

Building Strong Collaborative Relationships for a Sustainable Water Resources Future:

STATE OF NEBRASKA

SUMMARY OF STATE WATER PLANNING

U.S. Army Corps of Engineers
Civil Works Directorate
441 G Street NW
Washington, DC 20314-1000

December 2009

The findings contained in this report are based on the information collected from the literature search and interviews for this initiative and should not be construed as an official Department of the Army position, policy or decision unless so designated by other official documentation.

STATE OF NEBRASKA

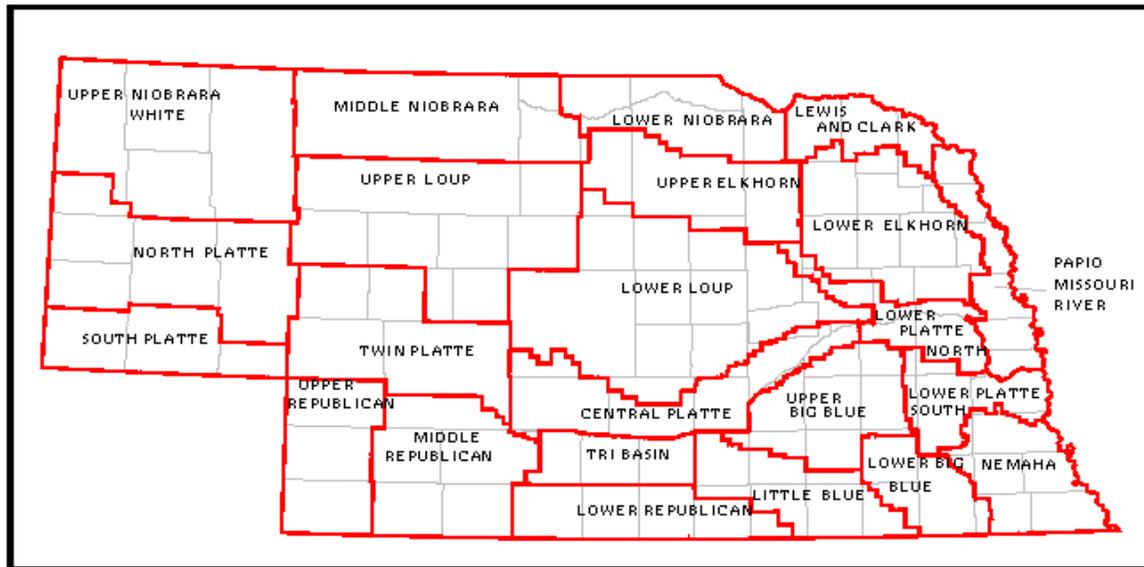


Figure 1. Map of Nebraska's 23 Natural Resource Districts

1. RESPONSIBLE STATE AGENCIES/REGIONAL ENTITIES

Nebraska does not have a single comprehensive state-wide water resources plan. There are several state-wide planning efforts for a variety of purposes that address water quantity, water quality and drought management which are highlighted below. The Nebraska Department of Natural Resources (DNR) is the state agency that is involved in a wide variety of water resources programs. The DNR has responsibilities in the areas of:

- Ground Water
- Surface Water
- Floodplain Management
- Dam Safety
- Natural Resources Planning
- Storage of Natural Resources and Related Data
- Administration of State Aid to Natural Resources Districts

Within the DNR the Natural Resources Planning and Assistance Division conducts the majority of the state's water resources planning and the Integrated Water Management Division leads agency efforts on Integrated Management Plans.

Key Agency Contacts:

Nebraska Department of Natural Resources
Pam Andersen, General Counsel, pamela.andersen@nebraska.gov

Steve Gaul, Supervisor, Planning and Assistance Division, steve.gaul@nebraska.gov

Mailing Address/Phone:

Nebraska Department of Natural Resources

P.O. Box 94676

Lincoln, NE 68509-4676

Phone 402-471-0583

Fax (402) 471-2900

<http://www.dnr.state.ne.us/>

The Natural Resource Districts (NRD) are also involved with water management in the state. The NRDs were created in 1972 to consolidate numerous small boards and districts with a variety of purposes relating to natural resources. The Districts have responsibility in the areas of:

- Soil conservation, erosion prevention and control
- Flood control and prevention of damages from flood water and sediment
- Water supply
- Groundwater use and conservation
- Pollution control
- Solid waste disposal and sanitary drainage
- Drainage improvement and channel rectification
- Development and management of fish and wildlife habitat
- Development and management of recreational and park facilities
- Forestry and range management

Each District is autonomous so has its own organization and structure. That means that resources planning is carried out differently in each District but each has responsibility for Integrated Management Plans, Ground Water Management Plans, Long Range Implementation Plans and Master Plans.

The Environmental Quality Council was established through the Nebraska Environmental Protection Act as the body that adopts rules and regulations which set air, water and land quality standards in order to protect the public health and welfare of the state. They adopt regulations that guide the activities and responsibilities of the Nebraska Department of Environmental Quality.

