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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TABLE OF CONTENTS

I. PLANNING AND REVIEW PROCESS ACTIVITIES

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

1) Interrelated Water Management (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) Interrelated Water Management Fund Reviews
4) Climate Assessment and Response Committee
5) Environmental Trust Committee
6) GIS Steering Committee
7) 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 2007 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 2007, as in the last few fiscal years, was work towards implementation of LB 962, the major water legislation passed during the 2004 session of the Unicameral. Nebraska Department of Natural Resources (NDNR) 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 are annual reports evaluating hydrologically connected water supplies and compilation of joint integrated management plans. On December 13, 2006 the Department issued the *"2007 Annual Evaluation of Hydrologically Connected Water Supplies"* in response to statutory requirements. It was the second annual evaluation. One Planning and Assistance Division staff member works closely with Natural Resources Districts on development of joint management plans. Other major Departmental planning related efforts have included Platte River Recovery Implementation Program work and work on Republican River settlement implementation.

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 led Cooperative Agreement/Platte River Recovery Implementation Program efforts for much of the 06-07 fiscal year.

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 AREAWIDE OR STATEWIDE WATER RESOURCES PROBLEMS

1) Interrelated Water Management (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. In 2006 the Unicameral also created an Interrelated Water Management Fund to provide monies to assist natural resources districts with research related to integrated management planning efforts. That fund is administered by the Natural Resources Commission with Department of Natural Resources staff assistance.

Funding and Research

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 FY 07-08 budget includes $1.25 million for LB 962 activities by the Department of Natural Resources and $2.7 million for state assistance to local governments for LB 962 implementation activities. 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 NDNR 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 to the interrelated water management plan program .

Over the last few years the above newly available funding was used to hire a Legal Division staff member, a geologist/interrelated water management specialist in the Planning and Assistance Division, two Water Administration Division staff members, a ground water modeler and a senior ground water modeler. As of this report the Department of Natural Resources also has committed or expended for contract studies or related data collection a total of $1,662,430 for the combined periods of FYs 05-06, 06-07, and 07-08. This does not include the separate Natural Resources Commission commitment through the Interrelated Water Management Fund. Table 1 identifies that research and related completion dates.

In addition to the contract studies; the new staff have enabled the Department to address a number of needs associated with the implementation of interrelated water management legislation. The two ground water modeling positions have provided needed Departmental expertise on ground water models which have uses for both interstate compacts and agreements and for other internal modeling uses in support of interrelated water management plans. The geologist/interrelated water management specialist has helped provide expertise to direct research activities into needed areas and apply results to departmental needs.

2007 Annual Evaluation of Hydrologically Connected Water Supplies

On December 13, 2006 the Department published the *"2007 Annual Evaluation of Availability of Hydrologically Connected Water Supplies"*. The report was required to reach a preliminary conclusion on whether any additional basins were fully appropriated beyond those previously identified by the Department.

The report was the second 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.

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 each year.

Integrated Management Plan Activity

Although no new management plans were completed and approved during the year, activity on the plans continued in a number of natural resources districts. Of the nine natural resources districts involved in the LB108 process on July 16, 2004, when LB 962 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 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 and Assistance Division has one staff member who spends 80 to 90 percent of her time working with the IMP/basin-wide planning process.

Due to determinations of fully appropriated areas in 2006 the Department is continuing to work 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 Recovery and Implementation Program

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. In October 2006 Nebraska Governor Heineman signed the formal document agreeing to the Platte River Recovery and Implementation Program (Program). Jim Cook, legal counsel for the Department served as the state representative on the governing body for the agreement from the August, 2005 resignation of Roger Patterson as Director of Natural Resources until his retirement in March 2007. Since that time NDNR Director Ann Bleed has served as the State representative to the Governance Committee of the Program. Members of the Governance Committee represent nine groups, the Bureau of Reclamation, US Fish and Wildlife Service, State of Colorado, State of Nebraska, State of Wyoming, Downstream Water Users, South Platte Water Users, Upper North Platte Water Users and Environmental Groups.

