and 2010, the State Water Commission has completed the hydrology and hydraulics analysis for both the Knife River and Beaver Creek, and they have been approved by the U.S. Army Corps. The Corps is now evaluating that data to identify potential flood risk reduction measures for both communities. Also in February 2016, the Corps and State Water Commission conducted non-structural flood prevention workshops in both communities and have scheduled Emergency Action Planning Workshops for both communities in October 2017. The Section 22 studies for both communities are scheduled to be completed in the 2017-2019 biennium.

### Red River Basin Flood Forecasting Improvement Project

Approved during the summer of 2014, the project was designed to identify gaps and shortfalls in data necessary to better predict Red River basin spring flooding. The project consists specifically of identifying the soil moisture content and temperature throughout the Red River basin. The project was completed November 2016, and is assisting with better flood forecasting within the Red River basin. Partners include the Corps, NWS, United States Geological Survey (USGS), North Dakota, Minnesota and local Red River basin organizations.

As a result of the Mouse River flood in 2011, the Silver Jackets have been actively engaged with the Souris [Mouse] River Joint Board (SRJB) and City of Minot with several projects and studies. Since the 2011 flood there have been several projects but specifically for the 2015-2017 biennium the following projects were initiated and completed:

#### Souris River Joint Board Rural Property Inventory

This project consists of inventorying properties throughout the Souris River basin. It includes extensive property description, location and elevation data. This project began in winter 2015, with coordination and outreach with officials and property owners and collection of data in the spring and summer of 2015. This data will be used by the SRJB to further develop flood risk reduction measures in support of the rural reaches of the basin and was completed in the winter of 2015/2016.

#### Unsteady Flow Hydrologic Engineering Center River Analysis System (HEC-RAS) for U.S. and Canadian Stretches of Souris/Mouse River

Approved in January 2015 and completed in May 2017, this project is intended to enhance and refine both existing U.S. and Canadian HEC-RAS Models with current data. The goal is to have one comprehensive continuous

unsteady flow model from Rafferty Dam in Saskatchewan, through Sherwood to Westhope, North Dakota. This project will both support the International Joint Commission's Plan of Study for the Souris/Mouse River, sponsored by the US and Canadian authorities along with the SRJB, and the Mouse River Enhanced Flood Protection Project.

#### NGVD '29 to NAVD '88 Change for the Mouse River Basin

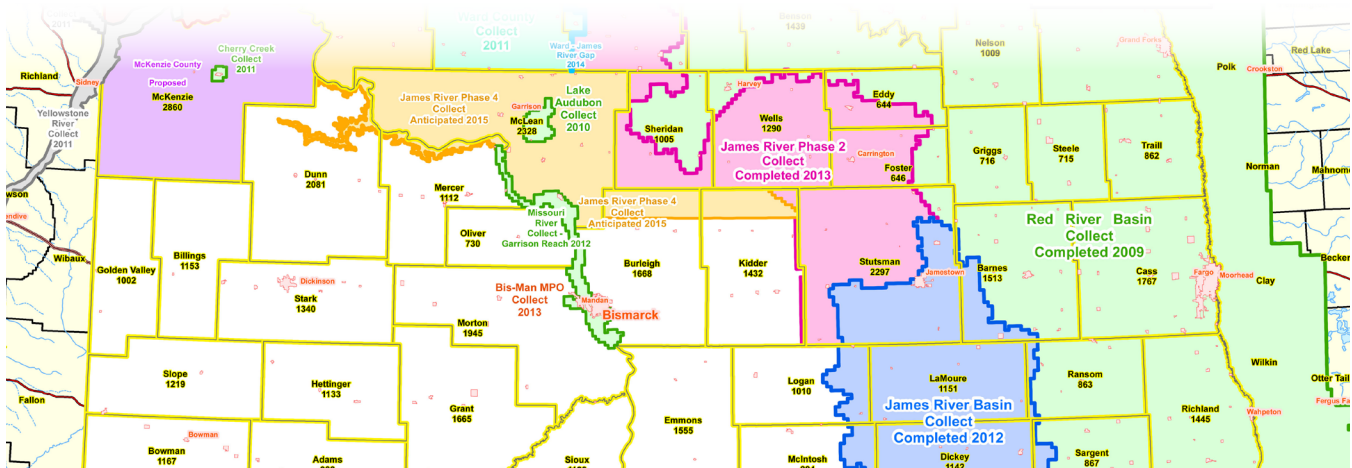
This project was initiated during fall 2015 at the request of the SRJB to change the Vertical Elevation Datums used for the NWS Advanced Hydrologic Prediction Site (AHPS) (River Gauge Sites for NWS flood forecasting) from NGVD '29 to NAVD '88. The USGS and NWS were integral to the implementation and approval of this project along with support from the Corps and NWS. USGS gage sites and the NWS AHPS websites were revised in the spring of 2016.

#### Souris River Basin Inundation Mapping Project

The SRJB leveraged the Silver Jackets Program to provide interactive inundation mapping tied to the NWS's AHPS sites for the Souris River basin. This project, initiated during January 2016, was identified during the Emergency Action Planning Workshops conducted for the SRJB, with Phase 1 of the project currently ongoing.

#### LiDAR Collection

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. The LiDAR collection was completed in fall 2016 and in spring 2017, all the new LiDAR has been posted to the State Water Commission website. For the first time, LiDAR coverage is available for the entire state and available for local, state, and federal agencies.





## FLOODPLAIN MANAGEMENT

Two staff members work with FEMA funded 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 FIRM creation and subsequent contract management. The State Water Commission is currently managing four countywide mapping contracts and are working closely with FEMA Region VIII on an effort to collect Large Scale Base Level Engineering (LSBLE) data for the State of North Dakota. Phase 1 includes 32 counties on the eastern side of North Dakota, which kicked off in summer 2017. Phase 2 will complete LSBLE for the remaining 21 counties on the western side of the state. Kickoff efforts for Phase 2 are slated to begin in 2018.

The CAP-SSSE is a federal program that provides 75% funding to the state 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 329 participating communities in North Dakota.

Each community designates a representative as their Floodplain Administrator to oversee floodplain development within flood prone or identified floodplains. Regulations that meet the minimum federal and state standards are outlined within their own floodplain development ordinance. N.D.C.C. 61-16.2 explains the higher state floodplain standards that communities are expected to follow.

For communities that go above and beyond the minimum requirements, the Community Rating System (CRS) was developed to recognize those efforts. Eleven communities are now enrolled in the CRS, which gives NFIP flood insurance policy holders a discount on their premium. The current total annual savings is estimated to be approximately \$156,000.





## 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 260 test holes during the 2015-2017 biennium, and installed 194 monitoring wells, including a 415-foot deep monitoring well within the Spiritwood Glacial Aquifer. The deep channel of the Spiritwood Aquifer was identified using a new geophysical logging tool and airborne electromagnetic data collected by helicopter.

Division staff measure 25,000 to 30,000 water levels annually, in monitoring wells and surface water locations. Continuous water-level data is collected and stored for onsite retrieval from about 80 locations across the state. Development and testing of remote water-level data acquisition is ongoing. The agency plans to deploy several remote water-level systems across the state to continuously record water levels and provide real-time data to the public via the internet. Water samples were collected from 1,880 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, the State Water Commission IT staff has developed the necessary data management tools to access the data for internal and public use through web access.

## RESEARCH, STUDIES, AND REPORTS

During the 2015-2017 biennium, the Water Appropriations Division was involved in numerous studies that were completed or are in progress. Descriptions of these studies follow.

- In fall 2016, an Airborne Electromagnetic Survey (AEM) was flown over the Spiritwood aquifer east of Jamestown from Montpelier to Walum, representing over 1,200 miles of flight lines. This technique was used to delineate the geometry of buried channels and to gain insight into locations of flow barriers by characterizing changes in resistivity. The survey was a first agency exploration of a new technology for achieving high-resolution areal and stratigraphic definition of aquifers in ND. Maps of the Spiritwood aquifer resulting from the survey are excellent and the technology is very promising for applications. Plans for further AEM surveys in areas of critical water use and need are in place for the next (2017-2019) biennium. The results of the work on the AEM project (co-authored by Appropriations Division staff) have been presented at several international conferences.
- At the request of Governor Burgum, a study of historical water permits that have been granted, and historical water use in the Little Missouri River basin was completed in June of 2016. The report, titled: "Historical, Current And Prospective Future Surface Water Management In The Little Missouri River Scenic River Basin" is available online at: [http://www.swc.nd.gov/pdfs/little\\_mr\\_report.pdf](http://www.swc.nd.gov/pdfs/little_mr_report.pdf).
- Use of Aquifer Storage and Recovery (ASR), in which surface waters during periods of high availability are stored in aquifers for later use, has been explored and assisted in implementation on unconfined aquifers by the State Water Commission in past years. Preliminary work for a new project evaluating the potential use of ASR in highly stressed confined aquifers was initiated in early 2017, and planned for continuation in 2017-2019. Dr. Scott Korom, of Barr Engineering, has been engaged under contract to work with Appropriation Division staff in evaluating the feasibility of ASR, and a possible pilot project for use of ASR on the Spiritwood Aquifer.
- The Water Appropriations Division, using pass-through funding from the USGS, have conducted a study of urban water use, in cooperation with North Dakota State University (NDSU) and the USGS. The research is being conducted by Dr. Christina Hargiss, of NDSU and her students. The first phase of the study was completed and published as a M.S. thesis by graduate student Amy Gnoinsky, in 2016. A successful competitive grant application was completed in 2016, under which a 2-year extension of the project is being conducted.
- A study of the effects of the use of perforated pipe as a discharge conduit for tile drainage systems on aquifer water loss was initiated in spring 1997, including initiation of gaging on one outlet location by the USGS. The study is expected to be complete by late 2017.
- Water Appropriations water management staff assisted and co-authored two university studies on water use in the Bakken Region during the biennium, including: "Managing the Increasing Water

## Permitted Water Use Summary July 1, 2015 - June 30, 2017

WATER USE	ACRE-FEET
<b>Irrigation</b>	
Applications Filed: 75	
Acre Feet Requested: 20,382.9	
Acres Granted*: 8,158.8	
Storage Granted*	21.4
Water Granted*	10,430
Ground Water Granted*	8,613.3
(Ground Water Acres) 6,684.1	
Surface Water*	1,816.7
(Surface Water Acres) 1,474.7	
<b>Flood Control</b>	
Applications Filed: 0	
Storage Granted*	0
Water Granted*	0
<b>Industrial</b>	
Applications Filed: 80	
Water Granted*	30,579.2
<b>Livestock</b>	
Applications Filed: 0	
Water Granted*	0
Storage Granted*	0
<b>Municipal</b>	
Applications Filed: 1	
Water Granted*	1,196.2
<b>Recreation, Fish &amp; Wildlife</b>	
Applications Filed: 3	
Storage Granted*	1,008.4
Annual Use Granted*	2,197.3
<b>Rural-Domestic</b>	
Applications Filed: 0	
Water Granted*	0
Total Applications Filed	159
Total Water Granted	44,402.7

\*Includes backlog-permits applied for in previous bienniums.



## Temporary Water Permits July 1, 2015 - June 30, 2017

Type of Use	Number of Permits	Authorized Volume (Acre-Feet)
Construction	506	9,407.96
Fire Protection	2	0.04
Industrial	3	74.16
Industrial-Water Depot	562	158,230.86
Irrigation	53	13,495.24
Livestock	3	570.00
Resource Planning	31	384.96
Rural Water	2	300.12
<b>Total</b>	<b>1,162</b>	<b>182,463.34</b>
Voided or Denied	96	45,788.34

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

Footprint of Hydraulic Fracturing in the Bakken Play, United States,” corresponding author Dr. Bridget Scanlon of the Jackson School of Geosciences, University of Texas, published in Environmental Science and Technology, in 2016; and “Impacts of Bakken Shale Oil Development on Regional Water Uses and Supply,” corresponding author Dr. Zhulu Lin of NDSU, recently approved for publication in the Journal of the American Water Resources Association.

- The State Water Commission has initiated a plan to enhance surface water monitoring of small streams in the oil field development areas of the state, with up to six additional measurement sites. As a first step, a pilot study to develop high-resolution, low-cost, real-time data acquisition was started in 2014. The State Water Commission has deployed a preliminary real-time stream gage station in western ND to help monitor surface water appropriations. A similar design has also been tested for real-time ground water levels in remote areas. Testing and development is ongoing.

### DATA MANAGEMENT

- A preliminary real-time data acquisition platform has been developed and tested to push hydraulic information (water level, atmosphere pressure,

temperature, among others) from the field to the Office of the State Engineer database. This platform may provide a pathway to better integrate current hydraulic conditions into real time management of the waters of the state.

