

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

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I. PLANNING AND REVIEW PROCESS ACTIVITIES

A. PROVIDE INFORMATION AND ALTERNATIVE METHODS OF ADDRESSING WATER POLICY ISSUES AND AREA WIDE OR STATEWIDE WATER RESOURCES PROBLEMS

- 1) Implementation of LB 962
- 2) Platte River Cooperative Agreement Studies
- 3) Republican River Basin Activities
- 4) Platte River Cooperative Hydrology Study
- 5) Floodplain Planning
- 6) Water Decision Support System
- 7) Blue Basin Supply Augmentation Study
- 8) Lower Platte River and Tributaries Feasibility Study
- 9) Lower Platte River Corridor Alliance
- 10) Lower Platte Cumulative Impacts Study
- 11) Environmental Education Activities
- 12) Frenchman Valley Study

B. DEVELOP AND MAINTAIN THE DATA, INFORMATION AND ANALYSIS CAPABILITIES TO PROVIDE A SUPPORT BASE FOR WATER PLANNING AND MANAGEMENT

- 1) Water Rights Digitizing
- 2) Flood Prone Area Mapping
- 3) National Hydrography Dataset
- 4) Creation of Nebraska Geospatial Data Center and Metadata Clearinghouse
- 5) Soil Survey Digitization
- 6) Watershed Boundary Delineation
- 7) Nebraska Rainfall Assessment and Information Network (NeRAIN)

C. PROJECT AND PROGRAM REVIEW ACTIVITY

- 1) Water Policy Task Force Activity
- 2) NRDF Reviews
- 3) Climate Assessment and Response Committee
- 4) Environmental Trust Committee
- 5) GIS Steering Committee
- 6) Other Activity

D. PROVIDE THE STATE WITH THE CAPACITY TO PLAN AND DESIGN WATER PROJECTS

II. INTRODUCTION

The Nebraska State Water Planning and Review Process was initiated in 1978 to redirect and accelerate Nebraska's water planning efforts. This Annual Report and Plan of Work summarizes work completed as part of that process in FY 2006 and presents a work program and budget for future fiscal years. This is a report of the Director of Natural Resources and is submitted in compliance with Nebraska Revised Statutes Sec. 2-15106. Section 2-1599 of the statutes directs that the process shall be designed to: 1) provide the Legislature and the 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 most important and high profile water planning activity that took place in FY 2006 was work towards implementation of LB 962, the major water legislation passed during the 2004 session of the Unicameral. Nebraska Department of Natural Resources (DNR) staff engaged in the State Water Planning and Review Process activity provided support, information and major work on implementation. Major NDNR staff support was provided through the agency's Director, Assistant Director, Legal Division and Planning and Assistance Division. Implementation of LB 962 provisions will be a major activity for both NDNR staff and Natural Resources District (NRD) staff in future years. Two major aspects of that activity will be annual reports evaluating hydrologically connected water supplies and compilation of joint integrated management plans. On December 30, 2006 the Department issued the *"2006 Annual Evaluation of Hydrologically Connected Water Supplies"* in response to statutory requirements. One Planning and Assistance Division staff member works closely with Natural Resources Districts on development of joint management plans.

Another focus of the State Water Planning and Review Process has been on natural resources information management. Work has been closely coordinated with the work of the Information Technology Division to produce a variety of maps and other information useful in addressing the state's natural resources problems. Geographic information systems (GIS) and computer assisted data manipulation and modeling continue to be an integral part of the long range planning and management of the state's water and soil resources. The work items in this report continue to reflect that emphasis.

The State Water Planning and Review Process work items related to information management are found primarily in Section B. Some of the information management products and activities found in this report are co-products of the Department's Information Technology Division and the Planning and Assistance Division. This is a report of planning activities and includes no programmatic information about Information Technology Division initiatives. However, the Information Technology Division does have a major role in most of the information management/basic planning activities listed. Other divisions of the Department also participate in

planning activities. For instance, the Floodplain Management and Dam Safety Division conducts floodplain planning activities and the agency's Legal Division is the agency lead in Platte River Cooperative Agreement activities.

Planning and review process activities are organized into the major statutory planning categories listed above. Within these categories, activities are listed roughly in the order of staff time and other non-financial support required.

III. STATUS REPORT ON COMPLETED AND ONGOING WORK

A. PROVIDE INFORMATION AND ALTERNATIVE METHODS OF ADDRESSING WATER POLICY ISSUES AND AREA WIDE OR STATE WIDE WATER RESOURCES PROBLEMS

1) Implementation of LB 962

General

LB 962 as passed in the 2004 session of the Unicameral gave the Department of Natural Resources new responsibilities in several categories – water rights transfers, identification of overappropriated or fully appropriated basins, reports evaluating hydrologically connected water supplies, and joint plans for integrated management of surface water and groundwater. Both the NDNR responsibilities on Integrated Management Plans and on reports evaluating hydrologically connected water supplies are largely planning functions. In addition NDNR has initiated longer term studies to provide information needed for both fully appropriated determinations and integrated management planning efforts.

Funding

The combined FY 2006- FY 2007 appropriation for LB 962 implementation activities from the 2005 session of the Unicameral was about \$7.5 million. In the 2006 session of the Unicameral an additional \$3.9 million was appropriated for FY 07 with about \$2.6 million of that amount set aside specifically for Republican River water leasing programs. The budgeted funds were/are to be used for a number of purposes, including incentives for water use reduction in fully and overappropriated areas, additional staff and supplies for DNR management and planning, contract funds for needed studies, and assistance to natural resources districts in the area subject to the cooperative agreement. In addition to the above mentioned funding, \$2.5 million per year for two years was appropriated for an interrelated water management plan program to be administered by the Natural Resources Commission to provide funding for natural resources district management activities.

In FY 2006 the newly available funding was used to hire a Legal Division staff member, a geologist in the Planning and Assistance Division, and a Water Administration Division staff member. Three additional staff are also expected to be hired in 2006, likely: a senior groundwater modeler, a groundwater modeler, and an additional water administration staff

member. As of this report the Department of Natural Resources also has \$1,076,255 committed or expended for contract studies needed for LB 962 implementation.

