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WATER CURRENT

VOL. 34, NO. 4 UNL WATER CENTER AUGUST 2002

# Summer Tour Attracts More Than 80

**by Steve Ress**

More than 80 people boarded tour buses for a four-day look at drought conditions, irrigation management, hydropower, endangered species and interstate compact issues in the North Platte River watershed last month.

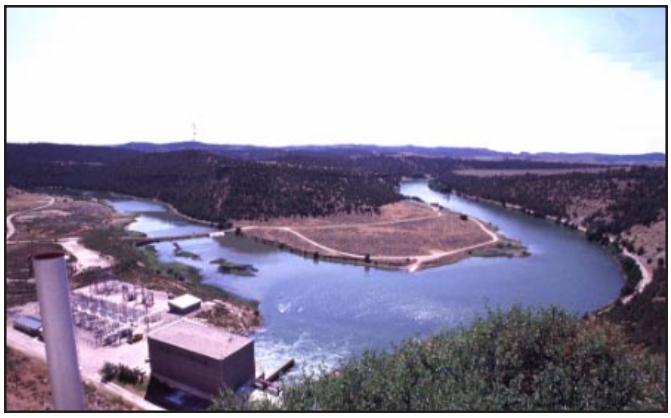
The annual University of Nebraska summer water and natural resources tour examined the watershed from its headwaters in Colorado to Nebraska's own Lake McConaughy from July 22-25. The tour began and ended in Kearney.

Participants represented many federal and state agencies, UNL, many of the Natural Resources Districts, commercial agri-businesses, environmental organizations, farmers and ranchers, legislators and members of the media.

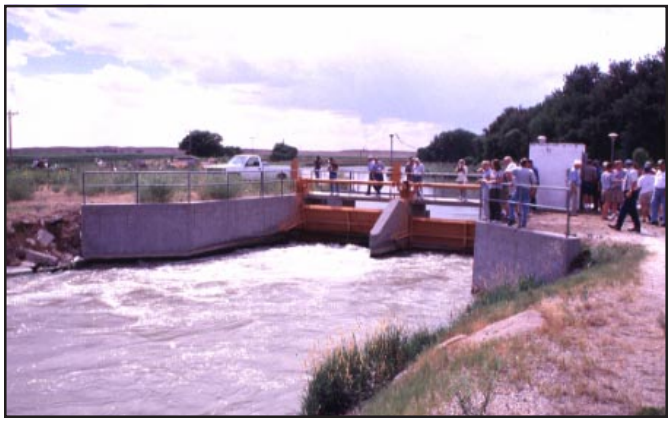
"I think a lot of people (on the tour) gained a much better understanding of the dependence we have on North Platte River water for irrigation and hydropower generation, as well as for the extent of the current drought conditions throughout the area," said tour co-organizer Michael Jess, acting director of the UNL Water Center.

"The (North Platte River) watershed itself is truly awesome, both in terms of its natural beauty and in its more than 100 year development as a driving force in the agricultural economies of Nebraska, Wyoming and Colorado," he continued.

The tour of the watershed began at the North Platte River's headwaters near Walden, CO. and continued up



**The North Platte River flows past the hydroelectric powerhouse at Glendo Dam in eastern Wyoming. This was one of several U.S. Bureau of Reclamation reservoir sites visited on July's water and natural resources tour (photo: Kyle Hoagland).**



**Summer water and natural resource tour goers explore the Mitchell-Gering Diversion dam on the Nebraska-Wyoming border. Stream flow allocations there have been a subject of controversy for many years (photo: Kyle Hoagland).**

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# SNRS/CSD Merger and Summer Water and Natural Resources Tour

## *from the* DIRECTOR

J. Michael Jess

### SNRS/CSD Merger

As media reports correctly indicate, the impacts of our current state budget reductions and discussions now taking place among our legislators in a special session of the Unicameral are being felt by nearly all elements of the University of Nebraska.

Actions to eliminate some units, consolidate others and transfer certain functions have already been implemented at various locations. There is little doubt that further budget reductions will prompt additional changes for many of us here at NU.

Shortly after the Unicameral reduced appropriations for the University in April, Institute of Agriculture and Natural Resources (IANR) officials were forced to shutdown several programs. Significantly, IANR began several initiatives aimed at coping with the possibility of additional budget reductions. One of these was merging the Conservation and Survey Division (CSD) and the School of Natural Resources Sciences (SNRS).

To that end faculty and staff members from both organizations met to discuss alternatives and make recommendations. One of the merger proposals includes encompassing the Water Center in this new unit. Those charged with making recommendations believe that consolidating the Water Center, which is now a stand-alone unit with IANR, with these other units would enhance overall efficiency and effectiveness of all the merged units.

Within this new organization it is specifically envisioned that the UNL Water Sciences Laboratory (now a part of the Water Center, administratively) would be joined with other scientific data collection and analysis activities, such as CSD's deep probe and test drilling program. A broad field services, data management and analytical support element, which various faculty members could call upon when pursuing complex research endeavors, would thus be created and made a viable part of the new organization.

Members of a so-called "Integration Committee" examining the various alternatives and procedures for the formation of this new CSD / SNRS entity have been asked to develop an organizational plan, a list of possible names for the new organization and a time table for implementation.