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.

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.

Until March of 2007 the primary agency work on the Program was handled through the Director of Natural Resources and the agency Legal Division. Since March of 2007 the Planning and Assistance Division has provided the major assistance to the Director in coordinating and conducting agency Program efforts and New Depletion Plan implementation work. Some work is also being carried out by personnel with the Nebraska Game and Parks Commission now that Kirk Nelson has been appointed as the Nebraska State alternate to the Governance Committee.

An additional responsibility under the Program is for each state to mitigate, offset or prevent any new depletion to the river's target flows as part of the proposed program. This responsibility, which must now be carefully coordinated with the Integrated Management Plan (LB962) activities described previously, 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 seven Natural Resource Districts.

In FY 05-06 a contractual basin land use study was completed and land uses for 1997, 2001, and 2005 were compared to determine the extent to which the number of irrigated acres had changed since 1997, and the COHYST models and other information were 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 depletions caused by new irrigation uses of hydrologically connected groundwater that were begun between July 1, 1997 and December 31, 2005 has been determined and reported to the Governance Committee in the spring of 2007. The state is still determining the depletions caused by other new uses. Those are the depletions for which, under the new depletion plan, the state is responsible for offsetting. Those offsets are to be in place by the end of calendar year 2008.

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 legislature in earlier years also provided appropriations that went to studies and Governance Committee expenses.

One large issue that has been resolved is 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 the water and land contributions being made by CNPPID and NPPD such that no cash will be required from Nebraska for any portion of the $187M. 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, run modeling scenarios that may show the effects of different implementation mechanisms for meeting new depletions plan needs, 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. However, an internal draft document has been developed to help coordinate action and assign responsibilities for NDNR work on Program activities.

3) Republican River Basin Cooperative Activities

NDNR and the Republican River NRDs have continued to implement the Comprehensive Settlement of the Kansas v. Nebraska and Colorado lawsuit. NDNR and the Lower, Middle and Upper Republican NRDs are working to complete and adopt updated Integrated Management Plans (IMP). The plans will be effective beginning in 2008. Water metering is now required on all large capacity wells and the NRDs are reading the meters annually. The well meter information is used in the Republican River Compact Administration (RRCA) ground water model, as part of the water allocation system.

The Republican River basin is still experiencing water supply shortfalls. While the basin water supply increased considerably during the spring of 2007, it is likely that 2007 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, NDNR and the NRDs entered into negotiations with four surface water irrigation districts/companies to purchase the use of part or all of their 2007 water supply.

- The NDNR will purchase 12,500 acre-feet of storage water and the natural flow available to the Nebraska Bostwick Irrigation District below Harlan County Lake from the Nebraska Bostwick Irrigation District for delivery to the Kansas Bostwick Irrigation District.

- The NRDs will purchase the natural flow available to the Frenchman Valley Irrigation District and the Riverside Irrigation District and the natural flow above Harry Strunk and the storage water available from Harry Strunk from the Frenchman Cambridge Irrigation District for delivery to the Kansas Irrigation District.
- The NRDs and the NDNR will continue and expand projects to control vegetation in the Republican River and tributary stream channels. (Statutory changes in 2007 resulted in creation of 13 member Riparian Vegetation Task Force. That task force is to make recommendations for riparian vegetation management in fully and overappropriated areas, including the Republican Basin. It is the intent of the Legislature to appropriate two million dollars annually for the management of vegetation within the banks of a natural stream or within one hundred feet of the banks of a channel of any natural stream. Two million dollar appropriations were made for both FY 08 and FY09.
- The NRD and NDNR will continue and expand programs to inform and educate landowners about irrigation best management practices and encourage additional water conservation. (Approximately $50,000)
- The NDNR will continue to work with pivot manufacturers and the University of Nebraska to develop new methods to make better use of whatever water is available to the basin and to develop programs to educate landowners about the availability of these practices.