The Nebraska Department of Health and Human Services is responsible for regulation of public drinking water supplies in the State. The Nebraska Game and Parks Commission has a variety of water resource related responsibilities involving fish, wildlife and recreation, and the Conservation and Survey Division of the University of Nebraska serves as the State Geologic Survey.

Plans relating to fish and wildlife habitat and park and recreational facilities have to be in conformance with the any outdoor recreation plan for Nebraska and any fish and wildlife plan for Nebraska developed by the Nebraska Game and Parks Commission.

2. STATE/REGIONAL WATER PLANNING STATUS

Through legislation Nebraska has developed a proactive approach to water resources quantity management by working to anticipate and prevent conflicts between surface water and ground water users through annual reviews of river basins to determine the relationship between available supplies and current and future demands. The state recognizes the need for integrated ground water and surface water management and the components contributing to a more unified system of water management are beginning to emerge through the implementation of integrated management plans in basins whose water resources are declared “fully appropriated.”

In Nebraska, the Department of Natural Resources (DNR) regulates surface water and some aspects of ground water. Natural Resource Districts (NRD) regulate ground water. All Districts are required to have ground water management plans that contain information about supply, ground water quantity or quality problems as well as management objectives, a proposed reservoir life goal, ground water quality goals and solutions, and proposed controls. The current and potential impacts of this regulatory structure have been among the highest priorities of the DNR in recent years. In 2004 the Nebraska Water Policy Task Force, a forty-nine member group appointed by the Governor from a statutorily specified mix of organizations and interests to address conjunctive use and management issue inequities between surface water and ground water users, and water transfers/water banking. A significant accomplishment of this group was new legislation that sought to integrate the management of hydrologically connected surface and ground water resources in the state. As a result, Legislative Bill 962 (LB 962) was adopted and codified as part of the Groundwater Management and Protection Act.

The Natural Resources Planning and Assistance Division of the Department of Natural Resources assists in or conducts state-level planning work, provides assistance to other governmental units, provides statewide mapping and geographic information system analysis, provides a variety of technical assistance to the Director, and coordinates Departmental stream gaging efforts. The Division's duties and projects span a wide variety of topics and do not have a single discrete theme. Changing needs can also result in significant changes in many of the Division's projects and activities through time. The Division works closely with the Integrated Water Management Division in developing information.

State water planning activities are reviewed annually in the *Annual Report and Plan of Work*. The review process began in 1978 with the purpose of improving efficiency in Nebraska's state water planning efforts. The broad focus of the report is on providing information and alternative methods of addressing water policy issues and area-wide or statewide water resources problems, developing and maintaining the data, information, and analysis capabilities to provide a support base for water planning and management, project and program review, and providing the state with the capacity to plan and design water projects (DNR, 2008(c)).

Water Supply Planning

LB 962 under the Nebraska Ground Water Management and Protection Act states that NRDs in the state whose waters are determined to be overappropriated or fully appropriated must develop an integrated management plan (IMP) evaluating hydrologically connected water supplies. The Act also requires an annual evaluation of the expected long-term availability of hydrologically connected water supplies for every river basin, subbasin, or reach that has not initiated or implemented an IMP. Natural Resource Districts (Figure 1 below) are subdivided to correspond with the natural boundaries of the state's river basins to offer a better opportunity to deal with water resources issues that do not correspond to political jurisdictions. The key goal of each IMP will be to manage all hydrologically connected ground water and surface water for the purpose of sustaining a balance between water uses and water supplies so that the economic viability, social and environmental health, safety and welfare of the basin, sub-basin or reach can be achieved and maintained for both the near and long-term.

The Department of Natural Resources leads the development of the IMPs for Natural Resources Districts in Nebraska through its Division of Integrated Water Management. IMPs are prepared by the DNR and the Natural Resources District Board of Directors in accordance with Nebraska Revised Statute §§ 46-715 through 46-718. Comment and collaboration the public and with relevant stakeholders are also part of the IMP process. The Integrated Water Management Division (IWMD), a recently created division of the Nebraska DNR, was borne out of the implementation of LB 962 with the purpose of providing technical, planning, and interstate coordination staff to work with NRDs in carrying out integrated water management. The IWMD will work with NRDs to ensure compliance with statutes and interstate agreements and to manage the beneficial use of interconnected ground and surface water. According to the DNR website, there is one Division staff member assigned to be the lead contact with each Natural Resource Districts to work on integrated water management activities (DNR, 2009(c)). Within DNR there is a team for each river basin that has been determined to be fully appropriated or overappropriated.

Once the overappropriated or fully appropriated designation is applied, an Integrated Management Area (IMA) boundary must be established, an IMP must be developed within 3 to 5 years, and a temporary stay on new high capacity ground water well development, new surface water appropriations, and new irrigated acres is enforced. Any new approved uses of water in an IMA determined to be fully appropriated will require a variance from the Department or District and possibly an offset. An offset requires that for any new use that is allowed, a corresponding reduction in use is needed to offset the new use and maintain the streamflow as if the new use had never occurred. The IMPs do not require Districts to regulate ground water uses in place at the time of the DNR's preliminary determination that the river basin, subbasin, or reach is fully appropriated, but NRDs may voluntarily adopt such measures (Neb. Rev. St. 46-715).

