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NU Environmental Programs Soon To Be Under One Roof

By Steve Ress

Key University of Nebraska-Lincoln environmental programs and departments will soon be under one roof, both administratively and literally.

The long-planned merging of units was approved by the University of Nebraska Board of Regents at their April 26 meeting.

"The merger will enhance UNL's teaching, research and extension efforts in natural resources," said John Owens, vice chancellor of the Institute of Agriculture and Natural Resources.



Faculty and staff of the School of Natural Resources are expected to move into the Clifford Hardin Nebraska Center at N. 33rd and Holdrege streets sometime in 2005 (photo: Steve Ress)

The merger will combine UNL's School of Natural Resource Sciences, Conservation and Survey Division and Water Center into the School of Natural Resources (SNR). Eventually, SNR will be housed in the Clifford Hardin Nebraska Center on UNL's East Campus.

"Consolidating administration, faculty and staff and facilities is cost effective and permits better coordination in the environmental sciences," Owens said.

"An initial step in this direction was made when the former School of Natural Resource Sciences was formed five years ago from formerly independent departments such as Meteorology, Forestry, Fisheries and Wildlife, and affiliates such as the Conservation and Survey Division and Water Center," Owens said.

The new SNR will combine programs such as climate, fisheries, forestry, geological sciences and survey, remote sensing-GIS, soils, water and wildlife. The revamped

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Water Resources Research Initiative Could Expand UNL Research Role

by Steve Ress

A Water Resources Research Initiative (WRI) could strengthen the University of Nebraska-Lincoln's efforts to be a world leader in the field of water research by combining diverse areas of water resources expertise.

"This is just what we have been needing to reenergize faculty members and research efforts in a variety of water-related fields," said Kyle Hoagland, interim director of UNL's School of Natural Resource Sciences and director of the UNL Water Center.

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Membership in CUASHI; End of Year Equipment Grants

from the DIRECTOR



J. Michael Jess

Elsewhere in this issue is an article outlining the water resources research initiative recently initiated by the University of Nebraska. The initiative will be led by professors Kyle Hoagland and Sherilyn Fritz who will work closely with NU Vice Chancellor For Research Prem Paul in building a nationally competitive research program. Those from various departments with disciplinary expertise in hydrology, engineering, social sciences and other areas will work collaboratively to develop research plans and secure funding for their execution.

During a recent formal presentation, members of the Board of Regents reacted favorably to the various activities outlined by Vice Chancellor Paul. Roger Patterson, Director of the Department of Natural Resources, also voiced support for the initiative during the Regents' April 26 meeting.

To that end the Water Center recently sought affiliation with a newly created national organization — the Consortium of Universities for the Advancement of Hydrologic Sciences, Inc. (CUASHI). CUASHI was created at the urging of the National Science Foundation whose staff members concluded NSF lacked sufficient expertise to effectively invest federal funds in certain areas of water resources research. Thus, through affiliation with CUASHI, funds to support elements of the NU water resources initiative will be sought from NSF.

Affiliation with CUASHI is not free, but, with some discretionary funds available to him, I was very pleased to accept professor Ed Harvey's generous offer to assist the Water Center in support of initial membership expenses. Thanks, Ed.

End of Year Grants

Last month NU faculty were asked to submit proposals to fund up to \$10,000 in small equipment

purchases to aid them with their research programming.

I am also pleased to announce that this request for proposals (or RFP) generated 21 requests for funds and that the Water Center was able to fully or partially fund six of those. Each of the proposals had merit and we would liked to have funded them all, but the amount of money we had available for awards simply would not allow that.

We appreciate the interest faculty exhibited in taking advantage of this RFP and for the high quality of the proposals they submitted. Weighing the relative merits of each proposal and choosing those that would receive funding was a difficult task.

The following faculty members received full or partial funding of their submitted proposal:

Wayne Woldt, Departments of Biological Systems Engineering and Civil Engineering;

Steve Comfort, School of Natural Resource Sciences;

Matthew Morley, Department of Civil Engineering;

Blair Siegfried, Department of Entomology;

F. Edwin Harvey and **David Gosselin**, School of Natural Resource Sciences and Conservation and Survey Division;

Sherri Fritz, Department of Geosciences.

