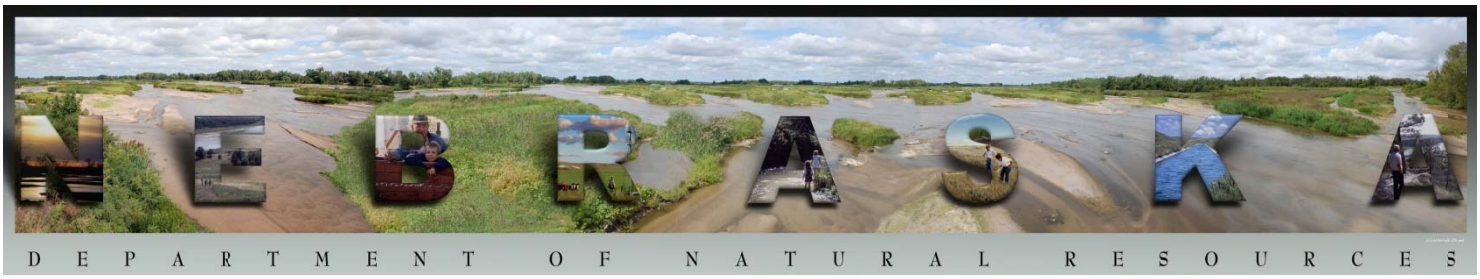


# Annual Report and Plan of Work for the Nebraska Water Planning and Review Process

Submitted to the Governor and Legislature
by the
Director of the Nebraska Department of Natural Resources

September 2016

Nebraska
Department of Natural Resources

# I. INTRODUCTION

**Authority**

The Nebraska Water Planning and Review Process was initiated in 1978 to redirect and accelerate Nebraska's water planning efforts. This is a report of the Director of the Department of Natural Resources and is submitted in compliance with *Neb. Rev. Stat.* §§ 2-1599 and 2-15,106.

*Nebraska Revised Statute* § 2-1599 provides that:

*In order to provide for the effective conservation and management of Nebraska's water resources, the legislature hereby endorses the concept of a state water planning and review process. The purpose of this planning process shall be to coordinate and direct the planning efforts of the state agencies and university divisions with the responsibilities and interest in the water resources field. This interagency planning process shall be designed to: (1) Provide the Legislature and citizens of Nebraska with information and alternative methods of addressing important water policy issues and area-wide or statewide water resources problems; (2) provide coordinated interagency reviews of proposed local, state, and federal water resources programs and projects; (3) develop and maintain the data, information, and analysis capabilities necessary to provide state agencies and other water interests with a support base for water planning and management activities; (4) provide the state with the capacity to plan and design water resources projects; and (5) conduct any other planning activities necessary to protect and promote the interests of the state and its citizens in the water resources of Nebraska.*

The Department of Natural Resources (Department) utilizes several of its program areas to implement *Neb. Rev. Stat.* § 2-1599. Implementation focuses on the following objectives:

1. Maintain data, information, and analysis capabilities for water planning, including specific programs for collecting, maintaining, and distributing information on stream flows, as well as analyzing water uses and water supplies across the state;
2. Provide staff and resources to support planning and implementation of water resources projects;
3. Support locally developed water management plans for managing hydrologically connected water supplies;
4. Provide resources to map and identifying areas vulnerable to flood damage; and
5. Provide coordination of federal agencies, state agencies, local natural resources districts (NRDs), and other water interests for the development of water resources programs and projects.

**Purpose**

The purpose of the Department's Annual Report and Plan of Work document is to fulfill the Department's obligations under *Neb. Rev. Stat.* §§ 2-1599 and 2-15,106. This document provides information on several key areas of Department water planning activities, including current and future activities regarding information, data, and analysis capabilities, as well as water resources planning and management. The *summary of previous work completed* component of this report details Department activities that aided in achieving those goals over the previous year. The *future activities* component of this report details how various Department programs work towards achieving the Department's goals of implementing its authorities and related statutes; acquiring, summarizing, and disseminating water related data; increasing interagency collaboration; and utilizing planning to recognize water management opportunities.

This document contains only activities pertaining to the Department's authorities and does not include independent activities or authorities of other local, state, or federal agencies. The Department's authorities do not include water quality, groundwater management, or management of public drinking water supplies; these authorities lie with other local or state agencies. The Department does coordinate with agencies when a nexus of authorities occurs, such as in integrated management planning and floodplain planning.

To accomplish its water planning objectives, the Department primarily utilizes staff from the Integrated Water Management and Engineering Programs and Services Divisions, with support from five field offices located across the state. Department divisions contribute to and support water planning activities in a collaborative effort in order to achieve planning objectives.

**Report Outline**

The general report format utilizes the river basin framework to provide an update on Department water planning activities for the previous fiscal year, and near-term future activities in regard to its information, data, and analysis capabilities, as well as its water planning and management activities. The document provides a description of statewide activities as well as specific activities occurring in the various basins throughout the state. The basins in this document (Figure 1) include the:

a) Big Blue-Little Blue River Basins;
b) Lower Platte River Basin,
c) Missouri Tributary and Nemaha River Basins;
d) Niobrara-White-Hat River Basins;
e) Republican River Basin; and the
f) Upper Platte River Basin.

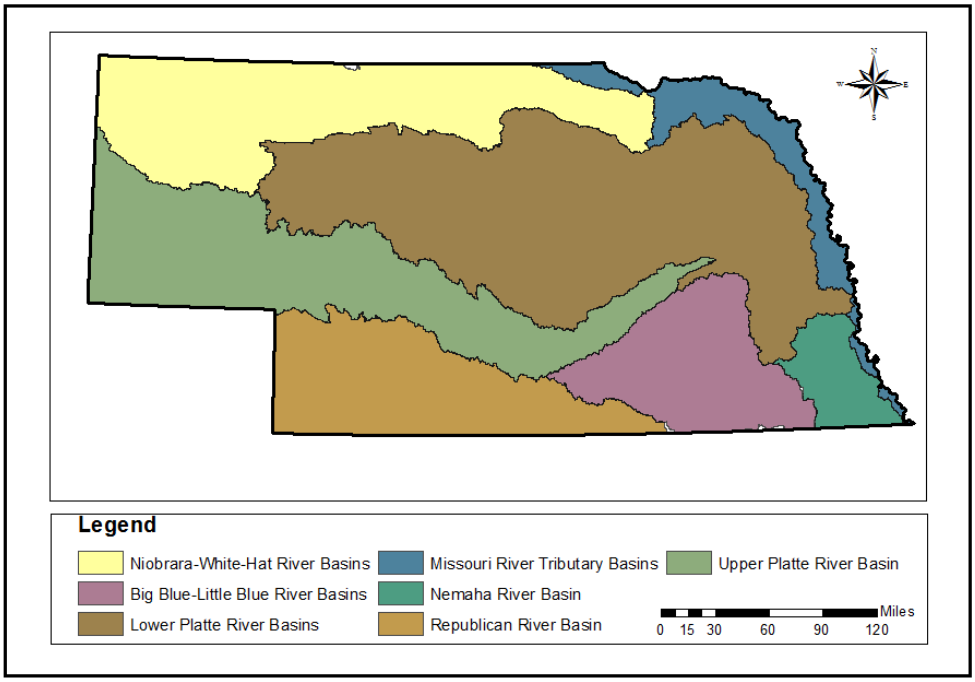


**Figure 1: Nebraska River Basins**

The Statewide section and each basin section are divided into two subsections: *Synopsis of Fiscal Year 2016 Activities* and *4-Year Work Projection*. These sections provide a summary and analysis of previous fiscal year events that aided in the achievement of Department objectives, as well as planned work for the succeeding four years. These sections contain information pertaining to the Department's data and analyses capabilities, planning activities, and management activities.

Additionally, the Statewide section contains an update on the Department's objectives related to interagency coordination, as well as management alternatives and project development. These two sections are discussed in the Statewide section as the Department strives to develop and implement consistent protocols and metrics for interagency coordination across the state, as well as assist in the development of management alternatives and projects.

