

## **Water Resources Advisory Panel Ranks Research Priorities, Spurs Proposal Development**

By Rachael Herpel, UNL Water Center and NU Rural Initiative

The University of Nebraska–Lincoln’s Water Resources Advisory Panel (WRAP) ranked their priorities for water quality, water quantity, and basin-specific research (see list).

WRAP Water Quality and Water Quantity Work Groups were formed and held meetings in August to review the priority ranking lists. The WRAP also reviewed reports developed using the *NU Water-Related Research Database* that described how faculty's current and recently completed research is applicable to each topic. WRAP members affirmed the research priority ranking lists and discussed an ideal strategy to supplement research funds obtained by faculty with additional support if and where needed.

Faculty working in the priority research areas were informed that their area of research is a WRAP priority. Faculty were asked for their feedback on:

1. whether their current work was accurately represented on the research database;
2. the degree to which their previous work should be added to the research database (to increase awareness of this work and lay the foundation for future research);
3. whether they had any research project proposals pending in this topic area; and
4. their specific interest in and availability for additional research in this topic area.

WRAP members met in Kearney October 14 to hear about projects underway and project proposals pending or in development.

Chuck Burr, coordinator of the Center Pivot Water Conservation Project, described how center pivot manufacturers and UNL Extension have come together to deliver a united message that center pivot irrigation can be used to help producers maximize the benefit of a constrained water supply. Burr’s update was preceded by a discussion on Extension’s role in educating individual producers about how to continue operating during water short years and concluded by describing how extensive evaluation will be used to plan future education programs and approaches. This project is made possible by support from the Nebraska Environmental Trust, the Nebraska Department of Natural Resources, UNL Extension, Lindsay Corporation, Reinke Manufacturing, T-L Irrigation Co., and Valley Irrigation.

Dean Yonts, Associate Professor at the Panhandle Research and Extension Center, focused on how Nebraska can achieve sustainable irrigation water use. Yonts described how now is the time to use available technology to make it as simple and cost-effective as possible to use as little water as possible. Yonts proposed implementing a large scale water conservation project that focused on the producer’s bottom-line. Existing research and data show that deficit irrigation can be used to stress a crop in a way that is least likely to affect yields; in some cases, irrigation can be reduced by 25% and still maintain yields. The key is to look at producer decision-making and remove barriers that keep a producer from adopting lower water use practices. WRAP members concurred, noting that stressed plants can revive while drowned plants simply die, and that it is key to reduce the hassle factor, reward producers for reducing both their energy and water

consumption, and show producers they can reduce their costs-per-acre by better managing their water use.

The WRAP will reconvene in January to continue to provide advice and guidance to the University of Nebraska on state water research needs, education, and outreach programs. The WRAP members are Mark Brohman, Nebraska Environmental Trust; Senator Tom Carlson, Agriculture Committee, Nebraska Legislature; Brian Dunnigan, Nebraska Department of Natural Resources; Eugene Glock, Cedar Bell Farms; Frank Kwapnioski, Nebraska Public Power District; Marian Langan, Audubon Nebraska; Chris Langemeier, Natural Resources Committee, Nebraska Legislature; Mike Linder, Nebraska Department of Environmental Quality; John Miyoshi, Lower Platte North NRD; Kirk Nelson, Nebraska Game and Parks Commission; Jerry Obrist, Lincoln Water System; Lee Orton, Nebraska Well Drillers Association; Jay Rempe, Nebraska Farm Bureau; Dennis Strauch, Pathfinder Irrigation District; and Dayle Williamson, Office of Senator Ben Nelson.

### **Water Quality Research Priorities**

- Developing realistic Nebraska standards for nutrients in flowing waters
- Managing the risk (mitigating) water contamination from livestock manures and land application areas
- Evaluating and measuring the effectiveness of riparian buffer strips
- Managing the risk (mitigating) water contamination from agricultural production
- Evaluating and measuring the effectiveness of wetlands and wetland vegetation on reducing water contamination
- Other drinking water contaminants (of human health concern): nanomaterials, arsenic, uranium, pathogens, hormones, and pharmaceuticals
- Human dimensions of water quality – developing and implementing effective outreach efforts and measuring their impact
- Water quality in urban settings

### **Water Quantity Research Priorities**

- Develop methods to monitor and measure the consumptive use of water and develop methods to maintain beneficial use but reduce non-beneficial consumptive use
- Study current water management concepts in Nebraska and research options for improving the relevance, efficiency, and effectiveness of current approaches
- Identify methods to recognize the value of water for uses not easily monetized, such as recreation, aesthetic and wildlife uses
- Identify methods to establish fair and equitable water market systems
- Determine the impacts of climate change on Nebraska's water resources, especially in areas where demand is greater than supply, and increase understanding of these impacts. Develop an approach to identify actions that mitigate the potential impacts of climate change that may also have other supplemental water management benefits.
- Identify effective social systems that achieve sustainable water resource management
- Create and support more comprehensive, ongoing, real-time water monitoring protocols to ensure comparability and QA/QC of data
- Study water and energy production connections - whether energy is produced by conventional steam plants, or by harvesting the sun in biomass, water and energy production are closely linked. A thorough understanding of this linkage, and the interactions and trade-offs to be considered in decision and policy making, is needed to ensure sound management of both energy and water resources.

### **Basin-specific Research Priorities**

- Quantify water supply and water demands for each Nebraska basin, beginning in the west
- Identify opportunities for the conjunctive management of water, especially where surface water could be stored as groundwater until needed for compliance with surface water compacts
- Determine the inter-relationship between surface water and groundwater supplies
- Assess the impact of cyclical water supply (i.e., drought and wet weather) and identify better management options to reduce these impacts