

**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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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 2001 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.

In recent years a major 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 Data Bank Section 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. Although alternate approaches are being studied, 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. Many of the information management products and activities found in this report are co-products of the Department's Data Bank Section and the Planning and Assistance Division. This is a report of planning activities and includes no programmatic information about Data Bank Section initiatives. However, the Data Bank Section does have a major role in almost all 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 Counsel plays a vital role in Platte River Cooperative Agreement activities.

Beginning with this annual report and plan of work reporting on planning and review process activities will be 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 AREAWIDE OR STATEWIDE WATER RESOURCES PROBLEMS

1) 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 basinwide recovery program for endangered species in the Central Platte Basin. Roger Patterson, Director of Natural Resources, serves as the Nebraska state representative on the governing body for the Agreement and Jim Cook, legal counsel for the department, serves as his alternate. The program proposes to reduce shortages to target flows for endangered species in the Lexington to Chapman reach of the river 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) modify Pathfinder Reservoir in Wyoming to store water in another environmental account to be similarly managed, and (3) construct and operate 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.

However, the three projects listed in the previous paragraph will only supply a portion of the needed water. 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 fact initiated.

The primary agency work on the Cooperative Agreement has been handled through the Director of Natural Resources, a now retired special assistant, the deputy director of the department, and the agency legal counsel and a public information specialist headquartered in Kearney. Planning and Assistance Division staff have occasionally worked with committees trying to determine the nature and feasibility of potential water conservation and water supply options.

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 will require development of a mitigation plan that will allow new uses of both surface water and hydrologically connected groundwater to begin as long as the impacts to the target flows are offset. Several drafts of Nebraska's new depletion plan have been developed thus far 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 is led by a department staff member. Further work on the details of the new depletion plan will continue in FY 2002 and is closely related to work on the Cooperative Hydrology Study discussed elsewhere in this document.

The budget adopted by the Legislature for FY 2002 and FY 2003 includes funds for two studies 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. The first study is a survey of land use in the Platte River Basin for 2001. A similar survey was conducted for 1997 through the Cooperative Hydrology Study. Comparison of land uses for those two years will be needed to determine the extent to which the number of irrigated acres is changing and how that is affecting flows in the Platte. It will be critical to quantifying the amount of water needed to offset for post-1997 depletions pursuant to the new depletion plan discussed in the preceding paragraph. The cost of that survey, over the biennium, is estimated at \$175,000.

The second study funded will be a study of the economic impact of the proposed program in Nebraska, especially the impact of the new depletion plan discussed above. That study will be conducted by an independent contractor and will be coordinated by a group of economists from DNR, DED, UNL, and NPPD. The estimated cost of that study is \$150,000 spread over the biennium.

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 being funded by the three states on an equal basis is a study of the channel stability of the Platte. That study, which is being conducted by Parsons Engineering, Inc., has a total price tag of no more than \$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 exacerbate that problem unless other new components are added to the Program. The results of that study are due at approximately the same time as this annual report is due.

The remainder of the \$700,000 appropriated by the Legislature is being 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 are now funded 65.79% by the federal government (Department of Interior), 15.79% by

Colorado, 10.53% by Nebraska, and 7.89% by Wyoming. Nebraska's share of those and related expenses the last two fiscal years has been just over \$48,000 in FY 2000 and approximately \$59,600 in FY 2001.

The original deadline for the Cooperative Agreement (July 1, 2000) has now been extended until June 30, 2003. During the 2½ year extension, there will be ongoing expenses to be shared by the states and the federal government. However, at this time it appears sufficient funds remain from the original appropriation of \$700,000 to pay the Nebraska portion of those expenses in FY 2002 and 2003.

In future fiscal years, Department staff also are expected to contribute to continued development of the state mitigation plan, contribute to advancement of the water conservation and supply plan, assist in land use delineation, help with land use and mapping, and review and comment on the Environmental Impact Statement being prepared by federal agencies in a separate process. Land use analysis and planning for mitigation of future water uses could conceivably become a major activity for Department staff, depending upon future direction from the agreement governing body and Nebraska state officials. It remains to be seen what portion of that Department activity will be carried out by the planning staff. In FY 2000, the Department hired a public information specialist to assist with the process.