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 Commission. 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.

NDNR significantly expanded its efforts related to COHYST with the hiring of a ground water modeler and a senior ground water modeler in late 2006. The additional staff enabled the Department to better examine the technical accuracy of modeling work as well as develop and run scenarios relevant to integrated management planning. The staff also participated in work related to a joint effort on a conjunctive water resource plan for the Central Platte Valley.

Two other NDNR staff members continued to contribute to 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.

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 2008 period.

5) Floodplain Planning / Hazard Mitigation Planning

The completion of the all-hazards mitigation plan for the Papio-Missouri River Natural Resources District, which was approved by FEMA last fall is a major accomplishment. With an approved plan Nebraska can move from pilot-type study to serious work to "cover" large chunks of Nebraska's population in a plan by completing NRD plans. In May, Nebraska received notification that PDM planning grant applications had been approved for the Lower Platte South NRD and Lower Elkhorn NRD. Once these plans are completed and approved, the percentage of Nebraska's population covered in a mitigation plan will be well over 50%. Along with those two NRD plans, Nebraska also received application approval for plans for Seward County, the City of Aurora, and City of Schuyler.

In addition to the Papio- Missouri River NRD plan, NDNR is currently involved with plans for Elmwood, Hall County, Bloomfield, and Beatrice. NDNR also expects to receive notification soon that FMA project funds have been received for the City of Alliance. The Department assisted with flood hazard and all mitigation hazard plans throughout the state.

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 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 purpose of the decision support system would have been 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.

In February of 2007 the Department withdrew that request, noting both its own internal priorities, and the need levels and inputs from other agencies. It was noted that a decision support system may ultimately be of some use in Platte River Recovery Implementation Program efforts and in managing water in the Environmental Account. It was noted that parties might wish to pursue development of a Platte River decision support system again at some point in the future for that reason. Because work has been discontinued, the current intention is that this work item not be included in next year's annual report.

7) Lower Blue River Basins Flow Augmentation Study

The Lower Blue River Basins Flow Augmentation Study is a joint effort by the Nebraska Department of Natural Resources, U.S. Bureau of Reclamation, the Little Blue Natural Resources District, and the Lower Big Blue Natural Resources District 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 is to:

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.

Most of the work on the study to date has been provided through Department of Natural Resources staff. However, the Bureau of Reclamation is expected to provide substantial assistance on portions of the work involving economic analysis and the natural resources districts are expected to assist with the alternatives. The study was delayed in the past year but is now expected to be completed by the end of 2007.

8) Lower Platte River and Tributaries Feasibility Study

Initiated in January 1998, the Lower Platte River and Tributaries Feasibility Study was 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 eventually helped result in feasibility studies for separate projects on Sand Creek and for the Western Sarpy County Levee as well as water quality and development research and floodplain planning. NDNR contributed $500,000 in pass through funding and $200,000 in staff time earlier in the process. The process is now effectively complete and will not be mentioned in future annual reports.

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. Much of the effort has centered on providing digital geographic information for various land use and development characteristics in the study area. The Department of Natural Resources has a very limited role, agreeing only to provide limited in-kind services to the study. Study completion is expected during the current fiscal year.

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 Appraisal Study

The Frenchman Valley Appraisal Study is a cooperative effort with the U.S. Bureau of

Reclamation to develop and evaluate alternative water management scenarios in the study area with a view toward optimizing the economic and environmental benefits of the water resources in the study area. Participants in the study process include: the U.S. Bureau of Reclamation, the Nebraska Department of Natural Resources, Frenchman Valley and H&RW Irrigation Districts, the Upper Republican Natural Resources District, the Middle Republican Natural Resources District, and the Nebraska Game and Parks Commission. A revised draft plan of study was completed in February 2007. Study objectives currently include:

- Optimize economic benefits of irrigation to the study area, including surface and ground water irrigation
- Optimize economic benefits of Enders Reservoir for recreation, fish and wildlife
- Evaluate environmental benefits/values of recreation, fish and wildlife and water quality to the study area
- Evaluate economic benefit of flood control provided by Enders Dam
- Provide alternative water management scenarios to aid partners/stakeholders in future planning
- Minimize adverse environmental impacts

This study has involved extensive work by the Department of Natural Resources ground water modeling staff. Draft scenarios for the study have been completed and are currently being incorporated into a Bureau of Reclamation appraisal level study report. Study participants are considering whether any further effort is needed in a potential future phase of the study.