WATER CURRENT

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Meet the Faculty

Dr. Donald A. Wilhite

Director, National Drought Mitigation Center and International Drought Information Center; Professor and Associate Director, School of Natural Resources. Tenure: School of Natural Resources. Major fields of expertise: Drought planning, mitigation, and policy; drought monitor-



Don Wilhite

ing; use of climate information in decision making

Education:

Ph.D., Geography and Agricultural Climatology, University of Nebraska, Lincoln, NE
M.A., Geography and Climatology, Arizona State University, Tempe, AZ
B.S., Geography, Central Missouri State University, Warrensburg, MO

Current Research/Outreach Programs:

Drought risk management, drought indices, drought planning methodologies, development of climate-based decision support tools for decision makers. Two books in preparation: *Drought and Water Crises: Science, Technology and Management Issues* (Marcel Dekker Publishers) and *Australian Drought Policy* (Kluwer Academic Press).

Other Outreach Programs:

- Development of global/regional drought preparedness networks in collaboration with United Nations organizations and appropriate regional organizations. Chair, Drought Discussion Group, U.N. Secretariat for the International Strategy for Disaster Reduction.

Teaching:

- NRES 452/852, *Climate and Society*. Identify the impact of climate and extreme climate events on society and societal responses to those events. Global in scope and interdisciplinary.

Samples of Recent Publications:

- Wilhite, D.A. 2003. *Drought Policy and Preparedness: International Experiences and Future Directions*. In: Botterill, L. and M. Fisher (eds.) *Drought: People*, (continued on page 7)

Dr. Charles S. Wortmann,

University of Nebraska-Lincoln, Department of Agronomy and Horticulture. Specializing in nutrient management, soil fertility and water quality. Soil fertility and soil acidity management.

Past Research/Extension Programs:

Cover crop technology for soil fertility management.
Efficient use of nitrogen and phosphate.

Education:

Ph.D., Crop Science, University of Nebraska-Lincoln, 1987.
M.S., Soil Science, University of Nebraska-Lincoln, 1978.
B.S., Agronomy, University of Nebraska-Lincoln, 1972.

Current Research/Extension Programs:

Research:

- Soil fertility research for no-till systems.
- Tillage systems for reduced water loss.
- Factors affecting manure phosphorus runoff.
- Increasing monetary returns to land application of manure.

Extension:

- Improving manure use efficiency.
- Improving information availability on nutrient and pesticide management for protecting surface water quality.
- Soil fertility and soil acidity management.

Past Research/Extension Programs:

- Cover crop technology for soil fertility management.

- Efficient use of nitrogen and phosphate fertilizers.

Publications:

- Wortmann, Charles S., C.A. Shapiro, and R.L. Deloughery, 2002. *Sampling Manures For Nutrient Analysis. NebGuide G02-1450.*

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Charles Wortmann

Guest Column:

Sidney Area Residents Are Adapting to Changes From Current Drought Conditions

by Kerry Ferguson,
Information & Education Coordinator
South Platte Natural Resources District, Sidney, NE

Sidney area residents are, by nature and experience, a very adaptive people.

Time and time again, the people of this western Nebraska town have shown a special ability to play the hand they're dealt. It happened in 1902 when the residents of Sidney, population 1,001, were told that Union Pacific Railroad would discontinue operating a water well system for the community.

A bond issue to develop a municipal water system was soon approved, and on February 13, 1909, the lead story of the Sidney Telegraph proclaimed, "History Turns Page- Ye That are Thirsty Come Drink of the Water." The City of Sidney Water Department was born.

It happened again much more recently, when nitrate contamination showed up in the local water supply. In 1990, the city drilled three new wells northeast of town to blend higher quality water with water from its nine existing wells and came within water quality health standards.

That same year, the South Platte NRD created the Sidney Groundwater Management Area, one of the first such areas in the state. Farmers west of town agreed to sample their fertilizer and irrigation water for nitrogen and submit annual reports to the NRD.