LB 962 Related Studies

As of June 30, 2006 the following studies were either underway or had been completed in the previous year. The studies are primarily being completed through contracts or memorandums of agreement and are intended to assist in either evaluating the availability of hydrologically connected water supplies or in providing information that will be needed for integrated management plans.

- 1) Studies of Specific Yield, Transmissivity, Hydraulic conductivity, and Development of Basin Atlases – UNL and Central Platte Natural Resources District. DNR funding total \$186,235. Due Date: Final Study 6/30/07; some components already complete.
- 2) Platte River Land Use Study – UNL. DNR funding total: \$214,665. Due Date: 12/9/06. Note: this is funded through non LB 962 related sources.
- 3) Land Use – Remainder of the State – UNL Center for Applied Land Management Technology (CALMIT). DNR Funding Total \$282,652. Due Date: 7/25/07.
- 4) Box Butte County Study / Niobrara Hydrologic Model and Study of Aquifer-Stream Interaction in Upper Niobrara – UNL. DNR Funding Total: \$84,572. Due Date: 7/1/06 and 9/30/06.
- 5) Consumptive Use Research – UNL. DNR Funding Total \$8,000. Completed: 12/30/05.
- 6) Future NDNR COHYST Study and Future COHYST Model Maintenance – Hydrology Sponsors.
- 7) Loup/Elkhorn Groundwater Model – USGS, Upper Loup NRD and Lower Loup NRD. NDNR Funding Total: \$245,000 and \$25,000 apiece to be paid by each NRD.
- 8) Conjunctive Use Study – Central Platte NRD and Nebraska Public Power District. NDNR Funding Total: \$6,535.
- 9) Blue Basin Supply Augmentation Study – U.S. Bureau of Reclamation, Little Blue NRD and Lower Big Blue NRD. Due Date 6/30/07.

2006 Annual Evaluation of Hydrologically Connected Water Supplies

On December 30, 2005 the Department published the “2006 Annual Evaluation of Availability of Hydrologically Connected Water Supplies”. The report was required to reach a conclusion on whether any additional basins were fully appropriated and describe any areas determined to be hydrologically connected to the previously declared fully appropriated portion of the Platte Basin.

The report was the first annual evaluation of the expected long term availability of hydrologically connected water supplies, including fully appropriated status. As a general concept, in a fully appropriated basin uses of both surface water and hydrologically connected groundwater supplies are equal to but do not exceed the available supplies over the long term. A fully appropriated determination results in a temporary stay on new high capacity well development in a basin, new surface water appropriations, and new irrigated acreage and requires the NRD and DNR to begin work on a joint integrated management plan.

In addition to the preliminary determinations, the report provides information on the nature and extent of water use in each basin, the areas considered to be hydrologically connected to the fully appropriated Platte River was also analyzed. The report also contains over 700 pages including appendixes and over 400 figures depicting hydrology, geology, precipitation and water use in the affected basins. The report is required on an annual basis by statute. Planning and Assistance Division staff compiled the report utilizing a variety of hydrologic, water use and water rights information as well as other related data. Major assistance was provided through the NDNR Legal Division. The next report is due no later than the end of December 2006.

Integrated Management Plan Activity

Of the nine natural resources districts involved in the LB 108 process on July 16, 2004, when LB962 went into effect, three of those districts, Lower Republican, Middle Republican, and Upper Republican, have a completed integrated management plan (IMP) in place. The remaining six NRDs, Upper Niobrara White, North Platte, South Platte, Twin Platte, Central Platte, and Tri-Basin, are currently working with the Department and stakeholder groups on the development of an IMP. In addition, the five Platte Basin NRDs which are overappropriated, North Platte, South Platte, Twin Platte, Central Platte, and Tri-Basin, are working with DNR and a group of stakeholders on development of a basin-wide plan. Both the IMP and the basin-wide plan are joint plans which are adopted by the applicable NRD(s) and the Department. The Planning Division has one staff member who spends 80 to 90 percent of her time working with the IMP/basin-wide planning process.

Due to the new determinations of fully appropriated areas, the Department will continue working with the Tri-Basin NRD on their IMP and will begin the IMP process with the Upper Big Blue NRD later this year.

2) Platte River Cooperative Agreement Studies

On July 1, 1997 the governors of Nebraska, Colorado and Wyoming and the U.S. Secretary of Interior signed a cooperative agreement outlining a proposed basin wide recovery implementation program (program) for endangered species in the Central and Lower Platte Basins. Jim Cook, legal counsel for the department has served as the state representative on the governing body for the agreement since the August, 2005 resignation of Roger Patterson as Director of Natural Resources. The program proposes to reduce shortages to U.S. Fish and Wildlife Service "target flows" and provide additional land habitat for endangered species in the Lexington to Chapman reach of the river. The reduction in shortages to target flows is to be realized in part by: (1) operating Kingsley Dam and related facilities in Nebraska to store a portion of the inflows to Lake McConaughy as well as environmental water made available from upstream projects in an environmental account that is managed by the USFWS (this portion of the program is already in operation because of licensing requirements of the Federal Energy Regulatory Commission and releases have been made from that account starting in the summer of 2000), (2) modifying Pathfinder Reservoir in Wyoming to store water in another environmental account to be similarly managed, and (3) constructing and operating the Tamarack Project in Colorado; that project will utilize excess flows when available

for groundwater recharge which will return to the river at times when flow shortages are more likely.

The three projects listed in the previous paragraph will only supply a portion of the needed average annual 130,000 to 150,000 acre feet of target flow shortage reduction. The remainder would need to be obtained through additional water conservation and water supply projects. A Water Action Plan that identifies potential projects in all three states to achieve the remaining water objective has been prepared. No projects will be implemented until additional assessments of their feasibility and impact have been completed. Those assessments will occur during the course of the program if it is, in fact, initiated.