2) **The Platte River Cooperative Hydrology Study**

The Platte River Cooperative Hydrology Study (COHYST) was a three-year cooperative effort to develop an understanding of the hydrological and geological conditions in the Platte Basin in Nebraska upstream of Columbus, Nebraska and was completed June 30, 2001. COHYST II has taken over where the original COHYST left off and will continue for another three years until June 30, 2004. That study is discussed following this description of COHYST.

COHYST I

To accomplish their goals, a group of Nebraska interests joined together to develop necessary data, analyses, modeling, and other information which when completed will;

1. Help Nebraska to meet its obligations under the Cooperative Agreement,
2. Enable NRDs and other entities along the Platte River to provide appropriate regulation and management,
3. Provide Nebraskans with a basis to develop policy and procedures related to ground water and surface water,
4. Enable Nebraskans to analyze proposed activities of the Cooperative Agreement and/or programs in Nebraska.

Study objectives include:

1. Collecting existing data and placing into a credible/appropriate database and fill in with new data as necessary.
2. Developing preliminary models to identify data gaps.
3. Collecting and adding supplemental data as necessary to provide a credible database.
4. Developing linked, sub-regional models to cover the Platte basin in NE.
5. Establishing credible models.
6. Using models.

The Department of Natural Resources is one of the 10 project sponsors of the study. The others are the Central Platte, Twin Platte, Tri-Basin, North Platte, and South Platte and Upper Big Blue NRDs, Game and Parks Commission, Nebraska Public Power District, and Central Nebraska Public Power & Irrigation District. The cost was a total of \$2.7 million for COHYST with \$1.6 million of that coming from a Nebraska Environmental Trust grant. A planning staff member was the DNR's official representative throughout most of the study period (since replaced by the staff attorney) and a member of the technical staff coordinator's committee. That Committee drafted the work plan and advises the sponsors on technical matters. Total scheduled NDNR effort on the study was expected to have a value of \$304,337, although \$245,800 of that amount is for past work by the Natural Resources Commission's Survey and Photogrammetry Section on baseline groundwater elevations and thus is technically outside the planning process. That work involved surveying locations and elevations of groundwater monitoring wells to help establish the current water table. The Commission originally received payment for \$97,900 of that work with more additional work being in-kind effort. Later in the study, more surveying work was needed and a total of \$155,575 was billed to the study by DNR. Other Department work involved planning staff in river stage and profile analysis, analysis of soils, runoff, recharge and consumptive use, database development and supervision, computer program development, and data collection. The Department is housing and supervising contract staff involved in the database development portions of the study.

In FY 2001, Department planning staff continued to meet with other sponsors to help review and direct progress. The Commission reached an agreement with the Hydrology Sponsors to provide office space, supplies, guidance and supervisory assistance for a GIS/database management specialist for the study beginning in late summer 1998. That component of the study will take about 2½ years total and is to include use of a GIS display and use hydrogeologic, hydraulic, and water use information in the basin. A graphical user interface will be used to make the information available to any party. The database and Arc/Info coverages developed as part of the study will be housed on NDNR hardware and the NDNR web server will be used to deliver information to the public.

In FY 2001, the agency provided extensive programming support to help develop the geologic layers for the ground water model. Programming support was also provided in developing the grid to be used to distribute the land use information developed by CALMIT for the study. Additional support was provided through participation on the Technical Committee to continue to organize and direct work efforts of the various contracts for the study. The planning staff member was also on the Contract Committee to review contract

details and on the Hiring Committee to review the applicants for the modeler's positions that were hired for the study.

Outputs of these efforts included developing contracts with USGS to provide the services of a senior modeler and hiring four other modelers that were stationed in Grand Island, Holdrege, North Platte and Scottsbluff. The land use inventory developed by CALMIT is nearly complete as is the recharge model in progress by Dr. Darrel Martin. Programming support was also provided in FY 2001 to integrate these two sets of information into the pumpage and recharge components of the models.

Also in FY 2001, a routine to estimate the historical distribution of land uses was developed by NDNR staff and the committee assignments continued.