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. 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 being developed. 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.

Planning Information Base – Work Completed and Planned

1) Water Rights Digitizing

Water rights digitizing is providing a useful agency database. The activity is carried out through the Floodplain/Dam Safety/Surveys Division. The Planning and Assistance Division also provides some 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 significant assistance provided through the Planning and Assistance Division. As of June 30, 2007, DNR has produced 19 countywide Flood Insurance Rate Maps (FIRMs) (augmented by 3 countywide maps completed by other agencies). The mapping process was underway in another 32 counties.

3) National Hydrography Dataset

The Department of Natural Resources has finished compiling tagged vector hydros for a National Hydrographic Dataset (NHD) for the state. Tagged Vector Hydros are surface water features represented, in electronic format, as lines that have been attributed with hydrographic descriptions. 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. It will enable spatial comparison of hydrographic data with a wide range of other data. More importantly it will provide the basis for, or enhance the efficiency of, a wide range of potential water analysis activities. NHD data is available now for most of Nebraska with the exception of the Loup river basin. USGS has indicated that NHD data will be available for the entire state by July of 2007.

The Department of Natural Resources is coordinating stewardship of the NHD in Nebraska. The NHD will be continuously maintained so that remains a current dataset and improved as Nebraska's requirements dictate. The NHD may also be used as major input to a Stream Hydrology Project to determine and publish hydrologic statistics for streams of interest in Nebraska. This project could help address requests for flood-related information, including discharge, stage, and flood elevation information.

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.

The SSURGO Digital Soil Survey for Nebraska was completed in 2004 and work of the partners then 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.

In addition Soil Survey Fund appropriations were greatly reduced in the last session of the legislature with funds only being made available at about a quarter of the previous biennium. While that funding should be sufficient to finish the county joins process by the end of 2007, state participation in future Natural Resources Conservation Service soil survey activities will likely be greatly diminished.

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. Edgematching with the surrounding state continued to be the emphasis of the effort last year and will extend into the next year. The surrounding states are not as far along as Nebraska so as their information catches up, an effort will be made to make sure all lines are consistent across state boundaries.

7) Nebraska Rainfall Assessment and Information Network

This 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 the 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. Several new NRDs have been trained on the use of the site and have their NRDs organized and in the network. The program has grown from 819 Nebraska volunteers at the end of March of 2005 to 1267 as of this writing with several more applications arriving each day.

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.

The Water Policy Task Force met four times in FY 06-07 with continued implementation of LB 962 and identification of needed funding mechanisms receiving major attention from Task Force members. The Task Force approved a white paper entitled "State of Nebraska Water management and Funding Needs Assessment and Report". That white paper recommends a systematic assessment of water management issues, alternative solutions, and funding needs related to water quantity in each basin in the state. In separate action the Task Force also reaffirmed its support for state funding to implement sections of the statutes requiring that integrated management plans *"ensure that the state will remain in compliance with applicable state and federal laws and with any applicable interstate water compact or decree or other formal state contract or agreement pertaining to surface water or ground water supplies"*.

The Task Force has 50 members and NDNR provides it with administrative assistance. In FY 2007 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. The

Task Force is also considering how to address water banking; one of the original legislative charges to the group.

2) Nebraska Resources Development Fund Reviews

During FY 2007 staff and the Commission developed a project proposal and application ranking process to help the Commission evaluate future projects due to the Natural Resources Development Fund's inability to fund all current requests and the limitations imposed by the NRDF Cap. The Commission also took action revising Title 256, Chapter 2, Rule 007 and Chapter 4, Rule 001 relating to when the Commission and Director act on project application requests. This change will allow projects to be considered annually, at the same time.