# II. STATEWIDE

## Synopsis of fiscal year 2016 activities

*Interagency Collaboration*
In fiscal year 2016, the Department continued to utilize the services of the Public Policy Center of the University of Nebraska in evaluating its internal operations and improvement of its water planning processes with regard to a wide set of river basin water planning activities. Within this framework, methods used to iteratively build a statewide, strategic planning process were assessed and improved upon. Methods included input gathering, production of needed information, dissemination of water-related information pertinent to water management entities and the public, and addressing future state-level water planning needs.

The services provided by the Public Policy Center included survey tools which help to gauge the effectiveness of the Department's dissemination of information to the public and other entities. Examples of the survey tools used included the NASIS survey, focus groups, and other directed surveys. Survey recipients included the general public, water managers, and other state agency personnel. The Public Policy Center used the survey results to advise the Department about options to increase public outreach and participation through the planning process, thereby allowing the Department to engage a larger sector of the public in river basin planning activities.

*Metrics Report for the Governor*
Beginning in July 2015, the Department has provided monthly updates to the Governor on a number of performance indicators. The process of developing metrics to best represent the work of the Department is ongoing. The Metrics Report currently includes measurements of how many new applications to appropriate surface water are approved within the target period of 18 weeks, how many new applications for dams are approved within 90 days, and how many dams have been inspected by the Department in the current year. The Department also recently added a measurement of how many times the INSIGHT web portal is viewed or accessed each month. This is an indicator of how often the Department's publicly available scientific data and modeling tools are being used. The Department now also includes periodic metrics reported on a less frequent basis, quarterly or annually as necessary. When new Integrated Management Plans went into effect on July 15th, a map showing the planning status of all areas of Nebraska was included with the Metrics Report. Monthly Metrics Reports are available for the public to view on the Department's website.

The Metrics Report is also used to update the Governor about potential emerging issues affecting the Department and State. This section of the report includes updates on the progress of any ongoing issues, such as evaluation of applications for the Water Sustainability Fund or CREP re-enrollment, and new issues, such as potential lawsuits. The Department also includes important accomplishments in this section of the report, such as the successful implementation of new technology. This portion of the report is not made public, and is provided only to the Governor and the Department's staff members.

*Communications*

Internal

Internal communication efforts have been increased through the use of internal agency electronic newsletters to inform staff of the variety of activities taking place within the Department. These efforts have helped to increase cross-division awareness and coordination. In addition, the Director has initiated in-house Open Houses to relay information to all staff. In an effort to keep field office staff informed, conference call technology is utilized allowing remote staff to attend virtually. A summary of the Open House is sent to all staff, for those who were unable to attend. Keeping all staff informed allows staff to respond to questions from stakeholders on Department topics that aren't immediately within the scope of their work.

External

The Department continues to actively engage with stakeholders and partnering local agencies across the state through our integrated management planning process, floodplain planning, and field office staff. Through these three facets of Department activities Department staff meet at least monthly with the various stakeholders. In addition, the Department continues to engage with stakeholders through participation in Husker Harvest Days, NARD conferences, the Governor's Agriculture Conference, the NSIA/NWRA joint convention, NRD water users' meetings, and water planning conference. Efforts to engage with stakeholders are being increased by taking part in more water related professional and community events across the state; including the Nebraska Women in Agriculture Conference, the NPZA/APA Nebraska Planning Conference, water basin tours, Lincoln Earth Day, Waterfest, World O! Water, and the Nebraska State Fair. In addition to participating in more activities, the Department has increased its use of interactive exhibits at outreach events, including a touchscreen water quiz, a groundwater flow model, and a floodplain simulation model.

A Department newsletter was re-established on a quarterly/seasonal basis to keep stakeholders informed on Department news and to provide important information concerning the management of water in Nebraska. Social media accounts were established and are updated frequently; the Department began using GovDelivery to reach stakeholders in a convenient, consistent manner.

The process of developing a new website was initiated and will continue with a tentative launch date of February, 2017. The new website design will simplify the way stakeholders receive information from the website and provide a more up-to-date snapshot of water management in the State.

*Water Planning Database Programs*

The Department continued to maintain various programs to acquire or update databases relevant to water planning activities. Specific statewide programs or activities that aid in water planning are listed below:

a) National Hydrography Dataset (NHD) and Watershed Boundary Delineation (WBD). Department staff coordinate stewardship of the NHD and the WBD,

which provide a common reference digital hydrographic dataset of surface water features and watershed/basin boundaries

b) Water rights delineation and conversion into digital formats
c) Nebraska Rainfall Assessment and Information Network (NeRAIN). This is a web portal used for the dissemination of statewide precipitation data that is reported by volunteers across the state
d) Voluntary surface water use reporting program
e) Quarter-Quarter section database to improve digital representations of the Public Land Survey System for Nebraska's sections
f) Provide representation for the Nebraska Geographic Information System (GIS) Council, it's subcommittees, and the Nebraska GIS/LIS Association
g) Statewide stream flow gaging program
h) INSIGHT (an Integrated Network of Scientific Information and GeoHydrologic Tools). This is web portal that provides summarized information on water use and water supply, as well as current and projected future water balances for Nebraska's basins and sub-basins.

*Funds to Aid Local Government*

The Department administers several Nebraska natural resources funds and programs that support water related management activities, programs, or projects within the state. Two of the larger funds primarily support local units of government and include the:

a) Nebraska Resources Development Fund
b) Water Sustainability Fund

Details regarding the administration of these and other funds can be found on the Natural Resources Commission's website (http://nrc.nebraska.gov) and below.

Nebraska Resources Development Fund

The Nebraska Resources Development Act of 1974 created the Nebraska Resources Development Fund (NRDF) to assist with the development and wise use of Nebraska's water and land resources. The NRDF can be used to provide grants or loans to political subdivisions of the state, or an agency of the state, for development projects. The Department is responsible for administering the program, while the statutory authority for approving projects and funding levels rests with the Nebraska Natural Resources Commission (Commission).

Legislation during the 2015 session included changes to this funding program. LB657 appropriated $3.143 million in General Funds for both the 2016 and 2017 fiscal years and stated the intent that this be continued through the subsequent biennium. The statute also increased Cash Fund authority by $3 million for both the 2016 and 2017 fiscal years. LB661 included a transfer of cash funds to NRDF from the Water Sustainability Fund of $3 million in both the 2016 and 2017 fiscal years. The funds continue to be limited to projects approved as of March 30, 2014. These existing projects are: Buck & Duck Creek, Lower Turkey Creek, Pigeon/Jones Creek, Sand Creek Environmental Restoration, Upper Prairie/Silver/Moores Creek, and Western Sarpy/Clear Creek.

Water Sustainability Fund

The Legislature created the new Water Sustainability Fund in LB906 (2014) and defined governance and appropriation in LB1098 and LB1098A. In July 2014, $21 million was transferred to the fund. In 2015, LB657 re-appropriated the unexpended cash balance of about $21 million and appropriated $8 million for both the 2016 and 2017 fiscal years. LB661 provided and stated the intent that $11 million be transferred to the fund for a minimum of 10 years. In 2016, LB957 authorized the Commission to approve one additional partial allocation, up to eleven million dollars, contingent upon the availability of unallocated funds. The goals of the Water Sustainability Fund are to:

a) Provide financial assistance to programs, projects, or activities that increase aquifer recharge, reduce aquifer depletion, and increase stream flow;
b) Remediate or mitigate threats to drinking water;
c) Promote the goals and objectives of approved integrated management plans or ground water management plans;
d) Contribute to multiple water supply management goals including flood control, reducing threats to property damage, agricultural uses, municipal and industrial uses, recreational benefits, wildlife habitat, conservation, and preservation of water resources;
e) Assist municipalities with the cost of constructing, upgrading, developing, and replacing sewer infrastructure facilities as part of a combined sewer overflow project;
f) Provide increased water productivity and enhance water quality;
g) Use the most cost effective solutions available; and
h) Comply with interstate compacts, decrees, other state contracts and agreements and federal law.

The Legislature found that these goals can be met by equally considering programs, projects, or activities in the following categories:

a) Research, data, and modeling;
b) Rehabilitation or restoration of water supply infrastructure, new water supply infrastructure, or water supply infrastructure maintenance or flood prevention for protection of critical infrastructure;
c) Conjunctive management, storage, and integrated management of ground water and surface water; and
d) Compliance with interstate compacts or agreements or other formal state contracts or agreements or federal law.

