

Nebraska Resources

Newsletter

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2012 Drought and Water Administration

By Mike Thompson and Tom O'Connor

The 2012 drought provided a harsh reminder that drought and related water shortages are continuing features of the Great Plains. The National Drought Mitigation Center at the University of Nebraska-Lincoln indicates that as of March 15, 2013, **most of Nebraska was still suffering from extreme to exceptional long term drought conditions (> 6 months)** impacting agriculture, ecology, and hydrology.



The drought has created unprecedented shortages of surface water throughout Nebraska. The Nebraska Department of Natural Resources and U.S. Geological Survey data showed that flows at most gages in the Platte, Big Blue, Little Blue, Republican, Big Nemaha, Niobrara, and Elkhorn River basins remained below normal as of late October when most irrigation was completed.

As a result of statewide water shortages, senior permit holders exercised their rights and called for the administration of surface water. **Water administration activities resulted in shutting down over 1,300 surface water permits during this past irrigation season.** Below are some examples of water administration activities in response to the 2012 drought:

- Irrigation and storage permits were closed in the Little and Big Blue River basins for the benefit of the Blue River Compact with Kansas. Notices were issued beginning in early July and permits remained closed through the Compact

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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.ne.gov/dnrnews/newsarchive2.html>.

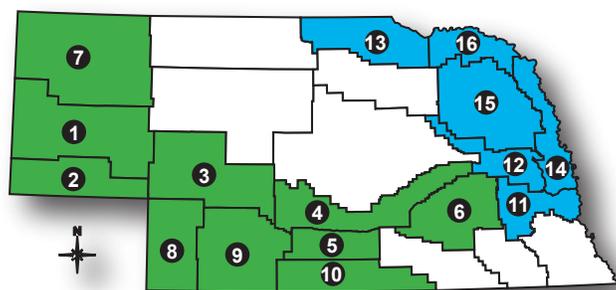
Voluntary Integrated Management Plans

By Brandi Flyr, Ph.D.

Integrated Management Plans (IMPs) are surface water-groundwater planning and monitoring efforts **jointly developed by the Department of Natural Resources (Department) Integrated Water Management Division and local Natural Resources Districts (NRDs)**. Both the Department and the NRDs are

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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. Upper Niobrara-White NRD
8. Upper Republican NRD
9. Middle Republican NRD
10. Lower Republican NRD
11. Lower Platte South NRD
12. Lower Platte North NRD
13. Lower Niobrara NRD
14. Papio-Missouri River NRD
15. Lower Elkhorn NRD
16. Lewis and Clark NRD



as of March 15, 2013

■ Basin Determination

■ Voluntary Process

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target date of September 30.

- Closing notices were issued for the benefit of instream flows on the lower Platte River in June through the end of irrigation season.
 - Because of insufficient flow on the Niobrara River, closing notices were issued beginning in May 2012, for the benefit of Nebraska Public Power District's Spencer hydro-power facility.
 - Numerous complaints were received of domestic wells going dry. These callers were referred to their local natural resources district and the Nebraska Department of Health and Human Services.
 - Several permit holders applied for temporary "conduct-groundwater permits," whereby water from a groundwater well is released at an upstream point and withdrawn at a downstream pump site. Due to the severity of the drought and the potential for crop failure, the Department expedited this process. With the cooperation of the Nebraska Game & Parks Commission and the local natural resources districts, temporary permits were generally granted within a week of the filing date. A temporary permit expires one year from the date the Order granting the permit is signed.
- Drought conditions continue to persist with upstream snowpack estimates at less than 70% of normal. Should these conditions continue through the upcoming growing season another year of water shortages and resulting surface water administration is likely.

