Nebraska Resources Newsletter

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

Inside this Issue:

Issue 36, July 2010

Agency Numbers to Remember

Agency address:
Nebraska
Department of Natural Resources
301 Centennial Mall South
Fourth Floor
P.O. Box 94676
Lincoln, Nebraska 68509-4676
Agency phone number:
(402) 471-2363
Agency fax number:
(402) 471-2900
Agency homepage address:
http://www.dnr.ne.gov

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.ne.gov/dnrnews/newsarchive2.html.**

New DNR Groundwater Wells Database

By Pam Bonebright

For the past 18 months Department of Natural Resources (DNR) staff have been planning, programming, meeting, and testing a new groundwater wells database. The new database and the updated online water well registration system were **launched on June 1, 2010**. Input was solicited from numerous individuals and organizations who register water wells and use water well registration information. DNR received input from Nebraska's Water Well Standards and Contractors' Licensing Program, natural resources districts, researchers, state agencies and other interested parties. This new database has incorporated a large percentage of the suggestions received concerning useful groundwater wells data.

The old groundwater well database was a Microsoft Access database that did well in its time but was limited in flexibility, user capacity, and quantity of data that could be stored. The new groundwater wells database is visible through a World Wide Web browser-based user interface and the

Continued on p. 2

Extreme Rainfall Results in Several Dam Failures

By Patrick J. Diederich, P.E., Chief of Dam Safety

The historic rains in mid-June put heavy pressure on many dams throughout the state causing several to fail. Fortunately, no loss of life occurred as a result of the dam failures, in fact, no person has ever died as a direct result of a dam failure in Nebraska.

Department personnel were first alerted to the flooding at 4:00 p.m. on the afternoon of June 12th by the Nebraska Emergency Management Agency (NEMA) and worked closely with NEMA throughout the evening providing requested information and advice. An Emergency Operations Center was subsequently opened by NEMA with floodplain and dam safety staff assisting NEMA at the center through June 23rd.

The flooding caused the failure of the following six dams: Ericson Dam, in Wheeler County, Bredthauer Dam in Valley County, Morgan Dam in Loup County, Gracie Creek Road Dam in Loup County, Taylor-Ord Diversion Dam in Loup County and the Ord-North Loup Diversion Dam in Valley County. Six other dams across the state were overtopped by floodwaters, but did not fail. All of the dams were classified as low hazard potential dams with the exception of Ericson Dam, which

Continued on p. 4

New Groundwater Wells Database continued from p.1

data is stored in an enterprise level relational database. This type of formatting allows for integration into other agency databases/information. The DNR has also created an integrated ownership/contact database that incorporates names and addresses from a number of programs across the Department. If owner information exactly matched between existing ownership and groundwater ownership, they were combined. This provides the ability to discover interactions related to surface water rights, groundwater wells, incoming/outgoing correspondence, maps and legal documents for an owner in a single search.

The new database will contain information that will be more useful to all interested parties and better protect our groundwater resource. DNR is collecting more detailed, and more uniform information concerning the water well location, grout and gravel, and geological material encountered. To this end a new water well registration form has been created. In the past, when a new form was made available we continued to accept the old forms with less information. That will not be the case this time. **All water well registrations received at DNR starting June 1, 2010, will be required to have the information required on the new form**.

We have incorporated a water well series table into the database. When the series water wells are for the purpose of irrigation this table allows us to document

acres once and show which water wells are providing water to a common piece of land. Previously, due to the old database structure, the same acres were documented individually under multiple water wells. Over time this will lead to more accurate information regarding acres being irrigated by more than one water well. We are also able to track historic changes in irrigated acres served by water wells.

On the New Water Well Registration form **all water wells will be required to have all of the following: GPS, ¼¼, Section, Township, Range w/direction, County and NRD.** To assist the public with converting GPS locations there is a link on our web page that will help verify the correct location and provides an aerial photo to view. The link is under Groundwater Well Registration Information on the DNR web homepage. Scroll down under *Other on-line options and click on To Convert Latitude Longitude Coordinates to Section-Township-Range Location*. If additional assistance is needed obtaining correct GPS coordinates, please contact the field personnel for Nebraska's Water Well Standards and Contractors' Licensing Program or your local NRD.