- A data management tool for quick evaluation of the status and other vital information on temporary water permits was developed and deployed.
- A data management tool for quick evaluation of the status of unused water permits was developed and deployed.
- In 2016 the Appropriation Division conducted a 4-day aquifer test in a fractured lignite bed north of Dickinson to evaluate effects of additional ground water withdrawals on a limited resource.
- The Ground Water Section of the Appropriations Division evaluated and purchased a borehole geophysical tool for characterizing wellbore lithologies during the well installation process. The new tool adds formation resistivity measurements to our existing geophysical data collection program.
- 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.
- 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 2015-2017 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 2015-2017 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.
- The well network designed and constructed to monitor and estimate seepage from the West Devils Lake Outlet channel was monitored for both water levels and ground water quality changes during the 2015-2017 biennium.
- 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.

## LANDFILL AND MINE PERMIT REVIEWS

The Water Appropriation Division cooperates with the Health Department in reviewing ground water aspects of landfill applications. From July 1, 2015 through June 30, 2017, 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 performs approximately 24 mine-related environmental reviews every 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.

While no new special investigations were undertaken for specially designated economic development projects during the biennium, the Appropriations Division 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

Water use by the oil industry in western North Dakota had increased to about 17,000 acre-feet annually by 2013. High water use was sustained through the 2013-2015 biennium, although water use began to decrease with the downturn in oil field development in the later part of the biennium. A total of 1,468 temporary industrial water permits were issued during the 2015-2017 biennium. All water supply depots are now 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.



## 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 state and federal MR&I water supply cost-share programs;
- Management of general water management cost-share program;
- 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 cost-share requests received by the State Water Commission.



## INVESTIGATIONS SECTION

Numerous flood control initiatives and studies grew from the aftermath of the 2009 and 2011 floods. Section staff continued providing support on the flood-related efforts for the Mouse River, including support on the Mouse River Enhanced Flood Protection Project and the IJC's Plan of Study. A more comprehensive description of these items is included in the Mouse River section of this report. During the past biennium, the State Water Commission funded a USGS analysis of regulated flood frequencies on the Upper Mouse River basin. It is anticipated that this analysis will be finalized in the 2017-2019 biennium.

The Section also provided support on Missouri River issues, including staff participation on the Missouri River Recovery Implementation Committee (MRRIC) and coordinating comments on the Missouri River Recovery Management Plan and Environmental Impact Statement. Other activities included tracking Missouri River dam operations and basin conditions, reviewing the Corps' Annual Operating Plans, participating in the ND Interagency Emergent Sandbar Habitat Team, and providing support on the Corps' Surplus Water/Reallocation issue. A more comprehensive description of some of these items is included in the Missouri River section of this report.

In spring 2016, the lawsuit involving the Pembina Border Dike was heard in Canadian federal court. The lawsuit was originally filed in 2004 by the Pembina County Water Resource District, along with other local political municipalities and private landowners, against the Province of Manitoba and the rural municipality suing for damages and removal of the dike. The State Water Commission cost-shared on the lawsuit and Section staff provided testimony when the lawsuit went to court. The Cana-



dian federal court ruled against the plaintiffs due to lack of jurisdiction. The ruling was appealed to the Canadian Supreme Court in August 2017.

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/McHugh Slough, Nelson County
- Tolley Slough, Renville County
- Strausburg Slough, Emmons County
- Rice Lake, Ward County
- McGregor Dam, Williams County

In addition to these activities, the section continued to work on a number of investigations for local counties and cities. These include: hydrologic and hydraulic studies for the Knife River basin for the Mercer County Water Resource District; similar studies for the Beaver Creek basin for the Emmons County Water Resource District; hydrologic and hydraulic analysis and alternatives for Twin Lakes in LaMoure County and Tolley Slough in Renville County; a bank erosion and alternatives analysis for the Sherwood stream gage site for the United States Geological Survey; a bank erosion analysis and alternatives for LaMoure County; and a dam safety analysis for McGregor Dam in Williams County.

The Section also supports the rest of the agency by providing surveying services and technical advice on hydraulics, hydrology, and related matters. The Section continually explores and adopts new technologies in modeling and GIS, making them available to those who need them elsewhere in the agency.

## COST-SHARE PROGRAM

The State Water Commission has been fortunate to have access to significant funding for project expenditures 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 2015-2017 biennium, the Development Division processed almost 800 cost-share requests. There were approximately 365 total projects, totaling over \$341 million in approved funds.

## MUNICIPAL, RURAL & INDUSTRIAL WATER SUPPLY

In federal fiscal years 2016, and 2017, the Garrison Diversion Municipal, Rural, and Industrial (MR&I) Water Supply Program received \$24.56 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 \$372 million since the program was authorized in 1986.

The State Water Commission and the Garrison Diversion Conservancy District (GCDC) also provided funding toward project development.

Projects that were allocated funds during federal fiscal years 2016 and 2017 included Burlington Water Tower; Carrington Water Tower; Cass Rural Water Users District, Leonard Service Area; Casselton, Water Tower; Gladstone, Water Storage; Glenburn, Water Storage; Kindred Water Tower; Makoti, Water Tower; Mohall, Water Tower; New England, Water Tower; Northeast Regional Water District, Rural Expansion; Rugby, Water Treatment Plant Improvements; Sherwood, Water Main; Wahpeton, Water Treatment Plant Improvements; Westhope, Water Main; and Southwest Pipeline Project, Dickinson Water Treatment Plant.

## 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 hydraulics and hydrology 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.

The Survey Crew completed several bathymetric surveys of the Missouri River, with emphasis on the Double Ditch area and, confluence of the Heart and Missouri rivers. Additional bathymetric surveys have also been completed at areas of concern along the Mouse River as well as many other smaller projects throughout the state. Water surface profiles were surveyed each field season on the Missouri River, from near the Steckel Boat Ramp to Graner Bottoms upstream and downstream of Bismarck. With the addition of remote controlled devices, the survey crew will be able to survey far more detailed areas.



In an effort to gain more accurate information on the state border for the North Dakota State GIS Hub, and for historical preservation purposes, over 100 border monuments were located and surveyed. Surveyed monuments were located along the ND-SD and ND-MT border, with most being along the ND-SD border.

State Water Commission staff from the Investigations Section, as well as the IT Section, maintain a database of all survey data. This data, as well as Government Land Office (GLO) survey data is available to staff and the public. The GLO data is provided on our website and is maintained by IT staff. The Office of the State Engineer is the custodian for the GLO survey data. Many engineering and survey firms access GLO notes from the State Water Commission MapService on a daily basis.

## NORTHWEST AREA WATER SUPPLY

The NAWS project has been under a federal court injunction since April 15, 2005, but the court has allowed work to continue on the High Service Pump Station in Minot and the pipeline projects north of Minot. The Federal Court issued an order on March 5, 2010, requiring the Bureau of Reclamation to take a thorough look at: 1) the cumulative impacts of water withdrawal on the water levels of Lake Sakakawea and the Missouri River, and 2) the consequences of biota transfer into the Hudson Bay basin, including Canada. The most recent order, dated March 1, 2013, allowed then-current construction contracts to be completed, however it does not allow any more pipeline construction until the Environmental Review is completed and approved by the court.

The United States Department of Interior, through the Bureau, began working in the summer of 2010 on a Supplemental Environmental Impact Statement (SEIS) for the NAWS project to address the federal court's order for additional environmental review. A cooperating agency team consisting of the State Water Commission, City of Minot, Garrison Diversion Conservancy District, Environmental Protection Agency, Corps, and Fish and Wildlife Service, were also involved in the development

of the SEIS. A Draft SEIS was available for public review in June 2013. Federal law requires a 30-day public comment period on draft environmental impact statements, which in this case was extended. Numerous comment letters were received and their comments addressed in the Final SEIS, which was published on April 10, 2015. The Bureau received additional comment letters upon publication of the Final SEIS, which were addressed and included as an appendix to the Record of Decision, issued in August 2015. A Joint Motion for Entry of Case Management and Scheduling Order was submitted to the District of Columbia District Court December 22, 2015 and accepted with minor modifications December 23, 2015. The plaintiffs filed supplemental Complaints January 29, 2016, and the defendants lodged and served the Administrative Record February 5, 2016. A Motion to Modify Injunction Pendente Lite was filed by the State of North Dakota as intervenor defendant, on March 1, 2016. Oppositions by the plaintiffs were filed April 4, 2016, and a reply was filed April 25, 2016 by the state. The Plaintiffs filed a Motion for Leave to sur-reply May 18, 2016, and an opposition to that motion was filed May 20, 2016, by the State of North Dakota. The Plaintiffs then filed a response to our opposition May 25, 2016, and the Motion for Leave was accepted by the Court May 27, 2016. The Motion for Modification to the Injunction was denied by the court June 14, 2016. A notice of appeal was filed with the DC Appellate court July 1, 2016. A Statement of Issues for Appeal and Motion to Expedite Appeal were filed August 15th, 2016. A Motion for Summary Affirmance and Opposition to Motion to Expedite Appeal were filed by Manitoba and joined by Missouri August 29, 2016. Opposition to Summary Affirmance was filed September 6, 2016, and a Reply in Motion to Expedite Appeal was filed September 8, 2016. A Reply in Support of the Motion for Summary Affirmance was filed September 22, 2016. The Briefing Schedule was set for the Appeal, the Motion for Summary Affirmance was denied and the Motion to Expedite Appeal was granted September 28, 2016. The Brief of Merits was filed October 7, 2016 by the Appellants and Brief of Plaintiff-Appellees was filed November 7, 2016. The Reply by the Appellants was filed November 22, 2016.

Oral arguments were held January 13, 2017 in front of circuit judges Brown and Wilkins, and senior circuit Judge Edwards. The decision was filed by (circuit) judge Brown on March 3, 2017 remanding the decision to Judge Collyer, with instruction to grant the modification to the injunction. This decision, while a single step in the right direction, was a significant victory for the plaintiff as it is the first ruling in our favor. There have been six other modifications to the injunction, but this is the first that wasn't consented to or unopposed by the plaintiffs in the case.

Motions for Summary Judgment were originally to be filed by the defendants April 11, 2016, with combined cross-motions/opposition by the plaintiffs due May 13, 2016, and combined oppositions/replies by the defendants were due June 17, 2016. However, the briefing schedule was delayed once, due to a desire by the federal defendants for additional time for review and a medical issue of the plaintiff's legal counsel, and then again for the same medical issue for the plaintiffs' legal counsel.

The State of North Dakota consented on both requests, to delay the briefing, but filed a joinder on the second request to ask the court to expedite the judgment on the injunctive relief motion.

The Motions for Summary Judgment were filed by the defendants June 3, 2016, with combined Opposition/Cross-Motion by the plaintiffs filed July 8, 2016 and combined Reply/Opposition by the defendants filed August 16, 2016. Manitoba filed a motion for leave to sur-reply on September 12th, which was accepted by the court the next day. Motions for Leave to sur-reply were filed by the defendants on September 26, 2016, and a reply by the Plaintiffs was filed October 7, 2016. Oral argument for the cross-motions for summary judgement was scheduled for March 30, 2017, in DC District Court.

The first summary judgement in this case was delivered eight months after the briefing was completed, and four months after the oral argument, and the second summary judgement was issued four months after the final briefings. There was no oral argument for the second summary judgement.

## NAWS WATER DISTRIBUTION

In Minot, as part of the NAWS project, the State Water Commission employs a Water Distribution Operator. The primary duty of the Water Distribution Operator, as a certified Level II Distribution System Operator, is testing and compliance for Safe Drinking Water Act regulations pertaining to a public water system. This includes water quality sampling and testing procedures, addressing

water quality concerns within the NAWS system, as well as assisting in troubleshooting water quality concerns of subsequent water users, flushing, or adjustments in operation of pump stations and reservoir levels. The position is also responsible for the routine maintenance on the project works. They must also perform locates of system facilities for One-Call requests, and observe contractors working near the NAWS facilities to limit/prevent damage during such activities, reading meters monthly, and maintaining the properties.

## SOUTHWEST PIPELINE PROJECT

The 2015-2017 biennium was a monumental biennium for the Southwest Pipeline Project (SWPP), as the final rural distribution contracts that encompassed the last service area for the SWPP were completed. With those contracts, all the rural users in the 12-county area of the SWPP were given the opportunity to access quality water from the SWPP.

With the final rural distribution contracts completed, the focus of the SWPP moved to increasing the capacity at the SWPP's Dickinson Water Treatment Plant (WTP). The capacity of the existing WTP is 12 Million Gallons per Day (MGD). The 12 MGD capacity cannot support any future population growth. A contract for the construction of an additional 6 MGD WTP, adjacent to the existing WTP, was awarded during the biennium, and construction is over 70% complete.