At the end of Fiscal Year 08, 14 of the state's 23 NRDs had areas that had been declared fully appropriated or overappropriated (Annual Report, 2008). The connective nature of

the state's water resources requires that coordinated planning efforts be developed among Natural Resource Districts. In the overappropriated area, the five NRDs (North Platte, Central Platte, Twin Platte, South Platte, and Tri-Basin) that share the overappropriated area must work together to integrate their individual efforts to bring about a balance in reducing consumptive water use. They are required to adopt a basin-wide overappropriated integrated water management plan that addresses areas of the basin(s) that are overappropriated.

Ground Water Management

Nebraska has more ground water than any other state (Nebraska Association of Resource Districts, 2009(a)). As mentioned above, ground water regulations in Nebraska are primarily the responsibility of NRDs. The Ground Water Management Areas program is for regulation of both water quality and water quantity. When an Area is designated for water quality, a joint ground water monitoring and analysis effort between the Nebraska Department of Environmental Quality (DEQ) and the NRDs of the state is required. The DEQ collects and assesses data to determine if a correlation exists between land use practices and nonpoint contamination trends. The DEQ produces an annual report on the status of ground water to the Natural Resources Committee of the Legislature. When an Area is designated for ground water quantity issues such as dropping groundwater levels or conflicts between users, the Department of Natural Resources assists the NRDs with their efforts.

In order to better understand the interrelationships between ground water and surface water systems in the upper Platte River, the Nebraska Platte River Cooperative Hydrology Study (COHYST) was formed to generate data and numerical ground water flow models to be used in supporting regulatory and management decisions. In addition, data produced from a magnetic resonance sounding (MRS) study underway may be useful for application to COHYST models to enhance the overall decision making abilities of the NRDs and the Department. Another project currently underway, the South Central Nebraska/North Central Kansas LIDAR Project, will also produce data that will be available for use as appropriate. The USGS Nebraska Water Science Center also works with the DNR in developing models to understand the relationships between surface and ground water and in determining whether basins are fully appropriated. The Department and the NRDs have worked together to have models developed in many areas of the state to help manage hydrologically connected water supplies.

Water Quality Management

The Nebraska Department of Environmental Quality (DEQ) is the lead agency in matters pertaining to water quality in the state. The DEQ is required through the Clean Water Act to provide a surface water quality report every 2 years, known as the Section 305(b) Water Quality Report, which describes the status and trends of existing water quality for all waters of the state. The biennial report combines the Section 305(b) Water Quality Report and the requirements of the Clean Water Act Section 303(d) list in order to

provide a comprehensive summary of surface water quality that can be made available to the general public.

Natural Resources Districts oversee various water quality programs. Examples of NRD water quality programs include illegal water wells decommissioning programs, inspections pursuant to the Nebraska Chemigation Act, source water protection programs, and the application of soil and water conservation practices by establishing Groundwater Management Areas as discussed above. NRDs also have the legal authority to regulate certain activities which may contribute to ground water contamination in both rural and urban areas.

Drought Planning

Nebraska does have a plan in place to address droughts in the state. The Nebraska Climate Assessment Response Committee formally adopted the state Drought Mitigation and Response Plan on June 26, 2000. The intent of the plan is to provide the state government with, “an organizational structure to systematically address the impacts of drought in a more effective, timely and coordinated manner” (CARC, 2000). The objectives of the Nebraska Drought Mitigation and Response Plan are to:

- Collect, analyze, and disseminate timely and reliable drought-related data and information in a timely and systematic manner to the Governor and other interested persons.
- Identify sectors, communities, and population groups most at risk and work with those groups to determine mitigation and response programs to address these risks in advance of drought events.
- Determine appropriate triggers for the initiation and termination of drought mitigation and response programs.
- Provide an organizational structure that facilitates interagency cooperation and a delivery system that assures information flow to state and federal agencies and others.
- Define the duties and responsibilities of state and federal agencies, the University of Nebraska, and others in preparing for and responding to the impacts of drought.
- Compile and maintain an inventory of state and federal mitigation and response programs that can assist in lessening the impacts of and facilitating the recovery from drought.
- Develop and maintain an information delivery system, including a CARC web site, to keep the public informed of current drought conditions and potential mitigation and response actions.
- Perform other climate-related mitigation, assessment, and response functions as desired by the Governor (CARC, 2000).

3. WATER MANAGEMENT VISION AND GOALS

The goals of integrated management plans are to ensure a balance between water supplies and uses in the short- and long-term, and to protect the rights of existing users of surface water and ground water when possible. The key goal of the plan is to manage all

hydrologically connected ground water and surface water for the purpose of sustaining a balance between water uses and water supplies in an effort to maintain the economic viability, social and environmental health, safety, and welfare of the basin, subbasin, or reach for both the short and long term.