On the land habitat side, the proposed program would provide for 10,000 acres of suitable habitat by the end of the first thirteen-year increment. Interests in land could be acquired through title, easements or leases but no eminent domain would be used. Taxes would continue to be paid on the land whether or not the recorded owner was tax exempt.

The primary agency work on the Cooperative Agreement has been handled through the Acting Director of Natural Resources and the agency legal counsel, none of which are part of the Planning and Assistance Division. However, Planning and Assistance Division staff have frequently worked with, and are expected to continue to work with, those staff members and others on various activities relating to the agreement.

An additional responsibility under the agreement is for each state to mitigate, offset or prevent any new depletions to the river's target flows as part of the proposed program. This responsibility, which must now be carefully coordinated with the LB962 planning activities described above, requires each state to develop a mitigation plan that will allow new uses of both surface water and hydrologically connected groundwater to begin only as long as the impacts to the target flows are offset. Nebraska's new depletion plan was developed by a group of Nebraskans, most of whom represent organizations that either would be responsible for implementing the plan or constituents that would be most affected by the plan. The group was led by Jim Cook. The plan was approved by the Governance Committee in late 2005.

Implementation of the new depletion plan will depend on use of the Cooperative Hydrology Study (COHYST) models discussed elsewhere in this document and through adoption of regulations by the boards of several Natural Resource Districts.

The budget adopted by the Legislature for FY 2004 and FY 2005 included funds for a study designed to help the Governor (and the state in general) better understand the significance of entering into a Platte River Program once formulation of that Program is complete. That study, a survey of land use in the Platte River Basin, was delayed until calendar year 2005 because of changes in program scheduling. Similar studies also were conducted for 1997 and 2001. The 2005 study has now been completed, land uses for 1997, 2001, and 2005 have been compared to determine the extent to which the number of irrigated acres has changed since 1997, and the COHYST models and other information have been used to determine how that increase in irrigated acres is affecting and will later affect flows in the Platte. The amount, timing and location of water needed to offset for depletions caused by new uses of hydrologically connected groundwater that

were begun between July 1, 1997 and December 31, 2005 is now being determined. Those are the depletions for which, under the new depletion plan, the state is solely responsible for offsetting. Those offsets are to be in place by the end of calendar year 2008. The cost of providing those offsets is still subject to revision but is currently estimated as follows:

Funds were also appropriated for FY2004 (\$200,000), FY2005 (\$400,000), FY2006 and FY2007 (\$400,000 each year) to assist the seven Natural Resources Districts involved in preparing for and implementing the Nebraska new depletion plan. Agreements that establish each NRD's portion of those funds and prescribing the tasks to be performed were executed in late FY2004 and early FY2005.

The Department is also serving as the agency through which the state's financial obligations for the term of the Cooperative Agreement are met. The appropriations to the Department's predecessor, the Natural Resources Commission, for FYs 1998, 1999, and 2000 for that purpose totaled \$700,000. Of the three year total, about \$265,000 was expended for Nebraska's share of the Water Conservation and Supply Study conducted by Boyle Engineering, Inc. of Denver. The contract for those services terminated at the end of calendar year 2000. Each of the other two states also had contracts with Boyle and expended the same amount.

Also funded by the three states on an equal basis was a study of the channel stability of the Platte. That study, which was conducted by Parsons Engineering, Inc., had a total price tag to the states collectively of \$300,000 and was deemed necessary by the states because of concerns with preliminary federal conclusions that the channel of the Platte River on the Big Bend reach is still degrading (narrowing and deepening) and that some of the measures proposed for the Program might actually exacerbate that problem unless other new components were added to the Program. The results of that study were helpful to the states in redirecting portions of the proposed program to what the states believe is a more realistic pilot/adaptive management approach to assessing the relationship between flows, sediment and other factors on the width and depth of the Platte River channel.

The remainder of what was left of the \$700,000 appropriated by the Legislature (approximately \$50,000 was lost to the budget reduction process in the 2002 session) and of an additional \$125,000 appropriated for FY 2004 has been used for other expenses approved by the Governance Committee. Among those expenses are the costs of the services provided by the Executive Director, Dale Strickland, a consultant from Cheyenne, Wyoming. So that the negotiated "fair shares" for the costs of the Cooperative Agreement would be provided by each party, Mr. Strickland's services have been funded 65.79% by the federal government (Department of Interior), 15.79% by Colorado, 10.53% by Nebraska, and 7.89% by Wyoming.

The original date for initiating a basin wide program (July 1, 2000) has been extended several times because of the difficult nature of the negotiations over the details of that program. However, those negotiations have now essentially been completed and October 1, 2006 is a target date for starting the program if all three governors and the Secretary of Interior concur. At this time it appears that funds remaining from previous appropriations to DNR will be adequate to pay the Nebraska portion of those expenses through that date.

One large issue recently resolved was how increases in Program costs are to be divided among the federal government and the three states. Since the original Cooperative Agreement was signed, the anticipated **cash** demand for the first thirteen-year increment of the Proposed Program has risen from just under \$45 million to approximately \$187 million. When the cash demand was estimated at \$45 million, Nebraska's share of the total program cost was to be taken care of by (1) credits resulting from the Environmental Account in Lake McConaughy, (2) dedication to the Program of a large habitat area, Cottonwood Ranch, by NPPD, and (3) the \$700,000 previously appropriated and discussed above. Even with the increased costs, the federal administration has agreed that the federal share of that cost should equal \$157M. Of course, for the federal share of \$157M to be made available, Congress must authorize the Program and must appropriate the funds as needed during the first increment. If the program is approved, Colorado will pay another \$24M and Wyoming will pay \$6M. Nebraska will receive enough credit for its the water and land contributions being made by CNPPID and NPPD that no cash will be required from Nebraska for any portion of the \$157M. As noted earlier, however, Nebraska will have substantial costs in offsetting depletions caused by new uses begun after July 1, 1997.

In future fiscal years, Department staff are expected to contribute to final development and implementation of the state new depletion plan, contribute to advancement of projects for the water conservation and supply plan, assist in land use delineation, and help with land use and mapping. Land use analysis and planning and implementation of programs and projects for mitigation of future water uses could conceivably become a major activity for Department staff if a basinwide program is established. The extent of that work will depend upon direction from the Governor and the Legislature.