The new system has addressed the issue of double cased and nested water wells. There are now two sections for casing and screen and grout and gravel that allow additional information. Also under grout and gravel, additional information is required. The *Material Description for Gravel* is to be **limited to the options listed on the form**. Also *Quantity of Gravel* and *Volume & Type Grout* are **required and limited to the descriptions provided on the form**. A conversion table was provided to us from Nebraska's Water Well Standards and Contractors' Licensing Program to calculate borehole capacities. This link is located at the above mentioned web site location.

The Geologic Materials Logged has been completely changed to allow for more uniformity and understanding to all parties. The options for *Type, Hardness,* and *Color* are limited to those provided on the form. This information will provide assistance to other contactors and interested parties regarding the conditions for drilling in a given area.

The new groundwater well database allows for better customer service. Water well registrations that contractors submit online can have a turnaround of one day, rather than the previous two or three day delay. The database allows for better tracking of forms and correspondence received at the Groundwater Section. Phone calls regarding specific water wells are also being documented within the database.

DNR's goal has been and will continue to be to provide the best information possible regarding groundwater well information to our customers. The new database is a flexible tool and will be updated and improved as required by the needs of the citizens of the state. DNR thanks everyone who provided input and suggestions regarding the database.

2010 Spring Floods

By Gloria Bucco and Steve McMaster

During two wet weeks in June, just about the entire State of Nebraska was under some type of flood watch or warning. Major rivers and tributaries flooded, causing damage to homes, businesses, crops and bridges. The spring rains resulted in flooding on the Missouri, North Loup, Elkhorn and Platte rivers. In addition, Ponca, Big Papillion, Weeping Water and Logan creeks set flooding records. All told, 16 gages broke historic records, two records going back to 1947.

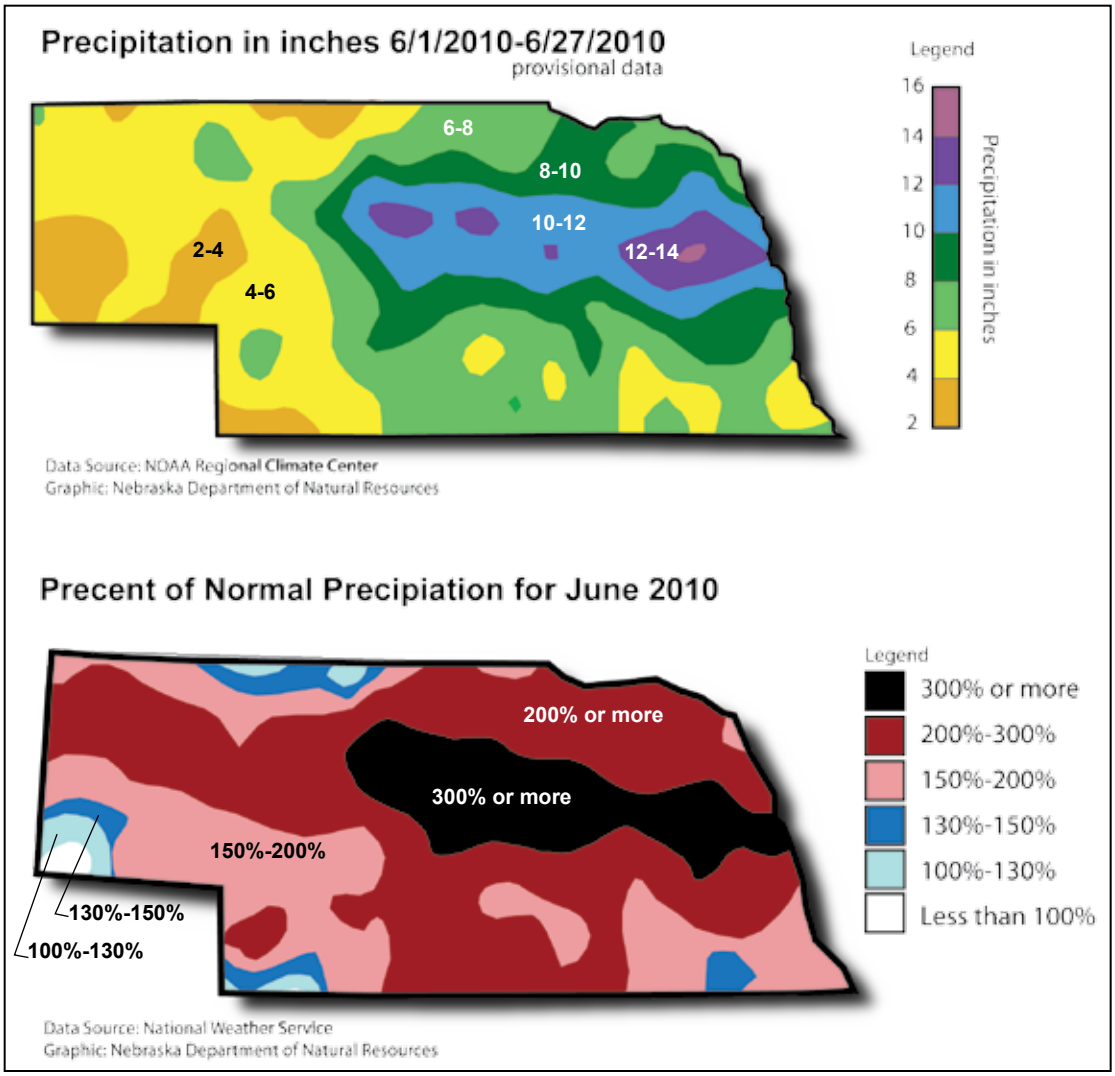
So far, preliminary damage estimates to public infrastructure from the Nebraska Emergency Management Agency total more than $16 million statewide.