Two projects, Lower Turkey Creek Watershed and the Little Sandy Creek Watershed both requested and received allocation increases. Five requests for FY 2008 obligations were received. These requests exceeded the amount available by over 2 million dollars and were therefore tentatively approved at a reduced rate during the Commission's May meeting, pending receipt of the Legislatures General Funds.

3) Interrelated Water Management Fund Reviews

The Interrelated Water Management Plan Program (IWMPP) was created in 2006 with the passage of LB 1226 Section 20. This grant program is intended to facilitate the duties of Natural Resource Districts (NRDs) arising under the Nebraska Ground Water Management and Protection Act, and to help offset costs incurred in performing those duties.

This program fund is administered by the Natural Resources Commission (the Commission) and DNR upon recommendations of the NRC. Funds appropriated from the program are allocated by the Commission to NRDs based on guidelines adopted by the Commission. Amounts requested and approved must be supported by a minimum local revenue match comprising twenty percent (20%) of the total project cost.

On July 13, 2006, the Commission adopted guidelines for allocating the funds and evaluating applications. Guidelines were revised in November 2006 and July 2007. DNR is responsible for evaluating requests for project funding submitted annually by Natural Resource Districts based on guidelines and limitations established by the Nebraska Resources Commission. Funds approved by the Commission will be distributed to NRDs in accordance with the guidelines.

The Natural Resources Commission granted all requests for IWMPP funding in FY2006-07. A total of $2,424,436, representing all currently appropriated funds, was committed to fourteen projects encompassing participation from 22 NRDs. Of these, twelve projects were projected to continue for two or three years.

a total of $2,970,123 was requested from a total appropriation of $2,412,854. Requests included six new projects and continued funding of twelve previously approved projects. For FY 2007-2008 eighteen applications were filed. Of these, twelve were a continuation of projects from last year and six were requests for new projects. These eighteen requests exceeded the amount available for allocation from this fund by almost a half million dollars with $2,970,123 requested

from an appropriation of $2,412,854. After technical reviews and a scoring process, five of the applications were not funded or were funded less than requested.

4) Climate Assessment and Response Committee

The Climate Assessment and Response Committee (CARC) was active again in FY 2006/07 as drought conditions continued throughout portions of the state for the eighth year. The Panhandle region 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. Some portions of the state received sufficient moisture in the spring of 2007 and are no longer considered to be in a drought situation. 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; problems caused by excess moisture or flooding conditions; and other related activity like hail, wind storms, and tornadoes, and snow storms..

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.

5) 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

6) 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 coordinator serves on the Committee. The development of a high-resolution National Hydrographic database (NHD), Nebraska Geospatial Data Center and Clearinghouse, National Map Initiative and merger of existing low-resolution PLSS Databases have been identified as top areas of interest for Nebraska.

7) 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 implemented, the State has participated in project planning activities through the Natural Resources Development Fund.

TABLE 1 – INTERRELATED WATER MANAGEMENT RESEARCH DATA COLLECTION COMMITMENTS COMPLETION DATES (DOES NOT INCLUDE BUDGETED BUT UNCOMMITTED RESEARCH)