Contracts for the second Richardton and second Dickinson raw water reservoirs were awarded and construction began in the biennium. A contract for the first segment of parallel piping, a four-mile segment, from the intake to the Oliver Mercer North Dunn WTP, was also awarded. The supplemental intake contractor finalized the plan to complete the contract. The site was stabilized and preparations were made for the launch of a micro tunneling machine for an additional raw water intake along the new alignment.

Capital repayment collected from July 2015 through June 2017 was \$9,709,299.29. All of those funds were deposited in the Resources Trust Fund.

## DESIGN AND CONSTRUCTION SECTION

During the 2015-2017 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 state outlets on Devils Lake.



**FISH CREEK DAM, MORTON COUNTY**

Built in 1971, Fish Creek Dam is an earthen embankment, recreational-use dam. The outlet works consist of a concrete drop inlet, with a low-level drawdown system. Over the years, the low-level drawdown system pipe disconnected from the concrete drop inlet due to the low-level drawdown pulling away from the drop inlet. This condition led to loss of water from the reservoir. The State Water Commission Construction Crew undertook a project with the Morton County Water Board and the North Dakota Game & Fish Department (NDGF) to correct this issue.

The State Water Commission Construction Crew built a coffer dam around the drop inlet, and then excavated the low-level drawdown pipe. Since the pipe could not be simply re-inserted back into the hole in the drop inlet, a concrete collar was constructed around the pipe and connected to the drop inlet wall. Then, the excavation was backfilled and the coffer dam removed.

**RALEIGH DAM, GRANT COUNTY**

Constructed in 1988, Raleigh Dam is an earthen embankment, recreational-use dam. Over the years, the construction joints in the principal spillway conduit had spread apart, some to wider than two inches, with some seeping water. Several years ago, the sluice gate that controls the low-level drawdown system would no longer close without special effort. The sluice gate would only close by repeatedly turning the control stem and then hammering on the top of it until the gate was closed. The sluice gate is located under water in the wet well of the outlet structure making access to it challenging. The State Water Commission Construction Crew undertook a project with the Grant County Water Resource District and the NDGF to correct these issues.

To further complicate the project, a large rock found its way into the wet well and became lodged in the sluice gate at some point. As a result, the sluice gate could no longer be closed all the way, even with the turn and hammer method. It was determined that the rock could not be removed safely, so it was decided to lower the reservoir. The gate was fully opened and the reservoir drained over the next several months. Once the water was down, the project only took about three weeks to complete. The leaking joints were filled with a hydrophilic polyurethane expanding grout, and topped with a flexible caulk. Once the malfunctioning sluice gate was examined, it was determined that the collar that provides the down force for closing the gate had broken off. The broken collar was replaced by bolting a steel angle to the wall, just above the gate to provide the necessary down force.

**SWEETBRIAR DAM, MORTON COUNTY**

A recreational-use dam, Sweetbriar Creek Dam also serves as the embankment for Interstate 94. It is an earthen embankment dam, with a concrete drop structure, a box culvert and a chute stilling basin. In fall 2014, a sinkhole was found along the right wall of the stilling basin. In 2015, the sinkhole was excavated to investigate its cause, but the cause was not found. The hole was then refilled and compacted and will be monitored to see if it returns.

**HEINRICH-MARTIN DAM, LAMOURE COUNTY**

The dam, constructed in 1968, has a 48 inch corrugated metal pipe (CMP) drop structure riser connected to a 30-inch CMP principal conduit terminating at a plunge-pool stilling basin. The low-level system, installed in 1991, consists of high-density polyethylene (HDPE) pipe extending from a butterfly valve inside the drop structure into the reservoir. The CMP riser is constructed of two CMP sections, connected with a CMP band at approximately 10 feet below the weir elevation. This joint between the two CMP sections became offset due to failure of the CMP band, and subsequent movement of the upper section. This offset in the CMP sections resulted in a flow path for the water, causing internal erosion, and ultimately leading to a sinkhole around the drop structure.

A coffer dam was constructed around the principal outlet riser. The riser was then excavated to just below the elevation of the joint between the sections. The sections were realigned and new CMP band was installed.

**WHITE EARTH DAM, MOUNTRAIL COUNTY**

Constructed in 1970, the dam has principal, secondary, and auxiliary spillways. The secondary spillway, a concrete drop inlet with a 20 inch by 13 inch CMP arch conduit, was added in 1972. In the winter of 1972/73, the CMP floor plates buckled. In 1973, the CMP floor plates were replaced with a cast-in-place reinforced concrete floor. Almost right away, as the CMP deflected under the weight of the overburden, the CMP started pulling away from edges of the concrete slab. These gaps have grown over the years and became a concern for the integrity of the structure.





The repair project involved constructing a cofferdam around the stilling basin to dewater the downstream end of the structure, removing the concrete slab back to about 24 inches from the CMP arch, constructing a form for the new edges of the slab, and placing new concrete to replace that which was removed. After the new concrete cured, holes were cored in the remaining original concrete slab, for the injection of cementitious grout fill the remaining voids under the slab.

### MOUNT CARMEL DAM, CAVALIER COUNTY

Mount Carmel Dam, constructed in 1971, is an earthen embankment dam with a concrete chute spillway and low-level drawdown system. The low-level drawdown system consists of a one-foot intake pipe, that discharges through a butterfly valve in the chute spillway. The butterfly valve began to leak at some point. Since the intake pipe is in the reservoir, the valve has pressure on it at all times. In order to remove the valve, the intake pipe must be plugged to remove this pressure. In the past that was accomplished by having a diver find the end of the pipe in the reservoir and place a plug over it, which was not always successful. In this case, the State Water Commission Construction Crew used a new method of plugging the pipe that involved inserting an inflatable plug through the open valve. The valve was then replaced, and the plug removed.

While at the dam for the valve replacement, the construction crew also installed a new fall protection anchor bracket. To inspect this spillway, State Water Commission Dam Safety staff must climb down a 20-foot high ladder to reach the floor of the spillway. The previous fall protection system on the ladder was difficult to use, and getting connected and disconnected from the system was probably just as hazardous as climbing the ladder without the fall protection system. The State Water Commission Construction Crew installed an overhead steel anchor bracket for attaching the fall arrestor, and removed the previous fall protection system.

### USGS

The State Water Commission continued to cooperate with the USGS on the maintenance and improvement of the USGS's stream gaging sites throughout the state.

### **NEW DOZER AND LOW-BOY SEMI TRAILER**

In early 2016, State Water Commission reviewed separate bids for a new low-boy trailer, to replace the construction crew's previous trailer that was limited by ordinary load restriction limits. The new trailer has a third axle, allowing the capacity necessary to transport the crew's equipment to projects throughout the state.

Also in 2016, bids were let for a new dozer to replace the crew's existing dozer that had been in service since 1985. The new dozer is a 2016 Caterpillar D6T with variable angle blade.

### **DEVILS LAKE OUTLETS**

Flooding in the Devils Lake basin has demanded a large amount of time and resources from the State Water Commission over the last 25 years, and the 2015-2017 biennia was no exception. The Devils Lake water surface elevation began the biennium just under 1452 feet above mean sea level (amsl), dropped briefly below 1450 ft in 2016, and again rose by 1.6 ft in the spring of 2017.

Climate and local weather conditions are the primary drivers of lake level change, and two outlets serve to reduce the risk of additional basin flooding and potential downstream impacts from the lake spilling into the Sheyenne River through Tolna Coulee. The serious consequences of water rising in the basin have led to continued support of outlet operation by stakeholders. At a meeting of the Devils Lake Outlet Management Advisory Committee in May 2017, a long-term goal of drawing the lake down to 1448 ft msl before re-evaluating outlet operating parameters was agreed upon.

During the 2015-2017 biennium, over 310,000 acre-feet were discharged, which corresponds to approximately 1.8 feet at the current lake elevation. The total volume discharged since the beginning of outlet operations in 2005 was over 952,000 acre-feet, as of June 30, 2017. For a comparison, this is enough water to cover all of Barnes County, to a depth of one foot. In the 2017 operating season, it is likely that the outlets will exceed 1 million acre feet of cumulative discharge.

The outlets are operated according to specific limitations on downstream water quality and quantity. A network of stream gages and regular water quality monitoring enable staff to adaptively manage outlet operations with the goal of preventing damages in the Sheyenne and Red River basins, while discharging as much water as possible.

## 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 outlet operators are primarily responsible for: operating, maintaining, and monitoring all of the outlet works; weed control; planning, organizing, and directing collection of water quality samples; and maintaining records of water quality parameters.

## 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 Rural, and Industrial (MR&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 their 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 MR&I water supply needs.

### 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 MR&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 MR&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.

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 of the 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 2014, the Water Resources Reform and Development Act included legislation that prohibited the Corps from charging a fee for Surplus Water for a period of ten years. The WRRDA did not, however, resolve the fact that the Corps' efforts are fundamentally flawed.

Currently, the five remaining Surplus Water reports and the Reallocation Study are on hold. 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.

#### 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 prepared and released for public comment the 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 to species on the Missouri River protected under the Endangered Species Act, specifically the threatened piping plover and endangered least tern and pallid sturgeon.

The Preferred Alternative (PA), as identified in the MRRMP-EIS, 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 PA also includes a one-time flow test for the 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.

Comments were coordinated between the State Water Commission, NDGF, Health Department, North Dakota Department of Agriculture, and State Historical Society of North Dakota. The main point of the comments was that the state tentatively supports the PA under the following conditions:

- (1) Reconvene consultation with the North Dakota Interagency ESH Team on annual activities related to the Missouri River Recovery Program;
- (2) The final EIS and ROD state that any flow modifications outside the bounds of the current Missouri River Mainstem Reservoir System Master Water Control Manual (Master Manual) would require the preparation of an additional EIS, including consultation with affected states; and
- (3) The final EIS commits the Corps to obeying all applicable state laws, permit and regulatory requirements, and policies.

A ROD will most likely be issued in summer 2018. The State Water Commission will 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.

## 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, NDGF, 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 results of this study are due to be finalized during the 2017-2019 biennium.

### 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 will continue to monitor this site for further geomorphic change.

## RED RIVER

Relocating from West Fargo to Fargo in 2014, the Red River Office consists of one full-time position. During the 2015-2017 biennium, Red River Office personnel took part in various State Water Commission activities in eastern North Dakota.

Technical assistance was provided to the Red River Joint Water Resource District in pursuing flood control projects in the Red River watershed, including;

- Coordinated development of detention studies (using the HEC-HMS models) for the lower half of the Red River watershed in North Dakota;
- 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;
- Assistance with reconnaissance level studies of potential dams;



- Serves on the Flood Risk Management and Hydrology Work Group for the Corps/Red River Basin Commission Comprehensive Watershed Management Plan development;
- Technical assistance on various committees that were formed as a result of the Red River basin's flooding problems; and
- Assistance to individual water resource boards on several water-related issues.

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

- The International Red River Board;
- Member of the Pembina River Basin Task Team, organized by the Governor of North Dakota and Premiere of Manitoba to pursue a flood damage reduction project for the area near the border dike;
- Member of the Hydrology Committee for the International Red River Board;
- Inspections on several projects that the Water Commission had approved for cost-share;
- Attended various meetings concerning the proposed Fargo-Moorhead Diversion project;
- Acting as co-Interim Director, along with a Minnesota representative, for the Red River Retention Authority since April 2015;
- Working with the NRCS and local sponsors to pursue watershed protection studies that may ultimately provide construction of temporary floodwater storage in the Red River basin;
- Provided technical assistance for the border dike lawsuit located near the lower portion of the Pembina River; and
- Member of technical task team for the Oslo area hydraulic analysis study



## SOURIS (MOUSE) RIVER ISSUES

Flood risk reduction in the Souris River Basin is proceeding in several different initiatives. A parallel initiative is occurring between the Souris River Joint Board Mouse River Enhanced Flood Protection Plan (Mouse River Plan) and the Corps Feasibility Study to develop a flood risk reduction project for the City of Minot. Both are supported by the City of Minot receiving funds from the United States Department of Housing and Urban Development's (HUD) National Disaster Resiliency Competition. An initiative led by the IJC and International Souris River Board (ISRB) to complete the previously identified Plan of Study to evaluate operation of Rafferty, Alameda, Boundary, and Darling Reservoirs is also currently underway.

The Mouse River Plan has reached several project milestones this biennium, such as construction of flood works for the City of Minot's water treatment plant; design of major flood control phases within the City of Minot; and acquisition of 27 rural structures through the Rural Structure Acquisition, Relocation or Ring Dike (StARR) Program with 70 additional structures signing acquisition agreements. The Mouse River Plan is also nearing completion of the project's permitting process with an anticipated ROD on the EIS in the fall of 2017 and the Corps' Section 408 permit completion is anticipated to follow shortly afterward. Permit completion would allow construction of the designed phases within the City of Minot. The SRJB is anticipating completion of the permits and is preparing to bid for three major phases of the City of Minot's flood control project MI-1, MI-2, and MI-3 in mid-August, 2017. The City of Minot intends to acquire additional properties identified in the EIS, with funding from the HUD's National Disaster Resiliency Competition.