COHYST II

A new three-year grant application (being referred to as COHYST II) was submitted to and will be funded by the Nebraska Environmental Trust to enhance and improve the usefulness of the models developed with the first COHYST grant. This project combines multiple projects by individual agencies and governmental units into one uniformly coordinated basin-wide project.

The project budget is about \$3.7 Million of which \$2.3 Million will be paid for by in-kind services of the project sponsors and in some cases the contracting agencies. The NET grant will pay for the remaining \$1.4 Million. NDNR would contribute at a level consistent with the previous grant. The roles of NDNR staff would be similar to efforts in the first Nebraska Environmental Trust grant for COHYST. Projects will be designed and coordinated through participation in the Technical Committee. One new modeler has been hired for the project so no additional effort in the Hiring Committee is expected to be needed. Contracts for the new projects will need to be developed and agreed upon through work on the Contract Committee. Overseeing the databases, GIS coverages, website development, and programming assistance will continue at the same level also by the Planning and Assistance staff member assigned to this project. The Survey and Photogrammetry Section of NDNR will probably do additional GPS work on a 50-50 cost share basis for the project also.

3) Republican River Basin Cooperative Activities

The Planning and Assistance Division continued to provide assistance in critical township mapping projects in the upper Republican Natural Resource District.

The Department of Natural Resources, including Planning and Assistance Division staff has been assisting the Governor's Republican River Council in the development of a set of alternatives for management of ground and surface water in the basin.

Staff from the planning and engineering sections, along with the Departmental liaison from the UNL Conservation & Survey Division, have also initiated work on a map to show the alluvial boundaries in the Republican River Basin. This map will be derived using well log data, well location, slope, SSURGO Soils and Thematic Mapper data. These data will be compiled into a GIS database used to determine where the alluvial boundaries will be mapped.

4) Floodplain Planning

FY 2001 was an active year in flood mitigation planning. Through the Flood Mitigation Assistance (FMA) Program, the NDNR completed a flood mitigation plan for the City of Tekamah. Plans were started and are in the process of being completed in Fort Calhoun, Ponca, Sarpy County, Milford, DeWitt, Omaha (Cole Creek), and Arlington. NDNR has provided financial or planning assistance for communities doing flood mitigation planning. In addition, the NDNR is in the contracting phase of starting plans in Randolph and North Platte. The North Platte plain is particularly noteworthy because the city would like to combine the mitigation plan with their comprehensive planning initiative and will also be taking several other floodplain management actions. Another major benefit of this mitigation plan will be to remap the floodplains in the city to see if they are still accurate. With the North Platte River and South Platte River converging within the city's boundaries, there are extensive floodplain areas which are hindering efforts for economic development. Indeed, twenty-five percent of Nebraska's flood insurance policies are taken out on buildings in North Platte.

The FMA Program also funds projects for communities which have a completed flood mitigation plan. In the last year, the NDNR has helped fund floodplain acquisition projects in Beatrice and Fort Calhoun. Within the next three months, we anticipate also acquiring a residence in Arlington. In the case of the Fort Calhoun and Arlington residences, both were severely damaged in the same flood event in August of 1999.

In the next two years, the NDNR expects to continue to fund mitigation plans and help fund mitigation projects. Through the FMA Program, the NDNR receives annual planning and project grants from the Federal Emergency Management Agency which allows the agency to continue operating this program. This is the only pre-disaster planning program currently in existence, and it has been popular because it allows the citizens to be the leaders in deciding how to reduce flood damages and eliminate flood problems in their community. The NDNR also receives planning money from the Nebraska Emergency Management Agency as a result of presidentially-declared disasters. However, with the erratic nature of these disasters, it is impossible to plan on receiving any money year-to-year. Every year, severe summer storms, ice melt, and ice jams point out new, interesting, and sometimes difficult flood problems in Nebraska. The NDNR has partnered with the corps of Engineers, Nebraska Department of Economic Development, Federal Emergency Management Agency, and four local engineering/consultant firms to work with communities impacted by these flood problems in order to reduce or eliminate them. The NDNR is committed to continuing these activities and to find new partnerships to assist us.

A state flood mitigation plan is scheduled to be completed by January 1, 2002. That plan will provide an overview of Nebraska flood problems and efforts planned to address them.