Sometime this autumn IANR Vice Chancellor John Owens is expected to officially announce creation of the new organization and name its leader.

### July Tour

Last month's annual water and natural resources tour, jointly sponsored by the Water Center, Kearney Area Chamber of Commerce, Nebraska Public Power District, Central Nebraska Public Power and Irrigation District, the Nebraska Water Conference Council and others, was a huge success. The tour broke attendance records for the last few years. It was seemingly the right topic at the right time as participants had the chance to get a first-hand look at where and how the North Platte River supplies irrigation, recreation, endangered species and hydropower needs in Colorado, Wyoming and Nebraska. For those that had not seen them

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## WATER CURRENT

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# Meet the Faculty

## Dr. Donald C. Rundquist

Remote sensing specialist in the UNL School of Natural Resource Sciences and Conservation and Survey Division. Director of the Center for Advanced Land Management Information Technologies (CALMIT), a research and development facility focused primarily on remote sensing and geographic information systems (GIS). Dr. Rundquist has adjunct appointments in the Departments of Geography, and Agronomy and Horticulture. He has been involved in research and teaching in the field of remote sensing on the university level for more than 28 years.

**Education:**

Ph.D. in Geography, University of Nebraska-Lincoln, 1977.
M..A. in Geography, University of Nebraska at Omaha, 1971.
B.S. in Geography, University of Wisconsin-Whitewater, 1967.

**Current Research:**

— Current research focuses on high-spectral (hyperspectral) remote sensing as it applies to both cropland agriculture and surface waters. Remote sensing of the trophic status and other components of the water column. Airborne sensors (focus on hyperspectral) and procedures for data collection. Field procedures and technologies. Remote sensing as a component of site-specific agriculture.

**Past Research:**

— Wetland delineation and classification by means of remote sensing. Water-quality assessment by means of remote sensing. A variety of vegetation studies and educational projects funded by NASA (e.g., Consortium for Application of Space Data to Education / Virtual Nebraska, America's Farm).

**Teaching:**

— Regularly teaches two courses; one oriented to practical applications of remote sensing in agriculture and water resources; the other in field techniques as they relate to remote sensing campaigns.

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**Donald C. Rundquist**

## Dr. Bruce Dvorak

Associate Professor, Department of Civil Engineering and Department of Biological Systems Engineering, University of Nebraska-Lincoln. Dr. Dvorak's research interests include physical / chemical treatment processes and pollution prevention. He is interested in experimental verification and modeling of physical / chemical processes, mathematical modeling of treatment process performance and cost, and the modeling of imprecision in treatment processes, and pollution prevention assessments. He teaches in the areas of water treatment, physical / chemical treatment processes, and process laboratory courses.

**Bruce Dvorak**

**Education:**

Ph.D., Civil Engineering, University of Texas at Austin, 1994
M.S., Environmental Health Engineering, University of Texas at Austin, 1990
B.S., Civil Engineering, University of Nebraska-Lincoln, 1987

**Current Research/Extension Programs:**

— Has organized and operated a summer internship program in pollution prevention for the past five summers. The program contains educational, research and extension components One of the program's main goals is providing technical assistance and education to small businesses and industries in Nebraska. Program interns have annually identified an average of more than $250 million in cost savings that can be obtained by businesses and industries through waste minimization practices.

— Assessment of scale type and microbial induced corrosion on dissolved copper in Nebraska public water supplies.

**Past Research/Extension Programs:**

— Assessment of viral contamination in Nebraska's small community wells.
— Impact of different treatment processes on dissolved copper in new and aged pipes: Nebraska case study.
— Disinfection by-product precursor adsorption on activated carbon: impact of GAC physical and chemical properties.

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## Guest Column:

# We All Live Within One System

**by Mary Harding,**
**Executive Director,**
**Nebraska Environmental Trust Fund**

I want to put a few things in perspective: while we live and work in one small corner of the world, we are interconnected and interdependent with all of the planet. Whether we notice this on a day-to-day basis or not, it is true.

There are certain things that confirm this to us, on what you might call a gross conceptual level. For example: when an extraordinary windstorm hit the drought-blighted dust bowl in central China in April, 2000, within days North Americans from Seattle, WA to Fargo, ND were wiping dust off of their windshields. Within a week we were squinting into a haze in the sky that most of us didn't realize had traveled from Mongolia faster than Genghis Khan crossed the Gobi Desert.

When Mt. St. Helens exploded several years ago, the atmosphere likewise reminded us of our interconnectedness. Reminded us that we all live within one system.

We are all part of a system. Integral, inseparable parts. One system. The people of Nepal harvesting firewood on fragile mountainsides are polluting the drinking waters of Dhaka, Bangladesh — a thousand miles away — with their wasted topsoils. One system. The farmers of the Rainwater Basin are building the Mississippi Delta thousand miles away— one ton of washed topsoil at a time. One system.

Now, take this concept several steps further than simple gross awareness. Direct your attention for a moment to the fundamental building blocks of space: matter and energy. Science now tells us we are one at a much more profound level than breathing the same atmosphere or drinking the same water. All we are and all we perceive is part and parcel of what is referred to in modern physics as the "Unified Field." Talk about being one system.