The SRJB entered into a Feasibility Cost-Share Agreement with the Corps in May 2016. The agreement is to identify a component of the Mouse River Plan that would have federal interest. In January 2017, the Alternatives Milestone was reached, identifying an array of alternatives that will be evaluated in further detail based on preliminary assessments of costs and benefits. The next milestone in the study is to identify a Tentatively Selected Plan, which would identify an alternative that meets criteria of having federal interest. Identification of a Tentatively Selected Plan would allow the SRJB to have Corps involvement in construction of the selected component, which would tie in to the overall project.

The IJC, at the request of the ISRB, created a task force to study the operating plan for the dams of the Souris River Flood Control Project, which includes works in Saskatchewan, thus making the task force an international affair. The task force produced a Plan of Study that was approved by the ISRB and the IJC and forwarded to the governments of the United States and Canada for approval. The IJC has issued its reference for the Plan of Study which allows the countries to begin reviewing and updating the operating plan to improve its flexibility. The IJC has set a three-year completion date for the Plan of Study. The State Water Commission entered into a Planning and Assistance to the States Agreement (Section 22) with the Corps, that allows the State Water Commission to provide technical assistance and review for updates to the reservoirs' operating plans.

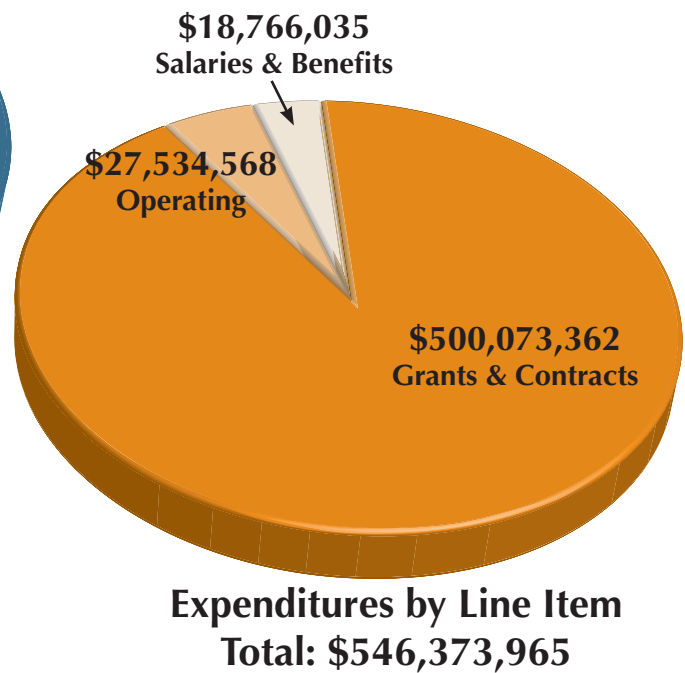
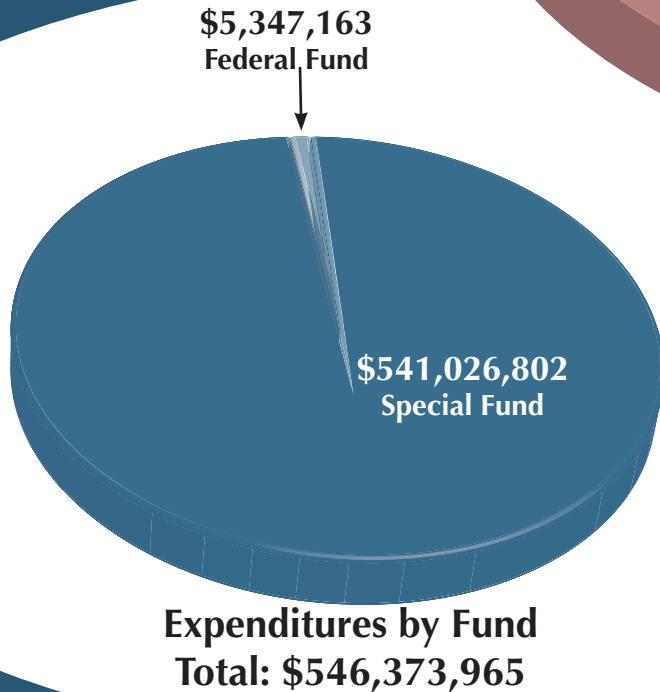
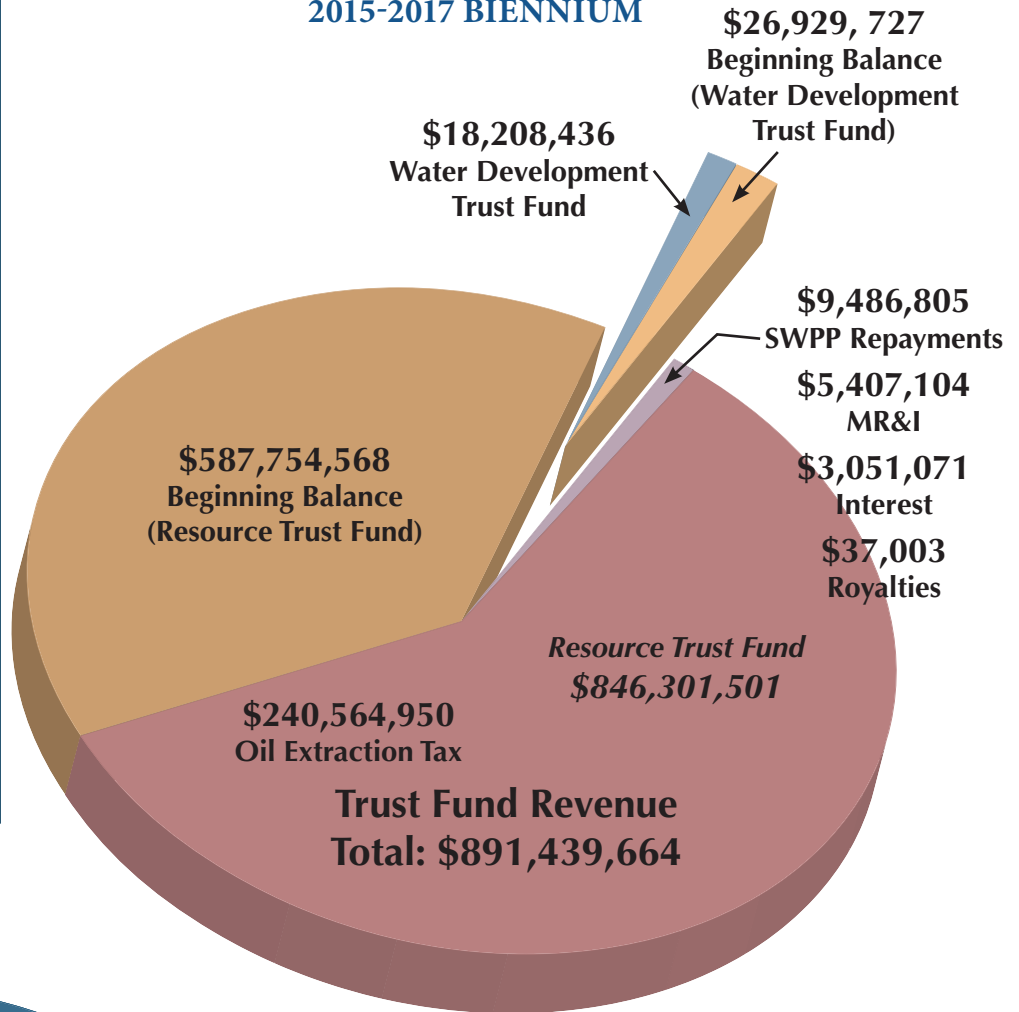


## FINANCIAL INFORMATION

The following pages contain financial information summarized in various formats. There are pie charts classifying the agency's expenditures by fund and by line item. There is a chart identifying expenditures by division and line item, and there is a detailed listing by object code.

The trust fund revenue pie chart on this page includes both the Resources Trust Fund and Water Development Trust Fund revenue. The remainder of the report addresses project and program obligations, completed projects, object expenditures, long-term debt, and resources available from the agency.

## STATE WATER COMMISSION APPROPRIATIONS 2015-2017 BIENNIUM



**STATE WATER COMMISSION  
PROGRAM BUDGET EXPENDITURES  
FOR BIENNIAL PERIOD ENDING JUNE 30, 2017**

AGENCY PROGRAM	SALARIES/ BENEFITS	OPERATING EXPENSES	GRANTS & CONTRACTS	PROGRAM TOTALS
<b>ADMINISTRATION</b>				
Allocated	\$2,729,489	\$2,806,129		\$5,535,618
Expended	\$2,680,580	\$2,038,095		\$4,718,675
Percent	98%	73%		85%
<b>ATMOSPHERIC RESOURCE</b>				
Allocated	\$1,107,158	\$743,382	\$4,885,212	\$6,735,752
Expended	\$1,044,626	\$459,120	\$1,659,258	\$3,163,004
Percent	94%	62%	34%	47%
<b>PLANNING AND EDUCATION</b>				
Allocated	\$1,472,573	\$352,990		\$1,825,563
Expended	\$1,460,852	\$224,538		\$1,685,390
Percent	99%	64%		92%
<b>REGULATORY</b>				
Allocated	\$2,828,565	\$2,947,500	\$15,000	\$5,791,065
Expended	\$2,352,848	\$1,536,552	\$0	\$3,889,401
Percent	83%	52%	0%	67%
<b>WATER APPROPRIATION</b>				
Allocated	\$5,762,691	\$1,185,300	\$1,372,844	\$8,320,835
Expended	\$5,528,119	\$899,011	\$1,108,231	\$7,535,362
Percent	96%	76%	81%	91%
<b>WATER DEVELOPMENT</b>				
Allocated	\$4,713,717	\$10,742,500	\$1,562,500	\$17,018,717
Expended	\$4,462,886	\$8,037,924	\$865,457	\$13,366,267
Percent	95%	75%	55%	79%
<b>NORTHWEST AREA WATER SUPPLY</b>				
Allocated	\$705,632	\$13,910,277	\$31,611,573	\$46,227,482
Expended	\$600,805	\$4,195,222	\$1,551,604	\$6,347,632
Percent	85%	30%	5%	14%
<b>SOUTHWEST PIPELINE</b>				
Allocated	\$512,995	\$10,461,744	\$97,502,498	\$108,477,237
Expended	\$635,318	\$10,144,105	\$58,576,773	\$69,356,195
Percent	124%	97%	60%	64%
<b>STATEWIDE WATER PROJECTS</b>				
Allocated			\$959,003,567	\$959,003,567
Expended			\$436,312,039	\$436,312,039
Percent			45%	45%
<b>PROGRAM TOTALS</b>				
Allocated	\$19,832,820	\$43,149,822	\$1,095,953,194	\$1,158,935,836
Expended	\$18,766,035	\$27,534,568	\$500,073,362	\$546,373,964
Percent	95%	64%	46%	47%