While some of the problem was from agricultural fertilizers, some was from chemicals being applied to lawns in town. In 1988, soil samples taken from below a lawn in the middle of town showed the equivalent of 500 pounds per acre of residual nitrates — 2 1/2 times the amount needed to grow an acre of corn.

Regardless of the source, thanks to changes in these kinds of practices, groundwater nitrate levels have since stabilized and are now starting to improve.

Once again, the area's residents adapted.

Today, farmers and city residents alike find themselves in the middle of a new challenge--to adapt to Mother Nature and the effects of drought.

Those effects have been severe.

Last year, an NRD monitoring well west of town fell to a historic low of about 10 feet below normal. Several irrigation wells west of Sidney started pumping air and had to be shut down. In some cases, farmers were forced

to abandon fields altogether.

Two city wells were also shut down when groundwater declined to record levels. Outside irrigation was restricted to one day per week, and city water consumption dropped to less than 2 million gallons per day from a historic high of more than 6 million gallons.

Suddenly, water had become a resource that no one could take for granted.

Actually, the stage had been set for many years. Producers in the Lodgepole Creek Valley and the Sidney Draw, in addition to the City of Sidney, draw most of their water from the limited alluvial and Brule aquifers.

In the case of the Brule, groundwater exists mainly in fractures, making the aquifer quick to recharge, but also very vulnerable in times of shortage.

Between 1930 and 2003, the number of active registered irrigation wells from Sidney west to the Cheyenne-Kimball county line went from two to 179. The biggest jump came in the mid 1960s and 1970s, when land could be leveled and irrigation systems installed economically.

Thirdly, Sidney and Cheyenne

County enjoyed a record breaking progress in the last decade, with \$230 million in new community and economic development projects. The town population went from 5,959 in 1990 to 6,282 today, with a considerable amount of the city's progress tied to the Cabela's retail store and corporate headquarters.

All of this development improved productivity, both economically and agriculturally, but has also placed increased demand on very limited supplies of groundwater.

So how will Sidney area residents respond to this newest challenge? In many ways, they already have. City restrictions limiting outside watering to twice a week went into effect April 1, and a 20 percent water rate increase also went into effect. The city hopes to pipe in water next year from new wells about 20 miles away in the Ogallala Aquifer.

The NRD has obtained grant funds to install a series of monitoring wells to help evaluate the quality and flow of groundwater in the Sidney area. The NRD helped form the Sidney Groundwater Guardian Team to help shape various groundwater protection projects such as the annual Western Nebraska Children's Groundwater Festival.

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"Sidney area residents are a very adaptive people."

NU Environmental Programs Soon To Be Under One Roof (continued from page 1)

school also will be home to a new fish and wildlife cooperative research unit, funding for which recently was approved by the U.S. Senate. That unit is a venture between the federal government, UNL and the Nebraska Game and Parks Commission.

"The integration will increase interaction among our scientists and teachers on a broad range of physical, biological and chemical aspects of natural resources affecting our state," Owens said.

The SNR is expected to move to the Clifford Hardin Nebraska Center at North 33rd and Holdrege streets sometime in 2005. The Hardin Center recently was closed due to budget cuts that eliminated UNL's Division of Continuing Studies that was housed there.

Grant funds earmarked for construction of a new building to house the former School of Natural Resource

Sciences will be used to renovate the Hardin Center into classrooms, teaching and research laboratories, and offices for the new SNR.

"This makes good use of existing facilities and allows us to roughly double the square footage of space that was to be included in the new building," Owens said.

The Hardin Center also has excellent telecommunications capabilities, a 640-seat auditorium, meeting rooms that can be converted to classrooms, easy public access, and space for planned laboratory additions. Much of the center's central hotel tower will be converted to office space, leaving the remainder of the building for teaching, research and public uses.

The SNR's 83 faculty and nearly 100 staff from the combined units currently are housed in more than a half dozen buildings on UNL's City and East Campuses.