All our understandings of ourselves as separate beings and the world around us as separate phenomena are strangely the erroneous by-product of our limited sensory capacities. In a way, it's as if we are looking at the world through binoculars and don't realize that there is anything outside the circle of the lens. We may be able to see some things very, very well, but certainly there is much beyond our field of vision, much more beyond our perception than within our perception, especially if we never take our eyes away from the device.

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## Guest Column:

# Has The Time Come To Look at Urban Stormwater Differently?

**by Glenn D. Johnson, General Manager,**
**Lower Platte South Natural Resources District**

A gentle rain is generally thought of as a good thing; however, too much of the good thing is usually seen as a problem for someone else to solve, especially in our urban communities. Too much stormwater can flood streets and yards, get into basements, wash sediments off bare construction sites, and create messes to clean up. Does it have to continue to be that way?

Property owners and public agencies have traditionally approached stormwater runoff as a detriment whose solution has been to put it in a ditch or underground as quickly as possible. Can we begin to see stormwater as a possible asset and begin to treat it responsibly?

Maybe, but what does that have to do with me? Let's take a look at where we live, drive, work, and shop. They all have one thing in common, and that is impervious surfaces: roofs, parking lots, driveways, paved sidewalks and trails, and well-watered lawns. Impervious surfaces do not absorb stormwater, consequently, it runs away. The more impervious surface on a property, the greater the amount of runoff; and the greater the runoff, the greater the potential for problems.

Every property owner can reduce the amount of stormwater runoff or manage the runoff to lessen the impact. Some of the steps are simple and inexpensive, such as limiting the amount of impervious area, restricting lawn watering when rain is likely or has just occurred, and directing downspouts and gutters to grassy areas of the property. More intensive steps could involve lawn grading to create swales for slowing the runoff and allowing greater infiltration, creating water gardens and small retention or detention areas to temporarily store runoff, and directing runoff to gravel-filled infiltration trenches or buried containers.

More extensive efforts are needed for streets, parking lots, and large building sites. Where possible, instead of having curbs and gutters, streets can be constructed with grassed medians and roadway ditches with small driveway culverts, to catch and slow down the runoff and give it a greater chance to soak in. Parking lots can be constructed of porous concrete / asphalt to allow some infiltration to occur, with a gravel and tile underdrain system, or be depressed to temporarily store stormwater as a detention basin. Larger sites with expanses of rooftop, either themselves or cooperatively with their neigh-

(continued on next page)

# Mapping Groundwater Recharge for Nebraska

University of Nebraska-Lincoln hydrologist Jozsef Szilagyi and hydrogeologists Ed Harvey and Jerry Ayers recently completed a computer-generated map depicting mean annual recharge to groundwater in Nebraska. The map's current level of detail has never before been produced for the state.

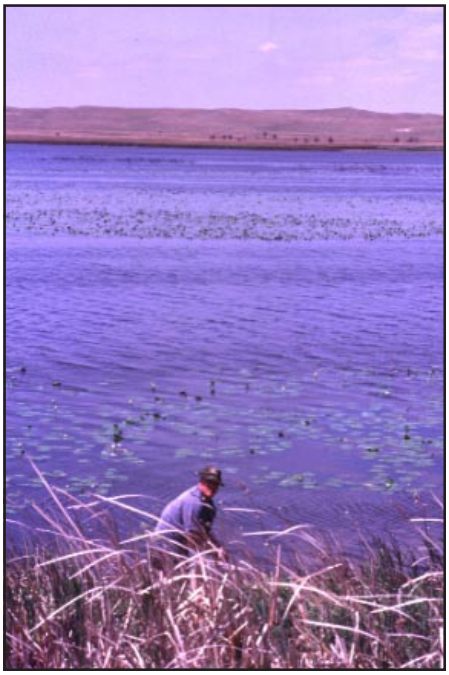
Knowing recharge on a statewide basis can help decision makers in the state or interstate panels develop future water resource management plans in the High Plains aquifer system. It can also assist modelers interested in non-point source pollution problems or in stream-aquifer interactions, according to the three UNL Conservation and Survey Division faculty members.

The study used long-term data of about 300 precipitation and a 100-plus gaging stations in the state. It utilized radiation measurements of the Solar and Meteorological Surface Observation Network (SAMSON) to estimate mean annual evapotranspiration over Nebraska. Computer maps of surface elevation, configuration of the groundwater table, land use/land cover, and groundwater-vulnerability were also utilized.

The largest recharge rates (greater than 100 millimeters per year) were found in eastern Nebraska along the Elkhorn, Platte, Missouri, and Big and Little Nemaha valleys, mainly because precipitation is the highest in this part of the state, and the groundwater is close to the surface in the river valleys.

The Sand Hills region, due to its highly permeable sandy soils, also displays elevated recharge rates (40-50 mm per year on average) when compared to the surrounding area east and south of it with a mean recharge rates of 20 mm/year. In the southwestern corner of the state, mean annual recharge is less than 10 mm/year.

Print copies of the map are available for a nominal charge from UNL's Conservation and Survey Division. Contact CSD Map Sales at (402)472-3471.