**STATE WATER COMMISSION  
PROJECTS/GRANTS/CONTRACT FUND - PROGRAM OBLIGATIONS  
JULY 1, 2015 - JUNE 30, 2017**

<b>SWC PROJ. NO.</b>	<b>NAME</b>	<b>INITIAL APPROVAL</b>	<b>AMOUNT APPROVED</b>	<b>PAYMENTS</b>	<b>BALANCE</b>
<b>FLOOD CONTROL</b>					
1928-01	Fargo Flood Control Project	6/23/09	\$99,506,200	\$79,505,069	\$20,001,131
1928-02	Interior Flood Control Project	12/11/15	\$30,000,000	\$30,000,000	\$0
1928-03	Interior Disaster Relief Fund	12/11/15	\$30,000,000	\$30,000,000	\$0
1928-05	Fargo Metro Flood Diversion Authority 2015-2017	7/6/16	\$69,000,000	\$10,625,044	\$58,374,956
1771-01	Grafton Flood Control Project	10/12/16	\$32,175,000	\$0	\$32,175,000
1771-02	Grafton Flood Risk Reduction Project	12/5/14	\$1,750,000	\$1,750,000	\$0
1974-06	Development of 2011 Flood Inundation Maps	12/18/15	\$5,600	\$4,078	\$1,522
1974-08	Mouse River Reconnaissance Study to Meet Fed Guidelines	2/15/13	\$0	\$0	\$0
1974-09	Mouse River Flood Control Design Engineering	8/8/16	\$7,317,512	\$7,220,816	\$96,696
1974-11	Funding of 214 agreement between SRJB & USACE	12/5/14	\$106,500	\$75,000	\$31,500
1974-14	StARR Program (Structure Acquisition, Relocation, or Ring Dike)	3/9/16	\$7,200,000	\$1,304,025	\$5,895,975
1974-15	Perkett Ditch Improvements	12/2/16	\$2,188,592	\$1,783,999	\$404,593
1974-16	Corps of Engineers Feasibility Study MREFPP	12/9/16	\$750,000	\$394,454	\$355,546
1974-18	Rural Reaches, Preliminary Engineering	10/12/16	\$260,000	\$23,059	\$236,941
1974-19	4th Avenue Tieback Levee & Burlington Levee - Design Engineering	10/12/16	\$3,900,000	\$1,607,669	\$2,292,331
1974-20	Utility Relocations	10/12/16	\$467,057	\$45,023	\$422,034
1974-21	Highway 83 Bypass & Bridge Replacement	10/12/16	\$1,983,623	\$0	\$1,983,623
1974-22	Broadway Pump Station	3/29/17	\$15,197,000	\$0	\$15,197,000
1974-23	Peterson Coulee Outlet	3/29/17	\$1,427,022	\$0	\$1,427,022
1974-24	Independent Peer Review Phases BU-1 & MI-5	3/29/17	\$171,909	\$0	\$171,909
1758	International Joint Commission Study Board	5/29/14	\$302,500	\$0	\$302,500
1993-01	Downtown Infrastructure Improvements	9/15/14	\$1,256,426	\$1,256,426	\$0
1344-01	Sheyenne River Valley Flood Control Project	12/5/15	\$156,993	\$156,993	\$0
1344-04	Sheyenne River Valley Flood Control Project PHII	8/29/16	\$1,147,500	\$1,089,086	\$58,414
1504-01	Permanent Flood Protection Project	12/5/14	\$9,850,444	\$9,372,999	\$477,445



**STATE WATER COMMISSION  
PROJECTS/GRANTS/CONTRACT FUND - PROGRAM OBLIGATIONS  
JULY 1, 2015 - JUNE 30, 2017**

<b>SWC PROJ. NO.</b>	<b>NAME</b>	<b>INITIAL APPROVAL</b>	<b>AMOUNT APPROVED</b>	<b>PAYMENTS</b>	<b>BALANCE</b>
1504-02	Permanent Flood Protection Project (LOAN)	12/5/14	\$3,000,000	\$0	\$3,000,000
1504-03	Permanent Flood Protection PH III	12/9/16	\$13,157,600	\$0	\$13,157,600
1344-02	Sheyenne River Valley Flood Control Project	8/8/16	\$2,281,610	\$1,281,028	\$1,000,582
1991-01	Permanent Flood Protection Project	5/29/14	\$561,702	\$414,733	\$146,969
1991-03	Permanent Flood Protection - Levee C Project	3/11/15	\$3,153,440	\$2,775,641	\$377,799
1991-06	Permanent Flood Protection - Levee E Project	3/9/16	\$2,098,000	\$2,013,875	\$84,125
1991-08	Permanent Flood Protection - Levee D Project	3/29/17	\$3,600,000	\$9,465	\$3,590,535
1991-10	Permanent Flood Protection - Levee F Project	6/22/17	\$3,800,000	\$0	\$3,800,000
1344-03	Sheyenne River Valley Flood Control Project	6/19/13	\$0	\$0	\$0
849	Renwick Dam Rehabilitation	6/26/14	\$7,117	\$7,117	\$0
1992-02	Missouri River Correctional Center	9/21/15	\$1,200,000	\$1,200,000	\$0
1992-03	Fox Island Flood Control Funding Update	9/21/15	\$2,800,000	\$2,800,000	\$0
2079	West Williston Flood Control	12/9/16	\$3,655,517	\$0	\$3,655,517
<b>FLOODWAY PROPERTY ACQUISITIONS</b>					
1993-05	Minot Phase 2 - Floodway Acquisitions	3/29/17	\$27,858,972	\$19,915,743	\$7,943,229
1523-05	Ward County Phase 1, 2 & 3 - Floodway Acquisitions	1/27/12	\$6,046,590	\$31,243	\$6,015,347
1504-05	Valley City Phase 1 - Floodway Acquisitions	8/29/16	\$4,017,403	\$1,868,206	\$2,149,197
1992-05	Burleigh Co. Phase 1 - Floodway Acquisitions	3/7/12	-\$114,552	-\$114,552	\$0
2000-05	Sawyer Phase 1 - Floodway Acquisitions	6/13/12	\$184,260	\$48,416	\$135,844
1991-05	Lisbon - Floodway Acquisition	12/9/16	\$626,250	\$22,950	\$603,300
1987-05	Mouse River Enhanced Flood Plan Property Acquisition	5/10/17	\$45,516	\$43,350	\$2,166
<b>WATER SUPPLY GRANTS</b>					
2373-35	Grand Forks - Traill County WRD	6/13/12	\$303,715	\$303,715	\$0
2373-36	Stutsman Rural Water System - Phase IIB, III	2/27/13	\$4,443,172	\$4,443,172	\$0
2373-38	Kidder Co & Carrington Area Expansion	7/23/13	\$1,287,861	\$1,287,861	\$0
2373-39	Carpio Berthold Phase 2	5/29/14	\$2,970,141	\$544,974	\$2,425,167

**STATE WATER COMMISSION  
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JULY 1, 2015 - JUNE 30, 2017**

<b>SWC PROJ. NO.</b>	<b>NAME</b>	<b>INITIAL APPROVAL</b>	<b>AMOUNT APPROVED</b>	<b>PAYMENTS</b>	<b>BALANCE</b>
2373-41	Granville-Deering Area	10/24/16	\$5,940,102	\$4,108,562	\$1,831,540
2050-01	South Mandan	3/17/14	\$168,606	\$168,606	\$0
2050-02	Improvements	3/11/15	\$4,369,058	\$4,330,519	\$38,539
2050-03	Langdon RWD - ABM Pipeline Phase 1	10/7/13	\$540,437	\$540,437	\$0
2050-04	Langdon RWD - North Valley Nekoma	3/11/15	\$859,341	\$859,341	\$0
2050-05	North Valley WD - ABM Pipeline Phase 1	3/11/15	\$240,672	\$240,672	\$0
2050-06	North Valley WD - 93 Street	3/11/15	\$937,870	\$937,870	\$0
2050-07	North Valley WD - Rural Expansion	5/29/14	\$1,657,591	\$1,657,591	\$0
2050-08	Ground Storage	10/7/13	\$169,977	\$169,977	\$0
2050-09	Water Tower	3/11/15	\$571,225	\$571,225	\$0
2050-10	Water Supply Improvements	10/7/13	\$1,117,800	\$1,117,800	\$0
2050-11	Phase 2 Plant Improvements	10/7/13	\$3,951,363	\$3,951,363	\$0
2050-13	New Raw Water Intake	10/7/13	\$1,567,676	\$52,004	\$1,515,672
2050-14	Water Treatment Plant Improvements	10/7/13	\$226,762	\$226,762	\$0
2050-15	New Raw Water Intake	10/7/13	\$2,334,250	\$52,323	\$2,281,927
2050-16	Improvements	10/7/13	\$845,000	\$845,000	\$0
2050-17	Improvements	3/11/15	\$6,894,412	\$5,797,778	\$1,096,634
2050-18	Water Treatment Plant Phase 3	10/7/13	\$3,381,148	\$2,564,805	\$816,343
2050-19	Water Treatment Plant Improvements	10/7/13	\$3,849,151	\$3,849,151	\$0
2050-20	Capital Infrastructure	10/6/15	\$9,516,065	\$7,722,558	\$1,793,507
2050-21	Capital Infrastructure	2/27/14	\$1,897,040	\$1,360,413	\$536,627
2050-22	Capital Infrastructure	2/27/14	\$2,281,794	\$2,281,794	\$0
2050-23	SW Nelson County Expansion	3/17/14	\$4,199,547	\$3,433,753	\$765,794
2050-24	System 1 Well Field Expansion	9/15/14	\$292,500	\$0	\$292,500
2050-25	Bottineau County Extension, Phase I	7/29/15	\$896,000	\$596,642	\$299,358
2050-26	Fargo Water System Regionalization Improvements	7/29/15	\$6,841,750	\$2,709,962	\$4,131,788
2050-27	Tioga Water Supply Improvement Project	7/29/15	\$2,190,000	\$2,058,391	\$131,609
2050-28	Water Systems Improvement Project	10/6/15	\$2,582,535	\$576,770	\$2,005,765
2050-29	Water Systems Improvement Project	10/6/15	\$3,634,000	\$155,353	\$3,478,647
2050-30	Water Systems Improvement Project	10/6/15	\$5,435,087	\$60,448	\$5,374,639
2050-31	Water Systems Improvement Project	10/6/15	\$3,426,210	\$2,339,608	\$1,086,602
2050-32	Water Systems Improvement Project	10/6/15	\$10,890,472	\$3,033,462	\$7,857,010

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<b>SWC PROJ. NO.</b>	<b>NAME</b>	<b>INITIAL APPROVAL</b>	<b>AMOUNT APPROVED</b>	<b>PAYMENTS</b>	<b>BALANCE</b>
2050-33	Phase V Storage & Pipeline Expansion Project	10/6/15	\$4,170,100	\$2,997,340	\$1,172,760
2050-34	Storage and Water Main	10/6/15	\$3,459,837	\$1,491,751	\$1,968,086
2050-35	System Wide Expansion Feasibility Study	10/6/15	\$11,826,000	\$1,415,855	\$10,410,145
2050-36	Water Systems Improvement Project	10/6/15	\$1,042,500	\$367,619	\$674,881
2050-37	Dickinson State Avenue South Water Main	12/11/15	\$965,000	\$1,080	\$963,920
2050-38	Reservoir C Expansion	12/11/15	\$901,500	\$810,659	\$90,841
2050-39	Crown Butte Service Area Expansion Phase II	12/11/15	\$308,000	\$146,094	\$161,906
2050-41	City of Devils Lake Water Supply Project	12/11/15	\$15,543,750	\$2,754,730	\$12,789,020
2050-42	Phase 1 & 2 System Expansion	12/11/15	\$2,093,350	\$453,597	\$1,639,753
2050-43	System 4 Connection to System 1	12/11/15	\$4,900,000	\$0	\$4,900,000
2050-44	Water Treatment Plant	3/9/16	\$2,640,000	\$1,000,187	\$1,639,813
2050-45	System Expansion Project	3/9/16	\$2,003,550	\$272,440	\$1,731,110
2050-49	Grand Forks Water Treatment Plant	10/12/16	\$30,000,000	\$9,354,480	\$20,645,520
<b>WATER SUPPLY</b>					
1984-02	Fargo Water Treatment Plant	3/17/14	\$22,768,775	\$22,768,775	\$0
1736-05	Southwest Pipeline Project	7/1/13	\$105,120,160	\$66,431,752	\$38,688,408
2374	Northwest Area Water Supply	7/1/13	\$15,754,482	\$3,246,020	\$12,508,462
1973-02	WAWSA- (GRANT)	10/6/15	\$12,061,806	\$11,906,202	\$155,603
1973-03	WAWSA - (LOAN)	10/6/15	\$10,139,578	\$10,139,578	\$0
1973-05	WAWSA- (GRANT)	10/6/15	\$60,000,000	\$51,111,177	\$8,888,823
325-102	Red River Valley Water Supply - Intake Design Study	5/29/14	\$162,328	\$32,845	\$129,483
325-104	Red River Valley Water Supply Project	7/29/15	\$12,359,000	\$12,359,000	\$0
2051-101	Black and Veatch investigation	1/27/15	\$70,800	\$69,804	\$997
<b>GENERAL WATER MANAGEMENT</b>					
2041	USGS Stream Gage Joint Funding Agreement	3/9/16	\$529,075	\$529,075	\$0
2041	USGS Stream Gage Joint Funding Agreement	10/12/16	\$544,110	\$408,083	\$136,028
1400	Document Conversion (Water Permit Scanning)	8/23/16	\$53,876	\$53,875	\$0
<b>DEVILS LAKE BASIN DEVELOPMENT</b>					
416-07	Devils Lake Outlet	7/1/13	\$870,802	\$0	\$870,802
416-10	Devils Lake Outlet Operations	3/9/16	\$18,534,210	\$8,506,237	\$10,027,973
416-15	DL East End Outlet	7/1/13	\$2,774,011	\$505,355	\$2,268,656