The first incremental goal of an IMP in the overappropriated portion of the Platte River basin will be to, “address the impact of streamflow depletions to (a) surface water appropriations and (b) water wells constructed in aquifers dependent upon recharge from streamflow, to the extent those depletions are due to water use initiated after July 1, 1997, and, unless an interstate cooperative agreement for such river basin, subbasin, or reach is no longer in effect, to prevent streamflow depletions that would cause noncompliance by Nebraska with such interstate cooperative agreement” (Neb. Rev. St. 46-715). Following the first incremental goal of the IMP, the IMP will also plan for reductions in current water use levels in order to attain the necessary balance between water use and water supply i.e. maintain a fully appropriated status (DNR, 2008(b)).

The overarching goal of all NRDs is to respond to the natural resource issues of the State of Nebraska at a local level with local control and local solutions. Accomplishing this goal, however, requires coordination and assistance with a variety of partners including the Nebraska Departments of Natural Resources and Environmental Quality, the USDA Natural Resources Conservation Service, the Nebraska Natural Resources Commission, other state and federal agencies, municipalities, counties, and private organizations.

4. SCOPE OF WATER RESOURCE PLANNING

The number of river basins declared as fully appropriated have been designated. These areas are major water resources planning and management priorities in the State of Nebraska. Figure 2 below shows the areas of fully appropriated and overappropriated surface water respectively as of July 2008.

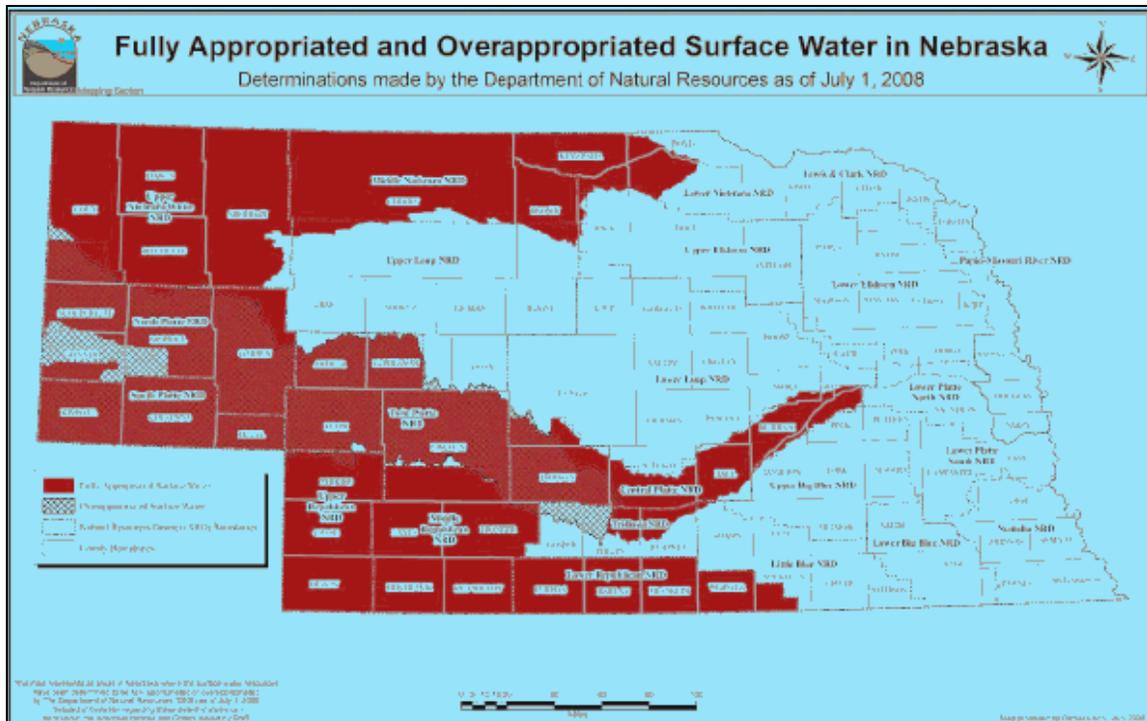


Figure 2. Map of the State of Available Water Supplies in Nebraska as of July 2008 (DNR, 2008(e))

A primary focus of an integrated management plan is to understand the supply of water in a hydrologically connected surface water and ground water system to be able to control water use in a way that maintains the balance of a fully appropriated basin. Hydrologically connected ground water areas are defined as the areas in which, “pumping of a well for 50 years will deplete a river or base flow tributary thereof by at least 10 percent of the amount pumped in that time”(DNR, 2007). A fully appropriated basin is one in which current uses will in the reasonably foreseeable future cause: “(a) the surface water supply to be insufficient to sustain over the long-term the beneficial or useful purposes for which existing natural flow or storage appropriations were granted and the beneficial or useful purpose for which, at the time of approval, any existing instream appropriation was granted, (b) the streamflow to be insufficient to sustain over the long-term the beneficial uses from wells constructed in aquifers dependent on recharge from the river or stream involved, or (c) reduction in the flow of a river or stream sufficient to cause non compliance by Nebraska with an interstate compact or decree, other formal state contact or agreement, or applicable state or federal laws” (Neb. Rev. Stat. § 46-713(3)).

