



Nebraska Resources

Newsletter

Published Quarterly by the Nebraska Department of Natural Resources
301 Centennial Mall / P.O. Box 94676 / Lincoln, NE 68509-4676

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Editor's Note:

A full color electronic version of this newsletter can be found on the Department's web site along with back issues at <http://www.dnr.gov/dnrnews/newsarchive2.html>.

Lower Platte River Basin Declared Not Fully Appropriated

New Scientific Evidence Reverses Preliminary Decision

On March 30, 2009, the Director of the Nebraska Department of Natural Resources (DNR), Brian Dunnigan, announced that the final determination is that the **Lower Platte River Basin is not fully appropriated**. The basis for overturning the original preliminary determination was the presence of new evidence.



"After evaluating all of the testimony and information provided through the hearing process, including the discovery of an erroneous method used to develop the ground water model simulations for the preliminary determination, the Lower Platte River Basin is not fully appropriated at this time," said Director Dunnigan. *"This final decision is, as the law requires, based upon the best scientific data, information and methodologies available."*

The Ground Water Management and Protection Act requires DNR to annually evaluate the expected long-term availability of hydrologically connected water supplies for both existing and new surface water uses and ground water uses in each of the State's river basins. State law also requires that determinations on whether river basins, subbasins, or reaches are fully appropriated must be based upon the best scientific data, information and methodologies available.

Continued on p.2

Integrated Management Plans - Update

By Amy Ostdiek



When a basin or portion of a basin is determined to be fully appropriated or declared overappropriated, the DNR and affected NRD(s) must work cooperatively to develop an integrated management plan (IMP) within three years (or five years if a two-year extension is granted). After a plan is developed, the NRD and DNR hold one or more joint hearings for public comment. Within 60 days of the final hearing, the IMP must be finalized and implemented. **Currently, 14 NRDs across the state are in some stage of the integrated management planning process.** The state's IMPs are dynamic, since they must be adaptive to current water uses and supplies. They are also specific to each area, since they must address the needs of a diverse state.

Continued on p.3

Lower Platte Declared Not Fully Appropriated continued from p. 1

On December 16, 2008, Director Dunnigan issued the 2009 annual report which included a preliminary determination that the Lower Platte River was fully appropriated based upon the scientific data, information and methodologies available at that time. As required by law, DNR then scheduled public hearings to receive information on the extent of the area in which the surface water and ground water supplies are hydrologically connected, and whether the stays on new uses should be terminated.

In making the preliminary determination, DNR relied on the United States Geological Survey's federal government study contracted by the Department and local natural resources districts known as the Elkhorn Loup Model or ELM study. At that time, the ELM study was the most accurate science available for making such determinations. Following the preliminary determination, additional information was released to

the Department and the natural resource districts. This information indicated that an erroneous method was used to calculate future ground water pumping under average climatic conditions. The erroneous method overestimated the amount of pumping, resulting in a greater estimate of the effect of average pumping on the Lower Platte River. The Department corrected the erroneous method and determined that the future effect of average pumping on the Lower Platte River would not currently cause the basin to be fully appropriated.

Dunnigan added, *"The Department will continue to collaborate with the local NRDs and other interested parties to improve the science and methodologies used in making such determinations. Together, we will strive to assure existing users of a dependable water supply into the future."*

Additional information on the final determination can be found on the Department's website at <http://dnr.ne.gov>.



Nebraska Environmental Trust Grants Help Department Address Integrated Management Information Needs

By Steve Gaul

For the past year the Department of Natural Resources has administered **three Nebraska Environmental Trust grants** that address research or educational needs related to the Department's integrated water management duties. Although University of Nebraska personnel are carrying out most of the work on these efforts, the Department applied for the grants and has a major interest in the results.

The educational project, **"Enhancing the Value of Water through Management Education,"** involves a joint effort of the University of Nebraska and the state's pivot manufacturers to help irrigators obtain maximum value from a constrained water supply. Although the program is statewide in scope, initial efforts have been concentrated in water-short areas, including the Republican Basin and the Platte River Basin upstream of Kearney. The program is to deliver three separate levels of educational modules and is relying on the pivot manufacturers to help attract a previously unreached audience.