**STATE WATER COMMISSION  
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<b>SWC PROJ. NO.</b>	<b>NAME</b>	<b>INITIAL APPROVAL</b>	<b>AMOUNT APPROVED</b>	<b>PAYMENTS</b>	<b>BALANCE</b>
<b>REVOLVING LOAN FUND</b>					
2077-02	Permanent Flood Protection - Levee C (LOAN)	3/11/15	\$886,500	\$886,500	\$0
2077-03	Sheyenne River Flood Protection - Levee E (LOAN)	3/9/16	\$527,000	\$527,000	\$0
2077-09	Permanent Flood Protection - Levee D & F (LOAN)	7/6/16	\$243,200	\$243,200	\$0
2077-08	Grafton Flood Risk Reduction (LOAN)	10/12/16	\$3,375,000	\$3,375,000	\$0
2077-06	Permanent Flood Protection Project (LOAN)	12/28/16	\$860,614	\$860,614	\$0
2077	Valley City Flood Protection - Phase II Construction (LOAN)	12/9/16	\$3,289,400	\$0	\$3,289,400
2077	Valley City Pre Design & Eng & Phase III Buyouts (LOAN)	12/9/16	\$1,392,500	\$0	\$1,392,500
2077-01	WAWSA - (LOAN)	10/6/15	\$10,000,000	\$10,000,000	\$0
2077-04	Storage & Water Mains (LOAN)	12/11/15	\$239,475	\$239,475	\$0
2077-10	Water Treatment Plant (LOAN)	3/9/16	\$880,000	\$880,000	\$0
2077-05	City of Devils Lake Water Supply Project (LOAN)	3/9/16	\$1,686,920	\$1,686,920	\$0
2077-11	Phase 1, 2, & 3 System Expansion Project (LOAN)	3/9/16	\$250,490	\$250,490	\$0
2077	Rural Expansion (LOAN)	10/12/16	\$835,000	\$0	\$835,000
2077-13	Carpio Berhold Phase 2 (LOAN)	10/12/16	\$215,000	\$0	\$215,000
2077-12	Granville-Surrey-Deering Water Supply Project (LOAN)	10/12/16	\$139,000	\$0	\$139,000
2077-07	Phase 3 Expansion (LOAN)	10/12/16	\$721,000	\$721,000	\$0
<b>TOTAL PROJECTS/GRANTS/CONTRACT FUND - PROGRAM OBLIGATIONS</b>			<b>\$919,958,288</b>	<b>\$526,889,302</b>	<b>\$393,068,986</b>

**STATE WATER COMMISSION  
PROJECTS/GRANTS/CONTRACT FUND - PROJECT OBLIGATIONS  
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SWC PROJ. NO.	NAME	INITIAL APPROVAL	AMOUNT APPROVED	PAYMENTS	BALANCE
<b>GENERAL PROJECT OBLIGATIONS</b>					
274	Neché Levee Certification Project	3/21/16	\$54,000	\$0	\$54,000
322	ND Water: A Century of Challenge	2/22/10	\$36,800	\$0	\$36,800
346	Epping Dam Spillway Reconstruction	3/29/17	\$846,134	\$826,635	\$19,499
347	City of Velva's Flood Control Levee System Certification	3/28/11	\$102,000	\$69,503	\$32,497
390	Beaver Lake Dam Rehabilitation Feasibility Study	6/8/16	\$16,076	\$0	\$16,076
394	Odland Dam Rehabilitation Feasibility Study	10/13/16	\$13,220	\$0	\$13,220
399	Kathryn Dam Feasibility Study	9/19/14	\$21,250	\$8,508	\$12,742
420	Mirror Lake Dam Emergency Action Plan	12/2/16	\$24,400	\$0	\$24,400
460	Ueland Dam Rehabilitation Feasibility Study	5/20/16	\$17,500	\$0	\$17,500
477	Mill Dam Rehabilitation Feasibility Study	6/8/16	\$15,073	\$0	\$15,073
512	Nieuwsma Dam Emergency Action Plan	11/28/16	\$12,000	\$4,468	\$7,532
531	Bouret Dam Rehabilitation Feasibility Study	10/11/16	\$12,118	\$0	\$12,118
551	Buffalo Lodge Lake Outlet	6/22/17	\$134,915	\$0	\$134,915
561	Tioga Dam EAP	5/20/16	\$40,000	\$0	\$40,000
568	Sheyenne River Snagging & Clearing Reaches I	12/11/15	\$99,000	\$25,098	\$73,902
568	Sheyenne River Snagging & Clearing Reaches II	12/11/15	\$105,000	\$77,095	\$27,905
568	Sheyenne River Snagging & Clearing Reaches III	12/11/15	\$90,000	\$2,965	\$87,035
568	Sheyenne River Snagging & Clearing Reaches I,II,III	12/9/16	\$294,000	\$143,927	\$150,073
571	Oak Creek Snagging & Clearing Project	3/30/15	\$3,672	\$2,565	\$1,107
620	Mandan Flood Control Protective Works (Levee)	6/22/17	\$15,000	\$0	\$15,000
662	Park River Snagging & Clearing	2/17/17	\$55,385	\$3,950	\$51,435
710	Upper Swan Creek Channel Improvement Project	10/6/15	\$171,763	\$109,702	\$62,061
841	Garsteig Dam Repair Project	1/26/15	\$40,163	\$21,502	\$18,661
848	Tewaukon WS-T-1-A (Brummond-Lubke) Dam EAP	12/18/15	\$20,000	\$7,984	\$12,016
848	Tewaukon WS-T-7 (Nelson) Dam EAP	12/18/15	\$20,000	\$7,820	\$12,180
849	Renwick Dam Emergency Action Plan	9/29/15	\$63,680	\$61,468	\$2,212

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SWC PROJ. NO.	NAME	INITIAL APPROVAL	AMOUNT APPROVED	PAYMENTS	BALANCE
<b>GENERAL PROJECT OBLIGATIONS</b>					
980	Rush River Watershed Detention Study	1/7/16	\$154,000	\$26,303	\$127,697
980	Swan Creek Watershed Detention Study Phase II	3/11/15	\$154,000	\$31,334	\$122,666
980	Upper Maple River Watershed Detention Study	1/11/16	\$154,000	\$25,961	\$128,039
1056	Tacoma Bitz Legal Drain	7/6/16	\$312,105	\$101,533	\$210,572
1056	Stead Legal Drain	2/16/17	\$19,142	\$4,404	\$14,738
1064	Cass County Drain No. 2 Channel Improvements Project	3/11/15	\$106,989	\$65,306	\$41,683
1070	Drain #14 Channel Improvements	3/29/17	\$741,562	\$0	\$741,562
1071	Cass County Drain #15 Channel Improvements	3/9/16	\$296,562	\$14,001	\$282,561
1088	Cass Drain #37 Channel Improvements	3/9/16	\$230,326	\$15,169	\$215,157
1089	Cass County Drain #39 Channel Improvements	3/9/16	\$221,871	\$11,303	\$210,568
1180	Legal Drain No. 7 Channel Improvements	5/11/17	\$24,926	\$0	\$24,926
1101	Yorktown-Maple Drainage Improvement Dist. No. 3	12/11/15	\$798,562	\$0	\$798,562
1140	Drain 11 Outlet Extension Cost Overrun Project	7/7/15	\$5,088	\$0	\$5,088
1176	Legal Drain #2 Reconstruction/Extension Project	3/9/16	\$535,500	\$311,269	\$224,231
1179	Legal Drain #5 (Lateral 27) Reconstruction	3/9/16	\$531,000	\$350,647	\$180,353
1222	Drain No. 11 Channel Improvements	10/12/16	\$1,417,967	\$39,591	\$1,378,376
1227	Mergenthal Drain No. 5 Reconstruction	9/15/14	\$18,502	\$6,277	\$12,225
1231	Carson Drain No. 10 Channel Improvements	10/12/16	\$152,328	\$11,006	\$141,322
1236	Murray Drain No. 17 Channel Improvements	10/12/16	\$138,450	\$10,691	\$127,759
1264	Little Dam Repurposing Feasibility Study	6/17/15	\$16,100	\$3,715	\$12,385
1270	Wilton Pond Dredging Recreation Project	12/29/15	\$35,707	\$0	\$35,707
1273	James River Bank Stabilization	12/11/15	\$262,500	\$0	\$262,500
1287	Souris River Snagging & Clearing Project	2/3/15	\$15,000	\$4,500	\$10,500
1289	Control of Noxious Weeds on Sovereign Land	4/10/17	\$44,010	\$0	\$44,010
1296	Bathgate-Hamilton & Carlisle Watershed Study	10/17/13	\$45,226	\$38,500	\$6,726



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SWC PROJ. NO.	NAME	INITIAL APPROVAL	AMOUNT APPROVED	PAYMENTS	BALANCE
<b>GENERAL PROJECT OBLIGATIONS</b>					
1301	North Branch Antelope Creek NRCS Small Watershed	3/9/16	\$113,400	\$0	\$113,400
1303	Gwinner Dam Improvement Feasibility Study Program	4/17/15	\$42,844	\$22,663	\$20,181
1303	Gwinner Dam Breach Project	2/20/17	\$31,125	\$0	\$31,125
1303	Shortfoot Creek Watershed Planning Program	3/9/16	\$154,000	\$44,953	\$109,047
1311	Buxton Township Improvement District No. 68	3/9/16	\$512,090	\$401,672	\$110,418
1314	Hurdsfield Legal Drain	3/29/17	\$644,292	\$0	\$644,292
1328	Drain No. 23 Channel Improvement Preliminary Engineering	9/30/15	\$5,775	\$4,854	\$921
1328	Drain #23 Channel Improvements	3/9/16	\$137,181	\$55,569	\$81,612
1331	Drain #14 Reconstruction	12/9/16	\$315,000	\$62,262	\$252,738
1389	BND AgPace Program	12/13/13	\$180,316	\$9,951	\$170,365
1401	International Boundary Roadway Dike Pembina	12/11/15	\$786,032	\$491,504	\$294,528
1418	Big Coulee Dam EAP	5/10/17	\$11,320	\$0	\$11,320
1444	Flood Protection System Certification	4/19/16	\$75,000	\$73,343	\$1,657
1453	Karey Dam Rehabilitation Feasibility Study	5/23/16	\$13,550	\$6,697	\$6,853
1486	Thompson Bridge Outlet No. 4 Project	10/6/15	\$621,661	\$0	\$621,661
1520	Walsh County Drain 30-1	3/29/17	\$282,307	\$0	\$282,307
1520	Drain 87/McLeod Drain	3/29/17	\$5,238,586	\$0	\$5,238,586
1523	Robinwood Bank Stabilization Project	10/6/15	\$256,449	\$157,801	\$98,648
1625	Ordinary High Water Mark Delineations Left Bank of Missouri River	12/2/16	\$23,800	\$21,800	\$2,000
1638	Red River Basin Non-NRCS Rural/Farmstead Ring Dike Program	6/23/09	\$177,864	\$0	\$177,864
1667	Goose River Snagging & Clearing	6/21/17	\$47,500	\$0	\$47,500
1705	Red River Joint WRD Watershed Feasibility Study - Phase 2	9/21/11	\$60,000	\$40,782	\$19,218
1808	Beaver Creek Dam Safety Inspection	5/23/16	\$2,625	\$0	\$2,625
1851	Drought Disaster Livestock Water Supply Assistance	7/20/17	\$250,000	\$0	\$250,000
1891	Drain No. 8 Channel Improvement	7/6/16	\$411,773	\$409,174	\$2,599

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<b>GENERAL PROJECT OBLIGATIONS</b>					
1932	Michigan Spillway Rural Flood Assessment	3/9/16	\$1,214,256	\$1,188,406	\$25,850
1934	Elm River Snagging & Clearing	6/21/17	\$47,500	\$0	\$47,500
1951	Lynchburg Channel Improvements	7/6/16	\$1,131,338	\$0	\$1,131,338
1951	Lynchburg Channel Improvements	7/6/16	\$63,788	\$40,376	\$23,412
1968	McClusky Canal Mile Marker 10 & 49 Irrigation Project	3/17/14	\$256,321	\$204,707	\$51,614
1968	MM 15 Irrigation Project	3/29/17	\$321,781	\$0	\$321,781
1974	Regulated Streamflow Frequency for the Upper Souris River Basin	12/16/16	\$37,100	\$24,733	\$12,367
1974	Installation of 5 Rapid Deployment Gages in the Mouse River	3/23/17	\$23,200	\$0	\$23,200
1975	Drain 31-1	10/12/16	\$111,543	\$0	\$111,543
1977	Jackson Township Improvement Dist. #1	5/20/15	\$1,601,325	\$1,153,672	\$447,653
1978	RS Legal Dam #1 - Pre-Construction Engineering	10/24/16	\$13,680	\$0	\$13,680
1978	RS Legal Drain #1 Extension & Channel Improvements Phase II	3/29/17	\$378,000	\$0	\$378,000
1990	Lake Shore Estates High Flow Diverstion Project	3/7/12	\$43,821	\$0	\$43,821
1991	Sheyenne Riverbank Stabilization Project	9/15/14	\$163,720	\$115,952	\$47,768
2008	Recertification of Flood Control Levee System Project	3/17/14	\$101,100	\$0	\$101,100
2016	Establishment of Pembina County Drain No. 80	4/10/17	\$74,965	\$0	\$74,965
2042	Haas Coulee Legal Drain Phase II	6/22/17	\$86,361	\$0	\$86,361
2049	Grand Forks Legal Drain No. 58	3/29/17	\$1,481,850	\$0	\$1,481,850
2050-50	Eastern Expansion & TRWD Interconnect Fesibility & Design	11/15/16	\$75,000	\$0	\$75,000
2055	Lower Red Basin Regional Detention Study	7/17/15	\$45,500	\$0	\$45,500
2058	Grafton Debris Removal Plan	4/10/17	\$8,177	\$0	\$8,177
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
2062	Trail Co. Drain #64	7/6/16	\$116,558	\$97,009	\$19,549
2065	Lake Bertha Flood Control Project No. 75	3/9/16	\$201,350	\$0	\$201,350