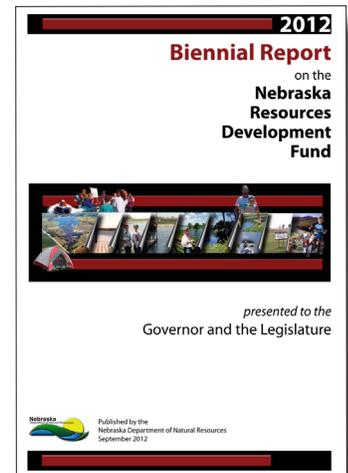


Nebraska Resources Development Fund - Biennial Report

By Rex Gittins and
Kent Zimmerman

Benefits accrued by Nebraskans are expected to exceed \$1.4 billion

from completed projects with assistance from the Nebraska Resources Development Fund (NRDF). Estimates are based on flood reduction, recreation opportunities, groundwater recharge, and other advantages realized over the projected 50-year lives of those projects. To achieve these results, sponsors invested about \$250 million in project development costs of which over 40 percent was contributed from the NRDF. These statistics and specifics about each project are included in the *2012 Nebraska Resources Development Fund Biennial Report* available on the Departments' website at: http://dnr.ne.gov/rdfund/BiennialReport_2012/2012BiennialReport.pdf.



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involved in this process as the Department manages surface water and the NRDs manage groundwater. This joint approach allows the NRDs and the Department to **work together to ensure the short and long-term sustainability of our state's water**

One of the overarching goals of the process is to prevent or minimize water conflicts between existing water users.

resources. NRDs can enter into this planning process either through a basin determination or through a voluntary process. Several NRDs have taken advantage of the voluntary planning process to proactively manage

hydrologically connected surface water and groundwater within their districts. One of the overarching goals of the process is to **prevent or minimize water conflicts between existing water users.**

Proactive water planning provides significant flexibility in management strategies and options by monitoring and having management alternatives in place before potential conflicts arise. Currently, six NRDs have initiated the voluntary integrated management planning process with the Department (see map on page 1).

The IMP process allows for flexibility based upon local needs and conditions. IMPs vary between the NRDs, which can be seen in the ten approved IMPs posted on the website (http://dnr.ne.gov/IWM/docs/IWM_ApprovedPlans.html). **While some differences exist, all IMPs contain goals and objectives**, maps that designate the management area, surface water and groundwater controls, and monitoring plans. Another similarity between all IMPs is the stakeholder process. Stakeholder involvement is essential to the IMP process, as the local input derived aids in the development of the IMP goals and objectives. Several NRDs have begun this process by holding several stakeholder meetings to receive input from various public aspects.

Nebraska Hosts 85th Annual AWSE Meeting

By Mike Thompson



The Department of Natural Resources (Department) had the privilege of hosting the eighty-fifth annual meeting of the Association of Western State Engineers (AWSE). The meeting was held from September 23-26, 2012, in Omaha. The annual meeting **provides an opportunity**

for the top water resource

engineers and administrators from throughout the 19 western states to share information and collaborate with colleagues. Department Director, Brian Dunnigan, P.E., is the Nebraska member of AWSE and was the presiding President of the AWSE at the meeting. Themes for the conference this year were flooding, energy and drought. The annual business meeting was also conducted. Sixteen of the nineteen states were represented. Attendees came from Alaska, Arizona, Colorado, Kansas, Idaho, Montana, Nebraska, Nevada, New Mexico, North Dakota, Oregon, South Dakota, Texas, Utah, Washington, and Wyoming.

As explained on the AWSE website: "The Association of Western State Engineers (AWSE) was formed in 1928 and has been continuously active through present day. AWSE members are state engineers or other officials charged with administration of the laws governing appropriation, distribution or control of the water resources of each state."

The program this year encompassed the following interest areas: 1) the 2011 Missouri River flooding; 2) the latest practices in design and rehabilitation of levees; 3) risk assessment in determining design parameters for dams; 4) the energy/water nexus regarding water needs and water regulation for petroleum exploration; 6) the current drought situation; 7) drought planning and mitigation; and 8) the latest in drought research.

A bus tour on Monday, September 24, 2012, visited areas affected by the 2011 Missouri River flooding.

Stops included Omaha's Eppley Airfield, the flood wall just south of the Bob Kerrey Pedestrian Bridge over the Missouri River in Omaha, the Council Bend chute rehabilitation project along the Council Bluffs levee, the Highway 2 levee setback project across the river from Nebraska City and lastly, the Lewis & Clark Visitor Center above the Missouri River on the Nebraska side. The center focuses on the navigation and scientific aspects of the Lewis & Clark expedition of discovery.