"Whether it is by workshop or web we believe this project is developing and delivering the needed hands-on information to help producers maximize use of a limited water supply," says UNL Coordinator Chuck Burr. *"We've especially appreciated the solid information, support, and finan-*

cial support supplied by the manufacturers as well as the financial support from the Nebraska Environmental Trust." Lindsay Corporation, Reinke Manufacturing, T&L Irrigation, and Valmont Industries have all provided support for the effort which is scheduled to continue through June 2011. The project website can be found at <http://water.unl.edu/pivotproject>.

One of the challenges in integrated management of surface and ground water is understanding how changes in land use practices can impact consumptive water use and the water budget of an area. The consumptive use effects of conservation measures are being more closely examined in another project receiving Nebraska Environmental Trust support, **"Quantifying Evaporation, Crop Evapotranspiration, and the Water Balance for Tilled and Untilled Fields."**

In that project, the annual, seasonal, monthly, weekly and hourly evapotranspiration losses are being measured and the amount of surface evaporation difference between the two tillage practices is being determined. *"We hope to both provide information to enhance farm productivity and to help state agencies with better information for their decision-making,"* says Project Coordinator Suat Irmak, Associate Professor of UNL Department of Biological Systems Engineering. He said *"the project*

is progressing very well and we already have preliminary results for one year on evapotranspiration, plant physiological characteristics, yield, and hydrologic balance differences between tilled and untilled fields." The project began in April 2008 and is scheduled to be completed in June 2011.

With the need to reduce consumptive water use apparent in some basins, major efforts to control riparian vegetation are underway. However, a better understanding of the impacts of vegetation and vegetation removal may help Nebraskans to better target future efforts. An additional Nebraska Environmental Trust grant coming through the NDNR, **"Riparian Vegetation Impacts on Water Quantity, Quality, and Stream Ecology"** is intended to help provide some of that guidance. The research will provide observational and model-based estimates of the hydrologic impacts of vegetation removal within riparian zones (particularly phragmites, an invasive species), as well as an analysis of the impacts on water quality and stream ecology. UNL researcher and study team member John Lenters characterized the project as *"a multi-faceted approach to assessing the impacts of phragmites removal."* He said that progress is *"moving along well, and we have all the instrumentation in place to monitor the impacts of vegetation removal later this summer."* The final study report is due in June 2010.

Integrated Management Plans - Updated continued from page 1

Republican River Basin

The Republican NRDs (Upper Republican, Middle Republican, and Lower Republican) were declared fully appropriated after the passage of LB962 in 2004. These NRDs, in cooperation with the DNR, implemented IMPs for the period 2005-2007. They were recently revised to account for variations in water supply (as determined under the Republican River Compact). The current Republican IMPs will be in effect until 2012.

Platte River Basin

Areas of the North Platte, South Platte, Twin Platte, Central Platte, and Tri-Basin NRDs were designated fully and/or overappropriated after the passage of LB962 in 2004. In addition to an overappropriated basin-wide plan, each NRD is also required to have an individual IMP, which should address both the overappropriated and fully appropriated areas.

These Platte Basin IMPs (including the IMPs of the North Platte NRD, the overappropriated basin portion of the South Platte NRD, the Twin Platte NRD, Central Platte NRD, and Tri-Basin NRD), as well as the overappropriated basin-wide IMP, are on schedule to be adopted and implemented by September 15, 2009. The boards of directors and the DNR have worked very hard to develop the surface water and groundwater controls within the IMPs, which should be finalized in April and May. Hearings will take place in June and July, and in August 2009, the NRDs and the DNR will take action to adopt and implement the controls and other programs. The South Platte NRD adopted an IMP on June 20, 2008, which will be modified this year to conform with the overappropriated basin-wide plan.

The hydrologically connected waters of the Platte Basin also extend into the Upper Big Blue NRD. The DNR and

Upper Big Blue NRD will be working to complete an IMP for this area over the next year or two.

Niobrara River Basin

Portions of the Upper Niobrara White NRD, including the Hat Creek Basin, the White River Basin, the portion of the Niobrara River Basin above the Mirage Flats Diversion Dam, the Box Butte Creek Sub-Basin, and the Snake Creek Sub-Basin, were declared fully appropriated in 2004. Then, the Niobrara River above Spencer Dam was determined fully appropriated in January 2008, including areas of Dawes, Sheridan, and Box Butte counties hydrologically connected to the Lower Niobrara River below the Mirage Flats diversion. The final hearing on the Upper Niobrara White NRD proposed IMP and surface water and groundwater controls was held on March 18, 2009, and the deadline for adoption of the Upper Niobrara White IMP is May 18, 2009.