Water Resources Research Initiative Could Expand UNL Research Role

(continued from page 1)

The WRRI will promote greater collaboration among research faculty in UNL water science disciplines of great strength such as groundwater hydrology, water quality, climate change, irrigation, remote sensing and geographical information systems. It will include outside organizations such as the Nebraska Department of Natural Resources, the state's network of Natural Resources Districts and irrigation districts.



Institute of Agriculture and Natural Resources Vice Chancellor John Owens announces Board of Regents approval for formation of the School of Natural Resources at a celebration for faculty and staff at UNL's East Campus Union on May 1 (photo: Steve Ress).

"The initiative promotes greater collaboration among researchers and disciplinary areas and coalesces their efforts around key water issues facing the state and will create the synergy needed to support large-scale externally funded research," Hoagland said.

UNL vice chancellor for research Prem Paul, who helped craft the proposal, said it makes sense for UNL to play a leading role in water research because of the state's abundance and variety of water resources.

Nebraska groundwater makes up 65 percent of the water in the Ogallala Aquifer, which is the largest groundwater aquifer in the U.S. Nebraska also ranks tenth nationally in stream miles and 16th in wetland acres. Nebraska's groundwater reservoirs contain about two billion acre-feet of water, which represents about 25 years of the state's annual precipitation, said Paul.

"Because of the interactive nature of surface and groundwater systems, decisions about Nebraska's water resources may have far-reaching implications for water use and management across the central Great Plains," Hoagland said.

"UNL has consistently shown its leadership in a water-related research in a number of areas, including remediation of ground and surface water contaminants, irrigation use and efficiency, drought planning and management, lake and wetland restoration and other areas," he added. "It only makes sense to further strengthen



Mike Jess, Mark Kuzila (pictured) and Kyle Hoagland treated SNR faculty and staff to a cook-out on the grounds of the Clifford Hardin Center on May 22. The center will be renovated to house the new unit and its wide variety of functions by 2005 (photo: Steve Ress).

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Water and Electricity Are Inseparable

By Michael P. Gutzmer,
Environment Regional Manager, North America
Central Region,
Electric Power Research Institute

Having worked in the electric utility industry for the last fifteen years, one realizes the interconnectedness and immense value that water and electricity share with one another. Electricity is primarily dependent on water availability, and water use and sustainability are for most intent and purposes dependent on electricity. This relationship becomes even more critical as Nebraska and other states (47 out of 50) enter into or are in the middle of an extended drought period.

According to recent water balance estimates by the United States Geological Survey (USGS) and others, some regions of the United States are already running short of water during even average precipitation years. Considering projected increases in water demand, water shortages are likely throughout the Rio Grande, upper and lower Colorado, the Great Basin and California water resource regions within the next 20 to 50 years. This is in the order of magnitude of billions of gallons per day with most of the growth in the southeastern U.S.

Nebraska may lose a few football games but wins the largest aquifer game with a vast reservoir of groundwater storage in the Ogallala aquifer; however, Nebraska electric generation relies primarily on surface water flows, which are heavily impacted by drought conditions

Numerous factors could lead to more widespread and severe shortages of water, including population changes, expanding markets for U.S. agriculture, and with very good reason, more stringent in-stream flow requirements. The big unknowns are noticeable climate changes, precipitation and drought cycles, and to some extent, additional freshwater demand by the energy sector.

Electricity demand will grow markedly over the next half century. Where one lives will dictate how severe the water consumption budget will be. According to Electric Power Research Institute's Electricity Roadmap, a technical strategic plan for the future, predicts 10,000 gigawatts of new generating capacity will be required to electrify the world in the next 50 years.

To put it in perspective, that's like building 100 new Gerald Gentleman Stations that Nebraska Public Power District owns and operates in western Nebraska (the largest coal-fired plant in the state) to service the world's future.

Conventional steam-electric power plants, including nuclear, fossil, waste and biomass units represent about 85 percent of the total U.S. generation. Most of these plants withdraw significant quantities of surface and ground water for cooling. One of the most significant factors affecting plant siting is water availability. The majority of the water withdrawn for a power plant is used for steam cooling and essentially removes heat from the turbines.