On July 15, 2010, President Obama issued a federal disaster declaration for Public Assistance in 53 Nebraska counties for June's storm damage and flooding. Public Assistance can help with eligible costs to remove storm debris, take emergency protective measures and repair or replace disaster-damaged roads, bridges, public buildings and critical facilities such as water, sewer and power systems, and other public facilities. Hazard Mitigation Grant Program funds will also be available statewide to reduce future hazard risk.

Highest Flood Stages Recorded During June 2010

River	Flood Stage* (feet)	Crest Date	Historic Record (feet)	Historic Year	Source
Missouri at Rulo	26.63	6/23/2010	25.60	1952	USGS
North Loup at Taylor	7.21	6/12/2010	7.17	1978	USGS
Elkhorn at Ewing	13.32	6/13/2010	11.32	1947	USGS
Ponca Creek at Verdel	15.14	6/12/2010	14.70	1960	USGS
Big Papillion Creek at Fort Street in Omaha	23.61	6/5/2010	21.58	2008	USGS
Platte Mid-Channel at Cottonwood Ranch near Elm Creek	9.75	6/25/2010	8.38	2008	USGS
Elkhorn at Norfolk	16.85	6/15/2010	13.05	1995	USGS
Elkhorn at Pilger	15.21	6/16/2010	12.23	2007	USGS
Logan Creek at Wakefield	26.28	6/12/2010	23.55	2003	USGS
Elkhorn at Neligh	15.54	6/15/2010	13.37	1995	NDNR
Weeping Water Creek at Union	32.67	6/21/2010	30.97	1993	NDNR
Cedar River near Spalding	8.47	6/14/2010	7.50	1947	NDNR
Calamus River near Harrop	7.75	6/12/2010	4.68	1995	NDNR
Elkhorn River near Atkinson	10.34	6/13/2010	9.27	1995	NDNR
North Loup River at Ord	6.89	6/12/2010	5.52	1962	NDNR
Mira Creek near North Loup	12.96	6/12/2010	10.56	1981	NDNR

* new flood stages recorded in June are provisional



The National Flood Insurance Program is available to any community or county that makes application and adopts floodplain management regulations. Those regulations, based on state and federal minimum requirements, will ensure that new development will be protected from the 1% annual chance flood (100 Year Flood). There is no application fee, and DNR staff members are available to help with the process or other floodplain management questions.

This spring's rain and subsequent record-breaking flooding reinforce the importance of floodplain management. When a community or county knows where its flood risks are located, officials and citizens can take steps to protect life and property by controlling development within those areas.

Extreme Rainfall Results in Several Dam Failures continued from p.1

was a significant hazard potential structure. **Dams in the state are classified into three categories: low, significant, and high based on the amount of expected downstream damage from breaching or mis-operation.**

All of the facts concerning the failure of the dams listed above are not known at this time and therefore no conclusions regarding the failures are presented. In the case of the five low hazard potential dams that failed, it is likely that the dams were overtopped and the floodwater simply eroded the earthen embankment. The design standards for low hazard dams vary depending upon size. However, the **standard for small, low hazard dams is for them to pass the 50-year rainfall event without overtopping**. The 50-year rainfall event varies across the state from 4 inches in the west to 6.5 inches in the southeast in 24-hours. Seeing the record rainfall totals from across the state, it is not surprising that some, small low hazard dams were overtopped.