It was further stated that the Legislature intended the fund to be equitably distributed statewide to the greatest extent possible for the long-term and to give priority funding status to projects that are the result of federal mandates.

The Department is responsible for administering the program, while the statutory authority for approving projects and funding levels rests with the Commission. Both the Commission and the Department have defined and established policies and rules for the process of applications review and evaluation set out in LB1098. Currently sixteen initial

applications have been funded. Thirty-four additional applications for projects, programs, and activities funding were submitted in July 2016.

*Participation in Outside Organizations*

The Department participates in various organizations and committees that either directly involve water planning or provide input from the Department's perspective on water quantity related topics. Two of these organizations, the Western States Water Council and the Interstate Council on Water Policy, allow the Department to interact with and share information with other state agencies that administer similar responsibilities. The Department is involved to varying degrees with other organizations, including: the Climate Assessment and Response Committee, Nebraska Carbon Sequestration Advisory Committee, Missouri River Recovery Implementation Committee, and the Lower Platte River Corridor Alliance.

*Data Collection*

Stream Gaging Program

Stream and canal gaging activities are considered part of the State Water Planning and Review Process. *Neb. Rev. Stat.* §§ 46-227, 46-252, 46-258, 46-261(3), 61-208, 61-209, 61-211, 61-215, and 61-216 authorize and require the Department to measure the quantity of water in the state's streams and canals. Due to the size of the stream gaging network and the importance of accurate, timely stream flow information, significant funding is budgeted for ongoing stream gaging activities.

The Data Collection Program of the Water Administration Division oversees data collection procedures, reviews stream gaging records, and ensures that quality control standards are met. The Data Collection Program works in close conjunction with the five Department field offices. The field offices are responsible for making stream gaging measurements, operating and maintaining stream gaging stations and equipment, and for general water administration. Data collected through the stream gaging network is used by the Department to make informed decisions when administering water rights, issuing permits, studying surface water/groundwater interactions, responding to flood emergencies, modeling floodplains, quantifying water supplies and uses, calibrating groundwater models, complying with interstate compacts, and planning for future water demands.

In fiscal year 2016, the stream gaging program focused on continuing to update its telemetry system from landline and cellular to satellite telemetry. Upgrading more stream gages to satellite telemetry reduces costly cell phone bills and further facilitates our goal of providing users with timely data through the Department's stream gaging website.

Voluntary Water Use Reporting

The Department further expanded its voluntary online water use reporting for surface water appropriators. The voluntary online water use reporting application is now available throughout Northeast Nebraska, in the Loup, Lower Niobrara, Little Blue and Lower Platte River basins. This online survey tool helps to better assess current water use, project future water needs and enhance management, and oversight of surface water throughout our state.

*Floodplain Management*

The Department is responsible for handling floodplain management matters for the State of Nebraska. The floodplain section of the Engineering and Technical Services Division coordinates an overall program aimed at addressing the wise use of land that is subject to flooding. This program includes multiple elements related to hazard mitigation and floodplain management planning.

Technical Assistance

The Department provides technical assistance to communities, state agencies, federal agencies, and the general public on a daily basis. One unique form of technical assistance that the State of Nebraska provides to local floodplain administrators is Base Flood Elevations (BFEs) Determinations. These BFEs allow administrators to make informed floodplain management decisions related to proposed development. During fiscal year 2016, the Department provided 264 BFE Determinations.

The Department also provides technical assistance through outreach and training for local officials. During the last fiscal year, the Department presented on floodplain issues at the Nebraska Floodplain and Stormwater Managers Association (NeFSMA) Annual Conference, Silver Jackets Workshop, NeFSMA Membership Meeting, NeFSMA Spring Workshop, the Nebraska Planning and Zoning Annual Conference, and the Association of State Floodplain Managers National Conference. Information booths on floodplain management were exhibited at Husker Harvest Days, and the American Planning Association/Nebraska Planning and Zoning Association Conference. Demonstration booths with the floodplain model were exhibited at the Lincoln Water Fest. The section also publishes the Department Floodplain Newsletter for local floodplain administrators and other interested parties.

Mapping

The Department identifies and delineates floodplain and floodways using both Federal and State dollars. As of June 30, 2016, the State of Nebraska had completed digital Flood Insurance Rate Maps (FIRMs) for 57 counties. The maps were provided by either or both the floodplain management section and the Federal Emergency Management Agency (FEMA). Mapping work is ongoing through the FEMA Risk MAP process for a number of watersheds and counties including Upper Little Blue, Upper Big Blue, West Fork Big Blue, and Middle North Platte – Scotts Bluff. Updated maps for the City of Bloomfield, Knox County, Colfax County, Village of Barneston, and Gage County have gone effective since July 1st, 2015. This mapping information is utilized by communities to support hazard mitigation and floodplain management planning activities.

National Flood Insurance Program

The Department serves as the National Flood Insurance Program (NFIP) Coordinating Office for the State of Nebraska. The NFIP Coordinator serves as a liaison between FEMA, Nebraska community floodplain administrators, and the general public. Numerous Community Assistance Visits, Community Assistance Contacts, and Ordinance Review Assistance efforts have been completed around the State. This typically involves floodplain management or flood insurance related technical assistance that may be used to support community floodplain management decision making. Due to ongoing changes in the NFIP, the Department has also sent staff to training sessions to

learn more about the Community Rating System (CRS) in order to provide accurate technical assistance. Department staff is now providing additional technical assistance to help communities interested in joining the CRS program. CRS allows communities to implement floodplain management activities above the NFIP minimum and get credits in the form of flood insurance premium reductions. The Department helps the communities in the state save approximately $625,000 per year in flood insurance premium costs. There are currently six communities in Nebraska participating in CRS and there are seven new communities working on their applications. NFIP coordination activities and CRS assistance activities provide resources to communities that support floodplain management planning and the management of floodplain development.

Mitigation

The Department provides technical assistance to any entity implementing flood mitigation planning and related projects. The Department provides Natural Resources Districts (NRDs), counties, and communities with planning assistance for the purpose of updating local Hazard Mitigation Plans (HMPs). According to the Nebraska Emergency Management Agency (NEMA), most of the state's population is now covered by an all Hazards Mitigation Plan, or will be covered by a plan in the future. HMPs include flood mitigation components.

The Department currently administers the Flood Mitigation Assistance grant (FMA) on behalf of the FEMA. In addition to this program, the Department assists the NEMA with two other FEMA programs: the Hazard Mitigation Grant Program (HMGP) and the Pre-Disaster Mitigation grant program (PDM). In June 2016, two FMA grant applications were submitted for nearly $200,000 of flood mitigation and planning projects in Nebraska.

Due to recent and anticipated disaster declarations, the state has received funding for hazard mitigation projects through FEMA's HMGP, administered by NEMA. Grant applications received may include flood risk mitigation projects. The Department assists with review of these applications and may provide technical assistance for project implementation as appropriate, per existing authorities.

Interagency Partnerships

The Department continues to facilitate partnerships with numerous state and federal agencies to make Nebraska more resilient from flooding. The Nebraska Silver Jackets team is a partnership among the Department, NEMA, USACE, FEMA, USGS, NOAA, and other partners to coordinate and expand communication about flood risk. Previous projects have included hydrologic and hydraulic studies for specific communities with particular flood problems, assessment of flood mitigation strategies for Cass County communities, and workshops to help floodplain administrators learn more about flood mitigation. Since July 1st, 2015, Silver Jackets has hosted a workshop on changing flood risks in climate change, completed a study of repetitive loss properties throughout the state, organized a dam safety workshop, and installed nearly two dozen high water mark signs in various communities.

The Department also assists state agencies when requested. In late spring 2016, high water continuously threatened many communities and property owners in western

Nebraska. The  assisted NEMA in providing and helping the public to understand real time flood information for the North Platte, South Platte, and Platte Rivers. Department staff monitored the river and stayed in contact with NEMA staff throughout the high water event.