3) Republican River Basin Cooperative Activities

DNR and the Republican River NRDs have continued to implement the Comprehensive Settlement of the Kansas v. Nebraska and Colorado lawsuit. DNR and the Lower, Middle and Upper Republican NRDs have completed and adopted Integrated Management Plans (IMP). The most recent one was approved before the end of June 2005. Water metering is now required on all large capacity wells and the NRDs are reading the meters annually as well as providing maintenance. DNR assisted in the design and implementation of the databases for tracking ground water use. DNR is currently reviewing the data and will work with the NRDs to streamline the process and introduce quality assurance measures.

The DNR has entered into 4 inter-local agreements to financially support the NRDs in their settlement implementation activities. These contracts are effective from July 1, 2005 through June 30, 2007. The monies are to be used for water use data collecting and reporting and activities supporting the implementation and enforcement of the IMPs.

The Republican River basin is still experiencing water supply shortfalls. It is likely that 2006 will be an official "Water Short Year". As such, it is imperative that Nebraska closely limit its consumptive use of water above Guide Rock diversion dam to the supply above that point on the main stem. Therefore, DNR entered into negotiations with three surface water irrigation districts/companies to purchase the use of part or all of their 2006 water supply.

The Nebraska Bostwick Irrigation District agreed to sell its right to the natural flow below Harlan County Lake for 2006, which was estimated at 5,000 Acre-Feet (AF). In addition, it will not take water stored in Harlan County Lake. It sold the right to its share of the 15,700 AF of irrigation water stored in the lake as predicted in January by the Bureau of Reclamation. The State will spend \$2.5 million on this agreement. As a result of the successful negotiations Nebraska will reduce consumptive use and Kansas will receive a more equitable share of the river flows under the Compact.

Frenchman Valley Irrigation District and Riverside Canal Company agreed to sell their right to divert natural flow from Frenchman Creek. Frenchman Valley I.D. sold its right to divert in 2006 for \$400,000 and should keep 8,000 AF in the river that would have been diverted. Riverside Canal Company will not divert approximately 2,000 AF and will be paid \$100,000. The Middle Republican Natural Resources District (MRNRD) partnered with DNR on the Riverside Canal Company agreement. MRNRD will pay half of the cost of this agreement. These two agreements will increase Nebraska's allocation and reduce consumptive use, which will help the compliance effort significantly.

Planning and Assistance Division worked with ground water modeling experts to review the performance of the Republican River Ground Water Model. It is important to continue to analyze the performance of the model, since it is the tool that is used to compute the consumptive use of stream flow by ground water pumping.

Planning and Assistance Division has been working with local and federal officials to obtain additional funds to permanently convert irrigated acres to dryland status. Conversion of acres would aid the State's efforts to remain in compliance with the Compact, while lessening the economic impact in the basin.

4) The Platte River Cooperative Hydrology Study

The Platte River Cooperative Hydrology Study (COHYST) is an effort to develop an understanding of the hydrological and geological conditions in the Platte Basin in Nebraska upstream of Columbus, Nebraska. The project involves the Department of Natural Resources along with six Natural Resources Districts, two power districts and the Nebraska Game & Parks. The costs for the project come from a Nebraska Environmental Trust grant as well as funds directly from the involved parties and in-kind services.

Two NDNR staff members are putting in significant time on this project. One is a member of the technical staff coordinator's committee. That Committee drafted the work plan and advises the sponsors on technical matters. They also direct the efforts of the ground water modelers hired for this study. That member is also the programmer for the study responsible for developing routines for projecting crop and irrigation distribution back in time and historical pumpage from that irrigation. This is all in-kind service. The other member's time has been committed to fulfill the GIS, database and web development needs of the study. COHYST is paying for half of that person's salary and anything above that is in-kind service.

During the 2006 FY, calibration of the ground water models was completed for the half-mile cell size. Other significant effort has gone into improving the model documentation based on comments from the peer review process. Now that the models are completed, the COHYST data and models have been used significantly to assist in determining the hydrologically connected area to the overappropriated basin in support of LB 962. This effort will continue in the FY 2007 period.

5) Floodplain Planning / Hazard Mitigation Planning

Mitigation is defined as any action taken today which will reduce or eliminate future damage for that hazard. While the NDNR has been involved mostly with flood-related mitigation projects and plans, federal legislation now requires an “all-hazards” approach. As a result, tornadoes, severe winter and summer storms, drought, dam failure, and other natural hazard risks can be studied and mitigated. For example, NDNR has assisted the Nebraska Emergency Management Agency (NEMA) with the benefit-cost analyses for utility pole upgrade projects. Since the power infrastructure in Nebraska is publicly-owned, it constitutes an entity which is eligible for federal disaster assistance. Nebraska has emerged as the nation’s leader in this area.

While projects are the desired outcome, the cornerstone of effective mitigation is local mitigation planning. It is said that, “All mitigation is local,” which is true since it is at the local level that land use decisions are made, where response and recovery efforts are conducted (and could be avoided with appropriate mitigation), and where the local citizenry and property owners will see the most direct benefit. In order to be eligible for federal mitigation project funding, the project sponsor must have an adopted mitigation plan that has been approved by the Federal Emergency Management Agency. NDNR has assisted communities across the State to complete mitigation plans, and interest in hazard mitigation planning has grown so that there is currently a backlog. In the last year, NDNR completed an in-house all-hazards plan for the City of Lexington and plans to start soon on plans for the Village of Elmwood and Village of South Bend. The plan for the City of Valley was approved by FEMA in late 2005, and was the successful test of partnering with the Corps of Engineers to have them complete the flood portion of the all-hazards plan. The City of Alliance plan is in the process of being completed by a consultant – it should be finished by the time this goes to print. NDNR hopes to receive funding for a mitigation plan for the City of Beatrice to be completed with the same consultant.