**UNL aquatic botany students (above and at left) work on pressing microphytes at the Valentine National Wildlife Refuge. The hands-on research and training were part of a summer course taught from the Cedar Point Biological Station near Ogallala (photos: Kyle Hoagland).**

## Has The Time Come To Look at Urban Stormwater Differently? (continued)

bors, can construct larger detention or retention basins and direct the runoff to these facilities to slow down the rate of runoff from the property. Preserving natural stream corridors and buffers are other effective stormwater practices. A combination of other, smaller practices can be used to supplement the larger facilities and reduce their size.

These practices can be an attractive asset to the property. People are paying good money today to construct mounds and water ponds and to use low maintenance and native plant materials, which incidentally improve infiltration. It seems every new homeowner wants a walk-out basement backing onto a lake or open area.

However effective these efforts are in reducing or slowing down the rate of stormwater runoff, some amount will still leave a property and find its way downhill into a storm sewer, stream or lake. That is where the public agencies step in and start taking responsibility for stormwater and paying the costs for constructing, maintaining and replacing this infrastructure.

Increasingly, urban communities, faced with budget and property tax issues and state and federal regulations, are beginning to look at stormwater infrastructure as a utility service, similar to drinking water and sanitary sewerage. They are developing stormwater fee systems based upon the amount of impervious area on a property, under the principle that the more stormwater runoff you contribute to the system the more you pay, with credits for property owner conservation efforts. This dedicated and predictable fee system can supplement or replace *ad valorem* property tax and bond issues as a funding source for stormwater infrastructure.

So, aren't we all responsible in our own way, and isn't the time right to look at urban stormwater differently?

# Nebraska Water Marketing Policy Choices

**by J. David Aiken,**
**UNL Water & Ag Law Specialist**

Water marketing is a powerful water management tool that allows water to be reallocated to new uses. However, water marketing involves considerable transaction costs that may significantly disadvantage current water users. Water marketing has not developed in Nebraska because municipalities and industry can generally obtain needed water supplies from Nebraska's generally abundant ground water supplies. Water marketing will probably be adopted sometime in the near future in order to successfully implement the Platte River endangered species cooperative agreement.

## Water Marketing Basics

Water marketing usually involves the buyer purchasing a perpetual water right from the seller (only 5-year water leases are currently under discussion in Nebraska). The buyer typically is a city or industry, while the seller usually is an irrigator. Water right transfers must go through an administrative process to ensure that the rights of other water users are not harmed by the transfer. Specifically the seller cannot purchase the buyer's return flows that are relied upon by downstream water users.

Hypothetical: Seller irrigates 100 acres with 300 acre feet (AF) of water. Of the 300 AF applied, 200 AF are consumed in crop growth and 100 AF are return flows. These return flows return to the stream where they are used by downstream appropriators, both senior and junior to the seller. In this case the Seller can sell only the 200 AF of consumptive use to the Buyer; the Buyer cannot acquire more than the Seller's consumptive use.

In the real world, it is not always clear how much water has been diverted by the Seller, how much of that diverted amount is consumed, and the quantity of return flows. In water marketing proceedings, deep pocket buyers will seek to maximize the seller's consumptive use (and minimize return flows) through the use of technical consultants in order to have the most water available for purchase. Similarly downstream appropriators (who are often required at their own expense to participate in water marketing proceedings to protect their interests) seek to maximize the return flows (and minimize the consumptive use).

The state water engineer (in Nebraska, the Director of Natural Resources) can go a long way in making these proceedings less burdensome, particularly to the downstream appropriators (whose interest the state engineer is legally required to protect) by being more than a passive referee in these proceedings. As these transaction costs are likely to be a significant issue in Nebraska water marketing policy debates, care must be taken to insure that they do not burden downstream appropriators.

## Nebraska Water Marketing?

Other western states have water marketing not just because it is good policy (it is), but because some interest group (probably municipalities) needs the law to be changed in order to allow it to acquire needed water supplies. We have only very limited water marketing in Nebraska because municipalities haven't needed marketing to satisfy the needs of growing urban populations. Indeed, LB1209, the first of the recent conjunctive use statutes adopted, was enacted because Lincoln and Omaha needed water rights for their Platte river wells, not because conjunctive use needed to be addressed in Nebraska water law.

**Community impacts.** A related concern is that water marketing will reduce irrigation such that local agribusinesses and communities dependent upon irrigation will fail. Other states have tried to deal with this issue by limiting the percentage of irrigation rights that can be sold in an area and by requiring the buyers to make economic development payments to the communities or counties from which the water rights came from. This will be a significant issue in the Nebraska water marketing debate.

**Political dimensions.** Water marketing is viewed with suspicion by surface irrigators in Nebraska for a variety of reasons, including (1) transaction costs, (2) distrust of those promoting water marketing, and (3) concerns that cities etc. will buy up all agricultural water rights, leading to the decline of Nebraska's irrigated agriculture economy. Municipal use is only two to three percent of Nebraska water use and irrigation nearly 90 percent, so even doubling municipal use would not have a significant impact on irrigation statewide (local impacts might be more significant however).