The conference opened with a presentation by Michael K. Sotak, P.E., Owner and Principal Engineer with FYRA Engineering in Omaha, on the current state of levee certification and current methods for addressing levee deficiencies related to hydraulic capacity and seepage control measures. He highlighted some newer advances in geophysics and risk analysis related to interior drainage modeling.

The Department's Tim Gokie, P.E., presented new and emerging trends in dam safety. He talked about the possibilities and benefits of using two-dimensional hydrologic and hydraulic models when evaluating new and existing dams. He also spoke about the growing use of risk-based criteria in dam safety and the new "WinDam B" computer program used to model the erosion of earthen dam embankments.

The next portion of the program dealt with supply and regulatory challenges related to energy exploration and production. Pat Tyrrell, P.E., Wyoming State Engineer, discussed oil exploration in his state. As is typical in western states, energy exploration and water-short landscapes tend to coincide. He spoke about temporary water use agreements that curtail a permitted use in lieu of using the consumptive use portion of the permit for oil and gas exploration.

Todd Sando, P.E., North Dakota State Engineer, spoke about the challenges North Dakota is facing with the oil boom in the northwest corner the state. The stress is being felt in every aspect of society. Roads, housing, schools, and water resources are all being stressed. That portion of the state is relatively dry and does not have widespread groundwater resources. There is a

debate regarding the permitting and administration of access to Missouri River water on the shores of the federal reservoirs.



AWSE members at Labor Monument at Lewis & Clark Landing in Omaha, Nebraska, during the bus tour of areas affected by the 2011 flooding.

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Gary Spackman, P.E., J.D., Director of the Idaho Department of Water Resources, spoke about the challenges his state faced when international mineral speculators began leasing mineral rights for natural gas exploration. Heretofore, there had been no knowledge of hydrocarbon resources in Idaho, so there were no such regulatory programs or statutes in place. The state quickly implemented a regulatory framework. The exploration remains speculative at this point.

The final segment of the informational portion of the annual meeting was centered on drought preparedness and climate analysis. Mark Svoboda, climatologist with the National Drought Mitigation Center (NDMC) at the University of Nebraska - Lincoln, presented information on the current drought and the near-term outlook. He discussed how the winter and spring were relatively dry and warm. As of September 18, 2012, approximately 65% of the U.S. was experiencing some level of drought. This was the most widespread drought since the NDMC began producing its "Drought Monitor" products in 1999. The heat waves in June and July 2012, expanded rapidly and a persistent drought settled in, which had major impacts on corn, soybeans, hat, livestock, and pasture.

Bob Oglesby, climatologist and professor of climate modeling at the University of Nebraska – Lincoln, discussed drought as a ubiquitous feature of the Great Plains. The historic period has been relatively 'wet.' Studies of drought indicators over thousands of years indicate that drought in the Great Plains can persist for decades, but the indicators do not provide information on the severity of the prolonged droughts. Sea surface temperature

patterns likely initiate most droughts. Some of the latest research suggests that local feedbacks, such as soil moisture and snow cover, can affect the duration of drought. While we can't control the weather, we should be prepared.

Don Wilhite, professor of Applied Climate Science in the School of Natural Resources at the University of Nebraska – Lincoln, discussed climate, both in terms of "climate state" and "climate variability." Both climate state and variability are changing. Extreme climate events are increasing in frequency globally, making managing impacts critically important. Improved management of climate variability today will lead to improved management of and adaptation to climate change. Drought preparedness planning, fully integrated with stakeholder participation, is critical to moving society from vulnerability to resilience. He believes that developing risk-based national drought policy guidelines is critical to reducing societal vulnerability. National and international initiatives are increasing momentum for changes in drought management.

The states also participated in a three-hour round-table discussion and each state's representative had a chance to extemporaneously speak on issues of common interest and provide information about significant administrative actions, court rulings and legislation.

The digital presentation files are available on the AWSE website at the following address: <http://western-stateengineers.org/2012/10/12/2012-fall-conference/>.