5) Water Decision Support System

In the past year the Department has begun to evaluate the feasibility of creating a Decision Support System for the Platte River. The system will likely consist of four components: 1) a mid-range predictive model, 2) a short-range predictive model, 3) a forum for exchange of information, and 4) a clearinghouse for current and predicted flow data. The information will allow the Department and other interested parties make educated decisions regarding the use of the Platte River. Currently the Department is working with the U.S. Bureau of Reclamation on the possibility of the Bureau completing the feasibility study and project or the possibility of constructing the model within the Department.

6) Assistance to NRCS on Buck and Duck Basins Watershed Project Planning

In December 1999 an agreement was reached with the Natural Resources Conservation Service and the Nemaha NRD for NRC to provide assistance on the economic analysis portion of a study of the Buck and Duck watershed in southeast Nebraska. The majority of the economic analysis is completed. A small amount of staff time will be required as public meetings are held and the final report is completed.

7) Lower Platte River and Tributaries Feasibility Study

In January 1998, agreements were signed initiating work on the Lower Platte River and Tributaries Feasibility Study. The \$2.7 million study to investigate flood damage reduction and water resources problems and solutions in the Lower Platte Basin is being led by U.S. Army Corps of Engineers. In addition to the Department, cooperators include: the Lower Platte South NRD, the Papio-Missouri River NRD, the Lower Platte North NRD and the Lower Platte River Corridor Alliance. The Department has provided \$125,000 per year in pass through funding over a four-year period (for a total of \$500,000) and a total of over \$200,000 in in-kind services. The study is scheduled for completion by May 31, 2002. The feasibility study area includes the Platte River from Columbus to its mouth.

The study is a follow-up to an earlier reconnaissance level study and is to provide a variety of structural and non-structural options and recommendations. In addition to examining five specific structural options it has solicited public suggestions on natural resources management issues for the area and is addressing water quality, land use and public policy concerns in the watershed. Past Department work has included extensive cross-sections, surveys and mapping that were provided by what is now the Department's Floodplain/Dam Safety/Surveys Division. Past Planning assistance has included supervisory assistance for creating GIS products for the area, website assistance, assistance to the Corps in compiling community flood mitigation plans, and assistance in environmental evaluation. Along with the Corps and the Lower Platte South NRD, the

Department acts as a co-sponsor and serves on the executive committee for the project. The Lower Platte South NRD acts as primary administrator of funds. Half of project costs are a Corps responsibility with the state and local sponsors providing 25% funding and 25% in-kind match.

The major Department staff input to this project has already occurred and the Department is scheduled to provide the final \$125,000 of its financial obligation in FY 2002. Much of the Corps work on the project in FY 2001 centered on the Western Sarpy County levee and Sand Creek Projects. Future Corps work is planned on a number of components, including non-structural flood mitigation planning, the Union Dike and South Fremont structural projects and water quality and land use components.

8) 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 and restore the vitality of the river's resources between Columbus and Plattsmouth. The major project supported by the Alliance to date has been the Lower Platte River and Tributaries Feasibility Study. However, the organization has a separate purpose from the feasibility study and has been meeting on a quarterly basis. In FY 2001, there was limited financial support of the Alliance by the Department and other state agencies, and that support is expected to continue. This activity has taken only a very limited amount of NDNR staff time.

Alliance activities have included local water quality and flood mitigation planning activities.

9) Environmental Assessment Assistance Related to Glendo Reservoir Irrigation Contracts

Local irrigation districts involved in assembling environmental assessments for use in contract renewals for Glendo Reservoir irrigation water were scheduled to receive NDNR assistance. Staff completed an initial draft of the Environmental Assessment and sent it to the Bureau of Reclamation for comments. Additional work is on hold at the request of the Bureau of Reclamation. Completion is scheduled to coincide with the Platte River Cooperative Agreement EIS in 2003.

10) Environmental Education Activities

Agency environmental education activities include: 1) participation in planning and staging the Nebraska Envirothon, 2) participation in the Children's Groundwater Festival, held annually in Grand Island by the Groundwater Foundation, 3) participation in the Earth Wellness Festival, annually held at Southeast Community College in Lincoln, 4) participation in the Nebraska Organizations for Environmental Education meetings, and 5) continued limited distribution of Stop, Look and Learn About Our

Natural World: A Nebraska Natural Resources Elementary Education Guide. (a very limited number of copies remain). This activity takes only a small portion of staff time.