*Integrated Water Management*

Fully Appropriated Basins (FAB) Evaluation

The Department is tasked annually to complete and publish an evaluation of the expected long-term availability of hydrologically connected water supplies. In December 2015, the Department completed its 11th annual evaluation entitled "2016 Annual Evaluation of Availability of Hydrologically Connected Water Supplies", also known as the Fully Appropriated Basin (FAB) report. Statute requires that the report be completed by January 1 of each year. A variety of hydrologic, water use, water rights and other related data were utilized in compiling this report.

Technical Analyses

The Department has also been developing new and improving existing hydrologic tools and models which, when combined, cover every major river basin in the state. These tools assist the FAB evaluation and other analyses conducted by the Department. Improvements in fiscal year 2016 included development and utilization of extension toolsets which accelerated the running of models and processing of results. Details for specific models are included in subsequent basins sections.

The Department created an interactive web portal, INSIGHT – Integrated Network of Scientific Information and GeoHydrologic Tools to share data and information on water supplies and water uses. INSIGHT uses the best available scientific data, information, and technology related to stream flow and water quantity to provide a broad overview of information intended for the general public, more technical information for water managers, and access to data and model files for engineers, modelers, or other highly technical individuals and entities. Various Department programs, including Integrated Water Management, Stream Gaging, and Permits and Registration, have contributed data and information to the INSIGHT project, along with source data from local NRDs, surface water irrigation districts, and other water users.

## Four-Year Work Projection

*Data Collection*

The Department continually prioritizes and evaluates its data collection and analysis capabilities to support state and local planning efforts based on needs across the state. The Water Administration Division through its Data Collection Program and the field offices will continue to work together to develop improved workflows, implement automated quality checks, and increase data accessibility. The Water Administration Division will continue to work with the Information Technology Section to develop and refine mobile applications that will be utilized by the field offices to administer surface water, complete inspections, and collect data in the field.  Within the next four years the Department projects that the Voluntary Water Use Reporting application will be offered throughout the entire State of Nebraska.

Further improvements are needed to finish the satellite telemetry update to the stream gaging network to meet the Department's and the public's needs. This will include identifying and developing systematic approaches to evaluate the adequacy of the existing stream gaging network, as well as determining the need for additional gages.

*Floodplain Management*

The Department will continue to provide technical assistance to communities for floodplain management administration activities and deliver related training to local officials. The Department will also continue to offer technical assistance to any entity implementing flood mitigation planning and related projects. This includes assisting NEMA as requested. The Department also provides NRDs, counties, and communities with planning assistance for the purpose of updating local Hazard Mitigation Plans (HMPs). According to NEMA, most of the state's population is now covered by an all Hazards Mitigation Plan, or will be covered by a plan in the future. HMPs include flood mitigation components.

The Department will continue to work with FEMA on Risk MAP projects throughout the state. In the next four years, the following watersheds are proposed to receive new flood hazard data (although final authorization to commit funds will be made from FEMA on a regular basis): The Upper Little Blue, West Fork Big Blue, Upper Big Blue, Middle North Platte–Scotts Bluff, Lower Elkhorn, Logan, North Fork Elkhorn, and Upper Elkhorn. Counties that are proposed to receive new flood insurance rate maps in the next four to six years include Adams, Clay, Hamilton, York, Seward, Scotts Bluff, Cheyenne, Deuel, Richardson, Nemaha, and Burt.

*Integrated Water Management*

The Department will continue to work with all NRDs (either through FAB determinations or voluntary approaches) that are developing or implementing integrated management plans (IMPs) jointly with the Department, or are participating in basin-wide planning activities with the Department. Each IMP is evaluated on a regular basis to determine if modifications or updates to the plan, tools, or data are necessary. The ongoing implementation of integrated management plans and basin-wide plans in fully and overappropriated areas of the state rely on funds from the Water Resources Cash Fund, for which a separate report is completed by the Department and filed with the legislature. Pursuant to statutory authorization, this fund is used to implement management actions by NRD's and the Department that result in reductions in consumptive uses or enhanced stream flows. Projects being developed and implemented include conjunctive management of groundwater and surface water, streamflow augmentation wells, retirement of irrigated acres, and other projects to capture excess stream flows and release the water back to the stream at times when existing streamflow is unable to meet the demand for flows.

The Department will continue to update existing models and tools, as well as develop new tools that support water management. Some of these future tool updates will be collaborative efforts with NRDs in regard to the planning process and evaluation of overall plan goals. Other efforts will be geared toward developing new tools or updating existing models to support the FAB analyses.

# III. Blue (Big & Little) River Basins

## Synopsis of fiscal year 2016 activities

*Stream Gaging Activities*
The Department operates six stream gages in the Blue River Basin.

*Floodplain Management*
Floodplain management staff continued work on hydrologic and hydraulic studies, as well as floodplain mapping for watersheds in Adams, Clay, Hamilton, York, and Seward counties, as part of a FEMA Risk MAP project. Gage County and the Village of Barneston maps became effective in May 2016. This mapping information is utilized by communities to support hazard mitigation and floodplain management planning activities.

*Integrated Water Management*

Blue River Basin Model
The Department completed development of a groundwater model of the Big and Little Blue River basins in 2013 and utilized this model for the 2016 FAB report. The Department continued to collect data and information that will be used for model updates.

Fully Appropriated Basins (FAB) Evaluation
For the most recent FAB report, the Department reached a preliminary conclusion that the Big and Little Blue basins are not fully appropriated.

Voluntary Integrated Management Plans (IMPs)
The Little Blue and Tri-Basin Natural Resources Districts and the Department joint voluntary IMPs were in initial stages of development during fiscal year 2016. During this time, stakeholder groups with diverse interests were convened for each NRD. The stakeholder processes guide development of goals and objectives for the voluntary IMPs. The first stakeholder meeting was a joint meeting between the NRDs where stakeholders discussed overall concerns with the Little Blue Basin in its entirety. Subsequent stakeholder meetings were held separately in each NRD to discuss more specific issues and goals.

Blue River Basin Compact
The Blue River Basin Compact Administration met for the annual meeting in May, 2016. Here, regular business was conducted which included reports from Nebraska and Kansas on water administration activities in the basin and standing committee reports on water levels, stream gage readings, legal activities, and budget items. Department staff supplied support for compact administration and standing committees. Intra-state coordination on the Blue River Basin Compact mainly occurs between the Department of Environmental Quality and the local NRDs.

## Four-Year Work Projection

*Data Collection*
Based on needs across the state, the Department continually prioritizes and evaluates its data collection and analysis capabilities to support state and local planning efforts. These efforts will continue in the area of stream gaging, floodplain mapping, and integrated water management in the Blue River Basins. Other details regarding the four-year projection of work are contained in the Statewide section of this report.

*Floodplain Management*
Over the next several years the Department will be working with FEMA to complete Risk MAP projects in the Upper Big Blue Watershed, the West Fork Big Blue River Watershed, and the Upper Little Blue Watersheds. These projects will include new detailed hydrologic and hydraulic studies, and will incorporate the 2009 Department Work Maps into new Flood Insurance Rate Maps (FIRMs). The Work Maps are floodplain maps developed by Department that have not approved by FEMA for flood insurance rating. They cannot be used for floodplain regulations unless they are adopted by a community. The Risk MAP process will include outreach and planning events to promote resilient communities and risk reduction. The desire is to have new FIRMs for Adams, Clay, Hamilton, York, and Seward counties by the time the Risk MAP projects are completed.

*Integrated Water Management*

Technical Analyses
The Department will work to improve and update the Blue Basin model. This model will provide some of the data and information necessary for the Department's continued evaluations of long-term availability of hydrologically connected ground and surface water for both the Big and Little Blue River basins.

The Department will continue to coordinate with other state and local water management agencies in order to refine the hydrologic data to better understand hydrologically connected water resources. These efforts will likely focus on expanding upon the network of water use information, evaluating existing models and input datasets (for example, local aquifer properties and recharge characteristics) for data quality and/or gaps, and refining and building upon existing modeling tools.

Integrated Management Plans (IMPs)
The Department will continue to work with the Little Blue and Tri-Basin NRDs on development of voluntary IMPs. The Lower Big Blue NRD and the Department are planning to begin development of a voluntary IMP in upcoming months. The Department is also looking forward to discussions with Upper Big Blue NRD regarding a potential voluntary IMP development process in the upper portion of the Basin.