As part of an integrated management plan addressing hydrologically connected surface water and ground water, consideration must be given to protect existing users. Therefore, the IMPs include a comprehensive water monitoring system that helps to identify water supplies that could provide water for a new use without compromising an existing user. If no additional supplies are identified, new users must offset their water use or share in the available groundwater supply correlatively.

When hydrologically connected surface and ground water do not coincide to a single NRD, the DNR and the NRDs must cooperate with each other. In the overappropriated area, the NRDs must coordinate to jointly develop a basin-wide plan for the area designated as overappropriated. The basin-wide plan shall be adopted after hearings by the DNR and the affected NRDs. Section 46-703(4) of the Nebraska Legislature states that authority in such instances is to be exercised jointly and uniformly by agreement of the respective boards of all Districts affected.

Natural Resource Districts

Certain water resources programs and planning are implemented at the NRD level. Each of the twenty-three NRDs has a master plan, a long range implementation plan, and a ground water management plan. Obviously, these are not state-wide comprehensive plans. These provide the local direction for water and other natural resource related activities. Each NRD sets its own priorities and develops its own to best serve the local needs. Programs are carried out through the partnership with state and federal agencies, cities, counties, and extension offices. In addition NRDs offer a variety of programs to educate both adults and children about conservation and natural resources. The Nebraska Association of Resources Districts (NARD) coordinates the efforts of individual NRDs to collectively accomplish overlapping goals.

NRDs may establish Ground Water Management Areas to address problems relating to quantity, quality, or integrated management of surface water and ground water. NRDs can exercise various controls over management areas including:

- Allocation of withdrawals
- Rotation
- Reduction of irrigated acres
- Limit or prevent the expansion of irrigated acres
- Well spacing
- Metering and monitoring
- Use of BMPs
- Chemical/fertilizer analysis of water or deep soil
- Mandatory education
- Moratorium on new wells
- Other reasonable rules and regulations

Water Supply

The need to integrate surface and ground water management is closely related to the potential economic impact of improperly managed water resources, especially the future development of agriculture in the state. The demand for irrigation wells in Nebraska has risen steeply in the past (Figure 3). Recognizing this relationship LB 54 introduced into the 2009 Nebraska Legislature provided additional authority for NRDs and the DNR to track and administer the depletions and gains to stream flows from new, returned, or other changes to uses within the river basin (Nebraska Association of Resource Districts,

2009(b)). This will help to identify potential water available to mitigate new uses and outline plans for consultation with irrigation districts, public power and irrigation, reclamation districts, municipalities, other political subdivisions, and other water users to make water available to use as an offset to enhance and encourage economic development opportunities.

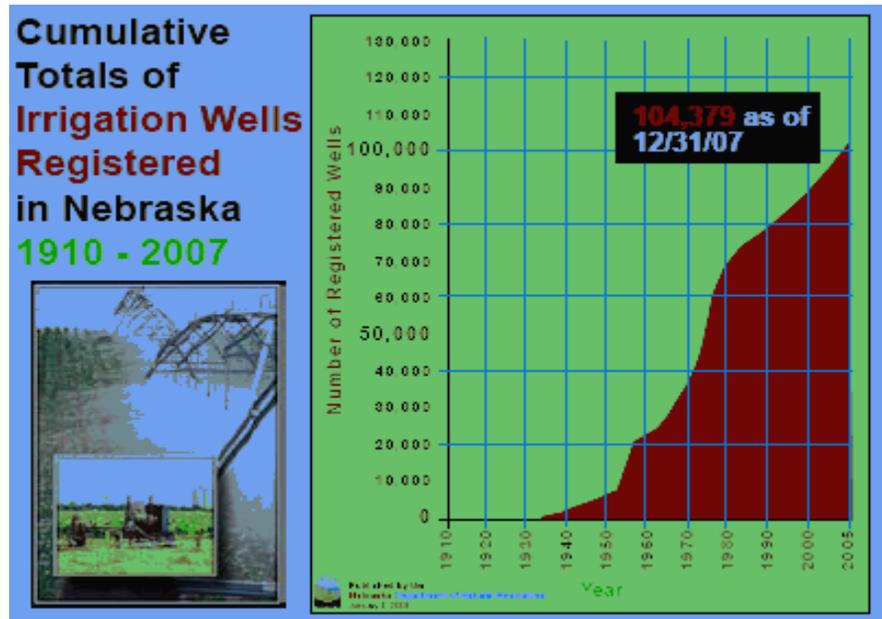


Figure 3. Trends in Registered Irrigation Wells in Nebraska (DNR, 2008(d))

As part of the overappropriated basin-wide planning effort in the Platte River, the DNR and NRDs must conduct an analysis of the gaps between available water supplies and the level of water withdrawals that would satisfy a “fully appropriated” designation. This analysis shall take into account cyclical supply, including drought, identify the portion of the overall difference between the current and fully appropriated levels of development that is due to conservation measures, and identify the portions of the overall differences between the current and fully appropriated levels of development that are due to water use initiated prior July 1, 1997, and to water use initiated on or after such date.