11) Other Planning Activity

Not all NDNR Planning Activity is water related or part of the State Water Planning and Review process. In FY 2001 and FY 2002, Department staff are lending effort to compile Carbon Sequestration related reports being compiled in response to LB957 (2000).

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 continues to be a major function within the Department of Natural Resources . In addition to providing information to other agencies and interests, work in this activity was also 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

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. This includes data on soil characteristics, land use, surface and ground water data, geologic characteristics, climate, socio-economic characteristics, forestry characteristics, hydrology and water use. The development of statewide databases for use by state, federal, NRD and local units of government will continue to have a high priority.

The databases developed through the State Water Planning and Review process will be those with special application to water or watershed planning and activities.

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. To that end GIS processing offers a tool for decision makers that combines multiple layers of information with the interactive capability of a relational database.

The products that will be and in some cases are being produced are as varied as the agencies that will use them. These include land use maps, soils maps, aerial photography with interpretations, multi-spectral satellite imagery, enhanced high altitude color aerial imagery, floodplain management information, water rights, well registrations, hydrologic information, and resources planning and environmental protection data. Applications of

this information base can enhance state, federal and NRD management as well as city and county services and tax assessment.

NDNR's GIS efforts will continue to support the priorities of the GIS Steering Committee. The production of digital orthophoto quadrangles (DOQs) and digital elevation models (DEMs) on a statewide basis was a major agency priority completed in FY 99 and a second updated version of those DEMs was initiated in FY 2001. Among other uses, these DOQs and DEMs are being used by Department staff to help digitize soil survey maps recompiled by the Natural Resources Conservation Service and bring them up to SSURGO (Soil Survey Geographic Data Base) national standards. The work on updating DEMs-DOQs that was started in FY 2001 should help to expand the future use of these products and assist in future floodprone area mapping. In addition, NDNR work on a National Hydrographic data set should help address the priorities of the committee.

The acquisition, processing and sharing of statewide databases has a multifold purpose. First, a multi-user database cuts costs by avoiding duplication and enhances coordination as the basic data set is the same for all uses. Secondly, a statewide database provides a consistent departure point for future enhancements. Satellite imagery, digitized aerial photography with rectification as well as actual ground surveying using global positioning technology can produce maps and map products with varying degrees of high resolution, accuracy and coverage. The NDNR actively supports the development and use of statewide databases freely available for the use of a host of government agencies. 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 Mapping

The Department and its predecessors have maintained a visual record of irrigated land under various types of water rights for over 100 years. Early cartographers relied on a combination of physical description and surveys to delineate boundaries of permitted lands. Eventually, surveys endorsed by a Professional Engineer were required to establish the boundaries of irrigated land under water right. Currently the Department allows anyone to file a water right map using tracing paper over aerial photographs. The information is transferred by hand to compiled water rights maps of all irrigated land in the area. The compiled maps are tiled by township or USGS 7½ minute quadrangle map.

The hand drafting method of creating and editing water rights maps is being replaced by digital cartography. Printed maps are being scanned and digitized. The digital maps will be linked to the surface water right database. This will provide the benefits of access to anyone on the network, increased analytical capability using spatial query techniques, and improved accuracy. This effort is expected to require about 2 1/2 years with completion expected by December 31, 2003. The analysis will be improved due to the layering ability of the geographic software. New maps will be immediately

incorporated into existing digital maps, so that discrepancies such as “overlapping” can be quickly recognized and corrected. The accuracy will be enhanced using existing digital aerial photography for proper field boundaries.

2) Flood Prone Area Mapping

There are only limited amounts of funding available for detailed floodplain mapping and about half of the counties in the state have no form of floodplain mapping. Therefore the NDNR has examined alternative approaches which utilize new technologies and innovative methods to rapidly delineate floodprone areas across the state. In FY 1999 Natural Resources Commission staff developed a relatively automated process to delineate floodprone areas using recently completed digital elevation models and digital orthophoto quadrangles.