Blue River Compact

The Department will continue to fulfill its obligations under the Blue River Basin Compact and does not expect an increased level of commitment under this obligation.

# IV. Lower Platte River Basin

## Synopsis of fiscal year 2016 activities

Note: this section includes the Elkhorn, Loup, and Lower Platte River basins.

*Stream Gaging Activities*

The Department does not operate Platte River stream gages in the lower portion of the Basin, but instead utilizes five gages operated by the U.S. Geological Survey. The Department operates 11 stream gages, one canal gage, and cooperates with the U.S. Geological Survey on one stream gage for the Elkhorn River and its tributaries. The Department operates 12 stream gages and 24 canal gages for the Loup River and its tributaries.

*Floodplain Management*

New flood insurance rate map (FIRM) panels went preliminary for the streams within the City of Wahoo, Saunders County in December 2014 and went effective in August 2016. This mapping information is utilized by communities to support hazard mitigation and floodplain management planning activities.

*Integrated Water Management*

CENEB—Central Nebraska Model

The Central Nebraska Model (CENEB) is a regional model that encompasses portions of the Loup and Elkhorn River Basins, which are tributaries to the Lower Platte River Basin. Model construction was completed by the Department and consultants in July 2013. Data from this model has been incorporated into INSIGHT for a portion of the Elkhorn River basin and the entire Loup River Basin. The CENEB model is available to NRDs to evaluate management actions as a part of IMP implementation. This model was used in the 2016 FAB evaluation.

Lower Platte and Missouri Tributaries Basins Model

The Department has continued to work with consultants on a regional numerical model for the Lower Platte and Missouri River Tributaries Basins. The model is divided into two parts: the upper model which covers the upper two-thirds of eastern Nebraska and the lower model which covers the Nemaha Basin. The model will be used for the Department's FAB analysis and is also available for use by NRDs. Data from the model will be incorporated into the INSIGHT analysis and available through the INSIGHT web portal. Initial development of the upper model was completed in summer 2016 with documentation scheduled to be completed in fall 2016. The Nemaha model development was initiated in spring 2016.

Fully Appropriated Basins (FAB) Evaluation

The Department made a preliminary determination in 2008 that the Lower Platte River Basin was fully appropriated and in 2009 made a final determination that the Basin was not fully appropriated. In 2014, at the Director's discretion, the Lower Platte River Basin was not evaluated pursuant to *Neb. Rev. Stat.* § 46-713(1)(a). For the 2016 FAB report,

the Basin was evaluated again for the first time since the reversal in 2009. The Department reached the conclusion that the basin was not fully appropriated.

Integrated Management Plans (IMPs)

In fiscal year 2016, all NRDs in the Lower Platte River Basin were either developing or implementing joint voluntary IMPs with the Department. The Lower Platte South and Papio-Missouri Tributaries NRDs adopted voluntary IMPs in 2014, and completed their first annual reviews in fiscal year 2016. The annual reviews consisted of a joint NRD and Department IMP progress report and an annual review meeting that was open to the public. The Lower Loup and Upper Loup also completed development of their voluntary IMPs, with adoption occurring in spring 2016 and summer 2016, respectively. Development on the Lower Elkhorn NRD and Lower Platte North NRD voluntary IMPs continued; here, both NRDs completed an involved stakeholder process in which issues, goals and objectives were identified over several stakeholder meetings. The Upper Elkhorn NRD is also in the process of developing a voluntary IMP; the planning for this process was initiated in early 2016.

Basin-wide Plan

The Department and several Lower Platte River Basin NRDs (Upper Loup, Lower Loup, Upper Elkhorn, Lower Elkhorn, Lower Platte North, Lower Platte South, and Papio-Missouri River) have entered into an inter-local cooperative agreement to develop a basin-wide plan for the Lower Platte River Basin. Since the inception of the inter-local agreement, the technical committee and management committees have worked with consultants to evaluate methods to develop a water banking system that could potentially be implemented in the Basin. The water banking system could work as an umbrella system for any local NRD water banking system that may be developed as a part of voluntary IMP actions. The group continued to meet throughout fiscal year 2016, working to develop broad goals and objectives for water quantity management in the Basin.

## Four-Year Work Projection

*Data Collection*

Based on needs across the state, the Department continually prioritizes and evaluates its data collection and analysis capabilities to support state and local planning efforts. These efforts will continue in the area of stream gaging, floodplain mapping, and integrated management. Other details regarding the four-year projection of work are contained in the Statewide section of this report.

*Floodplain Management*

FIRM panels are scheduled to go effective for the City of Wahoo and Saunders County in August 2016.

*Integrated Water Management*

Technical Analyses

The Department and consultants will continue to development of the Lower Platte Missouri Tributaries groundwater model. Additionally, the Department will continue to collect data for the CENEB model to assess portions of the Niobrara, Loup, and Elkhorn River basins. These modeling tools will be updated as needed and utilized in the Department's annual FAB report.

Integrated Management Plans (IMPs)

The Department will continue to work with the Lower Platte South, Papio-Missouri, Upper Elkhorn, Upper Loup and Lower Loup River NRDs to implement their respective voluntary IMPs and regularly assess progress being made toward the goals of these plans. The Department will continue work with the Lower Elkhorn and Lower Platte North NRDs in development of these voluntary IMPs. Upon adoption, the Department will work with each NRD to implement actions and regularly assess progress made toward meeting the goals identified in each plan.

Basin-wide Plan

The Department will also continue involvement in the inter-local Lower Platte River Basin agreement, and will work with these NRDs in developing a basin-wide plan and framework for a water banking system.

# V. Missouri Tributaries and Nemaha River Basins

## Synopsis of fiscal year 2016 activities

*Stream Gaging Activities*
The Department does not currently operate any stream gages in the Missouri River Tributaries Basin.

*Floodplain Management*
See the Statewide section for reference to general statewide floodplain activities related to the Missouri River Tributary Basins.

*Integrated Water Management*

Technical Analyses
The Department has continued to work with consultants on a regional numerical model for the Lower Platte and Missouri River Tributaries Basins. The model is divided into two parts: the upper model which covers the upper two-thirds of eastern Nebraska and the lower model which covers the Nemaha Basin. The model will be used for the Department's FAB analysis and is also available for use by NRDs. Data from the model will be incorporated into the INSIGHT analysis and available through the INSIGHT web portal. Initial development of the upper model was completed in summer 2016 with documentation scheduled to be completed in fall 2016. The Nemaha model development was initiated in spring 2016.

The Department continued to assess potential advancements in the best available science and methods that could be incorporated into these modeling tools, by supporting efforts of the Eastern Nebraska Water Resources Assessment (ENWRA) organization. A portion of ENWRA's work involves utilization of airborne geophysical studies to assist in mapping of subsurface geology/hydrogeology in Eastern Nebraska. The Department's primary interest in this work is to increase understanding geophysical technique effectiveness in assessing hydrologic connection of aquifers and streams via groundwater modeling tools. As such, in fiscal year 2016, the Department provided monetary support for ENWRA geophysical studies, and Department staff attended ENWRA meetings to stay up-to-date on study progress and developments.

Fully Appropriated Basins (FAB) Evaluation
For the areas with sufficient data to do an analysis, in the most recent FAB report the Department reached a preliminary conclusion that the basins are not fully appropriated.

Integrated Management Plans (IMPs)
The Lewis and Clark NRD and Department joint voluntary IMP development continued in fiscal year 2016. During this time, the NRD, Department and stakeholder group convened to identify issues, goals and objectives related to integrated management of

ground and surface water. The stakeholder process was completed in November 2015. Subsequently, several NRD and Department coordination meetings were held to discuss stakeholder input and draft the plan. At the close of fiscal year 2016, a final draft of the voluntary IMP was completed. This voluntary IMP was subsequently adopted by both the Lewis and Clark NRD and the Department in September 2016.