Ericson Dam failed following the erosion of the auxiliary, or secondary spillway. At Ericson Dam, the auxiliary spillway was a vegetated earthen overflow around the north end of the dam. Water flowed through the auxiliary spillway for several hours. It appears the vegetative cover in the spillway failed several hundred feet downstream of the crest of the spillway. Once the vegetative cover failed, the earthen spillway started to erode. After several hours, the erosion worked its way up the spillway and eventually breached the crest of the spillway and emptied the reservoir.

It should be noted that **dams in the state are the sole responsibility of the owner of the dam**. The Department periodically inspects all jurisdictional size dams in the state and works closely with dam owners to see that they are properly designed and well maintained. Generally, a dam falls under the Department's jurisdiction if it is either at least twenty-five feet tall or has a storage capacity of at least fifty acre-feet of water below the top of dam, unless it is in a high hazard potential location (meaning that loss of life would likely occur if the dam were to fail) then it falls under the Department's jurisdiction regardless of its height or storage capacity.

None of the 133 high hazard potential dams were stressed close to failure. This is mainly due to the exceptionally high design standards for this class of dam. **These dams must pass the 100-year rainfall event** through the principal, or primary, spillway only and not be overtopped by the "probable maximum precipitation." The "probable maximum precipitation" is the maximum amount of rainfall that can theoretically occur in any given area. In Nebraska, this amount ranges from 18.5 inches in 24 hours at the Wyoming border to 25 inches in 24 hours near Falls City.

It would have been preferred to have none of the dams fail, but given the over 2,300 dams and the record rainfalls in June, it is probably too much to expect. On the bright side, hundreds of flood control dams operated by local natural resource districts served their purpose and significantly reduced the degree of flooding. Notably, the recently constructed Lake Wanahoo and Leigh Dams performed superbly.

Additional information on dam safety can be found on DNR's website at:
http://www.dnr.ne.gov/docs/damsafety.html

A brochure on dam maintenance entitled
Safety and Maintenance of Small Earthern Dams can be found at:
http://www.dnr.ne.gov/floodplain/DamSafety/SmallEarthenDams_2010.pdf

Ogallala Platte River Recovery Project has been Awarded $2,000,000

The **Ogallala Platte River Recovery Project has been awarded $2,000,000** for fiscal year 2010 through the **Agricultural Water Enhancement Program (AWEP) of the Natural Resources Conservation Service**. This project will assist in planning efforts to reduce consumptive uses of water in the Platte River Basin. The Nebraska Department of Natural Resources (DNR) is the lead partner along with the Central Platte, Tri-Basin, Twin Platte, South Platte, and North Platte Natural Resources Districts (NRDs).

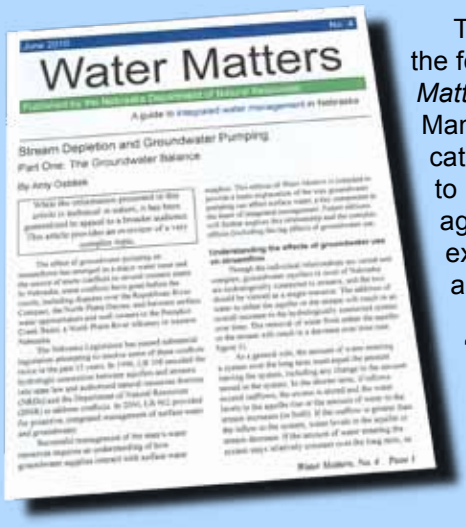
The **purpose of this project is to reduce water consumption and related depletions to surface water flows** in these five NRDs, helping to meet the requirements of the integrated management plans recently adopted by the DNR and the NRDs. The AWEP funds will provide direct payments to producers for a **conversion of agricultural land from irrigated farming to non-irrigated land uses for a period of five years**. Non-federal funds will then be offered to extend the conversion through the purchase of permanent easements. These non-federal funds are available through the Platte Basin Habitat Enhancement Program (PBHEP), funded through DNR and NRD contributions, and a grant from the Nebraska Environmental Trust. Through PBHEP, the DNR and the NRDs will promote and enhance the AWEP project.

