

2016 CREP Renewal Process Complete

By Susan France

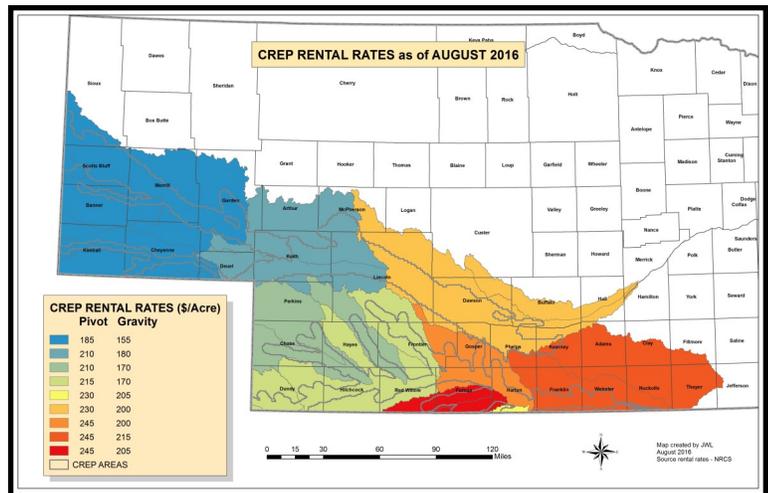
The new renewal process for the Nebraska Platte-Republican Conservation Reserve Enhancement Program (CREP) water use contracts went very well. This is the first year that existing CREP contractors whose original ten-year contracts were due to expire were able to reenroll into the CREP for another 10 to 15 years.

CREP is a voluntary program located in areas that have been determined to be fully or overappropriated in relation to water quantity. Under CREP, irrigated acres are temporarily retired, and receive yearly irrigated rental rates from the U.S. Farm Service agency.

Much of the success of the reenrollment is due to our partners. Department staff would like to thank the Nebraska U.S. Farm Service Agency (FSA) state and local offices, the natural resources districts, the irrigation districts and canal companies, and the U.S. Bureau of Reclamation in McCook for all of the additional work and the expediency under which they reacted. Without the cooperation received from many, the deadlines would not have been met, and many producers who wanted to stay in the program would have been thwarted.

There were 108 contracts which were due to expire on September 30, 2016. The 108 contracts totaled 7,487.94 acres of previously irrigated ground that

had not been irrigated for at least ten years under the program. Of the 108 contracts, there were 17 contracts that were not subject to reenrollment because of other legal considerations. The Department received reenrollment of 67 contracts, totaling 4,819.38 acres. During the reenrollment period, the Department also received seven new contracts totaling 483.9 acres. As of September 30, 2016, there was approximately 46,000 acres involved in the CREP program. This figure is prior



to the 108 contracts expiring and before the reenrollment or new contracts take effect.

Above is a map showing the current irrigated rental rates in effect for the CREP. The map also includes the boundaries of the CREP area. Anyone interested in applying for a new CREP contract should contact their local FSA office.

Are You Prepared?

Dam Failures and Emergency Action Plans

By Tom Schuerman

Several times a year, we are reminded of the importance of being well prepared for extreme weather events when a potentially dangerous situation develops

Due to the potential for the loss of lives in the event of a failure, high hazard potential dam owners are required to have an Emergency Action Plan (EAP) that is updated and tested periodically, and ALL dam owners need to know what to do in an emergency.



Failed dam in Thayer county after the May 2015 rain event caused overtopping of the embankment.

Regardless of how well a dam is maintained, it can still fail. The most common cause of dam failure is the dam being overtopped by flood water following extreme rainfall. National statistics show that overtopping due to inadequate spillway design or debris blockage of spillways accounts for approximately 34% of all dam failures in the U.S. Just because a dam has been in place for many years does not mean it cannot be overtopped by an extreme flood. It is important to

maintain a dense uniform grass cover in earthen spillways and on the slopes of the dam so it can withstand some overtopping without eroding. If a dam is found to be in imminent danger of failing, the owner should take the following actions:

maintain a dense uniform grass cover in earthen spillways and on the slopes of the dam so it can withstand some overtopping without eroding.

If a dam is found to be in imminent danger of failing, the owner should take the following actions:

- Notify local law enforcement by calling 911. Be prepared to tell them

the location of the dam, the severity and nature of the problem, and the downstream area that may be affected.

- Do whatever is necessary to bring people in immediate danger to safety.
- If time allows, take immediate action to delay, moderate or prevent failure of the dam.

I have recently been tasked with overseeing the status of the emergency action plans that are required for the high hazard potential dams in the state, and I've noticed we have quite a few that are approaching five years old and are in need of updating by the dam owner.