## Platte Cooperative Agreement

The primary impetus for current water marketing discussions is the Platte River Cooperative Agreement (CA). Under the CA, Nebraska, Colorado and Wyoming have agreed to provide 130,000-150,000 acre-feet (AF) of water for habitat streamflow increases by 2010-2013. The states have already implemented water projects to provide 60,000-70,000 AF of this first increment of increased habitat streamflow. Water marketing is one of several water management alternatives being considered to provide the remaining 60,000-90,000 AF of increased habitat streamflow.

### Water Right Prices

**Irrigated values minus dryland values.** A simple way to estimate water values is the difference between irrigated land values or cash rent rates and dryland land values or cash rent rates. For the south central crop reporting district, 2001 differences between dryland and irrigated land values would be $1053-1085/A. Cash rent differentials would be $76-81/A. These values suggest a range of minimum prices for purchasing or leasing surface water rights. This approach was used by Wyoming in the Nebraska v. Wyoming lawsuit to estimate damages that Wyoming's water overuse caused Nebraska.

**Land taxed as irrigated.** At least one other factor might increase water prices. Current water marketing proposals all require the seller to continue paying irrigated land property taxes on land that has been dried out by water marketing. Having to pay property taxes on dryland at least double what dryland property taxes would be would decrease the value of the dried out land, which could increase the asking price for water.

### Third-Party Impacts

**Irrigation district impacts.** If an irrigation district water is sold, typically the irrigation district must approve the sale. Typically irrigation districts will not approve the sale unless the buyer agrees in writing to continue all payments to the irrigation district.

**Community impacts.** Reduced irrigation impacts spending on agricultural production inputs and reduces community economic activity. Nebraska water marketing proposals to require dried up land to continue paying irrigated property taxes would help maintain property tax payments. Other states have required buyers to pay impact fees to communities affected by reduced irrigation. A similar approach is to cap or limit the amount of land that can be dried up in a area. However, unless the community can find replacement economic activity to make up for the reduction in agricultural spending, drying up irrigated land ultimately harms agriculturally dependent communities.

If the quantity of water transferred out of agriculture is large in relative terms, this could lead to long-term declines in agriculture. This has community implications and statewide political implications as well. Rural communities are already stressed, and uncontrolled water marketing could increase that stress. Rural areas competing for other statewide political objectives could be stressed as well.

(*Editor's Note:* Aiken can be contacted at (402)472-1848 or daiken@unl.edu).

## We All Live Within One System (continued from page 4)

I am not bringing this up, this "oneness thing," to make some remote mystical or semi-theological point. I don't want us all to join hands and sing, *Kumbaya*. But as we spend our days sharing information and seeking new solutions to common problems, we need to bear in mind that we are usually, typically, truly prisoners of our perception.

The second point along these lines is that as we look at the world through the window of our five senses, we must remember that the world is not the shape of the window frame. There is much more outside the frame.

A quick example of the limitations of perception: look at your hand. Name its color. You might say pink, brown, black, tan or flesh colored. This is not the color of your hand. To a dog, it is grey. To a snake, it is infrared. To a person who's just been photographed, it may be spotted with bright balls of funny colored light. Many of you may have named the color of your hand without even really looking. You may have made a cognitive decision without taking in any new data at all.

We are not only limited by the structure of our senses, but also by the environment within which we function as well as the history of our experiences. What we have learned or decided earlier to be true can define what we believe to be true now. The environment and conditions in that environment shape our perceptions even as our perceptions shape our awareness of the environment.

The third and final point I ask you to consider is this: our experiences, our environment, and our personal history shape our understanding of what is and of what's possible, as much if not more, than the simple empirical facts of the present. It's not a flaw in the human race. It's what we must do to function in the face of a phenomenal volume of information that bombards us every second. Yet, we must be mindful of how that experience shapes, and perhaps, limits our understanding of what is, and of what is possible.

You may not have expected these kinds of remarks in this column. But in this time, where 26 billion tons of top soil were lost last year to world urbanization, desertification and marginal farming; in this world, where species are disappearing at a rate ten times greater than natural forces would account for; and at a time when the human population is burgeoning, with ever increasing demands for resources, I want to say this to everyone who works to protect, utilize and conserve these resources:

You are an essential and integral part of one system. What happens to this part of the system has consequences and meaning for every other part of the system. The work you are doing is vitally important, not just for the animals and plants and people of this area, but globally. Your work is critical.

Step outside the limitations of your experiences and your training — work to build a shared vision of what is needed and what is possible. You are inventing our future for us and for all the creatures that depend on this little corner of the world. With insight and creativity, you will make this a much greater, much richer part of the whole.