This once-through cooling process transfers heat back to the environment at an elevated temperature, which is a

point source discharge, regulated by the Nebraska Department of Environmental Quality under the National Pollutant Discharge Elimination System (NPDES). In wet cooling towers, heat in the cooling water is released to the atmosphere via evaporation. Dry cooling systems rely on ambient air as the cooling medium and this cooling treatment technology is costly.

More stringent fish protection measures for cooling water intake structures under Section 316 (b) of the Clean Water Act could require retrofitting of cooling towers on plants using once-through cooling. According to EPRI's estimates, evaporative consumption by power plants is projected to increase by 17 percent compared to consumption in 2000. This could then produce a nationwide increase of 25 percent in evaporative consumption by 2020 from all sources. If proposed control requirements for airborne emissions could accelerate both the retirement of conventional coal-fired plants and the deployment of gas-fired combined cycle units, it would be responsible for reducing evaporative consumption by 25 percent.

Electricity is used to pump water to treatment facilities, to purify water and wastewater, and to deliver water to the public and receiving streams across the country. This transfer of water accounts for approximately four percent of the total U.S. power generation according to EPRI. Electricity accounts for more than three-quarters of the cost of municipal water processing and distribution.

As more cities eliminate traditional chlorine disinfection methods, widespread use of ozonation and ultraviolet treatment of water and wastewater will continue to grow. The need for electricity is also apparent to many Nebraska and heartland farmers for getting water out of the ground and moving pivots across the land.

Forecasts of future water availability are always uncertain; however, what is vividly clear is if Nebraskans and others around the country want to keep the lights on, water is a must. More than ever before, regulators and the "Regulated community," need to be on the same page to understand the complex and difficult challenges that lie ahead in dealing with these two inseparable components of our society. Business units from all sectors of society address short-term budget concerns and often ignore long term strategic planning efforts that benefit natural resources and the total costs of projects.

Most often, the resource is what is impacted and pays the ultimate price. Electric utilities, state and federal agencies, industry and municipalities, and the Electric Power Research Institute must all work together in promoting the use of electro-technologies that reduce water consumption by power plants and minimize impacts of energy production on water quality, aquatic ecosystems and the environment.

Hundreds of years ago there was a delicate balance between the buffalo, Native Americans, and the prairie, which gave sustained life. Today, the relationship between water and electricity is just as important to understand so there is a chance for harmony for the Great Plains dwellers of the 21st century and beyond.

Meet the Faculty

Donald A. Wilhite (continued from page 3)

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Water Resources Research Initiative Could Expand UNL Research Role

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those areas and position the University to take the lead in water-related research.”

“The WRRRI will provide federal funds to hire faculty and researchers to fill key gaps that have been identified in UNL’s catalog of water research experts and areas of expertise,” Hoagland said.

“The goal is for UNL to become a national and international resource for water research,” Paul said.

Funds will also allow for the hiring of staff assistants specializing in grant writing and other areas key to helping find and get state, federal and corporate research grant funds.

“There are a number of areas we could be especially competitive in seeking research grant funding,” Hoagland said.

These may include the following:

- Impacts of regional climate change and variability, including drought and floods, on water quantity and quality.
- Aquifer protection via industrial pollution prevention
- Develop new measurement technologies and monitoring systems

- Effects of long-term hydrologic change in semi-arid regions on aquatic and terrestrial ecosystems.
- Issues surrounding governance of water and conflict mediation/resolution among water users
- Improved water use in agriculture
- Programs that translate research results to educate and inform the public about water issues
- Public water policy, including an understanding of institutional barriers to water management
- Hydrologic modelling in large river systems in Nebraska, to assess the effects of changes in irrigation practices, drought, flooding, climate change and water use
- Changing social patterns of water use, economic forces, and community land-based needs in the Great Plains
- Water marketing, leasing, and transfers in Nebraska
- Improved and protecting domestic water supply systems
- Human health problems related to drinking water

Hoagland and Sherilyn Fritz of UNL’s Department of Geosciences, are leading the WRRRI with help from Paul.