AWSE members pictured from left to right:

Back Row - Herman Settemeyer (TX), Jeff Fassett (WY), Jan Langel (MT), Kent Jones (UT), Gary Spackman (ID)

Center Row - Garland Erbele (SD), Barry Norris (OR), Jason King (NV), Michael Walton (AK), Hal Simpson (CO), Brian Dunnigan (NE), Kevin Rein (CO)

Front Row - Patrick Tyrrell (WY), Herb Dishlip (AZ), David Pope (KS), Maia Bellon (WA), David Barfield (KS), Estevan Lopez (NM), Todd Sando (ND)

Not pictured:
Michael Johnson (AZ)



2012 Supervisor/Manager and Employee of the Year

The **2012 Supervisor/Manager of the Year** for the Nebraska Department of Natural Resources (Department) is Mike Thompson, Manager of the Permits and Registrations Division. With over 23 years of experience, Mike is a knowledgeable resource regarding the Department's duties. Mike takes great pride in his role as public steward, properly managing the water of Nebraska, and upholding state

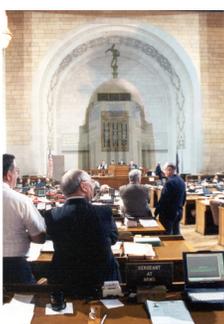


statutes in regard to the Department. Mike's management skills have enabled him to effectively work with all Department divisions to achieve common goals benefitting the entire agency. In particular, Mike has taken on the responsibility of managing the Conservation Reserve Enhancement Program retiring irrigated acres and he has done significant work on excess flood flow and groundwater recharge projects. Mike sets the example in the workplace and is an ideal role model. He is always available to answer a question or to pose one to help you learn on your own. Mike is highly respected within the Department not only for his agency accomplishments but also for his contributions outside of work assisting friends and family in need.

The **2012 Employee of the Year** for the Nebraska Department of Natural Resources (Department) is Chris Wiebke, Natural Resources Specialist of the Mapping Section of the Floodplain/Dam Safety/Survey Division. Chris efficiently provides project maps for use within the Department and for the public. To provide those maps, Chris has mastered the complexities of surface water rights. Chris' digitizing of surface water rights has provided the Department with accurate and timely data. Chris developed an improved workflow for scanning maps into the network so they are easily accessible to other divisions. Chris maintains excellent working relationships with irrigators, consultants, and natural resources districts resulting in better data sharing capabilities and increased productivity for all. Chris' knowledge and interest in Geographic Information System (GIS) has increased and he assists others with GIS software questions. Chris has been a valuable team player with the Department since 2007 and he continues to learn and grow in his position.



Photographs Credit: Robert Thompson, Dept. of Administrative Services



Annual Report and Plan of Work for the Nebraska State Water Planning and Review Process

By Brandi Flyr, Ph.D.

Each year, the Department of Natural Resources (Department) submits the **Annual Report and Plan of Work for the Nebraska State Water Planning and Review Process** to both the Nebraska Legislature and Governor (http://dnr.ne.gov/AnnualReport/Report_2012/AnnualReport2012.pdf). This process began in 1978 to facilitate water planning efforts. This document contains a summary of the Department's administrative and planning duties during the previous year, as well as planning components for future activities. The numerous Department responsibilities included

in the report fall under the general categories of floodplain management, bridge and dam safety, streamgaging, surface water administration, permitting, and integrated water management planning. The report contains links to the Department's website that provide either access to various datasets or further discussion about particular Department activities discussed in the report. The report also highlights the development of INSIGHT (Integrated Network of Scientific Information and GeoHydrologic Tools), which will serve as an easy to access web interface for much of the information discussed in the report.

http://dnr.ne.gov/AnnualReport/Report_2012/AnnualReport2012.pdf

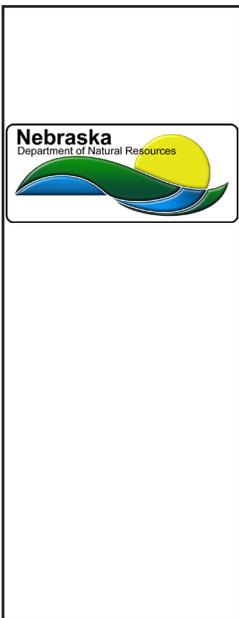
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The *Nebraska Resources* is a quarterly publication of the Nebraska Department of Natural Resources. We welcome your comments and suggestions.

Nebraska Department of Natural Resources....

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