Without periodic maintenance, your EAP will become outdated and ineffective over time; so it's important to review it at least annually. Updating your EAP should be done as needed with any changes in personnel and contact information, significant changes to the facility, or emergency procedures. The review should include an evaluation of any changes in flood inundation areas, downstream developments or in the reservoir area, and a determination of whether any revisions, including revising the inundation maps are necessary.

To assist dam owners in this effort the NeDNR has prepared instructions, a worksheet and a fillable EAP template, which is available at <http://dnr.nebraska.gov/dam/EAP>. The basic plan

information in the template has been completed so that dam owners only have to complete the portions that are specific to their dam, making the task as simple as possible. The template also brings consistency to EAP documents across the state, which will allow county and regional emergency managers, the National Weather Service, the Nebraska Emergency Management Agency, and the NeDNR to quickly and efficiently find critical information in the event of an actual dam related emergency.

We are committed to providing assistance to dam owners in updating their emergency action plans. Please contact me at (402) 471-1222 or tom.schuerman@nebraska.gov if you have any questions or if we can be of assistance.



Failed dam in Dixon county in 2016 due to erosion of the auxiliary spillway.

It's All Connected

Making the Connection Among Surface Water, Groundwater and Climate

By Colby Osborn

In September Zablon Adane and I traveled to Portland, Oregon, to the National Groundwater Association *Connecting the Dots...Groundwater, Surface Water and Climate Connections* conference to present some of the work the Department of Natural Resources (NeDNR) has been working on. The audience was mostly comprised of scientists with hydrology/hydrogeology background and professionals from the water management community.

Zablon presented on evaluating the role of precipitation pattern on the temporal changes in streamflow and baseflow. The NeDNR has long been interested in assessing the long-term trends in streamflow and baseflow in major drainage areas across the state. One of the overall objectives of this effort is to examine the presence of temporal trends in precipitation and its impact on streamflow and baseflow. In order to isolate the impact of precipitation, a relatively undeveloped area in the

Nebraska Sandhills was selected for this evaluation. Streamflow data for the Middle Loup River was obtained from USGS for 1950 to 2014. Regional climate data at the Purdum, Nebraska, weather station was also provided by High Plains Climate Center (HPRCC) for the same time period. Simple linear regressions indicate an increasing trend in daily streamflow and baseflow over time. Meanwhile, the trend in daily precipitation is effectively zero. The regressions for the total annual values also indicate a robust positive trend in streamflow and baseflow.



Further investigations show that the number of rainfall events have been steadily declining in the past few decades. A correlation matrix also reveals that streamflow has a stronger relationship with the number of rainfall events than with total precipitation. The declining number of wet days and the lack of trend in total rainfall suggest a potential increase in rainfall intensity, which could partially explain the increase in streamflow. It is important to note that other conditions that can increase streamflow, such as snowmelt rate, still need to be properly considered.



I presented on parallelization and linearization of stream depletion analyses. The conventional numerical methods of stream depletion analyses are often computationally demanding. This example demonstrates NeDNR's use of HTCondor and MODFLOW-SDA to parallelize and linearize the stream depletion analyses, respectively, to enormously reduce the computational time without deteriorating the accuracy in the conventional method. MODFLOW-SDA linearizes the flow equation in MODFLOW by assuming unchanged aquifer thickness within a time step period. MODFLOW-SDA is combined with HTCondor to compute the stream depletion distribution map in a parallel manner.

Example results produced with this method applied are compared with

results from the conventional method. The results compare favorably with those simulated using the conventional method, with significant improvement in computational efficiency. This method takes advantage of the existing computer resources within the NeDNR and proves to be an effective solution for the high computational demands of stream depletion analyses.

Both presentations were well received and left attendees impressed with the NeDNR's cutting edge work. Many hydrology/hydrogeology practitioners asked a number of questions afterwards and wanted to learn more. We even received a couple questions after the conference was over pertaining to documentation and how to use MODFLOW-SDA.

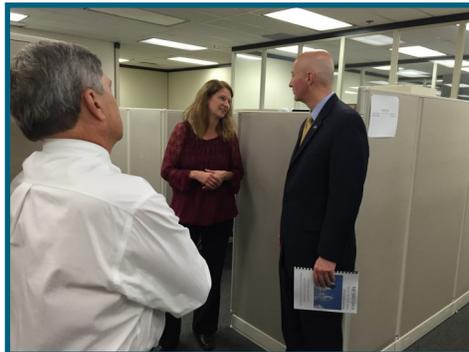
Photos:
Scenes from the
Columbia River in
Portland Oregon.
By Colby Osborn

Visit from the Governor

On October 13, Governor Pete Ricketts paid a visit to the office in Lincoln to meet employees and see all of the good work and programs at NeDNR. Our office was in a state of disarray due to construction, but we spit-shined it as best we could.