# Meet the Faculty

## Donald C. Rundquist (continued from page 3)

**Selected Publications:**

— Rundquist, D., J. Jensen, M. Nyquist, and T. Owens, 2002. Selected remote sensing monitoring and modeling projects. Chapter 22 in Bosler, J. *Manual of Geospatial Sciences and Technology*, 364-388.
— Rundquist, D., S. Narumalani, and R. Narayanan, 2001. Remote sensing of wetlands. *Remote Sensing Reviews,* 20:3:207-226.
— Rundquist, D., 2001. Field techniques in Remote Sensing: Learning By Doing. *GeoCarto International,* 16:1, 83-88.
— Tolk, B., L. Han, and D. Rundquist, 2000. The Impact of Bottom Brightness On the Spectral Reflectance From Suspended Sediments In Surface Waters. *International Journal of Remote Sensing*, 21:11, 2259-2268.
— Gitelson, A., Y. Yacobi, J. Schalles, D. Rundquist, L. Han, R. Stark, and D. Etzion, 2000. Remote Estimation of Phytoplankton Density In Productive Waters. *Archives of Hydrobiology: Advances in Limnology*, 55: 121-136.
— Gosselin, D., D. Rundquist, and S. McFeeters, 2000. Remote Monitoring of Groundwater-dominated Lakes: A Case Study In the Nebraska Sand Hills. *Journal of the American Water Resources Association*, 36:5, 1039-1051.
— Gitelson, A., J. Schalles, D. Rundquist, F. Schiebe, and Y. Yacobi, 1999. Comparative Reflectance Properties of Algal Cultures With Manipulated Densities. *Journal of Applied Phycology*, 11:345-354.
— Han, L. and D. Rundquist, 1998. The Impact of A Wind-roughened Water Surface On Remote Measurements of Turbidity. *International Journal of Remote Sensing*, 19:1, 195-201.

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drundquist1@unl.edu

## Bruce Dvorak (continued from page 3)

— GAC and PAC systems analysis: implications of the regulation of s-Triazine metabolites.

**Other Extension/Outreach Programs:**

— Drinking water education for the Native American Nations in Kansas, Nebraska and South Dakota. UNL assistance for five Native American Colleges to present 10 public awareness workshops concerning drinking water issues to Native American audiences.

**Selected Publications:**

— Woldt, W.E., Dvorak, B.I., and Dahab, M.F. 2002. Application of Fuzzy Set Theory to Industrial Pollution Prevention: Production System Modeling and Life Cycle Assessment, accepted for publication in *Fuzzy Sets and Systems*.
— Dvorak, B. and Schauble, J., 2001. Uncertainty in Air Stripping Tower design: Implications of Air-to-water Ratio, *Water Science and Technology*, October.
— Behrens, M., Dvorak, B., and Woldt, W. 2000. Implications of Hidden Costs: Comparison of Bitumen Testing Procedures, *Environmental Technology*, 21, 243-255.
— Wanzenried, B., Dvorak, B., Woldt, W. 1999. Descriptive Versus Prescriptive: Comparison of Pollution Prevention Opportunity Assessment Approaches, *Pollution Prevention Review*, 9(3) 67-79.
— Schauble J. and Dvorak B. 1999. Risk-Based Design of Air Stripping Towers with Fuzzy Set Theory, *Journal of Environmental Systems*, 27(2) 127-149.
— Dvorak, B. and Maher, M. 1999. GAC Contractor Design for NOM Removal: Implications of EBCT and Blending, *Journal of Environmental Engineering*, ASCE, 125(2) 161-165.

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# From the Director (continued from page 2)

before (and even for many that had), the U.S. Bureau of Reclamation's reservoirs on the North Platte River in Wyoming were probably the highlight of the tour. The scenery surrounding them is absolutely breathtaking.

We thank those that participated and helped support the annual tour.

Planning will begin later this autumn for the 2003 tour, which will very likely be a cooperative venture with the Four States Irrigation Council. This group conducts tours on an every-other-year basis, rotating the tour through member states Nebraska, Kansas, Colorado and Wyoming.

### Centennial Coverage

Look to the next issue of the *Water Current* to carry some special coverage on the history of U.S. Bureau of Reclamation water projects in Nebraska and eastern Wyoming. This coverage will be in honor of the Bureau's ongoing 100th anniversary celebration that began earlier this summer.

## Summer Tour Attracts More Than 80 (continued from page 1)

into the high country of Wyoming, where the tour visited U.S. Bureau of Reclamation reservoirs.

Buses left Kearney for Fort Collins, CO on Monday, July 22. At North Platte, Sharon Whitmore of the U.S. Fish and Wildlife Service talked about water releases from Lake McConaughy being used to augment fish and wildlife habitat requirements in Nebraska. In a stop at Sidney, members of the local chamber of commerce addressed area irrigation, agri-business and farming concerns.

The following day buses passed through Cameron Pass enroute to North Platte River headwaters at Walden, CO. and from there north to Wyoming.

Later that day, John Lawson and Ken Randolph of the U.S. Bureau of Reclamation district office in Mills, WY explained irrigation and hydropower issues at Pathfinder Dam, Seminoe, Alcova and Gray Reef Dams were visited later that same day.

On Wednesday, July 24, as buses headed east toward Nebraska, Glendo and Guernsey Dams near the Nebraska border were viewed.

After crossing into Nebraska, the tour stopped at the Mitchell-Gering diversion dam to discuss allocation of stream flows among irrigators in Nebraska and Wyoming and the recent settlement of the *Nebraska v. Wyoming* interstate compact suit. The Mitchell-Gering dam was the site of a 1936 Nebraska Army National Guard call-up to enforce water right regulations.

Later that day was a visit to subsurface drip irrigation research projects at UNL's Panhandle Research and Extension Center near Mitchell.

On Thursday, July 25, local irrigators discussed conjunctive water use tensions in the Pumpkin Creek valley in Banner and Morrill Counties.