The other NRDs in the Missouri Tributaries Basins include portions of the Papio-Missouri River NRD, a portion of the Lower Platte South NRD and the entire Nemaha NRD. The Papio-Missouri River NRD voluntary IMP does not apply to the Missouri Tributaries Basin, as it is only written to address the portions of the NRD that are in the Lower Platte South River Basin. However, the Lower Platte South NRD voluntary IMP was written to include the whole NRD including those portions within the Missouri Tributaries Basin. For more information, please see the Lower Platte River Basins section of this report. The Nemaha NRD did not have a voluntary IMP in place or in development during fiscal year 2016.

## Four-Year Work Projection

*Data Collection*

Based on needs across the state, the Department continually prioritizes and evaluates its data collection and analysis capabilities to support state and local planning efforts. These efforts will continue in the area of stream gaging, floodplain mapping, and integrated management. Other details regarding the four-year projection of work are contained in the Statewide section of this report.

*Integrated Water Management*

Technical Analyses

The Department and consultants will work to incorporate the recently developed Lower Platte-Missouri Tributaries model (upper portion) into the INSIGHT and annual FAB report analyses. The Department will continue development of the lower portion (Nemaha Basin) of this model, with completion of this model expected to occur in fiscal year 2017. Upon completion, the lower model will also be incorporated into INSIGHT and FAB analyses. In addition, the Department will continue to support efforts of ENWRA to evaluate whether the coupling of groundwater modeling tools and airborne geophysical techniques help improve understanding of aquifer and stream hydrologic connections.

Integrated Management Plans (IMPs)

The Department will continue to work with the Lewis and Clark NRD to jointly implement actions identified in their voluntary IMP, and will hold joint biennial public meetings to assess progress made towards accomplishing the goals and objectives of the plan. The Department will also continue work with the Lower Platte South NRD in implementation of the voluntary IMP; a portion of which applies to the Missouri Tributaries Basin. Should the Papio-Missouri River NRD (Missouri Tributaries portion) or Nemaha NRD express interest in developing a voluntary IMP, the Department will work with the respective NRD(s) to accomplish this.

# VI. Niobrara River, White River & Hat Creek Basins

## Synopsis of fiscal year 2016 activities

*Stream Gaging Activities*
The Department operates 14 stream gages, 20 canal gages, and uses information from an additional two gages operated by the U.S. Geological Survey in the Niobrara management area.

*Floodplain Management*
The Statewide section contains reference to general statewide floodplain activities related to the Niobrara, White, and Hat River basins.

*Integrated Water Management*

Upper Niobrara White NRD Conjunctive Use Model
The Department and the Upper Niobrara White NRD completed development of an integrated surface water and groundwater model in 2013. This model includes the upper portions of the Niobrara River Basin, and small regions of the White River and Hat Creek basins.

In fiscal year 2016, the model was used by the Department and NRD to implement a joint study on the effects of potential alternative management strategies on water use and supply. Data generated from the model were also incorporated into the Department's INSIGHT and FAB report analyses.

CENEB—Central Nebraska Model
The Department and consultants completed development of the Central Nebraska Model (CENEB) in July 2013. This is a regional groundwater model that encompasses portions of the Niobrara, Elkhorn, and Loup River Basins. In fiscal year 2016, data generated from the model were incorporated into the Department's INSIGHT and FAB report analyses. The CENEB model is available for projects/studies that may result from voluntary IMP efforts in the Basin.

Fully Appropriated Basins (FAB) Evaluation
The Niobrara River Basin downstream of the Mirage Flats Diversion Dam and upstream of Spencer Hydropower was not evaluated in the Department's in this report due to a reversal of a fully appropriated designation in 2011, and a statutorily defined four year waiting period that follows a reversal. In 2014, the Department reached a preliminary conclusion that the Lower Niobrara River Basin downstream of Spencer Hydropower was not fully appropriated as specified in the 2015 FAB report.

In the 2016 FAB report, the Department reached a preliminary conclusion that the Niobrara River Basin, downstream of the Mirage Flats Diversion Dam to the confluence of the Niobrara River and the Missouri River, is not fully appropriated.

Integrated Management Plans (IMPs)

In 2011, the Upper Niobrara White NRD jointly adopted an IMP with the Department for the portion of the NRD that is upstream of the Mirage Flats Irrigation District. In 2014, the Department and the Lower Niobrara NRD jointly adopted a voluntary IMP for the entire NRD. Thus, in fiscal year 2016, the Department and the NRDs conducted public annual review meetings to evaluate progress made towards achieving the goals and objectives of each IMP. In summer 2016, the Upper Loup NRD, which has a small portion of land in the Niobrara Basin, adopted a joint integrated management plan with the Department. This is also reported on in the Lower Platte Basin section of this report.

Niobrara Basin-wide Planning

The Department and the Niobrara River Basin Alliance (NRBA) initiated a voluntary basin-wide planning process in 2014. The NRBA includes the Upper Niobrara-White, Middle Niobrara, Lower Niobrara, Upper Loup, and Upper Elkhorn NRDs. In fiscal year 2016, the Basin-wide planning effort was put on hold, however, as the NRBA, the Nebraska Game and Parks Commission (Commission) and the Nebraska Public Power District (NPPD) negotiated an agreement to work together to protect future economic activity, agriculture, other water users, fish and wildlife, and recreation activities along the Niobrara River. This negotiation included the transfer of the Spencer hydropower dam water right which impacts land ownership, appropriations, and easements. Since this time, the Department has been working with the partners to consider a comprehensive path forward on a wide variety of water management and stakeholder processes, including consideration for the basin-wide planning process.

LB1038 Implementation

The Nebraska Legislature passed LB1038 on April 12, 2016. The bill included a several environmentally related provisions including a provision that addressed a water rights agreement between the NRBA, Nebraska Public Power District and the Nebraska Game and Parks Commission regarding the Spencer Dam. The bill was signed into law by the Governor on April 18, 2016. Since this time, the Department has been assessing and outlining the implementation of the bill along with a variety of related water resources and water rights administration issues in the basin.

Niobrara River Compact

The Upper Niobrara River Compact (Compact) was ratified by the states of Wyoming and Nebraska in 1962. The Compact provides for an equitable division of the available surface water supply of the basin. It provides for acquisition of information regarding groundwater and underground water flow necessary for apportioning said flow, in addition to calling on the states to address issues that may lead to disagreements. The Department and the Wyoming State Engineer's Office meet to discuss the Compact at a regularly occurring meeting in the fall.

At the fall 2015 meeting, the members discussed the States' water supply conditions, dam inspections, surface water administration, completed Niobrara River Basin climate

variability study, the June 2015 flood event that resulted in damages to stock reservoirs and stream gages, and other related hydrologic activities. An additional technical subcommittee meeting was held in the spring 2016 to provide additional information regarding the June 2015 flood event and the climate variability study.

## Four-Year Work Projection

*Data Collection*

The Department continually prioritizes and evaluates its data collection and analysis capabilities to support state and local planning efforts, based on needs across the state. These efforts will continue in the area of stream gaging, floodplain mapping, and integrated management. Other details regarding the four-year projection of work are contained in the Statewide section of this report.

*Integrated Water Management*

Technical Analyses

The Department will continue to work with the Upper Niobrara White NRD to collect the information needed to update and refine the integrated groundwater and surface water operations model discussed in previous sections and will use the model to evaluate various management actions and how these may affect water supply and use. The Department will continue to collect data to update the CENEB model to assess the central and lower portions of the Niobrara River Basin. Both models will be updated as needed and will be utilized in upcoming FAB reports and future INSIGHT editions.

Fully Appropriated Basins (FAB) Evaluation

The Department will continue to evaluate the Niobrara River Basin downstream of the Mirage Flats Diversion Dam and upstream of the Spencer Hydropower plant for upcoming FAB reports.

Integrated Management Plans (IMPs)

The Upper Niobrara White NRD and the Lower Niobrara NRD, in cooperation with the Department, will continue to annually review current IMPs to evaluate progress being made towards goals of each plan, and as needed, will jointly make decisions regarding modifications to the plan, monitoring, or hydrologic tools. The Upper Loup NRD will begin annual IMP reviews in 2017. The Middle Niobrara NRD initiated development of a voluntary IMP during the first half of 2015. This IMP planning effort and the Niobrara Basin Wide planning process are currently pending due to discussions between the NRBA, NPPD, and the Nebraska Game and Parks Commission regarding the assessment and implementation of LB1038 and associated management issues.