With only 45 minutes we weren't able to show him everything we do, but he was able to tour the offices and check in with a few staff to get a close-up view of our day-to-day operations and several online and specialized programming activities.

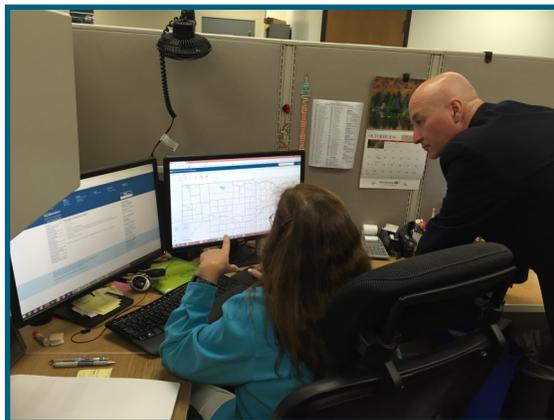
Governor Ricketts showed a good understanding of water management and data and asked good questions. He was impressed with all of the long-term, experienced professionals at NeDNR and thanked them for their service.



Kim Menke, IT division head, talks with Governor Ricketts and NeDNR Director Jeff Fassett.



Rex Gittins, Governor Ricketts and NeDNR Director Jeff Fassett



Pam Bonebright shows the Governor some of the many projects IT works on with the other divisions to provide up-to-date information to the public efficiently.



Vicki Rumbaugh and Mike Thompson discuss the many aspects of permits and registrations.

Know the Flow

New NeDNR Streamgaging Website Now Available

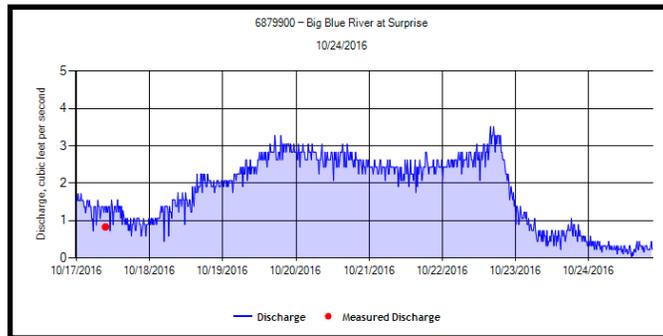
By Jim Williams

The NeDNR streamgaging website has a fresh new look. From the NeDNR home page (<http://dnr.ne.gov/>) click on **Current Streamflow** to see the new features.

The most obvious difference is that the map of active gages is now interactive. Users may search for gages by zooming in and panning around the map. The base map can be changed to an aerial photograph to assist with finding a particular location. By clicking on any one gage icon on the map, the site visitor may see the most recent instantaneous stage and discharge, as well as the average discharge for the past two days. Some reservoir gages have now been added to the map, with more to come. Visitors may click on the gage number in the box that pops up to see more information about the gage—they are directed to either to the NeDNR's detailed page for the gage or to the USGS web page.

Alternately, users may prefer clicking the **Gage List** button at the right of the streamgaging page to go to a table listing the gages. The table has been simplified to make navigation easier. The default listing is in downstream order, for those users that may not be familiar with how various diversions are related to nearby streamgages. As before, clicking on any of the headers will reorder the gages (alphabetically, for example, or by streamgage number, etc.). Drop down boxes for the source of the information, the type of gage, and river basin all help

to decrease the number of gages to look through. In addition, the user may type any portion of a gage name or number, or perhaps the river name, to narrow down available results.



Screenshot of streamgaging data for Big Blue at Surprise October 24, 2016

After clicking through to a particular streamgage, whether from the map or the table, discharge and stage graphs are shown as they were on the prior website, along with measurement data, rating curves, and hydrographic reports pages. Up to two years of instantaneous data are available to download (in six-month blocks). Daily data is available back to water year 2005; however, all published daily data will soon be available through the webpage for active streamgages.

For discharge and storage information that is not available through the website, please contact Susan France at (402) 471-1684 or susan.france@nebraska.gov.

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Employees Honored for Service

Congratulations to the following employees who were honored recently for their years of service to the State of Nebraska. Ceremonies were held throughout the State to offer congratulations and thanks. Honorees received a coffee mug.

10 Years:

**BJ Green
Bill McCollough
John Miller
Joshua Wilhelm
Stacey Kolar**

15 Years:

**Ron Theis
Christine Southwick
Jeff Nichols
Dave Gunderson**

20 Years:

Rob Gower, Jr.

25 Years:

**Josh Lear
Kevin Schwartman
Kent Zimmerman**

30 Years:

**Kris Reed
Jim Ostdiek**

45 Years:

Tom Mitchell

50 Years:

Mike Donovan