Sidney Area Residents Are Adapting to Changes From Current Drought Conditions

(continued from page 5)

The NRD and city are also cooperating on a project to install a series of groundwater infiltration basins to aid in recharging depleted city wells.

Adaptations in the ag sector are also impressive. In November of last year, the NRD imposed a moratorium on new irrigation wells and a restriction on the expansion of irrigated acres in the Lodgepole Creek Valley and

Sidney Draw. Cities and industries are also required to submit annual water use reports to the NRD.

Rather than face NRD-imposed irrigation restrictions this summer, a group of Sidney farmers developed a plan to save an estimated 1 billion gallons of water. The group will voluntarily plant crops that consume less water, turn off the end guns on center-pivot irrigation systems and reduce the number of acres under irrigation. The NRD board of directors praised the plan and gave it unanimous approval.

A second proposal by farmers to forego turning on irrigation wells west of town to make additional groundwater available to the city—in exchange for a one-time \$300 payment—was rejected by the Sidney City Council as too expensive. However, the idea served as an eye opener for everyone—urban and rural residents alike—about the value of this vital natural resource.

Of course, no one knows for sure if the adaptations made to face the Sidney area’s latest water challenges will be permanent ones. If nothing else, they’re a good start. It obviously depends on whether the area is in end of a four-year drought or in the midst of a much longer one.



Water Sciences Laboratory director Dan Snow (left) explains the lab’s capabilities to School of Natural Resource Sciences staff at a May 1 open house hosted by the lab (photo: Steve Ress)

Monitoring Shows Sharp Drops in Eastern Nebraska Groundwater Levels

by Charles Flowerday, Editor
Conservation and Survey Division and School of
Natural Resources, UNL

LINCOLN, Neb. — In the midst of a multi-year drought, groundwater levels dropped more than five feet at 14 monitoring sites in eastern Nebraska in the last two years, according to data from the University of Nebraska-Lincoln.

Another half of the 98 readings by UNL's Conservation and Survey Division showed two-year declines of two to five feet. Most of these declines were seen in the lower Platte River valley, the Big and Little Blue river basins and northeast Nebraska.

While recent rains have helped, it likely would take more than a year of above-average precipitation to replenish groundwater lost at that rate, said Mark Burbach, coordinator of CSD's water-level monitoring program.

These eastern Nebraska readings come from an area bounded on the west by Cedar, Wayne, Stanton and Colfax counties north of the Platte River and by Polk, Hamilton, Adams and Webster counties south of the Platte. Readings from elsewhere in Nebraska still are being gathered and will be available later this year.

"This confirms anecdotal information that not only has western Nebraska experienced significant declines, but the eastern part of the state has as well," Burbach said.

These readings are similar to declines recorded during the drought years of 1978-1981, the last period of severe, multi-year drought in the state, Burbach said.

Outside the Big and Little Blue river basins, the eastern part of the state is not known for extensive irrigation of cropland, the most demanding of water uses, but all but a few readings outside of those basins showed one- to five-foot declines for the two-year period.

As more data are gathered, CSD will release state-wide water-level information this fall in a report of maps and interpretative text detailing changes since pre-development and for the last two years.

Due to budget constraints, the report has not been published for a number of years, though an annual map of groundwater-level changes in the state has been posted on the Nebraska Department of Natural Resources' Web site. CSD resumed the report at the request of natural resources districts and others, Burbach said.

The division is part of a cooperative statewide groundwater-level monitoring program involving the U.S. Geological Survey, NRD's and other federal agencies, power and irrigation districts and municipal water systems.

CSD is part of the School of Natural Resources, which is a unit of the Institute of Agriculture and Natural Resources and the College of Arts and Sciences.

We're Updating!!

We are updating our mailing list. If you have a change of address, title and/or name, or would like to have your name added to or removed from the *Water Current* mailing list, please let us know. Also, if you know of anyone who might be interested in receiving our publications, please give us their names and we will be glad to add them to our mailing list.

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Send update to:

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or e-mail changes to sress1@unl.edu



Water News Briefs

USGS Fact Sheets

The U.S. Geological Survey (USGS) has recently published two fact sheets of particular local and state interest.