A major achievement has been the completion of the first draft of the all-hazards plan for the Papio-Missouri River Natural Resources District. In conjunction with NEMA, NDNR viewed completing NRD plans as the most efficient way to utilize limited staff and resources to cover larger chunks of Nebraska’s population with a mitigation plan. Like the Valley plan, the Corps of Engineers completed the flood portion of the plan while NDNR finished the other hazards and wrote the plan. If this plan is approved by FEMA, it will stand as a guide for completing mitigation plans for additional NRDs. This effective NDNR/Corps partnership will once again be used in the commencement of the Hall County all-hazards mitigation plan starting this summer.

6) **Water Decision Support System**

In 2005 the U.S. Bureau of Reclamation, at NDNR's request, worked with Nebraska agencies to examine options related to development of a Water Decision Support System for the Platte River Basin. Other agencies involved in the process have included Central Nebraska Public Power and Irrigation District, Nebraska Public Power District, Central Platte Natural Resources District, the Nebraska Game and Parks Commission, and the U. S. Fish and Wildlife Service. The agencies met through the spring and summer of 2005 and in September 2005 the Bureau of Reclamation issued a report entitled "*Evaluation of Capabilities and needs for a Platte River Advanced Decision Support System in Nebraska*".

The goal of that study was to assist managers in optimizing water resource management in Nebraska by identifying the needs for a DSS in the Platte River Basin and by recommending DSS development activities based on the needs identified. The primary DSS needs were identified as:

- . Determining appropriate water releases to provide the legally required or requested flows to environmental, irrigation, power and other requirements when needed.
- . Minimizing excess releases beyond those legally required, and
- . Optimizing both short and long-term water storage releases

The purpose of the model would be to assist managers in optimizing water storage releases by projecting short-term future water availability, gains and losses with sufficient accuracy so that environmental, irrigation, power, and other releases provide the legally required or requested flows at those times needed, and releases in excess of those requirements can be minimized.

One thing the Reclamation report did not provide was a cost estimate for the Platte River Decision Support System development. In the spring of 2006 NDNR requested Reclamation assistance in developing a cost estimate so that in the future the agency would have additional basis on which to judge whether to adopt a decision support system.

7) **Blue Basin Supply Augmentation Study**

The Lower Blue River Basins Supply Augmentation Study is a joint effort by the U.S. Bureau of Reclamation, the Little Blue Natural Resources District, the Lower Big Blue Natural Resources District and the NDNR to determine whether augmentation of surface water supplies during critical periods may provide a cost effective method of both meeting Compact target flows and providing additional benefits. Nebraska has sometimes needed to close junior surface water appropriations to meet the terms of the Nebraska-Kansas Big Blue River Compact and the resultant loss of water by irrigators has had significant economic impacts on those junior surface water appropriators. Providing sufficient water to meet Compact state-line targets in times of

shortage could allow many junior surface water appropriators to continue irrigating through critical periods.

This study would:

1. Determine the total annual augmentation water needed (acre-feet) in order to meet the state-line targets for both the Big Blue and Little Blue Rivers without closing junior water rights.
2. Determine the value (dollars/acre-foot) of the augmentation water to the junior irrigators in Nebraska and to the water users in Kansas junior to the Minimum Desirable Streamflows (which are the same as the compact state-line target flows).
3. Describe the legal issues that would need to be addressed in order to put in place a flow augmentation system.
4. Identify and conduct a preliminary analysis of potential solutions to meet flow augmentation needs. This should include a very rough analysis of the potential cost per acre-foot of water and a description of potential project benefits other than flow augmentation for the compact.

Total study cost is not yet certain, although NDNR fund outlays could range from no charge to \$50,000. Study completion is expected by June 30, 2007.

8) Lower Platte River and Tributaries Feasibility Study

Initiated in January 1998, the Lower Platte River and Tributaries Feasibility Study is an approximately \$5 million effort to investigate flood damage reduction and water resources problems and solutions in the Lower Platte River Basin. Led by the U.S. Army Corps of Engineers, the study has been mostly complete for some time, although some limited work on flood mitigation planning remains. NDNR contributed \$500,000 in pass through funding and \$200,000 in staff time earlier in the process.

9) Lower Platte River Corridor Alliance

The Lower Platte River Corridor Alliance is an umbrella organization of state and local agencies working to foster the development and implementation of locally drawn strategies, actions and practices to protect, enhance, or restore the vitality of the river's resources between Columbus and Plattsmouth. The organization meets on a quarterly basis and receives limited funding support from NDNR and other state agencies.

10) Lower Platte Cumulative Impacts Study

The Lower Platte Cumulative Impacts Study is a joint effort to determine the cumulative impacts of development in and adjacent to the floodplain of the lower Platte River. Partners in the effort include the Lower Platte North NRD, the Lower Platte South NRD, the Papio-Missouri River

NRD, the Nebraska Game and Parks Commission, the Nebraska Department of Roads, and the Nebraska Department of Natural Resources. The study has been conducted through the U.S. Army Corps of Engineers. The second phase of the project is now underway. The Department of Natural Resources has a very limited role, agreeing only to provide \$1,000 worth of in-kind services to the study.

11) Environmental Education Activities

Limited agency environmental education activities included: 1) participation in planning and staging the Nebraska Envirothon, and 2) participation in the Earth Wellness Festival, annually held at Southeast Community College in Lincoln.

12) Frenchman Valley Study

The Frenchman Valley Study is expected to be a cooperative effort with the U.S. Bureau of Reclamation to evaluate alternative program activities, structural measures, or incentives that can assist in optimizing existing facilities, providing lake level benefits, and providing recharge facilities for Enders Reservoir and the irrigated acres it serves. Reclamation issued a draft "*Plan of Study for the Frenchman Valley Appraisal Study*" in December 2005. Participants in developing the draft plan of study included: the Bureau of Reclamation, NDNR, Frenchman Valley and H&RW Irrigation Districts, the Upper Republican Irrigation District, the Middle Republican Irrigation District, and the Nebraska Game and Parks Commission. Future funding, staff participation and other needs for this study are still under discussion.