In FY 2001 under a contract with the Federal Emergency Management Agency, NDNR delineated and mapped floodprone areas for four counties in Nebraska, Stanton, Otoe, Dundy and Howard. Eight additional counties have been identified for mapping in FY 2002. This work is a joint effort of the Floodplain/Dam Safety Division and the Planning and Assistance Division.

3) Digital Elevation Modeling – Digital Orthophoto Quadrangles

In FY 1999 the Natural Resources Commission completed on schedule the three year process of compiling digital elevation model (DEM) and digital orthophoto quadrangle (DOQ) coverages for the state. The DOQs will support a wide variety of applications, including the development of statewide natural and cultural resources coverages. The Nebraska GIS Steering Committee has indicated that statewide coverage of 5 layers consisting of DOQs, soils, transportation, hydrography and land parcels is needed for Nebraska. The DOQs are important as a base map that will support the development of the other four layers. This includes use as a base map to bring soil mapping up to SSURGO national standards. The DEMs are also being used in the NDNR’s flood prone area mapping process. The DEM-DOQ process was completed cooperatively with the work of both the Comprehensive Planning Section and the Commission’s Data Bank Section.

In FY 2002 the DNR will continue with an update of DEMs and DOQs that will use newer photography and provide a more up to date base for future uses. The newer imagery is actually required for some uses, such as Federal Emergency Management Agency floodplain mapping standards. Data Bank is generating 10 meter DEMs. The Planning Division is assisting the Data Bank in that process.

4) Tagged Vector Coverage

The Tagged Vector Coverage was a by-product of the DEM-DOQ development process. The files that were used for that process were converted into ArcInfo coverage to be able to show USGS 7 ½ minute quadrangle contour lines. These can be used to

make finer custom grids than what is currently available. This project was completed in FY 2000. The results have been used for a variety of additional projects ranging from calculating depth to water (and locating wetlands) in a joint project between NRC and the Rainwater Basin Joint Venture to helping NRDs developing farm terraces. Other uses have included help in the delineation of the watershed boundaries.

Although Tagged Vector Coverage has been completed, there are a number of improvements in the data that should be corrected. They are very small (usually around quad boundaries) and did not affect the DOQ production so were disregarded earlier. With this ARCINFO coverage, the errors are more noticeable now and so are being corrected. This is an ongoing project that is worked on when time is available. Output uses are the same as the Tagged Vector Coverages except these coverages have improved accuracy and are subsequently more valuable and reliable. An additional use of this product is the Flood Prone Area Mapping initiative. This was an activity that this division was actively involved in during FY 2001.

5) National Hydrographic Dataset Pilot Projects

The National Hydrographic Dataset (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 mapping packages. It would also better enable spatial comparison of a wide range of water, social, landscape and other data. More importantly it would provide the basis for, or enhance the efficiency of, a wide range of potential water analysis activities. In FY 2001 the NDNR largely completed work on a NHD pilot project for the Logan Creek Watershed. Work is currently being initiated on a NHD project for the Salt-Wahoo watershed. That effort will be a joint effort between the NDNR Planning and Assistance Division and the Lower Platte Natural Resources District and the UNL Conservation and Survey Division. It is being supported through a grant from the Nebraska Information Technology Commission. It is expected that the Salt-Wahoo NHD project will be completed by June 30, 2002. Options are currently being explored for funding an NHD project for an additional watershed or initiating a statewide effort.

6) Water Use Data Study

In 1992, the Commission entered into an agreement with the U.S. Geological Survey to cooperate with USGS's nationwide program of data collection and estimation of water use. A Commission report on 1995 water use was issued in June 1998. NDNR staff have met with USGS personnel to discuss the compilation of the water use data report for 2000. A public water system use survey and industrial water use survey were conducted. Responses to these surveys are being entered into an Access database for further processing. Arc/Info coverages for water use data compilation have been and are being updated. The preliminary data will be reported to USGS in early October 2001. Some work on the effort will continue into FY 2002.

NDNR staff also provided help with responses to a number of water use data inquiries and will provide some limited assistance to USGS personnel responsible for the irrigation portion of the study.