The first is *Age of Ground Water at City of Lincoln's Municipal Well Field near Ashland, Nebraska* by G.V. Steele. It was released as USGS Fact Sheet 091-02 in January, 2003.

The second is *Water-Quality Assessment of the Central Nebraska Basins - Entering a New Decade* by Ronald B. Zelt and Jill D. Frankforter. It was released in March, 2003 as USGS Fact Sheet 013-03. Copies are available from USGS, Water Resources Division, Federal Building, Room 406, 100 Centennial Mall North, Lincoln, NE 68508 or contact USGS Technical Editor Kathy Wilson at (402)437-5663 or email kewilson@usgs.gov.

A limited number of each are also available from the UNL Water Center by phoning (402)472-3305 or by emailing sress1@unl.edu.

Wetlands and Mosquitoes — Good, Bad or Indifferent?

People often view marshes and other wetlands as barriers to agriculture or development....and as mosquito nurseries to boot.

Since at least the 1980's, however, the beneficial ecological and water-quality aspects of wetlands have received widespread attention. In

contrast to temporary mosquito-breeding habitats such as water-filled tires or containers, wetlands...while certainly providing breeding areas for mosquitoes...can at the same time provide habitat other than just still water, habitat that can also support dragonflies, damselflies and other insects that may prey upon mosquitoes.

Some communities have used enhancement of fairly large areas of marsh habitat to increase populations of mosquito predators.

In New Jersey, for example, a technique of "Open marsh water" (continued on next page)

Demonstrating Ways to Gather the Samples

Faculty and staff at the University of Nebraska-Lincoln were introduced to or reacquainted with "direct push" sampling technologies and how that technology might help them with their research during a demonstration on the UNL East Campus on April 29.

"The advantages of direct push techniques over conventional sampling techniques is there is no need to install permanent wells, no cuttings to dispose of, minimal site disturbance, and it's often faster and more economical," said environmental scientist Mark Burbach of UNL's Conservation and Survey Division (CSD).

New equipment demonstrated included a track-mounted Geoprobe unit with a more powerful hammer than CSD's present truck-mounted geoprobe.

"The new unit also has auger capabilities and the tracks are much friendlier for sampling in environmentally sensitive areas," Burbach said.

New tooling included soil sampling tools and a slug test kit for determining hydraulic conductivity without installing permanent wells.

Representatives from Geoprobe Systems, Salina, KS, demonstrated a cone permeameter used for

determining hydraulic conductivity. It has the capability for profiling the conductivity of a shallow aquifer without having to recover the sampling tooling. They also demonstrated equipment that can be used for placing remediation products in contaminated areas.

Older equipment and tools included in the day's demonstrations included electrical conductivity logging, groundwater water sampling options, soil sampling options, a grouting machine for sealing small diameter holes and gas sampling tools.

For more information on field sampling capabilities for UNL-sponsored research, contact Burbach at (402)472-8210 or email mburbach@unl.edu.



Environmental scientist Mark Burbach (second from right) demonstrates one of the Conservation and Survey Division's Geoprobe units to (from left) Steve Jebo, Joe Skopp and Troy Schmidt (photo: Steve Ress).

JUNE

13-19: Association of American State Geologists, 95th Annual Meeting, hosted by Nebraska Geological Survey, Conservation and Survey Division, and Institute of Agriculture and Natural Resources, University of Nebraska-Lincoln. Information and registration available online at <http://csd.unl.edu/aasg>.

29-July 2: International Congress on Watershed Management for Water Supply Systems, Melennium Hotel Broadway New York, New York, NY. Sponsored by the American Water Resources Association. For information, go to www.awra.org.

JULY

22-24: Water and Natural Resources Summer Tour, Kearney. Co-sponsored by the UNL Water Center, Four States Irrigation Council and others. This year's tour focuses on the Republican River watershed. For information, go to <http://watercenter.unl.edu>, email sress1@unl.edu or phone (402)472-3305.