B. DEVELOP AND MAINTAIN THE DATA, INFORMATION AND ANALYSIS CAPABILITIES TO PROVIDE A SUPPORT BASE FOR WATER PLANNING AND MANAGEMENT

Basic Planning Activities provide the data base and management information necessary to plan natural resource related activities. This activity is a major function within the Department of Natural Resources. In addition to providing information to other agencies and interests, work in this activity is used to support general planning activities, administer the planning process and review projects and plans. Although future fiscal years may see an increasing emphasis on other types of planning activity, data base management and mapping activities are expected to remain a vital part of the Department's planning program.

Planning Information Base – General

Natural resources needs can be better met by increased efficiency and effective use of natural resources data. Better techniques of information acquisition, processing, storage and use are required to accomplish that task. GIS processing offers a tool for decision makers that combines multiple layers of information with the interactive capability of a relational database. The databases developed through the State Water Planning and Review process will be those with special application to water or watershed planning and activities. The long-term goal of the information

base is to develop the capability to analyze the relationships of a wide variety of information in a GIS environment.

The NDNR actively supports the development and use of statewide databases freely available for the use of a host of government agencies. NDNR's GIS efforts will continue to support the priorities of the GIS Steering Committee. To that end, the NDNR has aggressively populated its World Wide Web server accessible through the Internet with easily available up-to-date information in both graphic and tabular forms.

Planning Information Base – Work Completed and Planned

1) Water Rights Digitizing

Water rights digitizing is providing a useful new agency database. The activity is carried out through the Floodplain/Dam Safety/Surveys Division. The Planning and Assistance Division also provides assistance.

2) Flood Prone Area Mapping

This important mapping activity/dataset is coordinated and primarily carried out through the Floodplain/Dam Safety/Surveys Division with about 1 FTE of assistance provided through the Planning and Assistance Division. As of June 30, 2006 floodprone area maps had been produced for 25 Nebraska counties (augmented by 5 counties completed by other agencies) and the mapping process was underway in another 15 counties.

3) National Hydrography Dataset

The Department of Natural Resources is currently compiling tagged vector hydros for a National Hydrographic Dataset (NHD) for the state and at the present rate of progress is likely to finish the process by 2007. NHD is a dataset model developed jointly by the USGS and EPA with a goal of providing a common reference digital hydrographic dataset for a wide cross-section of applications using data related to surface water features. At 1:24,000 scale it would present water features at the same scale as other state digital Datasets. It would also better enable spatial comparison with a wide range of other data. More importantly it would provide the basis for, or enhance the efficiency of, a wide range of potential water analysis activities

The Department of Natural Resources is coordinating development of the NHD in Nebraska. Under the current process NDNR has been supervising the completion of "tagged vector hydros" for targeted watersheds. Under a work share agreement the U.S. Geological Survey will then undertake the processing to convert those tagged vector hydros into the finished NHD product. The project is a joint effort, with funding being or having been supplied through the Nebraska Department of Environmental Quality, the Department of Property Assessment and Taxation, the Nebraska Information Technology Commission, the Nebraska Department of Roads, and Natural Resources District sources. Funding has been utilized primarily to hire student digitizing

personnel through the University of Nebraska Conservation and Survey Division. The students have then been officed and supervised at NDNR.

Extensive progress has been made on the project, which is divided into map catalog units. Fifty-one units have been completed. Digitizing is nearly completed. Remaining DNR work will be for preconflation efforts performed by the project coordinator in 13 catalog units, primarily in the Loup and Lower Platte areas.

4) Creation of Nebraska Geospatial Data Center and the Metadata Clearinghouse

In FY 2005, the Data Bank created a Nebraska Geospatial Data Center that provides internet access to a wide variety of geospatial databases developed and/or maintained by various state, federal and local government agencies, academic institutions, and private entities. It is a one-stop enterprise portal for on-line searching, accessing, displaying and mapping available geo-data relating to the geographic area of Nebraska.

As part of the Geospatial Data Center, the Data Bank also created a unified enterprise-wide Metadata Clearinghouse that provides a web-based metadata submission site for the State. The online entry of metadata facilitates ongoing publication of metadata into the clearinghouse. The metadata entry contains descriptive information about the specific geo-data and is structured in a standardized FGDC format. The site is designed to receive new metadata, edit existing metadata, and review available metadata resources at any time. This facilitates direct access to metadata information, and as well provides links to geo-databases across multiple participating sites. Such hypertext links are embedded in the metadata text.

Currently, both the Nebraska Geospatial Data Center and the Metadata Clearinghouse are operated and hosted by the Nebraska Department of Natural Resources (Data Bank), with oversight from the Nebraska GIS Steering Committee.

5) Soil Survey Digitization

The Department of Natural Resources, University of Nebraska Conservation and Survey Division, and the USDA Natural Resources Conservation Service have worked cooperatively to accelerate soils activities and produce a digital soil survey in the state that meets SSURGO national standards. The Department of Natural Resources has also had statutory responsibility (Sections 2-1596 to 2-1598, Neb. Rev. Stat.) for administering the Nebraska Soil Survey Fund. That Fund is statutorily to be expended by contractual agreement with the Division for the purpose of accelerating the program of modern soil survey. Through July of 2006 the NDNR also housed a cooperative NRCS employee working on the soil survey in the NDNR offices.

The SSURGO Digital Soil Survey for Nebraska was completed in 2004 and work of the partners has now turned to making that survey seamless. Because the surveys were originally gathered at the county level, information gathered by different personnel does not always match perfectly at the county lines. This can present problems when layering data on a river basin or other basis.

Improving data accuracy and consistency will be a goal of the partnership in coming years. Although DNR staff provided major assistance / staff time early in the soil digitization process, agency staff time expended on this activity has been limited in recent years.

6) Watershed Boundary Delineation

This project has been completed for several years but has been improved several times recently as more detailed maps and information became available. A recent federal initiative requires that each state have watershed boundary delineations that meet national mapping standards. While the Watershed Boundary Delineations do not meet the national mapping standards, they are close and will be used as the basis for updating to the new standards. NDNR is involved in the process of bringing this dataset up to standards as this project develops.