The final stop before buses reached Kearney was at the new visitors center at Lake McConaughy for a presentation on UNL dissolved oxygen research at Lake Ogallala.

Tour sponsors were Central Nebraska Public Power and Irrigation District; Nebraska Public Power District; Nebraska Association of Resources Districts; Gateway Farm Show; Nebraska Water Conference Council and UNL's Institute of Agriculture and Natural Resources, Conservation and Survey Division, Water Center and Panhandle Research and Extension Center.

Planning for the 2003 summer water and natural resources tour will begin in earnest later this fall. Initial discussions have focused on combining this tour with a Four States Irrigation Council tour, which visits Nebraska only once every eight years. Details will be published in upcoming issues of the *Water Current*.

**Dennis Straugh addresses summer tour participants at the Whalen diversion dam, where the Interstate and Fort Laramie irrigation canals also were viewed.**

**The North Platte River winds its way toward reservoirs and hydro-electric dams in the high country of central Wyoming.**

**Irrigation Engineer Dean Yonts talks to the summer water tour about his subsurface drip irrigation research being conducted at UNL's Panhandle Research and Extension Center near Scottsbluff.**

**(photos: Kyle Hoagland)**

# Water News Briefs

## Free Tabloids

Copies of *Wetlands-Understanding a Resource (1997)* and *Drinking Water-Understanding a Resource (1999)* are available for programming needs free from the UNL Water Center.

Organizations wanting copies for educational use or general distribution can have up to several hundred copies of either or both publications at no cost, providing they make arrangements to pick them up at our UNL East Campus office. If copies need to be shipped, you will be asked to pay shipping/mailing costs.

Call the Water Center at (402)472-3305 or email sress1@unl.edu. For a list of other free publications, go to http://watercenter.unl.edu.

## Free Directories

The UNL Water Center has a pocket-size directory of federal and state agencies, Natural Resources Districts and NU water research and cooperative extension offices designed to help answer your water-related questions. Listings are by telephone and FAX number. If you would like a copy, phone (402)472-3305 or email sress1@unl.edu. Copies will be distributed on a first-come, first-served basis.

## Contaminant Occurrence Database

The U.S. Environmental Protection Agency maintains the National Drinking Water Contaminant Occurrence Database, or NCOD, web site at www.epa.gov/ncod. The purpose of this database is to support EPA decisions related to regulation of contaminants. NCOD contains data from public water systems and other sources on the occurrence of physical, chemical, microbial and radiological contaminants. No data analysis is provided. NCOD may not be the database to answer questions from some users, such as from those trying to determine the quality of their drinking water, but the site offers alternatives for specific and frequently asked questions.

## Sixth National Mitigation Banking Conference

April 23 – 25, 2003. *Practice and Policy: the Nation's Hands-on Conference for Mitigation & Conservation Banking,* The Sixth National Mitigation Banking Conference takes you to San Diego, CA, a leader in conservation banking to protect endangered species and natural resources. See mitigation and conservation banks in operation, and meet and learn with the nation's mitigation/conservation bankers, regulators, users, suppliers, environmental interests and others involved in this industry.

"Call for Presenters" deadline is Sept. 4. For more information on topics, presenting, participating, or exhibiting, visit http://www.mitigationbankingconference.com or call (703) 548-5473.

## Mailing List Updates

No updates will be made to the *Water Current's* mailing list until at least October and possibly as late as January, 2003 due to the UNL Water Center's office supervisor being on maternity leave. If you have a change to your mailing label or wish to request a subscription for someone else, please continue to submit those changes, as they will be filed for updating as soon as the office supervisor returns.

If you have questions about this or need to submit a new subscription, change of name or change of address, email your questions or mailing label changes to sress1@unl.edu.

## Published Paper

Kolok, A.S., M. Hartman and J. Sershan, 2002. The Physiology of Copper Tolerance in Fathead Minnows: Insight From an Intraspecific Correlative Analysis. *Environmental Toxicology and Chemistry.* 21:1730-1735. For more information or to request a copy of the paper, email Alan Kolok at akolok@mail.unomaha.edu.

## Burbach Wins Teaching Award

Mark E. Burbach, field manager at the University of Nebraska-Lincoln's Water Sciences Laboratory, received a National Association of Colleges and Teachers of Agriculture (NACTA) Graduate Student Teaching Award.

The award was presented at NACTA's 48th conference, hosted by the UNL campus. The award recognizes and rewards graduate students who excel as teachers in the agricultural disciplines. It is a criterion based award that is reviewed by a committee of NACTA members. Award recipients must have been involved in classroom teaching for a minimum of one year. Recipients are evaluated on their teaching philosophy, endorsement from supervising faculty, evaluations submitted by students, administrative officers and peers, a self evaluation and involvement in teaching outside the classroom.

Burbach is completing a Ph.D. in addition to his duties as Water Sciences Laboratory field manager.

### September

**18-21:** Fifteenth Annual Arizona Hydrological Society Symposium, Radisson Woodlands Hotel, Flagstaff, AZ. For information, go to www.AzHydroSoc.org or email Sean.Welch@nau.edu.