AUGUST

12: New Mexico Symposium on Hydrologic Modeling, a one-day technical symposium, Macey Center, New Mexico Tech, Socorro, NM. Abstracts are being accepted through July 1. For information on the symposium or submission of abstracts, contact Catherine Ortega Klett at the New Mexico Water Resources Research Institute at (505)646-1195 or coklett@wrri.nmsu.edu



SEPTEMBER

17-20: Arizona Hydrological Society 2003 Annual Symposium, iSustainability Issues of Arizona's Regional Watersheds, Mesa Centennial Center, Mesa, AZ. For information, go to www.azhydrosoc.org, email Pkroopnick@brwnald.com or phone (602)567-3850.

OCTOBER

1-3: Forty-Eighth Annual Midwest Ground Water Conference, Fetzer Center, Western Michigan University. Abstracts being accepted until May 31. Session topics include the following: Agricultural chemicals in ground water; modeling, management and sustainability of ground water resources; novel remediation methods;

applications of isotopes in ground water; geophysical applications to ground water flow and contamination; and ground water interactions with lakes and rivers. For more information, call Alan Kehew at (269)387-5486 or email alan.kehew@wmich.edu. Online at <http://www.wmich.edu/geology/mwpgwc.html>

NOVEMBER

2-5: American Water Resources Association Annual Conference, Hilton San Diego Resort, San Diego, CA. For information, go to www.awra.org.

News Briefs (continued from page 10)

management" is used which seeks to eliminate breeding depressions and increase natural predators without use of insecticides. In 1969, the Cape May Mosquito Extermination Commission implemented the method on a 548-acre marsh; 25 years later the marsh still hasn't needed maintenance, cleaning or pesticides, and using the method saved the locality an estimated \$669,000 over the 25 years.

(Editor's note: Taken in part from *Virginia Water Central*, March 2003 (No. 25) page 18).

Drinking Water Security in America After 9/11 Report Released

According to a report issued by the American Water Works Association, America's water utilities' immense focus on homeland security since the terrorist attacks of 9/11 has resulted in an unprecedented mobilization of effort and resources to protect America's water supply.

"Drinking Water Security in America After 9/11," identifies the extensive new security measures water utilities have undertaken since 9/11. It also describes the new culture of security that water utilities now operate under and the challenges they still face in protecting the nation's water supplies from terrorism. For a copy of the report, go to http://www.awwa.org/advocacy/Water_Security_In_America_Final.pdf.

Planning Continues for July Water and Natural Resources Tour

by Steve Ress

Local response to settlement of the Kansas v. Nebraska Interstate Compact Lawsuit and coping with drought in the Republican River watershed are the forums for the July 22-24 water and natural resources tour.

The tour leaves the Kearney Ramada Inn, Tuesday morning, July 22 and concludes there late afternoon, Thursday, July 24.

Registration deadline is July 1 and past tour participants should have already received a registration flyer in their mail. Cost is \$375 single occupancy or \$325 double occupancy.

If you did not receive the registration mailing and want to register for the tour, contact Sara Koperski at the Kearney Area Chamber of Commerce at (800)652-9435 or email skoperski@kearneycoc.org. A tentative tour itinerary appeared in the April issue of the Water Current and can be accessed on-line at <http://watercenter.unl.edu/whatsnew/>

[summer_tour.htm](#). It is also included in this month's registration mailing.

"Our primary focuses will be looking at local responses to the settlement of the Kansas v. Nebraska lawsuit and how southwest and south central Nebraska are coping with the ongoing drought in the Republican River watershed," said tour co-organizer Michael Jess, Acting Director of the UNL Water Center.

A block of rooms will be available at the Kearney Ramada Inn the night prior to the tour, for those wanting to drive in on Monday.

Tour co-sponsors are the Nebraska Water Conference Council, Central Nebraska Public Power and Irrigation District, Gateway Farm Show, Kearney Area Chamber of Commerce, Four States Irrigation Council, Nebraska Association of Resources Districts, Nebraska Public Power District, The Groundwater Foundation, U.S. Geological Survey, Nebraska District and UNL's Water Center and School of Natural Resources.



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