The update of the Watershed Boundary Delineation project is a three-year effort and the delineation portion of the project was finished on schedule in the calendar year of 2005. Attributing the GIS coverage was started and completed in 2006 calendar year and the entire project has now been provisionally approved. The only steps remaining are to edgematch our Nebraska data with surrounding states as they get theirs also provisionally approved. Any changes necessary to get final approval are expected to be very minor because we have been coordinating our work with the surrounding states during the entire process.

7) Nebraska Rainfall Assessment and Information Network

A new program was initiated by the Nebraska Department of Natural Resources in cooperation with the Nebraska Natural Resources Districts (NRDs) in early 2004. It was patterned after the Community Collaborative Rain and Hail Study (CoCoRaHS) developed through Colorado State University. It was funded for the first year through a grant from the Nebraska Environmental Trust with the Little Blue NRD acting as the project sponsor for the grant but there was no additional funding from NET for this second year. However, the participating NRDs added it to their budget so it would be maintained into the future.

Through the NRDs, volunteers have been organized and trained to read "official" rain gauges (purchased using the NET grant money) and to enter this precipitation and other weather related information into a website developed by the NDNR. This information is available through the NDNR website to the public and specifically for use by the National Weather Service to supplement their existing network. During the past year, NDNR worked with NWS to develop a system to allow them to download and incorporate NeRAIN data into their network. This should help them better understand rainfall patterns in Nebraska and develop better predictive models for the future.

The initial goal was to develop a network of volunteers to be entering information into the database on a daily basis and covering an area that encompasses the Big and Little Blue, Republican, and Platte (above Columbus including the Loup) river basins. That was a one-year grant with plans to continue the program after the initial grant period.

Based on the success of the first phase, an additional Nebraska Environmental Trust grant was applied for and approved in March of 2006 to expand the project to the entire state. Since that approval, the website developed by NDNR has been revised to accept volunteers for all counties of the state. Applications have already been coming in for those new areas as well as new applications for the old areas where data gaps still exist.

C. PROJECT AND PROGRAM REVIEW ACTIVITY

This activity includes both individual reviews and service on a wide variety of review and program planning committees. It includes both smaller one-time reviews of some projects and programs as well as larger longer-term types of review activity. Some of the major longer-term work activities in this category are:

- Water Policy Task Force Activity
- Nebraska Resources Development Fund Reviews
- Climate Assessment and Response Committee
- Environmental Trust Advisory Committees
- Geographic Information System Steering Committee and Subcommittees
- Other Reviews

1) Water Policy Task Force Activity

In 2002 Nebraska created a Water Policy Task Force to evaluate the effectiveness of and make recommendations on any needed changes to the law governing the integrated management of surface water and hydrologically connected ground water. In December 2003 the Task Force issued a report titled; "Report of the Nebraska Water Policy Task Force to the 2003 Nebraska Legislature". The report helped result in the introduction of LB 962 which made provision for implementing many of the recommendations of the Task Force. The bill was subsequently passed and enacted into law. The bill included provisions related to both water transfers and to integrated planning and management of surface and ground water and provided for continuation of the Task Force through December 2009.

Implementation of LB 962 was a Task Force priority in FY 06 and the Task Force made recommendations concerning suggested legislative action on municipal water uses, funding provisions, and clean-up of language related to water transfers. With LB 933 the 2006 session of the Unicameral subsequently adopted legislation that had provisions related to at least some of the recommendations on each of those topics.

The Task Force has 50 members and NDNR provides it with administrative assistance. In FY 2006 NDNR staff scheduled and coordinated meetings, developed a variety of briefing materials, maintained a task force website, and provided overall administrative support and guidance to the task force. Future Task Force Activity is expected to include: additional suggestions related to funding, water transfers, and instream flows as well as suggestions on implementation activity and

further legislative language cleanup as experience is gained in implementation of the new law.

2) Nebraska Resources Development Fund Reviews

In FY 2006 one project application/feasibility report, Lower Turkey Creek Watershed Project, and one project proposal, Mullen Dam Project, were reviewed. DNR staff provided assistance to the sponsors of these and other projects during their project planning activities for Nebraska Resources Development Fund assistance. DNR staff re-analyzed the economic feasibility of three projects due to cost increases and also worked on the revision of the NRDF Guidelines.

3) Climate Assessment and Response Committee

The Climate Assessment and Response Committee (CARC) was active again in FY 2005/06 as drought conditions continued throughout much of the state for the seventh year. The western part of the state has been hit harder by drought conditions and many of the efforts of the CARC committee have been directed at that problem area. The Director of the Department of Natural Resources is a CARC member and the committee meets periodically and reports to the Governor. Reports are made as warranted by climatic conditions; including but not limited to problems caused by the lack of moisture; drought conditions; problems caused by excess moisture or flooding conditions; and other related activity like hail, wind storms, and tornadoes.

One Planning and Assistance Division staff member also serves as a Co-Chair of two subcommittees of CARC; the Agricultural, Natural Resources, and Wildlife Subcommittee and the Risk Assessment Committee. A second Division staff member also serves on another subcommittee of CARC; the Moisture Availability and Outlook Committee. That subcommittee meets throughout the summer to assess conditions across the state and provide a summary of this information to the Chairman of the Climate Assessment and Response Committee.

4) Environmental Trust Technical Advisory Committee

The Environmental Trust Board, of which the Director of Natural Resources is a member, has a technical advisory committee to help review grant applications. Department of Natural Resources staff assist in project application reviews. Activity levels are expected to remain limited in upcoming fiscal years. Time commitments range from no involvement some years to several days effort other years, depending on the projects submitted to the Trust

5) Geographic Information System Steering Committee and Subcommittees

The Geographic Information System Steering Committee has adopted a number of priority initiatives for GIS application in the State of Nebraska. The Department's GIS coordinators serve on the Committee. The development of a high-resolution National Hydrographic database (NHD), Nebraska Geospatial Data Center and Clearinghouse, National Map Initiative and merge existing low-resolution PLSS Databases have been identified as top areas of interest for Nebraska.