Water Quality

The following list summarizes the Legislative findings related to water quality in determining the need for requiring the NRDs to establish Groundwater Management Areas for water quality. (Rules and Regulations, 2005):

1. The levels of nitrate nitrogen and other contaminants in ground water in certain areas of the state are increasing.
2. Long-term solutions should be implemented and efforts should be made to prevent the levels of ground water contaminants from becoming too high and to reduce high levels sufficiently to eliminate health hazards.
3. Agriculture has been very productive and should continue to be an important industry to the State of Nebraska.

4. Natural resources districts have the legal authority to regulate certain activities and, as local entities, are the preferred regulators of activities which may contribute to ground water contamination in both urban and rural areas.
5. The Department of Environmental Quality should be given authority to regulate sources of contamination when necessary to prevent serious deterioration of ground water quality.
6. The powers given to districts and the Department of Environmental Quality should be used to stabilize, reduce, and prevent the increase or spread of ground water contamination.
7. There is a need to provide for the orderly management of ground water quality in areas where available data, evidence, and other information indicate that present or potential ground water conditions require the designation of such areas as management areas.

Water quality issues in Nebraska are generally related to those that result from agriculture including nonpoint source pollution from agriculturally-based chemicals. The DEQ is responsible for the adoption of standards for pesticides in surface water and ground water and has the power to establish levels for imposition of progressively more rigorous management practices as pesticides are detected in ground water or surface water at increasing fractions of the standards adopted by the DEQ or the Department of Health and Human Services.

Instream Uses

The Nebraska Game and Parks Commission and Natural Resources Districts may hold instream flow appropriations for instream uses for fish, wildlife and recreation (Neb. Rev. Stat. Sections 46-2,107 et.seq.)

Nebraska law requires all state agencies including the DNR to consult with the Game and Parks Commission before taking any action that may jeopardize the continued existence of threatened or endangered species. Neb. Rev. Stat. Section 37-807.

The Central Platte River has been identified as important habitat for 3 threatened/endangered birds (Whooping Crane, Least Tern, and Piping Plover). A creative voluntary program was recently finalized to allow the effected states and the federal government to cooperate in effort to address the needs of the 3 species. Under the Platte River Recovery and Implementation Program Nebraska, Colorado, Wyoming, and the federal government are working together to mitigate, offset, or prevent negative impacts to Platter River target flows that have been identified by the U.S. Fish and Wildlife Service (Annual Report, 2008).

5. PARTNERSHIPS, STAKEHOLDER, AND PUBLIC INVOLVEMENT

Federal Partnerships

The DNR maintains cooperative relationships with federal agencies concerning the state's water management issues. The Department is in close contact with the Bureau of Reclamation on water supply issues and stays in close contact with the Corps of Engineers and the Federal Emergency Management Agency on flood-related matters (Christensen, 2007). The State of Nebraska is a part of the Platte River Recovery and Implementation Program and the Department works with the U.S. Fish and Wildlife Service on matters dealing with water management and habitat protection. The Nebraska Emergency Management Agency (NEMA) provides the coordination and cooperation mechanisms needed between federal, state and local units of government in times of flood and drought. The Nebraska Ice Reporting Network and the Governor's Task Force on Disaster Recovery are two initiatives coordinated by NEMA to ensure interagency cooperation during and after emergencies. The DNR cooperatively operates some stream gages with the U.S. Geological Survey and the data is useful for planning activities. DNR has also contracted with USGS for work on model development and for research activity.

State Agency Partnerships

The DNR maintains partnering relationships with a variety of state agencies in the water planning process. Specifically, the DNR partners with the Game and Parks Commission, the Department of Agriculture, the Department of Health and Human Services, the Department of Environmental Quality, the University of Nebraska Water Center, and the Conservation and Survey Division of the University of Nebraska.

State and Regional Partnerships

Nebraska is a partner in the Missouri River Basin Association (MRBA). The stated mission of the MRBA is, "The Missouri River Basin Association addresses water-related issues and promotes effective water and environmental policy decisions regarding the Missouri River Basin. MRBA works with and coordinates communication among the basin's states, Indian tribes, federal agencies and stakeholders to enhance the basin's economic and environmental resources" (MRBA 2009).

Nebraska partners with Colorado and Kansas in the Republican River Compact. This compact provides for the equitable apportionment of the "virgin water supply" of the Republican River Basin between the states.

Nebraska works with Colorado and Wyoming and the United States in the basin-wide Platte River Recovery Implementation Program in managing the Platte River for the health of the ecosystem and people that depend on it. The plan focuses specifically on enhancing, restoring, and protecting critical habitat for endangered species (Platte River Recovery Implementation Program, 2009).

Nebraska works with the State of Kansas on the Blue River Compact, the State of Wyoming on the Upper Niobrara River Compact, and the states of Wyoming and Colorado at implementing the North Platte Decree.