AWEP is a **voluntary conservation initiative** that provides assistance to agricultural producers for agricultural water enhancement activities on agricultural land for the purposes of conserving surface water and groundwater and improving water quality.

Water Matters

a guide to integrated water management

By Amy Ostdiek


Water Matters

Stream Depletion and Groundwater Pumping
Part One: The Groundwater Balance

The DNR recently released the fourth edition of *Water Matters*, the Integrated Water Management Division's publication in which topics related to integrated water management in Nebraska are explained and explored in an approachable way.

The article, titled "Stream Depletion and Groundwater Pumping; Part One: The Groundwater Balance," is about the effect of groundwater pumping on streamflow. This is an important issue that has been the source of conflicts in several western states. In Nebraska, disputes over the Republican River Compact, the North Platte Decree, and between surface water appropriators and well owners in the Pumpkin Creek Basin have gone before the courts. The Nebraska Legislature has passed substantial legislation attempting to resolve some of these conflicts, including LB 108 in 1996 and LB 962 in 2004.

Compliance with state statutes and successful management of Nebraska's water resources require an understanding of how groundwater supplies interact with surface water supplies. *Water Matters* No. 4 provides a basic explanation of the way groundwater pumping can affect surface water, which is an important concept at the heart of integrated management. As discussed in the article, in large areas of Nebraska, groundwater aquifers are hydrologically connected to the streams, and the two should be viewed as a single resource. Many factors, such as aquifer properties and distance to the stream, can affect how quickly groundwater pumping depletes streamflow.

To learn more about stream depletion and groundwater pumping, read *Water Matters* No. 4. *Water Matters* is available online at www.dnr.ne.gov/iwm or contact DNR and request to be put on the mailing list. *Water Matters* No. 5, which will address the timing components of stream depletion, will be available in July 2010.

Newly Appointed Commission Member

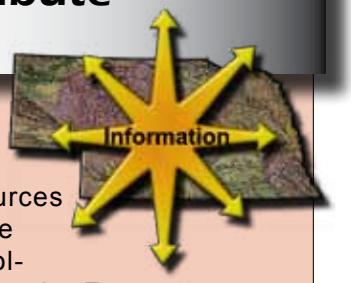
Governor Heineman has appointed Thomas Knutson to the Nebraska Natural Resources Commission (NRC). As of July 8, 2010, **Tom will represent Surface Water Irrigators interests throughout Nebraska.**

Tom's experience includes more than 30 years working in water resources management with over 25 years as general manager of the Loup Basin Reclamation District, which includes the Sargent and Farwell Irrigation Districts located in north-central Nebraska. He has served as director of the Nebraska State Irrigation Association and the Nebraska Water Resources Association, and has represented the State in the National Water Resources Association.

The NRC consists of 16 members. **Three of those members are appointed by the governor and approved by the legislature to represent the specific resource interests of municipal water users, surface water irrigators, and groundwater irrigators.** The remaining 13 commission members are selected to four-year terms by natural resource district directors to represent Nebraska's 13 major river basins.

The NRC members represent the interests of their areas and have broad responsibilities in soil and water conservation and development of resources. Commission members also give guidance in the oversight and management of six state funds administered by DNR to help conserve, protect, and develop Nebraska resources.

Centers Distribute Information



Staff members from the Department of Natural Resources (DNR) were among the many agencies and volunteers who assisted at the **Emergency Operations Center** and the **Joint Information Center** set up to help answer and distribute information about the flooding event and related issues. DNR responded to issues involving dam and levee safety and inspected breeched and overtopped dams and coordinated with the National Weather Service and U.S. Army Corps of Engineers to predict possible flooding locations. Numerous people ranging from the local level to the governor's office worked together to coordinate and distribute information during the event.

Nebraska Resources

Nebraska Department of Natural Resources
301 Centennial Mall South, 4th Floor
P.O. Box 94676
Lincoln, Nebraska 68509-4676

Return Service Requested

PRSRT STD
U.S.POSTAGE
PAID
LINCOLN NE
PERMIT 212

State of Nebraska
Dave Heineman, Governor

Nebraska
Department of Natural Resources
Brian P. Dunnigan P.E., Director

The *Nebraska Resources* is a quarterly publication of the Nebraska Department of Natural Resources. Your comments and 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.