February 2002

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WATER CURRENT

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UNL Chemistry Laboratory Analyzes, Teaches Groundwater's Story

by Steve Ress

Research hydrogeochemist Ed Harvey is fascinated with groundwater's stories. He is using a relatively new analytical laboratory at the University of Nebraska-Lincoln to listen to those stories, help tell them and teach them to students.

Unraveling groundwater's mysteries is the name of the game at UNL's Groundwater Chemistry Laboratory (GCL).

"Every groundwater tells a story. We listen to them here and use them to help better understand and manage our groundwater resources," the hydrogeochemist said.

Hydrogeochemistry is the science of determining the time and source of groundwater recharge, estimating how long water has been in an aquifer, identifying mineral make-up of aquifer materials, and examining how water from different sources mix and interact.

"We use the water's chemistry and isotopic composition as a forensic tool to find out where groundwater has been and what has happened to it along its journey," he said. The GCL helps he and his students do the necessary detective work..

Additional knowledge gained from the detective work can be used to create more comprehensive management and conservation plans and more equitable groundwater/surface water regulations.

The GCL, one of the UNL Water Center's core research facilities, is both a research and a teaching laboratory. As part of the core research program, it provides analysis to other state researchers, agencies and local clientele evaluating groundwater and surface water quality across the Great Plains.

Begun in 1998, the GCL was renovated and equipped using grants from facilities management at UNL, equipment grants from UNL's Conservation and Survey Division and School of Natural Resource Sciences and start-up monies from externally funded research projects.

Research Technician Kelli Warren and Hydrogeochemist Ed Harvey analyze samples for a research project at the Groundwater Chemistry Laboratory, one of the UNL Water Center's core research facilities (photo: Steve Ress).

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INSIDE

Acting Director Appointments; Spring and Summer Activities Underway or Being Planned

from the DIRECTOR

J. Michael Jess

During the past 18 months, regular columns from Water Center Director Kyle Hoagland have been appearing here. At least for those readers not closely aware of events and activities at the University, you are probably wondering why this column was not written by him, as well.

Let me explain. In early December of last year, Ted Elliott, Director of the UNL School of Natural Resources (SNRS), began an extended health care absence. To temporarily fill the vacancy left by Ted, Kyle agreed to become Acting Director of the SNRS. With that administrative move, the Water Center was left without a Director. To fill that vacancy, I agreed to assume Kyle's position as Acting Director of the Water Center. Both of these temporary appointments are expected to last approximately six months. During this period, I continue my responsibilities as associate director of UNL's Conservation and Survey Division.

During the period while I serve as Acting Director of the Water Center, several activities are planned. Already underway are the weekly water and natural resource seminars devoted to "Current Nebraska Water Issues." Thanks to a variety of timely topics covered by those invited to speak, the spring semester seminars have been a regular campus activity for more than 30 years. Often in equal numbers, it is attended by students, by faculty and by members of the public. We invite you to attend these free lectures, which are Wednesday afternoons at 3 p.m. in Room 116, L.W. Chase Hall on the UNL East Campus.

For many years another activity has been the annual Water Conference, sponsored in large part by the Nebraska Water Conference Council. The water conference will not be held in this March, however. Instead, discussions with several other organizations have focused upon the possibility of a fall conference. This is the centennial year of the founding of the U.S. Bureau of Reclamation, and conference organizers are exploring the possibility of using that as a central theme.

The annual Water and Natural Resources tour is being planned for

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Letter:
Build on Missouri River Benefits

by Bryce P. Neidig, President, Nebraska Farm Bureau Federation

In the October 2001 *Water Current* Chad Smith argues that it's time for change on the Missouri River. The Missouri River controversy centers on how much water should flow down the river, when it should flow, and who should benefit. Smith states that in the past the river has been managed only to support commercial barge traffic. In fact, since 1960, the Army Corps of Engineers has managed the Missouri River and its six dams and reservoirs to meet goals outlined by Congress: flood control (the primary purpose of the system), navigation, irrigation, hydropower, water supply, water quality, recreation, and fish and wildlife. By harnessing the river, flood protection, electricity and a freer flow of goods have been the result.

Now because of endangered species concerns, the U.S. Fish and

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WATER CURRENT

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Meet the Faculty

Dr. Thomas G. Franti

Surface Water Management Engineer and Associate Professor, Department of Biological Systems Engineering, University of Nebraska-Lincoln. Member of UNL faculty since 1993. Research and extension specialties in surface water quality, quantity and soil and water conservation.