Stakeholder Involvement

Several of the Districts have formed stakeholder advisory groups comprised of citizens representing a variety of interests including irrigation districts, reclamation districts, public power and irrigation districts, mutual irrigation companies, canal companies, municipalities, ground water and surface water irrigators, economic development, banking, environmental, and industrial (Kurtz, 2006).

Public Involvement

The Nebraska Open Meetings Act guarantees that every meeting of a public body shall be open to the public. The Nebraska Department of Natural Resources website makes notices of public meetings, legal notices, and water-related news in the state easily accessible through its website. A schedule of meetings and hearings are also listed on the website (DNR, 2009(b)).

According to Nebraska Revised Statute 46-718, once the goals and objectives, geographic scope, and controls and incentives of an integrated management plan have been reached one or more public hearings shall be scheduled within 45 days of the agreement at a location “within or in reasonable proximity to the area to be affected by implementation of the integrated management plan” to take testimony on the proposed IMP.

6. PLAN IMPLEMENTATION STRATEGY

The Nebraska State Water Planning Review Process focuses on a broad review and summary of the work completed during the previous fiscal year and develops a budget for future fiscal years (this process is not simply a review of a “state water plan”; as previously mentioned Nebraska does not have a single state water plan document). The process allows for the Legislature as well as the public to have information addressing important water policy issues statewide, provides coordinated interagency reviews of water programs and projects, develops and maintains the data, information, and analysis needed to support water planning and management activities, assists the state in planning and designing water resources projects, and assists the Department to conduct any other planning activities necessary to protect and promote the interests of the state and its citizens in the water resources of Nebraska (DNR, 2008(c)).

The most recent Annual Report (2008) pays considerable attention to the activities of interrelated water management under LB 962. In total, nearly \$8 million have been budgeted for efforts related to LB 962 for Fiscal Years 2008 to 2009. The funds are to be used for various purposes including incentives for water use reduction in fully or overappropriated areas, additional staff and supply for DNR management and planning,

contract funds for needed studies, and assistance to NRDs (DNR, 2008(c)). The report also emphasizes the need to maintain and enhance technologically-based tools in effectively addressing the water resources needs of the state. For instance, the report mentions models developed from the Cooperative Hydrology Study to better understand hydrological, geological, and climatological conditions and the effects on ground and surface water, and GIS data to enable a more informed planning decision making and provide for data dissemination that is dynamic and up to date.

7. OUTCOMES ASSESSMENT

Annual reviews of the long-term availability of hydrologically connected water supplies take place for every river basin, subbasin, or reach that does not have an IMP. The 2009 *Annual Evaluation of Availability of Hydrologically Connected Water Supplies* examined the long-term water supplies of the Blue River, Lower Niobrara, Lower Platte, and Missouri Tributary River Basins. Four NRDs have significant area in the Blue River Basin, the Lower Niobrara contains two, the Lower Platte has seven, and the Missouri Tributary has four. The evaluation found that the Blue River, Lower Niobrara, and Missouri Tributary Basins are not fully appropriated, while upstream of the confluence with the Missouri River, the basins of the Lower Platte are fully appropriated.

Under the Clean Water Act (Section 303(d)), the DEQ must report on the status of water quality every 2 years in the Section 305(b) Water Quality Report. It provides a comprehensive summary of surface water quality.

In accordance with Nebraska Revised Statute 46-715, during the ten years following the adoption of an IMP in the overappropriated portion of the state or during the ten years after the adoption of any subsequent increment of the IMP, the DNR and NRD shall conduct a technical analysis of the actions taken to determine the progress toward meeting the goals and objectives adopted. Examined in the analysis will be available supplies and changes in long-term availability, the effects of conservation practices and natural causes, including, but not limited to, drought, and the effects of the plan on reducing the overall difference between current and fully appropriated levels of development identified.

8. NEEDS, CHALLENGES AND CRITICAL PRIORITIES - INTERVIEW INSIGHTS

Many of Nebraska key needs, challenges and priorities have been discussed in the above summary. A few highlight from discussion with Nebraska staff are provided below.

The state of Nebraska is currently focusing on those data and water management needs that are most important to the citizens. Demographics are not a major driver for the state. Water use and accounting are a key focus, especially integrated surface and ground water management. Broader general statewide planning has been considered but given current trends in Nebraska and available resources it is not an immediate need or priority.

Prospects for more general planning may rest in part on perceptions of cost effectiveness given other budget priorities.

The state has faced significant drought over the last 7 to 10 years. The prolonged drought has been a challenge and has played a role in litigation between Nebraska and Kansas. Drought planning and assistance is helpful and the Bureau of Reclamation has provided drought assistance to the state.

Legislative changes have helped address some of the conflicts associated with drought and regulation of ground and surface water. Water markets are needed to help address current and future water needs and uses. The ability to create functional water markets is a key tool needed to allow water to move more easily from the source of supply to areas of demand; on a willing buyer seller basis.