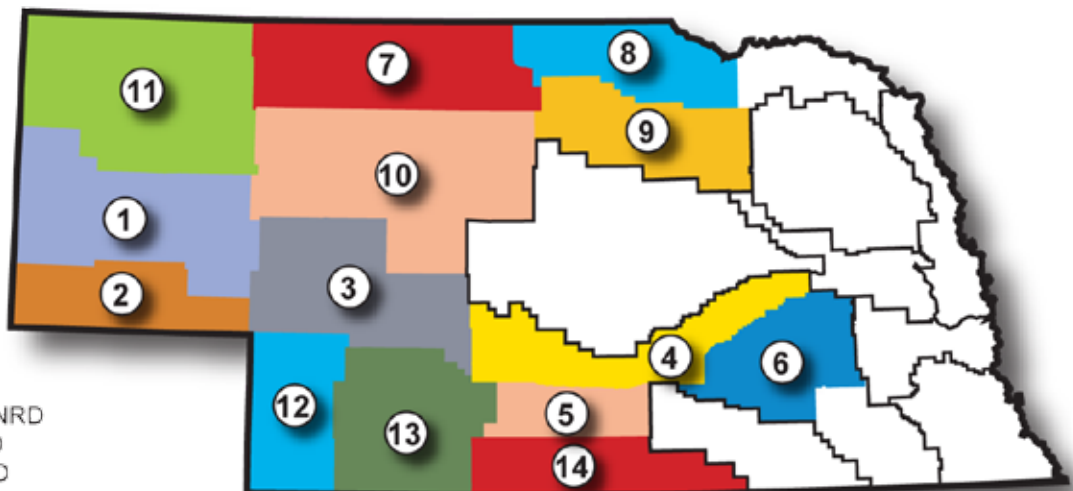
The Middle Niobrara NRD and portions of the Lower Niobrara, Upper Elkhorn, and Upper Loup NRDs were also included in the fully appropriated designation of the Niobrara River above Spencer in January 2008, and are currently in the initial stages of IMP development. The Middle Niobrara and Lower Niobrara NRDs have begun holding meetings for stakeholders.

Since the passage of LB962 almost five years ago, the DNR and NRDs have made significant progress in the integrated planning process. Stakeholder involvement has been critical to the successful development and implementation of the IMPs. The DNR looks forward to a continuing partnership with the NRDs, which will ensure the success of this process into the future.

For additional information on integrated management plans or process see our website at: <http://dnr.ne.gov/LB962/LB962Implementation.html>

natural resources districts

1. North Platte NRD
2. South Platte NRD
3. Twin Platte NRD
4. Central Platte NRD
5. Tri-Basin NRD
6. Upper Big Blue NRD
7. Middle Niobrara NRD
8. Lower Niobrara NRD
9. Upper Elkhorn NRD
10. Upper Loup NRD
11. Upper Niobrara White NRD
12. Upper Republican NRD
13. Middle Republican NRD
14. Lower Republican NRD



Currently, 14 of Nebraska's 23 NRDs are in some stage of an integrated management planning process.

Well Registrations in 2008

Water wells for various uses continued to be drilled across Nebraska in 2008. **Last year over 4,200 water wells were drilled** for purposes ranging from livestock watering to irrigation to municipal water use.

Current Nebraska law requires that **all** water wells be registered with the State. The Nebraska Department of Natural Resources is the state department responsible for maintaining well registration data. Exceptions to the law include test holes in existence for 10 days or less, dewatering wells with intended use of 90 days