**25-28:** Moving Waters (the Colorado River and the West) Culminating Conference, Northern Arizona University, Flagstaff, AZ. Address conference questions to (928)523-0494 or email community.culture@nau.edu.

**28 - Oct. 2:** WEFTEC 2002 "The Water Quality Event," McCormick Place, Chicago, IL. Sponsored by the Water Environment Federation. For information, email confinfo@wef.org or visit www.weftec.org.

### October

**9-11:** 47th Annual New Mexico Water Conference: "There's No Doubt, We're in a Drought," Ruidoso Convention Center, New Mexico State University, Las Cruces, NM. For information contact the New Mexico Water Resources research Institute, MSC 3167, Box 30001, Las Cruces, NM 88003-8001.

### November

**3-7:** American Water Resources Association (AWRA) annual conference, Philadelphia, PA. For information, go to www.awra.org or contact Harriette E. Bayse at (540)687-8390.

**6-7:** Virginia Water Research Symposium 2002: "Drinking Water Supplies Assessment and Management Strategies For the 21st Century," Sheraton Richmond West, Richmond, VA. For information, contact Judy Poff at (540)231-8030 or jupoff@vt.edu.

**7-8:** Conference on Water Law: "Water Regulation, Quality and Use in the Midwest," Embassy Suites Hotel and Convention Center, Lincoln. For information, go to http://www.cle.com/upcoming/elinwat02.shtml, or phone CLE International at (800)873-7130.

### April, 2003

**23-25:** Sixth National Mitigation Banking Conference Call for Papers: Panelists and speakers are being sought for this event, that will be held in San Diego, CA. Topics revolve around conservation banking to protect endangered species and other natural resources in addition to mitigation banking for wetlands. Abstracts of no more than 300 words should be submitted by Sept. 4. Topic list and other information can be found at www.mitigation bankingconference. com or phone (800)726-4853.

**West Central Research and Extension Center water resources engineer Jose Payero and South Central Reseach and Extension Center agriculturalist Darrel Siekman (right) explain sub-surface drip irrigation research that is beginning at the two UNL research and extension centers. The UNL Water Center helps sponsor that research. The presentations were part of an Aug. 8 field day at the South Central Research and Extension Center, near Clay Center (photo: Steve Ress).**

## NU Landscape Connections:

# A Union of Festival of Color and Gardener's Gala

**by Steve Ress**

Two premiere horticulture and landscape events join hands when the University of Nebraska-Lincoln East Campus hosts NU Landscape Connections: Celebrating A Union of Festival of Color and Gardener's Gala, Saturday, Sept. 14, 9 a.m. to 3:30 p.m.

The public event combines the best of the annual UNL East Campus Gardener's Gala, and Festival of Color, last held two years ago at NU's Agricultural Research and Development Center near Mead.

The new, combined program focuses attention on innovation and energy in UNL's academic programs as well as home and community quality of life issues for all Nebraskans that are enhanced through properly designed, installed and maintained landscapes.

"We have a beautiful campus here in Lincoln that we want to showcase more than we have in the past. We hope that many of those who attended Festival of Color will take the opportunity to visit this lovely landscape and learn more about their own landscapes and gardens in the process," said extension horticulture outreach specialist Anne Streich.

Combining the two events allows more effective sharing of resources and the opportunity for UNL to showcase academic programs, award-winning campus landscapes, and program expertise in designing and maintaining attractive and functional landscapes, said extension landscape horticulture specialist Steve Rodie.

The new combined program, which will be an annual event, focuses on a strong, personal connection of Nebraska's people to its landscapes.

"We want people to come away from this event with a deeper appreciation of our universal connectedness to nature and plants; a better understanding of the connection between good design and beautiful, functional outdoor living environments; broader sensitivity to the sustainability and environmental friendliness of built landscapes; and perhaps most importantly, a greater awareness of Nebraska's urban and rural landscape richness," Rodie said.

This year's program includes talks on selecting and maintaining plants; designing landscapes; and attracting and managing wildlife and birds. Tours will be given in several of the gardens on UNL's East Campus, including the Maxwell Arboretum.

Primary topics include landscape design, plant selection, maintenance, wildlife, campus garden tours, ponds, "what's happening in the horticulture garden," a plant and pest diagnostic clinic and "ask a master gardener."

Displays in the East Campus Union will feature information on student admissions from UNL's College of Agricultural Sciences and Natural Resources, Department of Agronomy and Horticulture and others, as well as free copies of popular "NebGuides" that answer many home and acreage landscape, gardening and pest management questions.

Tours focus on "bees in your landscape," "insects rule," and a tour of the Lester F. Larsen tractor test and power museum.

Parking is available in UNL lots, with shuttle buses to take people to and from their cars to tour and display areas. Snack food vendors will be set-up throughout the area, Streich said.

Volunteer donations of $5 per family or $2 per person are encouraged to help defray costs.

The program is sponsored by NU's Institute of Agriculture and Natural Resources, Cooperative Extension Division, Department of Agronomy and Horticulture, Nebraska Statewide Arboretum and Landscape Services (a division of University Services, UNL) with support from the U.S. Environmental Protection Agency Region VII through the Nebraska Department of Environmental Quality, and Earl May Seed and Nursery, Limited Partnership.

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