7) Digitizing of Soil Surveys to SSURGO National Standards

In April 1997, the Nebraska Natural Resources Commission, the Natural Resources Conservation Service, and the University of Nebraska Conservation and Survey Division entered into an agreement to digitize Nebraska's published Soil Surveys. The overall goal of the project is to develop a digital soils base of all 93 Nebraska counties and incorporate updated surveys as they become available. Once digitized, the file can be adjusted in scale, making it easier to integrate the soils data with other geographic data. A time frame for the project was set at five years and it is to be completed by September 30, 2002. The process utilizes the DEMs and DOQs produced by the Department. Both the NDNR Planning and Assistance Division and its Data Bank participate in the process. Personnel from both the Natural Resources Conservation Service and the University of Nebraska Conservation and Survey Division are stationed at the NDNR offices to work on the project. At the end of June 2001, about 57 counties had been completed and certified, another eight counties had been digitized and were waiting certification, and six counties had been remapped or were in the process of being remapped.

8) Watershed Boundary Delineations

This is both a completed and ongoing project. It is completed in that the entire state is done and the coverage is available on the web. It is ongoing because the Natural Resources Conservation Service needs to have additional watersheds delineated to meet national standards. The NDNR may contract with them to assist in this effort. Additionally, as more detailed maps become available, boundaries may be changed to improve this information.

This product has been used in the Flood Prone Area Mapping initiative as well as being a valuable layer for base maps. Most surface water maps developed by the Data Bank Section staff will probably use this layer to show boundaries and flow directions by watershed. This layer can also be used to display NDNR basic units or division boundaries, DEQ water quality stream reaches, NRCS and USGS hydrologic units, G&P stream fishery resource classifications and drainage areas of streamflow gage information.

9) Groundwater Level Website

The Department and U.S. Geological Survey have an annual agreement by which USGS produces an annual groundwater levels report and the NDNR provides limited financial support and places the material on the world wide web in an easily searchable format. Most of the agency work on the project has been provided through the Data Bank Section. However, financial support has been provided through planning funds.

Although this agreement will continue for calendar year 2001, consideration is being given to compiling this information on a biennial basis in future years.

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:

- Nebraska Resources Development Fund Reviews
- Environmental Trust Advisory Committees
- Geographic Information System Steering Committee and Subcommittees
- Western Governor's Association Geographic Information System Council
- Climate Assessment and Response Committee
- Other Reviews

1) Nebraska Resources Development Fund Reviews

In FY 2001 three project proposals were reviewed. These were the Antelope Creek Project in Lincoln, the Platte River Flow Enhancement Project at Grand Island, and the Western Sarpy/Clear Creek Project near Gretna. DNR staff also assisted project sponsors with their preparation of application and feasibility reports for the Lake Ericson Project, the Little Sandy Creek Watershed Project, and the Rushville Flood Control Project.

2) Climate Assessment and Response Committee

The Climate Assessment and Response Committee (CARC) was active again in FY 2001 as drought conditions continued throughout much of the state for the second year. The Director of the Department of Natural Resources is a member of this committee that 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 and wind storms.

One Planning and Assistance Division staff member also serves as a Co-Chair of a subcommittee of CARC; the Agricultural, Natural Resources, and Wildlife Subcommittee. This subcommittee has been meeting on a regular basis and has provided input to the Nebraska Drought Plan currently under review. In FY 2001 the State of Nebraska Drought Mitigation and Response Plan was completed and presented to the governor. Another Division staff member has worked with the Municipal Water Supply, Health, and Energy Subcommittee.

One 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.

3) Environmental Trust Advisory Committee

The Environmental Trust Board, of which the Director of Natural Resources is a member, has formed a technical advisory committee to help review grant applications. Department staff, including planning staff members, assist in project application reviews. Activity levels are expected to remain limited in upcoming fiscal years.

4) 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 Departmental Representative on the Committee is from the Floodplain Division and Planning Division staff have been heavily involved in committee related initiatives and work with the Committee Coordinator. The development of digital orthophoto quadrangles (DOQs), vectorized soils databases and a high-resolution National Hydrographic database (NHD) were identified as top areas of interest for Nebraska. The NRC developed DOQs to the U.S. Geological Survey standards and the NDNR is updating the DOQs with newer photography. NDNR is continuing the development of the digital soils database. NDNR is conducting a pilot project to determine the feasibility of developing a statewide NHD. Planning Division staff continue to attend and contribute to steering committee meetings.