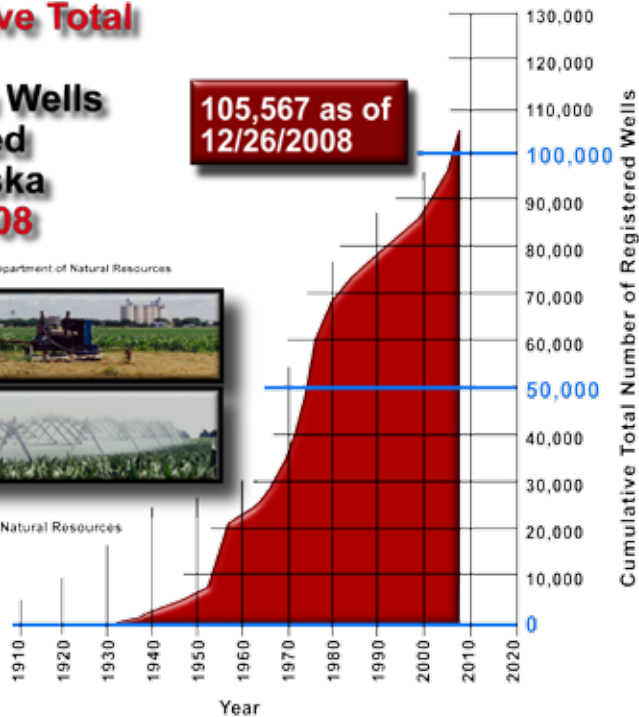
or less, domestic, and livestock wells **completed prior to September 9, 1993**. Water well contractors are responsible for filing the well registration for newly constructed water wells with DNR within 60 days of well completion. Well owners are responsible for registering existing wells which have not been previously registered with the State. Registration forms and information are available at DNR's offices or on our website at the address found below. Failure to register water wells is a Class IV misdemeanor under Nebraska law.

Cumulative Total of Irrigation Wells Registered in Nebraska 1910 - 2008

Registered with the Nebraska Department of Natural Resources



Published by the Nebraska Department of Natural Resources February 27, 2009



The electronic address for searching DNR well registration information is:
<http://dnrdata.dnr.ne.gov/wellssql/>

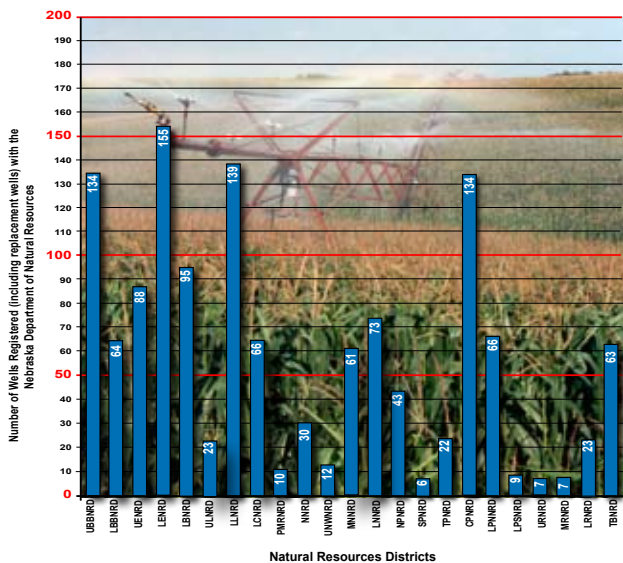
DNR Forms are available at:
<http://dnr.ne.gov/docs/wellforms.html>

Total Well Registrations for 2008 by Natural Resources District

Natural Resources Districts	Total Irrigation Wells Registered 2008 (includes replacement wells)	Total of All Wells Registered 2008
Central Platte	134	443
Lewis & Clark	66	117
Little Blue	95	181
Lower Big Blue	64	110
Lower Elkhorn	155	317
Lower Loup	139	359
Lower Niobrara	73	119
Lower Platte North	66	176
Lower Platte South	9	298
Lower Republican	23	89
Middle Niobrara	61	138
Middle Republican	7	128
Nemaha	30	109
North Platte	43	209
Papio-Missouri River	10	278
South Platte	6	43
Tri-Basin	63	125
Twin Platte	22	180
Upper Big Blue	134	251
Upper Elkhorn	88	207
Upper Loup	23	169
Upper Niobrara-White	12	176
Upper Republican	7	29
Totals	1330	4251

2008 Registered Irrigation Wells by Natural Resources District Including Replacement Wells

Note: There is a 60 day period after drilling for well drillers to register new wells so some wells drilled after December 26, 2008 may not be included in this chart.