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SWC PROJ. NO.	NAME	INITIAL APPROVAL	AMOUNT APPROVED	PAYMENTS	BALANCE
<b>GENERAL PROJECT OBLIGATIONS</b>					
2066	Sheyenne-Maple Flood Control Dist #1 Mitigation Improvements	3/9/16	\$198,023	\$28,822	\$169,201
2068	Stavanger-Belmont Drain No. 52 Channel Improvement	10/12/16	\$435,015	\$20,363	\$414,652
2069	Wild Rice River Bank Stabilization	4/19/16	\$43,036	\$42,082	\$954
2070	Mile Marker 42 Irrigation Project	5/20/16	\$29,741	\$0	\$29,741
2071	Alkali Lake High Water Feasibility Study	4/19/16	\$5,250	\$420	\$4,830
2072	Ten Mile Lake Flood Risk Reduction Project	6/8/16	\$37,800	\$988	\$36,812
2073	Oslo Area Ag Levee Feasibility Study	7/6/16	\$187,000	\$115,299	\$71,701
2074	Flood Control - Levee Certification	7/6/16	\$247,500	\$0	\$247,500
2074	Toe Drain & Encroachment Project	7/6/16	\$1,125,482	\$0	\$1,125,482
2074	Breakout Easements	7/6/16	\$265,000	\$0	\$265,000
2075	Second Larson Coulee Detention Pond	7/6/16	\$602,307	\$0	\$602,307
2076	Elm River Dam #1 Modification Study	7/6/16	\$9,503	\$0	\$9,503
2079	West Williston Flood Control	10/24/16	\$39,900	\$0	\$39,900
2080	Sam Berg Coulee Drain	10/12/16	\$401,005	\$218,230	\$182,775
2081	Drain #70	10/12/16	\$898,866	\$336,437	\$562,429
2083	Herzog Dam Gate & Catwalk Retrofit - Construction	10/12/16	\$117,000	\$2,368	\$114,632
2085	Orange Dam Rehabilitation Feasibility Study	10/13/16	\$10,770	\$0	\$10,770
2088	Drain No. 79	12/9/16	\$875,428	\$0	\$875,428
2089	Tower Township Improvement District No. 77 Study	12/19/16	\$28,175	\$0	\$28,175
2090	River Watch Program	1/12/17	\$24,150	\$0	\$24,150
2094	Lower Buffalo Creek Flood Management Feasibility	6/7/17	\$7,539	\$0	\$7,539
2095	Sheyenne River Snagging & Clearing	4/10/17	\$19,700	\$0	\$19,700
2096	Sheyenne-Maple Flood Control Dist #2 Improvements	3/29/17	\$1,035,358	\$0	\$1,035,358
2104	Levee Repair & Bank Stabilization Project	6/22/17	\$950,254	\$0	\$950,254
2108	Walsh Co Drain #22	6/22/17	\$266,086	\$0	\$266,086
2110	Meadowbrook Snagging & Clearing	6/21/17	\$33,000	\$0	\$33,000
2093/1427	Moen Legal Drain	9/6/16	\$63,458	\$44,916	\$18,542
1396-01	Missouri River Recovery Program	11/17/15	\$75,000	\$28,215	\$46,785



**STATE WATER COMMISSION  
PROJECTS/GRANTS/CONTRACT FUND - PROJECT OBLIGATIONS  
JULY 1, 2015 - JUNE 30, 2017**

<b>SWC PROJ. NO.</b>	<b>NAME</b>	<b>INITIAL APPROVAL</b>	<b>AMOUNT APPROVED</b>	<b>PAYMENTS</b>	<b>BALANCE</b>
<b>GENERAL PROJECT OBLIGATIONS</b>					
1878-02	Upper Maple River Dam EAP	5/20/16	\$12,800	\$0	\$12,800
849-01	Tongue River NRCS Watershed Plan	3/9/16	\$104,703	\$0	\$104,703
AOC/ WRD	ND Water Manager's Handbook	6/21/17	\$24,750	\$0	\$24,750
PS/ WRD/ ELM	Dam #3 Safety Improvements Project	9/15/14	\$7,297	\$1,625	\$5,672
PS/ WRD/ LOW	Lower Heart Flood Contral	5/10/17	\$21,140	\$0	\$21,140
<b>TOTAL PROJECTS/GRANTS/CONTRACT FUND - PROJECT OBLIGATIONS</b>			<b>\$35,184,544</b>	<b>\$7,912,345</b>	<b>\$27,272,198</b>

**STATE WATER COMMISSION  
PROJECTS/GRANTS/CONTRACT FUND - COMPLETED PROJECTS  
JULY 1, 2015 - JUNE 30, 2017**

SWC PROJ. NO.	NAME	INITIAL APPROVAL	AMOUNT APPROVED	PAYMENTS	BALANCE
<b>COMPLETED GENERAL PROJECTS</b>					
228	(USGS) O & M of Gaging Station on the Missouri River Below Mandan	12/8/14	\$8,970	\$8,970	\$0
240	Warwick Dam Repair Project	12/7/12	\$110,150	\$110,150	\$0
274	FEMA Levee Certification Feasibility Study	10/17/14	\$37,500	\$37,500	\$0
281	Three Affiliated Tribes/Fort Berthold Irrigation Study	10/26/10	\$37,500	\$0	\$37,500
346	Epping Dam Evaluation Project	2/27/13	\$66,200	\$60,840	\$5,360
346	Design Engineering for Epping Dam Safety Repair	7/6/16	\$24,658	\$24,658	\$0
391	Sargent Co. WRD, Silver Lake Dam Emergency Repairs	10/12/11	\$2,800	\$0	\$2,800
568	Sheyenne River Snagging & Clearing Project	4/17/15	\$49,500	\$49,500	\$0
568	Sheyenne River Reaches Snagging & Clearing Project	12/5/14	\$94,238	\$0	\$94,238
568	Sheyenne River Snagging & Clearing Reach 1 Proj 2	5/9/17	\$74,000	\$74,000	\$0
645	Hickson Dam Recreation Retrofit Project	10/26/10	\$44,280	\$44,280	\$0
646	Christine Dam Recreation Retrofit Project	10/26/10	\$184,950	\$139,034	\$45,916
662	Park River Snagging & Clearing	5/10/17	\$50,228	\$50,228	\$0
829	Rush River WRD Berlin's Township Improvement District No. 70	10/19/11	\$101,317	\$0	\$101,317
841	Swan Buffalo Detention Dam #12(Absaraka Dam)	11/15/16	\$127,164	\$121,561	\$5,603
841	Swan Buffalo Detention Dam #5(Garsteig Dam)	11/17/16	\$156,426	\$154,672	\$1,754
849	Renwick Dam Gate Repair	9/4/15	\$53,700	\$50,066	\$3,634
980	Maple River Watershed Flood Water Retention Study/ Maple River WRD	2/19/15	\$3,687	\$3,687	\$0
1069	Drain #13 Channel Improvements Project	9/29/15	\$46,150	\$12,293	\$33,857
1082	Cass Co. Drain No. 30 Channel Improvement Project	3/17/14	\$5,976	\$5,970	\$6
1101	Riverdale Township Improvement District #2	9/21/11	\$500,000	\$0	\$500,000
1135	Drain #4 Reconstruction Project	6/19/13	\$2,673	\$0	\$2,673
1161	Drain 55 Improvement Reconstruction	3/28/11	\$13,846	\$0	\$13,846
1174	Legal Drain #31 Improvements Project	3/9/16	\$161,852	\$59,374	\$102,478
1179	Drain #5 (27) Reconstruction Project	3/30/15	\$13,543	\$13,543	\$0
1183	Drain No. 15 Reconstruction Project	9/15/14	\$60,300	\$49,055	\$11,245
1217	Tri-County Drain Reconstruction Project	3/11/15	\$911,881	\$590,679	\$321,202
1219	Drain No. 8 Channel Improvement Preliminary Engineering Project	5/7/15	\$6,650	\$6,650	\$0
1219	City of Forman Floodwater Outlet	12/13/16	\$47,012	\$47,012	\$0
1224	Palace Drain Improvement District No. 80	5/20/15	\$149,828	\$130,947	\$18,881
1242	Rust Drain No. 24 Project	12/13/13	\$25,152	\$3,002	\$22,150

**STATE WATER COMMISSION  
PROJECTS/GRANTS/CONTRACT FUND - COMPLETED PROJECTS  
JULY 1, 2015 - JUNE 30, 2017**

SWC PROJ. NO.	NAME	INITIAL APPROVAL	AMOUNT APPROVED	PAYMENTS	BALANCE
<b>COMPLETED GENERAL PROJECTS</b>					
1270	Apple Creek Industrial Park Levee Feasibility Study	10/7/13	\$65,180	\$0	\$65,180
1289	Control of Noxious Weeds on Sovereign Lands	9/30/15	\$12,514	\$12,514	\$0
1290	Painted Woods Lake Flood Mitigation Study	4/1/16	\$53,200	\$53,200	\$0
1294	Stump Lake Park Bank Stabilization Project	3/11/15	\$115,436	\$79,294	\$36,142
1301	City of Lidgerwood Engineering & Feasibility Study for Flood Control	2/4/11	\$15,850	\$0	\$15,850
1301	City of Wahpeton Water Reuse Feasibility Study/ Richland Co.	9/8/11	\$2,500	\$0	\$2,500
1303	Upper Wild Rice Watershed Study	6/24/15	\$73,500	\$73,485	\$15
1311	Buxton Township Improvement District No. 68	6/17/15	\$15,745	\$15,745	\$0
1312	Skyrud Dam 2011 EAP	12/15/11	\$10,000	\$8,073	\$1,927
1312	Union Dam 2011 EAP	12/15/11	\$10,000	\$8,350	\$1,650
1314	Oak Creek Drain Lateral E Reconstruction Project	9/15/14	\$73,057	\$73,057	\$0
1314	Oak Creek Lateral E Reconstruction	12/29/15	\$20,173	\$20,173	\$0
1314	Hurdsfield Area Drain Preliminary Engineering Project	6/11/15	\$35,000	\$35,000	\$0
1396	(USGS) Missouri River Geomorphic Assessment	3/7/12	\$10,000	\$10,000	\$0
1403	(NDWRRRI) Student Fellowship Program	12/23/15	\$18,850	\$18,850	\$0
1403	(NDWRRRI) Student Fellowship Program	1/18/17	\$18,850	\$18,850	\$0
1418	Design & Repair of Big Coulee Dam	4/10/17	\$1,090,983	\$1,079,002	\$11,981
1418	Big Coulee Dam Feasibility Study	5/29/14	\$10,963	\$0	\$10,963
1438	Mulberry Creek Phase IV Reconstruction Project	6/19/13	\$102,019	\$2,250	\$99,769
1444	2014 Flood Protection System Modification Project	5/29/14	\$61,331	\$61,331	\$0
1520	Walsh Co Drain #30-1	8/29/16	\$14,000	\$14,000	\$0
1523	Flood Control County Road 18	5/29/15	\$325,208	\$325,208	\$0
1554	City of Underwood Floodwater Outlet Project	12/13/13	\$1,483,268	\$1,483,268	\$0
1577	Floodplain Mapping Project	5/29/14	\$55,000	\$55,000	\$0
1607	Flood Inundation Mapping of Areas Along Souris & Des Lacs River	6/15/11	\$13,011	\$0	\$13,011
1613	Cass Co. Drain No. 55 Channel Improvements Project	9/15/14	\$99,923	\$48,703	\$51,220
1625	(OHWM) Ordinary High Water Mark Delineations	8/20/14	\$4,560	\$0	\$4,560
1625	Gather infor regarding pipeline waterway crossings	2/9/16	\$25,000	\$8,745	\$16,255
1625	Dakota Access PipeLine Missouri River crossing sour analysis	2/9/16	\$25,000	\$21,315	\$3,685
1625	Sovereign Lands Recreation Use Grant	1/10/17	\$1,000,000	\$1,000,000	\$0