5) Western Governor's Association Geographic Information System Council

A NDNR Planning and Assistance Division Staff member formerly served as the Nebraska representative to the Western Governor's Association GIS Council. The Council was formed in the spring of 1999 to advise the governors on regional GIS issues and needs. In FY2000, the Council drafted resolutions in support of a NASA State and Local Government Remote Sensing Data & Technology Initiatives (PR00-006), which was adopted on June 13, 2000. The council also drafted an MOU with NASA designed to improve the use of remote sensing/satellite imagery in the state. Nebraska membership on this committee was recently transferred to the Policy Research Office.

6) Other Reviews

In FY 2001 planning staff reviewed draft or Final feasibility reports/EIS documents or preliminary draft reports for a number of federal studies. These included the Western Sarpy Clear Creek feasibility study and the feasibility report / EIS for the Sand Creek Watershed Environmental Restoration and the Antelope Creek Flood Control project. Planning staff also occasionally provide limited review of NRD groundwater management plan revisions, NRD long range implementation plans or NRD Master Plans.

10) 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. The DNR has examples of this information available on it's web site and has made this data available to other federal, state, and local agencies.

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 and recently through financial support for the Lower Platte River and Tributaries Feasibility study.

V. BUDGETARY TABLES

Table 1

PLANNING AND REVIEW PROCESS EXPENDITURES - FY 2001

	310 Acct.*	334 Acct.	Total
Platte River Alliance	2,708	----	2,708
Basic Planning Activity - Computer Hardware	21,120	17,175	38,295
Basic Planning Activity - Computer Software	----	----	----
Basic Planning Activity – Computer Licensing, Access Fees, Maintenance Contracts, Repairs and Data Processing	16,158	50,327	66,485
USGS Groundwater Levels	----	15,375	15,375
Basic Planning Activity - Intergovernmental Contract with NRCS	----	30,536	30,536
Staff and Other Support Including Travel	185,549	538,391	723,940
Platte River Cooperative Agreement	----	86,350	86,350
TOTAL	\$225,535	\$738,154	\$963,689

* FY 2001 was the final year for budget account 310. It is included in this table because it was broken out in all previous annual reports. This table was completed with significantly different assumptions than Table 2 (see Table 2).

Table 2

PLANNING & REVIEW PROCESS EXPENDITURES FY 01
AND BUDGET FYs 2002-2006

	FY2001*	FY2002	FY2003	FY 2004	FY 2005	FY 2006
Lower Platte River Alliance	\$ 2,708	\$ 5,416	\$ 5,687	\$ 5,972	\$ 6,270	\$ 6,584
Lower Platte Feasibility Study	--	125,000	--	--	--	--
Intergovernmental Contract with NRCS	30,536	32,063	33,666	35,350	37,118	38,973
Platte River Cooperative Agreement	86,350	287,500	272,500	--	--	--
USGS Ground Water Levels	15,375	--	9,260	--	10,210	--
Computer Hardware	38,295	**	**	**	**	**
Computer Licensing, Access Fees, Maintenance Contracts, Repairs and Data Processing	66,485	**	**	**	**	**
Staff/Other	723,940	711,380	706,827	736,781	747,848	779,932
TOTAL	\$963,689	\$1,278,610	\$1,027,940	\$778,103	\$801,446	\$825,489

* The basis for budgetary calculations is substantially different for FY 2001 versus future fiscal years. In FY 2001 and previous fiscal years, budgetary calculations were based upon the ten staff that served in the old Natural Resources Commission Comprehensive Planning Section. Both computer and office related expenses were included in those figures. Beginning in FY 2002, 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. This includes about 9.3 full time equivalent positions for part of the NDNR Planning and Assistance Division and about 2.25 full time equivalent positions from other portions of NDNR. Also beginning in FY 2002, computer and office expenditures are no longer included in the budgetary figures. While many of the planning activities represent collaborative effort that include other agencies, these rough estimates include only the NDNR planning related budget.