WORK ITEMS	Contracted Amt or Final Expenditure Fys 05-06, 06-07 and 07 08 Combined	Due Date	Completed
UNL			
Platte Land Use Mapping (Non 962 Funds) on line at Colmit	NA	Complete	Yes
Land Use Mapping- Rest of State soon	$282,652	6/25/2007	No
Hydraulic Conductivity Research ? Lat TAIK	$69,921	7/1/2006	No
Box Butte County - Niobrara Hydrologic - Groundwater-Flow Model Jim has original to CD	$66,189	Complete	Yes
Aquifer-Stream Interaction Study - Upper Niobrara	$18,383	Complete	Yes
Basin Geologic Atlases / Hydraulic Conductivity/ Specific Yield and Transmissivity Mapping Jim has CD	$116,314	6/30/2007	No
Consumptive Use Research for Use in Annual Evaluation of Availability of Hydrologically Connected Water Supplies final by Feb	$8,000	Complete	Yes
Estimation of Evapotraspiration from Riparian and Invasive Species in Republican Basin	$209,440	6/30/2007	No
COHYST (Platte River Cooperative Hydrology Study) (Dollar Amounts are Estimates)			
Future COHYST Model Maintenance	$33,491	NA	
Future DNR COHYST Study	$116,000	NA	
USGS			
Eastern Nebraska Heliborne geophysical mapping to examine glacial areas and help determine extent of hydrologic connection to SW	$251,000	9/30/2007	No
Loup-Elkhorn Groundwater Model to examine effects of GW withdrawal on availability of SW and long term effects on GW resource	$295,000	10/31/2007	No
JOINT EFFORTS WITH BUREAU OF RECLAMATION			
Blue Basin Augmentation Study to examine opportunities for providing compact flows to Kansas and allowing additional Nebraska Use	0		
Frenchman Valley Appraisal Study to examine water use options related to Enders Reservoir & Frenchman Valley & HRW Into Dist	0		
OTHER			
Conjunctive Use Contract - CNPPID/NPPD to Assist in management planning in Central Platte Basin	$15,000	Complete	Yes
Hydraulic conductivity mapping assistance in Central Platte area	$4,000	Complete	Yes
Contract for Senior Modeler to assist in examining Tri-County groundwater mound and provide outside comment on modeling efforts	$50,000	6/30/2007	No
Streambed Conductance Research in Elkhorn Basin to assist in quantifying water exchange between rivers and aquifers	Not yet contracted		No
Conservation Study	Not yet contracted		No
Unsaturated Zone Network- Imperial	Not yet contracted		No
Other		NA	NA
INTERNAL PROJECTS			
Integrated Water Information Project consultant assistance	$96,462	Complete	
Additional stream gages in areas useful for integrated management planning efforts	$30,578		
	$1,662,430		

TABLE 2 - PLANNING & REVIEW PROCESS EXPENDITURES FY 06 AND BUDGET FYs 2007-2011

	FY2007 (est)*	FY2008	FY2009	FY 2010	FY 2011	FY 2012
Lower Platte River Alliance	5,417	5,417	5,417	5,417	5,417	5,417
Platte River Recovery Implementation Program**			Unknown	Unknown	Unknown	Unknown
National Hydrography Dataset Expenses Other than DNR Staff (funded via grant or anticipated to be funded via grant)		0	--	--	--	--
Contract LB 962 Studies***		602,220	602,220	602,220	602,220	602,220
LB 962 Equipment, Computer Equipment, Supplies, Travel****		100,000	100,000	75,000	75,000	75,000
Staff/Other		1,300,000	1,300,000	1,300,000	1,300,000	1,300,000
TOTAL		**2,007,637**	**2,007,637**	**1,982,637**	**1,982,637**	**1,982,637**

* FY 07 Expenditures not yet available. 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 2007 this included about 13 full time equivalent positions for part of the NDNR Planning and Assistance Division and about 2.7 full time equivalent positions from other divisions of NDNR. These preliminary estimates include only the NDNR planning related budget and are not necessarily based upon totals in any single budget program amount received by the agency. 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 as well as some NDNR funds. 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. Also not included are Interrelated Water Management Funds of $2,412,854 each in FY 06-07, FY 07-08 and FY 08-09. Those funds are direct pass through to natural resources districts for research related to implementation of interrelated water management activities.

Funds for the Republican River Settlement, the North Platte Decree implementation, and the Platte River Recovery Implementation Program are not included in this budget.

** The budget for the Platte River Recovery Implementation Program includes pass through and contract funds. This includes monies 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 07 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 amount noted.

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.