Nebraska Natural Resources Districts

- UBB-Upper Big Blue
- LBB-Lower Big Blue
- UE-Upper Elkhorn
- LE-Lower Elkhorn
- LB-Little Blue
- UL-Upper Loup
- LL-Lower Loup
- LC-Lewis & Clark
- PMS-Papio-Missouri River
- N-Nemaha
- UNW-Upper Niobrara-White
- MN-Middle Niobrara
- LN-Lower Niobrara
- NP-North Platte
- SP-South Platte
- TP-Twin Platte
- CP-Central Platte
- LPN-Lower Platte North
- LPS-Lower Platte South
- UR-Upper Republican
- MR-Middle Republican
- LR-Lower Republican
- TB-Tri-Basin

Published by the Nebraska Department of Natural Resources <http://dnr.ne.gov> March 3, 2008

LiDAR Data Acquisition Almost Complete

By Shuhai Zheng

The south-central Nebraska and north-central Kansas LiDAR data acquisition, initiated in January 2009, is expected to be complete later this spring. Data for about 239 square miles along the Platte River, 14,446 square miles in south-central Nebraska, and 2,992 square miles in north-central Kansas will have been collected. As of April 2, data acquisition for 85 percent of the project area has been completed (See figure below for total area).

Two companies were hired to collect and classify LiDAR data: Merrick & Company and Optimal Geomatics. After completing their field data collection work, the contractors will conduct a quality check, classify data points by land cover type, and deliver the data to the project manager Dewberry for independent quality control review. The Nebraska Department of Natural Resources (NDNR) provided over a thousand ground-control points for the project area. Dewberry will use them to test the vertical accuracy of the LiDAR data for quality assurance.

LiDAR data that passes the quality check will be delivered to NDNR for digital elevation model (DEM) processing. Both raw and processed data will be available on NDNR's servers when they become available.

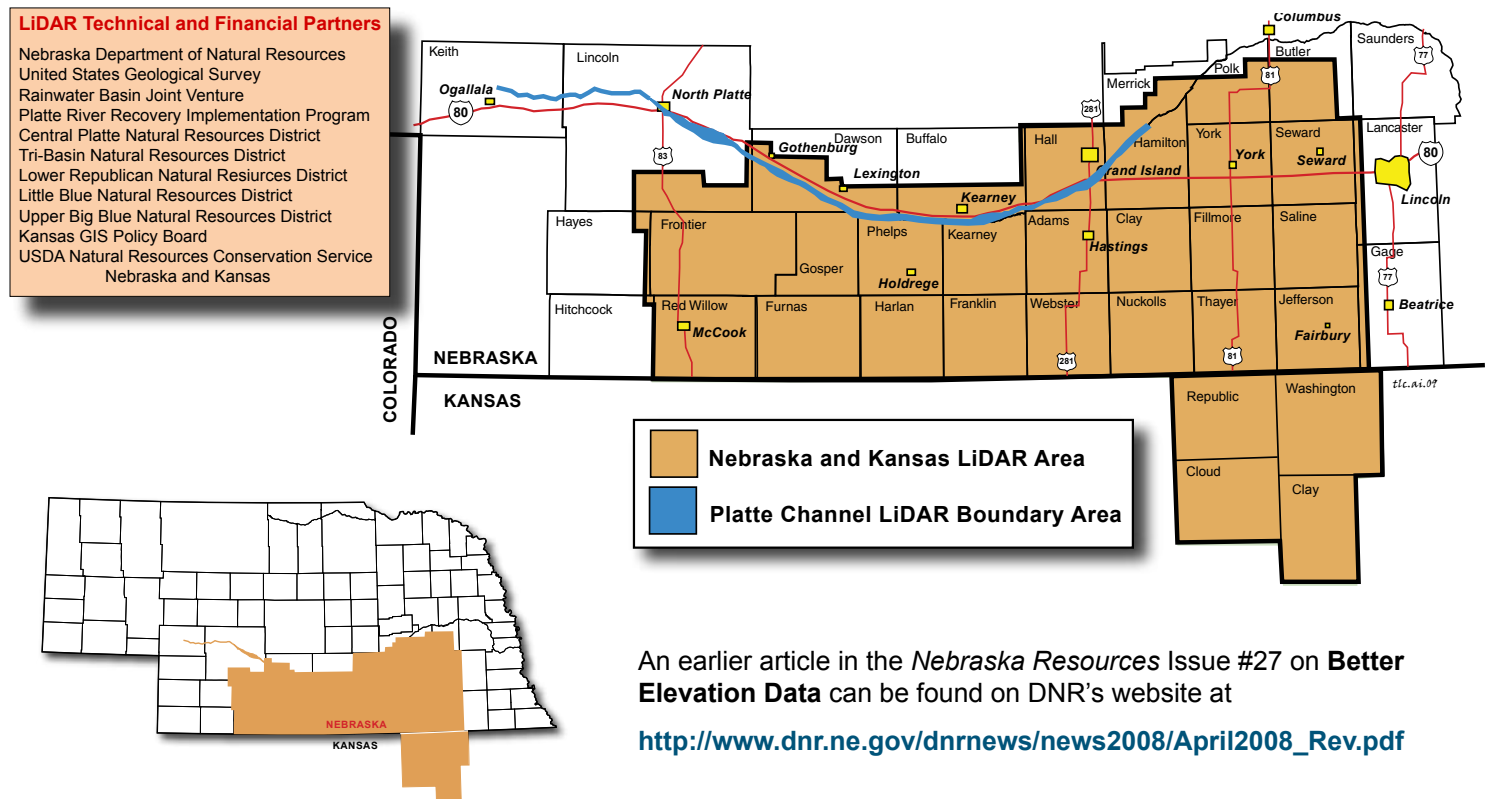
NDNR and the LiDAR project's other partners are anxiously anticipating receipt of this information. Floodplain Management will use the LiDAR data to enhance its floodplain mapping process thereby ensuring even more accurate