Niobrara River Compact

The States of Wyoming and Nebraska will continue to meet at least once annually to discuss the Compact. Additional technical committee meetings may be held with regard to the Niobrara River Basin climate variability study.

# VII. Republican River Basin

## Synopsis of fiscal year 2016 activities

*Stream Gaging Activities*
The Department operates 19 stream gages, four canal gages, and cooperates with the U.S. Geological Survey on three stream gages in the Republican River Basin.

*Floodplain Management*
The Statewide section contains reference to general statewide floodplain activities related to the Republican River Basin.

*Integrated Water Management*

Integrated Management Plans (IMPs)
The Department and the Republican River Basin NRDs continually assess the implementation of IMPs in the basin. During the second half of 2015 the Department and Republican River Basin NRDs worked to develop a fourth generation IMP for each of the three NRD's. This generation of IMPs was developed to incorporate new accounting procedure changes necessary to implement the February 2015 United States Supreme Court ruling and other elements necessary to account for augmentation crediting under agreements reached through the Republican River Compact Administration (RRCA). Three stakeholder meetings were held during the course of modifying the IMPs with final agreement reached between the Department and all three basin NRDs in late 2015. The new IMPs became effective on January 15, 2016.

This year's accounting and forecast indicated the potential for non-compliance with the Republican River Compact (Compact), unless certain management actions were put into place. Those actions are specified in the IMPs, and are proactively being implemented by both the NRDs and the Department to help ensure Compact compliance for Nebraska. This year's forecast was the third consecutive year that has been designated as a Compact Call Year.

Basin-wide Plan
The passage of LB1098 in the 2014 Legislative session mandated the creation of a basin-wide plan for the hydrologically connected portion of the Republican River Basin. The Department and the basin NRDs subsequently hired a local consultant to facilitate the stakeholder and planning process. In 2015, the Department, NRDs, and the consultant began a series of meetings with the stakeholder group to consult and collaborate with the group on the formulation of a plan and included management actions. In June 2016 the stakeholder group voted to set the goal of completing a draft plan within one year.

Republican River Compact
The States of Colorado, Kansas, and Nebraska continued the discussions on long term agreements throughout 2015. These discussions culminated in long-term agreements signed by all three states in August of 2016. These agreements are based upon the successes of the prior annual agreements that created positive outcomes for all States.

Several pending cases in State District Court have been filed by various irrigation districts and irrigation district patrons against the Department and the Natural Resource Districts in the Republican River Basin. The recent litigation has focused on claims related to actions taken by the Department and NRDs for implementation of the IMPs as a means of ensuring Compact compliance in 2013 and 2014. These litigations are in various phases and are being coordinated in conjunction with the Nebraska Attorney General's Office.

Conjunctive Management/WaterSMART Study*

Phase I of the Republican River Conjunctive Management Study (WaterSMART) study was completed and published by the Bureau of Reclamation in March 2016. The study was developed to proceed in two phases: Phase I is the conceptualization of various scenarios and the development of hydrologic tools; Phase II addresses analyses of conjunctive management scenarios, evaluation of the scenarios to assess hydrologic and economic implications, and development of an implementation plan.

*(http://www.usbr.gov/watersmart/bsp/docs/finalreport/republican/republican-river-basin study-final-report.pdf)

## Four-Year Work Projection

*Data Collection*

Based on needs across the state, the Department continually prioritizes and evaluates its data collection and analysis capabilities to support state and local planning efforts. These efforts will continue in the area of stream gaging, floodplain mapping, and integrated management. Other details regarding the four-year projection of work are contained in the Statewide section of this report.

*Integrated Water Management*

Technical Analyses

The Department will work with the Republican River Basin NRDs to develop and test specific conjunctive management action scenarios via modeling tool outputs from the Republican River Basin Conjunctive Management Project. Each irrigation district in the basin can be represented and analyzed with this set of modeling tools. A work plan was distributed to the Nebraska Bostwick Irrigation District (NBID) and initial screening work began, but was halted once litigation was initiated. Conjunctive management efforts will hopefully be reinitiated once litigation matters are resolved. The Department will continue to evaluate the tools and data to determine if updates or additional data are necessary.

Integrated Management Plans (IMPs)

The Department and Republican River Basin NRDs will continue to meet annually to review the IMPs and progress made towards achieving the goals of each plan. These reviews focus on the assessment of two key compliance standards: limitations on groundwater depletions and limitations on groundwater pumping, with the purpose of ensuring long-term groundwater depletions remain stable or decrease. The Department and NRDs will assess the compliance standards and make necessary adjustments as

needed. The Department and NRDs will also assess how the new basin-wide plan and recent RRCA agreements may necessitate future modifications to the IMPs.

Basin-wide Plan

The Department and the Republican Basin NRDs will continue to develop the basin-wide plan over the next year. It is expected that the stakeholder process will continue through the duration of fiscal year 2017. This collaborative process will set the framework for plan development, with the overarching goal of sustaining a balance between water uses and supplies in the Basin.

A significant source of funding for the activities in the fully appropriated areas of the Republican River Basin is the Water Resources Cash Fund. $6.6 million dollars are allocated to this fund annually and a significant portion is utilized to meet the requirements of integrated management plans and interstate decrees, compacts or agreements in the Republican Basin. Details on the projects and expenditures of the Water Resources Cash fund can be found in the annual report to the legislature regarding this cash fund.

Republican River Compact

The Department will continue to work to implement the Compact and ensure compliance through integrated management planning activities.

# III. Upper Platte River Basin

## Synopsis of fiscal year 2016 activities

*Stream Gaging Activities*
The Department operates 48 stream gages, 58 canal gages, and cooperates on one additional gage operated by the U.S. Geological Survey in the Upper Platte River Basin.

*Floodplain Management*
The Department is currently working with the Silver Jackets partnership to update hydrologic data along the North Platte River and its tributaries in Scotts Bluff County. The County will also likely receive updated flood hazard data as part of the Risk MAP process in the coming years. The Department is also providing technical assistance to the City of Scottsbluff on joining the NFIP Community Rating System. The Statewide section contains additional reference to general statewide floodplain activities related to the Upper Platte River Basin.

*Integrated Water Management*

Technical Analyses
Two regional modeling efforts are underway in the Upper Platte River Basin: the Cooperative Hydrology Study (COHYST) and the Western Water Use Management (WWUM) model. The models are being developed to help achieve and measure progress towards the goals of the IMPs. Similar to other Department modeling efforts, these models integrate watershed, surface water operations, and groundwater modeling components to create tools capable of analyzing varied water management scenarios. Scenarios have included analyses of conjunctive management projects, well pumping, alternative surface water operations, etc.

In 2015, work was performed to update the COHYST model as well as improve the model performance; the update included the extension of land use data from 2005 to 2010. The WWUM model was also updated by the South Platte and North Platte natural resources districts with new data through the most recent year. The current work plans anticipate that a tool capable of completing an evaluation of the over-appropriated area IMPs for the first planning increment (2009-2019) will be available within the next six months, with the evaluation analyses to follow. The Department integrated water management staff has expended significant resources in support of the development of the models and model analyses in partnership with the local NRDs and irrigation districts.

To meet the requirements of state statutes, these technical tools are needed to perform studies and modeling analyses. The studies include assessing the impacts of soil and water conservations measures on water supplies, and evaluating the differences between current and fully appropriated development levels, and a robust review of integrated management actions implemented in the basin.

In 2015, the COHYST and WWUM models were used to perform initial work on assessing the impacts of soils and water conservation measures and the evaluation of

differences between current and fully appropriated development levels studies. Both studies are currently in phase II of their work plans. The robust review analysis scope of work has been completed and a contract for the robust review work is expected to be executed by the end of 2016.

Integrated Management Plans (IMPs)

There are currently six IMPs in place within the Upper Platte River Basin. Five of the IMPs are for the over-appropriated area of the Platte River Basin. Modifications are made to the IMPs as needed to ensure progress is being made towards the goals of the plan, as well as to accommodate other overarching changes (socio-economic, policies, etc.). In 2015, it was determined that no modifications to the IMPs were necessary.