**STATE WATER COMMISSION  
PROJECTS/GRANTS/CONTRACT FUND - COMPLETED PROJECTS  
JULY 1, 2015 - JUNE 30, 2017**

SWC PROJ. NO.	NAME	INITIAL APPROVAL	AMOUNT APPROVED	PAYMENTS	BALANCE
<b>COMPLETED GENERAL PROJECTS</b>					
1640	(USGS) Maintenance of gaging station on Missouri River below Mandan, ND	9/25/13	\$8,710	\$0	\$8,710
1650	Drain #7 Channel Improvements Study	1/17/16	\$6,214	\$6,214	\$0
1650	Drain #7 Improvement	7/6/16	\$202,663	\$202,663	\$0
1667	Goose River Snagging & Clearing	12/18/15	\$47,500	\$47,500	\$0
1667	Goose River Snagging & Clearing	9/2/16	\$47,500	\$47,501	-\$1
1701	Red River of the North Unsteady Flow Model	11/25/15	\$17,825	\$17,825	\$0
1705	Red River Basin Distributed Plan Study	12/7/12	\$560,000	\$451,823	\$108,177
1758	(USGS) Stochastic Model for the Mouse River Basin	12/13/13	\$40,000	\$40,000	\$0
1792	SE Cass Wild Rice River Dam Study Phase II	1/29/15	\$32,252	\$32,252	\$0
1814	Wild Rice River Snagging & Clearing - Bridge #121-2	5/28/15	\$16,000	\$16,000	\$0
1815	Sheyenne River Snagging & Clearing - Fort Ransom Reach	6/11/15	\$6,350	\$6,350	\$0
1842	Wild Rice River Snagging & Clearing - Bridge Location Sites	2/3/15	\$11,063	\$0	\$11,063
1842	Wild Rice River Snagging & Clearing	7/6/16	\$24,948	\$24,948	\$0
1842	Wild Rice River Snagging & Clearing	10/27/15	\$57,000	\$37,334	\$19,666
1842	Wild Rice River Snagging & Clearing	12/13/16	\$57,000	\$50,143	\$6,857
1859	NPS Pollution Project	7/29/15	\$200,000	\$200,000	\$0
1891	Drain No. 8 Channel Improvement Preliminary Engineering Project	9/29/15	\$17,500	\$17,500	\$0
1921	Square Butte Dam No. 6/(Harmon Lake) Recreation Facility	3/23/09	\$231,002	\$65,583	\$165,419
1934	Elm River Snagging & Clearing	9/2/16	\$47,500	\$47,500	\$0
1946	Improvement of Walsh Co Drain #22 Preliminary Engineering	4/19/16	\$10,500	\$10,499	\$1
1960	Puppy Dog Coulee Flood Control Diversion Ditch Construction	8/18/09	\$796,976	\$0	\$796,976
1963	Beaver Bay Embankment Feasibility Study	8/10/09	\$18,078	\$0	\$18,078
1967	Grand Forks Co. Legal Drain No. 55 2010 Construction	11/30/10	\$9,652	\$9,652	\$0
1970	Walsh Co. Construction of Legal Assessment Drain # 72	3/28/11	\$39,115	\$39,115	\$0
1974	USGS Web-Based Mouse River Information Page	1/19/16	\$24,700	\$24,700	\$0
1975	Walsh Co. Drain No. 31 Reconstruction Project	9/21/11	\$37,742	\$37,742	\$0
1978	Richland & Sargent WRD RS Legal Drain No. 1 Extension & Channel Improvement	7/23/15	\$245,250	\$168,791	\$76,459

**STATE WATER COMMISSION  
PROJECTS/GRANTS/CONTRACT FUND - COMPLETED PROJECTS  
JULY 1, 2015 - JUNE 30, 2017**

<b>SWC PROJ. NO.</b>	<b>NAME</b>	<b>INITIAL APPROVAL</b>	<b>AMOUNT APPROVED</b>	<b>PAYMENTS</b>	<b>BALANCE</b>
<b>COMPLETED GENERAL PROJECTS</b>					
1983	City of Harwood Engineering Feasibility Study	12/9/11	\$62,500	\$0	\$62,500
1989	Hobart Lake Outlet Project	3/7/12	\$266,100	\$0	\$266,100
1991	Sheyenne River Snagging & Clearing Project	2/12/13	\$5,000	\$5,000	\$0
1992	Burnt Creek Flood Restoration Project	7/29/15	\$179,890	\$176,524	\$3,366
1998	Upper Turtle River Dam #1 2012 EAP	6/28/12	\$10,000	\$9,365	\$635
2002	Trutle River Dam #4 2012 EAP	6/29/12	\$10,000	\$8,656	\$1,344
2004	Drain No. 57 Project	10/7/13	\$413,576	\$413,576	\$0
2005	Turtle River Dam #8 2012 EAP	6/29/12	\$10,000	\$9,069	\$931
2007	Pontiac Township Improvement District No. 73 Project	5/11/15	\$747,093	\$594,183	\$152,910
2013	Wild Rice River Watershed Retention Plan	6/8/15	\$45,905	\$45,905	\$0
2019	Sheyenne River Snagging & Clearing Project	12/7/12	\$75,000	\$0	\$75,000
2022	Drain #73 Project	6/19/13	\$350,400	\$120,044	\$230,356
2040	Drain #74 Project	10/7/13	\$211,600	\$211,600	\$0
2042	Haas Coulee Drain Project	9/15/14	\$500,000	\$500,000	\$0
2043	District's Drain 78 Outlet Extension Project	12/9/16	\$390,041	\$372,671	\$17,370
2045	Stark County LiDAR Collection Project (FEMA)	7/17/15	\$33,584	\$33,584	\$0
2045	LiDAR Collection Project	9/15/14	\$262,308	\$262,308	\$0
2045	LiDAR Collection Project	5/29/14	\$10,425	\$0	\$10,425
2046	North Branch Park River Comprehensive Flood Damage Reduction Feasibility Study	12/13/13	\$134,400	\$108,772	\$25,628
2047	LaMoure Co Memorial Park Streambank Restoration	8/3/16	\$91,042	\$64,240	\$26,802
2048	Marion Flood Mitigation & Lagoon Drainage Project	5/29/14	\$116,659	\$116,599	\$60
2063	Swan Buffalo Detention Dam #8 (Embden Dam)	11/17/16	\$123,087	\$120,803	\$2,284
2068	Stavanger-Belmont Drain No. 52 Channel - Study	4/20/16	\$18,589	\$18,589	\$0
2078	Raymond-Mapleton Township Improv Dist No. 76	11/15/16	\$20,281	\$20,281	\$0
1878-02	Upper Maple River Dam Construction Phase	12/13/13	\$4,702,936	\$4,415,496	\$287,440
1928-04	Fargo Moorhead Diversion Agricultural Impact (Study)	1/20/16	\$80,000	\$79,716	\$284
1986-03	USDA Wildlife	9/9/15	\$250,000	\$250,000	\$0
2003-02	Recertification of the West Fargo Diversion Levee System	7/23/15	\$52,564	\$32,813	\$19,751
2009-02	Recertification of the Horace to West Fargo Diversion Levee System	9/17/12	\$25,504	\$25,504	\$0

**STATE WATER COMMISSION  
PROJECTS/GRANTS/CONTRACT FUND - COMPLETED PROJECTS  
JULY 1, 2015 - JUNE 30, 2017**

SWC PROJ. NO.	NAME	INITIAL APPROVAL	AMOUNT APPROVED	PAYMENTS	BALANCE
<b>COMPLETED GENERAL PROJECTS</b>					
AOC/ASS	Assiniboine River Basin Initiative Funding	7/29/15	\$100,000	\$100,000	\$0
AOC/IRA	ND Irrigation Association	10/6/15	\$100,000	\$100,000	\$0
AOC/RRBC	Red River Basin Commission Contractor	5/20/15	\$200,000	\$200,000	\$0
AOC/WEF	ND Water Magazine	5/20/15	\$36,000	\$33,500	\$2,500
AOC/WEF/TOURS	2017 Summer Water Tours Sponsorship	4/5/17	\$2,500	\$2,500	\$0
AOC/WUA	Dave Koland Term as WUA President	3/23/15	\$9,672	\$5,772	\$3,899
ASNDS	Oaks Irrigation Research Site - New Linear Irrigation System	11/18/15	\$25,636	\$25,636	\$0
CON/CAR	Will and Carlson Consulting Services	1/12/16	\$17,500	\$10,795	\$6,705
CON/WIL/CARLSON	Will and Carlson Consulting Contract	12/13/13	\$26,451	\$1,828	\$24,623
NDAWN	NDAWN CENTER	2/11/16	\$1,500	\$1,500	\$0
NDAWN	NDAWN CENTER	1/31/17	\$1,500	\$1,500	\$0
PS/WRD/DEV	DL Manager	5/20/15	\$60,000	\$60,000	\$0
PS/WRD/MRJ	Missouri River Coordinator	10/7/13	\$37,094	\$14,327	\$22,767
PS/WRD/MRJ	Missouri River Joint Water Board (MRRIC) T. FLECK	5/20/15	\$45,000	\$38,999	\$6,001
PS/WRD/MRJ	Missouri River Joint Water Board, (MRJWB) Start up	5/20/15	\$20,000	\$10,260	\$9,740
PS/WRD/UPP	Upper Sheyenne River WRB Administration (USRJWRB)	5/20/15	\$12,000	\$5,315	\$6,685
PSIR-RBUF	Upgrade to 3-Phase Power	4/19/16	\$32,770	\$32,770	\$0



**STATE WATER COMMISSION  
PROJECTS/GRANTS/CONTRACT FUND - COMPLETED PROJECTS  
JULY 1, 2015 - JUNE 30, 2017**

<b>SWC PROJ. NO.</b>	<b>NAME</b>	<b>INITIAL APPROVAL</b>	<b>AMOUNT APPROVED</b>	<b>PAYMENTS</b>	<b>BALANCE</b>
<b>COMPLETED GENERAL PROJECTS</b>					
PS- WRD- BUR	Pebble Creek Golf Course - Hay Creek Bank Stabilization	10/15/15	\$22,782	\$22,782	\$0
PS- WRD- CAS	Red River Watershed Comprehensive Detention Plan Updates	11/19/15	\$34,025	\$34,025	\$0
<b>TOTAL PROJECTS/GRANTS/CONTRACT FUND - COMPLETED PROJECTS</b>			<b>\$20,828,206</b>	<b>\$16,691,526</b>	<b>\$4,136,679</b>

**STATE WATER COMMISSION  
OBJECT EXPENDITURES  
FOR BIENNIAL PERIOD ENDING JUNE 30, 2017**

Permanent Salaries	\$12,916,741.41
Temporary Salaries	\$456,064.69
Overtime Salaries	\$248,493.03
Fringe Benefits	\$5,144,735.41
Travel	\$976,770.82
Supplies - IT Software	\$147,215.90
Supplies/Materials - Professional	\$296,469.23
Food & Clothing	\$5,058.08
Building, Grounds, Vehicle Supply	\$155,073.03
Misc. Supplies	\$47,787.86
Office Supplies	\$23,963.29
Postage	\$30,310.50
Printing	\$25,461.67
IT Equipment Under \$5,000	\$300,960.83
Other Equipment Under \$5,000	\$55,984.28
Office Equipment & Furniture Under \$5,000	\$29,534.59
Utilities	\$8,140,640.92
Insurance	\$29,703.25
Rentals/Leases - Equipment & Other	\$28,427.31
Rentals/Leases - Building & Land	\$398,594.51
Repairs	\$1,403,004.00
IT - Data Processing	\$285,696.90
IT - Communications	\$152,212.21
IT - Contractual Servicees	\$1,424.35
Professional Development	\$177,232.58
Operating Fees & Services	\$8,281,804.91
Professional Fees & Services	\$14,648,546.29
Land & Buildings	\$624,560.69
Other Capital Payments	\$59,634,178.36
Extra Repairs/Deferred Maintenance	\$16,043.00
Equipment Over \$5,000	\$489,849.23
IT Equipment/Software Over \$5,000	\$59,690.55
Grants, Benefits, & Claims	\$419,757,701.48
Transfers Out	\$11,384,029.42
<b>TOTAL</b>	<b>\$546,373,964.58</b>



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

**Additional information about the State Water Commission is available on our website at <http://www.swc.nd.gov>**