community and county floodplain maps.

LiDAR, an acronym for Light Detection And Ranging, is also known as airborne laser mapping. It is a fast-maturing technology that is being adopted within the mapping community. It combines a Global Positioning System with an inertial measurement unit and a laser scanner.

LiDAR aims a laser beam at the ground from an aircraft. It then measures the laser's return to determine ground or canopy elevations thereby enabling the efficient collection of highly accurate surface-elevation data for large geographic areas. The travel time of each laser pulse to an object and back is divided by two and multiplied by the speed of light to calculate the precise distance.

For more information on the LiDAR project's status, please contact Shuhai Zheng at 402-471-3936.



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Department of Natural Resources

Brian P. Dunnigan P.E., Director

The *Nebraska Resources* is a quarterly publication of the Nebraska Department of Natural Resources and is edited by Terry L. Cartwright, Public Information. Your comments and or suggestions are welcomed.

Printed with Soy Ink

Nebraska Department of Natural Resources....

....dedicated to the sustainable use and proper management of the State's natural resources.

The Department of Natural Resources continues presenting workshops developed for groundwater modeling and technical groups. The schedule, speakers, topics, and location for workshops are presented below. Additional workshops, topics, and dates can be found on DNR's website at <http://dnr.ne.gov/docs/currentmeetingschedule.html> or you can contact Doug Hallum at 402-471-1114 or doug.hallum@nebraska.gov.

May 28th, 2009: Integrated Water Management Planning - Atkinson

Jesse Bradley/Jim Schneider, NDNR – Water Management Planning
Lyndon Vogt, UNWNRD – One NRD's Perspective of the Planning Process
Doug Hallum, NDNR – Necessary Considerations when Calculating Offsets
Jason Kepler, NDNR – Water Budget Approach to Integrated Management –
Republican River Study

Time: 10:00am – 3:00pm

Location: Atkinson Country Club, Atkinson, NE

June 25th, 2009: Modeling Group Workshop - Scottsbluff

Staci Parent, NDNR – Statewide LiDAR Initiative Business Case
Jim Cannia, US Geological Survey - Nebraska Panhandle Geophysical Surveys
Doug Hallum, NDNR – Riparian Vegetation Water Use
Others TBA

Time: 9:00am – 3:00pm

Location: North Platte NRD, Scottsbluff, NE

July 30th, 2009: Transformational Modeling of the Water Environment: Visions from WATERS Network - Lincoln

Wayne E. Woldt, Ph.D., P.E.

Associate Professor of Biological Systems Engineering
School of Natural Resources, University of Nebraska – Lincoln

Time: 3:00-4:00pm

Location: UNL – East Campus (33rd and Holdrege), Hardin Hall, Room 901,
Lincoln, NE