6) Other Activity

Other Planning and Assistance Division work in basic planning activity has included the acquisition, cataloging, and maintenance of Landsat TM terrain corrected data for landuse/landcover planning activities. This data is acquired from the EROS Data Center. The NDNR has Landsat data that includes complete statewide coverage for 1991-1993 and partial coverage of the state for 1997. Through the Platte River Hydrology Study the NDNR also acquired a set of Landsat MSS data from the early 1980s; this was also acquired through COHYST. This provides a historical reference for land use analysis.

D. PROVIDE THE STATE WITH THE CAPACITY TO PLAN AND DESIGN WATER PROJECTS

Although the activity has not been fully implemented, the State has participated in project planning activities through the Natural Resources Development Fund.

**PLANNING & REVIEW PROCESS EXPENDITURES FY 06
AND BUDGET FYs 2007-2011**

	FY2006 (est) *	FY2007	FY2008	FY 2009	FY 2010	FY 2011
Lower Platte River Alliance	5,417	5,417	5,417	5,417	5,417	5,417
Platte River Cooperative Agreement**	\$766,000	\$486,000	Unknown	Unknown	Unknown	Unknown
National Hydrography Dataset Expenses						
Other than DNR Staff (funded via grant or anticipated to be funded via grant)	\$62,010	\$30,000	--	--	--	--
Contract LB 962 Studies***	\$210,393	\$1,483,770	\$800,000	\$800,000	\$800,000	\$800,000
LB 962 Equipment, Computer Equipment, Supplies, Travel****	\$139,546	\$100,000	\$100,000	\$100,000	\$100,000	\$100,000
Staff/Other	\$1,017,992	\$1,207,205	\$1,207,205	\$1,207,205	\$1,207,205	\$1,207,205
TOTAL	\$1,847,858	\$3,521,544	\$2,112,622	\$2,112,622	\$2,122,622	\$2,122,622

* Budgetary figures are based upon a roughly estimated combination of costs from a variety of NDNR divisions that work on state water planning and review process activities. In FY 2006 this included about 11.5 full time equivalent positions for part of the NDNR Planning and Assistance Division and about 3 full time equivalent positions from other divisions of NDNR. These preliminary estimates include only the NDNR planning related budget. Also included is a separate category for estimated expense for digitizing personnel for the National Hydrography Dataset Project. Those personnel are hired by the UNL Conservation and Survey Division, officed at NDNR, and paid with grant money NDNR receives from a variety of sources. For that project, computer software, hardware and budget expense are included in this budget. Special planning studies anticipated to use LB 962 budgeted money are included in their own categories. For some future years on the NHD budget amounts are based upon anticipated grants needed to complete the project rather than actual money pledged.

Related items not included in the Planning and Review Process budget include LB 962 monies to be used for upgrading the water administration database, Information Technology Division Expenses, and LB 962 Incentive and Implementation monies provided to outside entities.

** The budget for the Platte River Cooperative Agreement includes pass through and contract funds. This includes \$400,000 to be passed through to Natural Resources Districts for their new depletions implementation efforts as well as contract monies for a land use inventory and for other process contractual assistance.

*** The FY 06 expenditures for contract studies are only for amounts billed and paid during the year. The amount of work completed under existing contracts during the fiscal year and that will ultimately be charged is likely far higher than the \$210,393 noted. Those bills will likely be paid with funds listed as FY 07 on this table.

**** The equipment, supplies and travel costs for FY 06 include funding FOR Conservation Reserve Enhancement Program (CREP) publication and mailing, which was significant.

VI. GLOSSARY

Fully Appropriated – Defined in Nebraska Revised Statutes Section 46-713 “(3) A river basin, subbasin, or reach shall be deemed fully appropriated if the department determines that then-current uses of hydrologically connected surface water and ground water in the river basin, subbasin, or reach cause or 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 purposes 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 noncompliance by Nebraska with an interstate compact or decree, other formal state contract or agreement, or applicable state or federal laws”

Geographic Information System – Simply put, a GIS combines layers of information about a place to give you a better understanding of that place. What layers of information you combine depends on your purpose—finding the best location for a new store, analyzing environmental damage, viewing similar crimes in a city to detect a pattern, and so on.

National Hydrography Dataset – The National Hydrography Dataset (NHD) is a comprehensive set of digital spatial data that contains information about surface water features such as lakes, ponds, streams, rivers, springs and wells. Within the NHD, surface water features are combined to form "reaches," which provide the framework for linking water-related data to the NHD surface water drainage network. These linkages enable the analysis and display of these water-related data in upstream and downstream order

Overappropriated – Defined in Nebraska Revised Statutes Section 46-713 “(4)(a) A river basin, subbasin, or reach shall be deemed overappropriated if, on the operative date of this section, the river basin, subbasin, or reach is subject to an interstate cooperative agreement among three or more states and if, prior to such date, the department has declared a moratorium on the issuance of new surface water appropriations in such river basin, subbasin, or reach and has requested each natural resources district with jurisdiction in the affected area in such river basin, subbasin, or reach either (i) to close or to continue in effect a previously adopted closure of all or part of such river basin, subbasin, or reach to the issuance of additional water well permits in accordance with subdivision (1)(k) of section 46-656.25 as such section existed prior to the operative date of this section or (ii) to temporarily suspend or to continue in effect a temporary suspension, previously adopted pursuant to section 46-656.28 as such section existed prior to the operative date of this section, on the drilling of new water wells in all or part of such river basin, subbasin, or reach.”

SSURGO Soil Surveys - The Soil Survey Geographic Database (SSURGO) is a national dataset that will put all county soil surveys into an electronic format. This will allow soils information to be layered in conjunction with other electronic datasets as well as allow electronic access to county soil map information. The national SSURGO compilation process is being coordinated through the USDA Natural Resources Conservation Service.

Tagged Vector Hydros – Tagged Vector Hydros are surface water features represented, in electronic format, as lines that have been attributed with hydrographic descriptions.