In regard to trends and future challenges the following observations are provided:

- Biofuels are a water use factor but are affected by a number of market conditions; this certainly raised question about the water energy nexus.
- Hydropower operations have faced significant challenges from the standpoint of federal threatened and endangered species questions and competing uses.
- The main urban growth areas tend to be in eastern Nebraska where surface water supplies are more abundant.
- Agricultural efficiency projects have raised concerns over increased consumptive use and impacts to return flows and operation storage facilities such as Lake McConaughy.
- Better integrated surface and groundwater management will be a current and future focus.
- Vegetative management and control of invasive species is needed to conserve water and reduce water conveyance losses. Further research is needed to better characterize water savings involved and best practices.
- There is a statewide need for accurate and detailed water measurement and full funding of USGS gauging program will help address this need.
- Federal government emphasis should be on providing technical assistance to states rather than policy. . Possible areas of support include vegetative management and invasive species control, satellite imagery, and tools to help characterize water use and balance.
- Continue cooperation between the state and NRDs will help address future challenges.

9. REFERENCES

Much of the language and information in this summary comes directly from reports published by the Nebraska Department of Natural Resources.

Christensen, Senator Mark. 2007. "Questions for Natural Resources Committee's Interim Studies Hearing: LR 174". Department of Natural Resources Proposed Testimony, July 31, 2007. Retrieved January 29, 2009 from

http://www.dnr.ne.gov/legal/docs/LR174_DNR_Testimony.pdf

DNR. Integrated Management: Approved Plans. Retrieved January 29, 2009(a) from

http://www.dnr.state.ne.us/LB962/docs/IMP_approvedplans.html

DNR. Integrated Management: Meetings and Notices. Retrieved February 2, 2009(b) from <http://www.dnr.state.ne.us/LB962/docs/meetings2.html>

DNR. 2008(a). 2008 Biennial Report on the Nebraska Resources Development Fund. Retrieved February 2, 2009 from

http://www.dnr.state.ne.us/rdfund/2008_BiennialReport.pdf

DNR. 2008(b). 2009 Annual Evaluation of Availability of Hydrologically Connected Water Supplies: Determination of Fully Appropriated. 16 December, 2008.

DNR. 2008(c). Annual Report and Plan of Work for the Nebraska State Water Planning and Review Process. Submitted to the Governor and Legislature by the Director of Natural Resources, September 2008. Retrieved January 30, 2009 from

<http://www.dnr.state.ne.us/AnnualReport/ANNREPORT2008.pdf>

DNR. 2008(d). Fully Appropriated Surface Water in Nebraska: Determination made by the Department of Natural Resources on July 16, 2004. Retrieved January 29, 2009 from

http://www.dnr.state.ne.us/LB962/Maps/FullyAppropriated_SW_0704.pdf

DNR. 2008(e). Nebraska Resources Newsletter. Issue 27, April 2008. Retrieved January 30, 2009 from http://www.dnr.ne.gov/dnrnews/news2008/April2008_Rev.pdf

DNR. 2008(f). Nebraska Resources Newsletter. Issue 29, November 2008. Retrieved January 29, 2009 from <http://dnr.ne.gov/dnrnews/news2008/November2008.pdf>

DNR. 2008(g). Overappropriated Surface Water of Nebraska: Designated by the Department of Natural Resources on September 15, 2004. Retrieved January 29, 2009 from http://www.dnr.state.ne.us/LB962/Maps/Overappropriated_SW_0904.pdf

DNR. Planning and Assistance. Retrieved January 29, 2009(c) from

<http://dnr.ne.gov/docs/compplan.html>

Kurtz, Tina. 2006. "Development of Joint Integrated Management Plans Continues". From Nebraska Resources Newsletter. Issue 20, June 2006. Retrieved January 29, 2009 from <http://www.dnr.ne.gov/dnrnews/news2006/June2006.pdf>.

MRBA. Missouri River Basin Association. Retrieved January 29, 2009 from <http://www.mrba-missouri-river.com/>

Nebraska Association of Resource Districts. Water. Retrieved January 30, 2009(a) from http://www.nrdnet.org/nrd_programs/water.html

Nebraska Association of Resources Districts. Retrieved January 30, 2009(b) from http://www.nrdnet.org/news_events/leg_update_pdfs/January%209,%2009edited.pdf

Nebraska's Climate Assessment Response Committee (CARC). 2000. Drought Mitigation and Response Plan. Adopted June 26, 2000. Retrieved January 29, 2009 from <http://carc.agr.ne.gov/docs/NebraskaDrought.pdf>.

Nebraska Revised Statute 37-807. Retrieved February 2, 2009 from <http://www.nebraskalegislature.gov/laws/statutes.php?statute=s3708007000>

Platte River Recovery Implementation Program. Retrieved February 2, 2009 from <http://platteriverprogram.org/default.aspx>

Rules and Regulations Ground Water Management Area and the Integrated Management Plan.2005. For the Middle Republican Natural Resources District and the Nebraska Department of Natural Resources. Retrieved January 30, 2009 from <http://www.dnr.ne.gov/LB962/NRD/MiddleRep/TitleAndTOC.pdf>