Basin-Wide Plan

There is one basin-wide plan in place in the Upper Platte River Basin, which is for the over-appropriated area of the Platte River. The plan was developed for the years 2009 through 2019 (first planning increment). The Department and five Upper Platte River Basin NRDs met regularly during fiscal year 2016 to discuss implementation of the basin-wide plan and of the IMPs for the over-appropriated area. In addition, every year one regular meeting that occurs in June or July is directed toward dissemination of information to basin stakeholders and the general public. In June 2016, the Department and five Upper Platte River Basin NRDs held the first meeting of the basin-wide stakeholder group to initiate a consultation and collaboration process for developing a second increment basin-wide plan.

A voluntary basin-wide plan is in the early development phases for the Lower Platte River Basin. While this plan focuses on the Lower Platte River, upstream entities, particularly NRDs, will be encouraged to stay informed as this plan is developed.

Interstate Agreements

Three interstate agreements involve the Upper Platte River Basin: the North Platte Decree, the Platte River Recovery Implementation Program, and the South Platte Compact. Each interstate agreement is being fully implemented by the Department. This implementation includes the administration of water rights, various reporting elements, and support of various subcommittees and annual meetings. The Department is on schedule with implementation of tasks in support of these interstate agreements.

## Four-Year Work Projection

*Data Collection*

The Department continually prioritizes and evaluates its data collection and analysis capabilities to support state and local planning effort based on needs across the state. These efforts will continue in the area of stream gaging, floodplain mapping, and integrated management. Certain details regarding the four-year projection of work are contained in the Statewide section of this report.

*Floodplain Management*

The Floodplain Management section will continue working with communities in the Middle North Platte – Scotts Bluff watershed on the FEMA Risk MAP project identified there. New DFIRMs are proposed for Scotts Bluff, Cheyenne, and Deuel counties.

*Integrated Water Management*

Technical Analyses

The updated COHYST model is intended to be completed and documented by the end of 2016, while the updated WWUM model is in the documentation phase. The Department plans to use the WWUM and COHYST models and pertinent datasets for future IMP analyses, which will include implementing additional management scenarios to improve understanding of conjunctive management of ground and surface water. The robust review of management actions at the Basin scale will also be conducted using these models. The results of that study, the soil and water conservation measures study, and the evaluation of differences between current and fully appropriated development levels study will be used to guide planning efforts in the basin. The Department and others will review the data, tools, and models, and update as needed to fulfill goals and objectives of planning efforts.

Integrated Management Plans (IMPs) and the Basin-wide Plan

The five IMPs in the over-appropriated area of the Platte River Basin, in accordance with state statute, were written with a first increment to last no more than ten years. The plans are now beginning the eighth year of implementation for the first increment. State statute requires an evaluation of progress in meeting goals and objectives of the IMPs. From this evaluation, plans for a new 10-year increment of integrated management planning are developed.

The new stakeholder and associated planning process for the second increment of integrated management planning was initiated in 2015, and is expected to continue through 2019. This process incorporates an evaluation and revision of the basin-wide plan. Most coordination for IMP implementation occurs between the NRDs and the Department. However, for specific projects, additional coordination occurs with irrigation districts, canal companies, and other state agencies such as the Department of Environmental Quality, the Department of Roads, the Department of Health and Human Services, and the Nebraska Game and Parks Commission.

As the existing basin-wide plan and subsequent IMPs continue to be implemented over the next several years, Department staff will continue to supply technical and administrative support to develop, implement, and maintain planning efforts. Ongoing monitoring of the projects and their impacts on stream flows and groundwater levels make-up a significant section of each IMP. The Department supports monitoring activities by disseminating information, data, and the technical capabilities to analyze and use the existing hydrologic tools.

Interstate Agreements

Ongoing activities of implementation related to the interstate agreements are expected to continue as scheduled. Regular monitoring for compliance with the agreements will also

continue. For the North Platte Decree, regular coordination is carried out with the Bureau of Reclamation, the state of Colorado, and the State of Wyoming. Within Nebraska, the local irrigation districts and the North Platte NRD are contacted to coordinate on Decree meetings and any issues which impact their interests. As part of the interstate agreements, the Department supplies technical and administrative support for the development of projects according to the agreement schedules. The North Platte Decree Committees will continue an ongoing project to inventory and study irrigation practices and consumptive use along the North Platte River in Wyoming.

As a part of the Platte River Recovery Implementation Program (PRRIP), the Department works with the states of Colorado and Wyoming, the Bureau of Reclamation, the U.S. Fish and Wildlife Service, water users across the Platte River Basin, and environmental groups. The Department also holds regular meetings with the Nebraska Department of Environmental Quality, the Nebraska Department of Roads, the Nebraska Games and Parks Commission, and a downstream water users group which is composed of the five over-appropriated area NRDs, the Central Nebraska Public Power and Irrigation District, and the Nebraska Public Power District. The J-2 Regulating Reservoir Project, a large-scale water project being developed through PRRIP, has been put on hold due to factors that have impacted the implementation schedule. Thus, the PRRIP has reprioritized other ongoing water projects that have a shorter implementation schedule to a higher status, and is pursuing their implementation. These other projects share the same goal as the J-2 reservoir project, which is to improve state protected flows and target flows.

Conjunctive Management Projects

The Department and the NRDs in the over-appropriated area of the Upper Platte River Basin have been very active in implementing various management alternatives and projects to meet the goals and objectives of the IMPs. In many cases, the projects being implemented also meet the terms of PRRIP. Several conjunctive management projects are being developed and implemented in the Upper Platte River Basin. Conjunctive management projects involve the use of both surface water and groundwater resources to maximize water use and minimize negative impacts on stream flows and groundwater levels. In this way, availability and reliability of the regional water supply is increased. In other words, conjunctive management projects optimize use of the whole water supply. The NRDs have entered into agreements with canal companies to utilize the existing infrastructure of the canal systems so that stream flows in excess of system demands, as well as other transferred surface water rights, can be used to recharge the groundwater aquifers and increase base flow to the stream. As partners in the IMPs, the Department cooperates on these projects by providing technical, administrative, and monetary support. These efforts are expected to continue as the plans are implemented.

A significant source of funding for the activities in the over and fully appropriated areas of the Upper Platte River Basin is the Water Resources Cash Fund. $6.6 million dollars are allocated to this fund annually and a significant portion is utilized to meet the requirements of integrated management plans and interstate decrees, compacts or agreements in the Upper Platte Basin. Details on the projects and expenditures of the Water Resources Cash fund can be found in the annual report to the legislature for that cash fund.

# IX. Financial Summary Table

| | FY 2014 Actual | FY 2015 Actual | FY 2016 Actual | FY 2017 Budget | FY 2018 Budget | FY 2019 Budget |
|---|---|---|---|---|---|---|
| Personnel Services | $1,746,285 | $1,694,368 | $1,083,761 | $1,595,000 | $1,595,000 | $1,595,000 |
| Travel Expenses | $49,734 | $57,658 | $60,305 | $65,000 | $65,000 | $65,000 |
| Operating Expense – SOS Temporary Personnel | $81,138 | $89,550 | $139,444 | $240,000 | $240,000 | $240,000 |
| Operating Expense- Mgmt Consultant, Contractual Services and Engineering & Architectural Services | $2,104,041 | $1,782,382 | $2,049,539 | $1,000,000 | $1,000,000 | $1,000,000 |
| Equipment, Computer and Software | $68,370 | $152,533 | $71,838 | $91,000 | $91,000 | $91,000 |
| Operating Expense - Other | $337,300 | $391,082 | $507,457 | $600,000 | $600,000 | $600,000 |
| Capital Outlay/Fixed Assets Except Computer | $67,011 | $30,664 | $600,696 | $260,000 | $260,000 | $260,000 |
| Interstate Water Litigation | $591,808 | $649,055 | $467,512 | $600,000 | $300,000 | $300,000 |
| **TOTAL** | **$5,045,687** | **$4,847,292** | **$4,980,552** | **$4,451,000** | **$4,151,000** | **$4,151,000** |