Tom Franti

Education:
Ph.D. in Agricultural Engineering, Purdue University, West Lafayette, IN, 1987.
M.S. in Agricultural Engineering Iowa State University, Ames, IA, 1985.
B.S. in Agricultural Engineering, University of Wisconsin-Madison, 1983.

Current Research/Extension Programs:

— Best management practices (BMPs) to reduce agricultural contaminant runoff to surface water. Focus on effectiveness of riparian grass buffer strips to reduce soil, pesticide and nutrient runoff to streams. One of these studies is evaluating the impact of individual grass buffers along streams and comparing the runoff from one small watershed with 80 percent of the runoff passing through buffers, to one with no buffers. Developing a field demonstration study to evaluate various designs for riparian buffers ranging from alternate grass planting designs to combinations of grass, shrub and tree plantings. Extension programming on delivering BMPs to farmers and providing information and education on natural resources management in the Platte River watershed. Demonstration sites and educational programs in eastern Nebraska to encourage adoption of riparian forest buffers. Evaluating atrazine management education program in the Blue River Basin in southeast Nebraska (promoting BMPs for atrazine application and to reduce atrazine runoff to surface water). Continuing Platte Watershed Program addresses the need for information on water resource management, environmental

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J. Michael Jess

Senior Lecturer and Water Resources Engineer, University of Nebraska-Lincoln School of Natural Resource Sciences, Associate Director, UNL Conservation and Survey Division and Assistant Director, UNL Water Center. UNL faculty member since 1999. Former Director of the Nebraska Department of Water Resources 1981-1999. Registered Professional Engineer,

Mike Jess

Illinois (inactive) and Nebraska. Past president of Nebraska Section of American Society of Civil Engineers. Current member of the board of the Nebraska State Irrigation Association. Served as Administrative Law Judge for more than 150 disputes among water users in Nebraska. Of the 24 decisions that were appealed to the Nebraska Court of Appeals (3), or to the Nebraska Supreme Court (21), only two were reversed. Instituted a statewide, comprehensive adjudication of all abandoned water rights. Most regions had not been examined since appropriations were originally granted in the 1890's.

Education:

M.S., Civil Engineering, University of Nebraska-Lincoln, 1969.
B.S., Civil Engineering, University of Nebraska-Lincoln, 1968.

Current Programs:

General direction of CSD faculty and supervision of staff activities. Direct efforts aimed at creating awareness of and soliciting input for the Conservation and Survey Division and School of Natural Resource Sciences. Engaged in faculty efforts intended to create a curriculum devoted to effective local self-government of natural resources. Coordinate efforts of UNL Water Center and Nebraska Water Conference Council in producing annual conferences and summer water and natural resource tours.

Teaching:

Team teach two seminars: one focused on water law and done in conjunction with the UNL School

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Summer Water and Natural Resources Tour Follows North Platte River

This summer's water and natural resources tour will follow the North Platte River in three states, looking at water quantity, use, interstate compacts, development and basin history.

The tour is July 22-25, beginning and ending at Kearney's Ramada Inn Motel and Convention Center.

"That's about a day longer than normal since there is a lot to see along the basin, and there will be stops in Nebraska, Colorado and Wyoming," said Mike Jess, acting director of the UNL Water Center and tour co-organizer.

Complete tour details will be worked-out on a planning trip through the area in mid-April. The tour's basic framework is taking shape, however.

Buses will leave Kearney early on Monday, July 22. A block of rooms at the Kearney Ramada Inn will be available for those wanting to make the trip to Kearney the evening before the tour. A barbecue is being arranged for those who will be in Kearney Sunday evening.

Buses will stop to pick-up registrants in North Platte and/or Ogallala, an the tour's first visit will be in Sidney at world-famous Cabela's, with possibly a brief stop at a regional hazardous waste incineration facility near Kimball.

Overnight will be at Fort Collins, CO.

Day two begins at the North Platte River's headwaters in nearby Walden, CO. A number of stops are planned as the tour then follows the river into Wyoming enroute to the second night's stop at Casper, WY.

Day three continues the journey along the North Platte toward a final overnight stay in Scottsbluff, July 24.

As buses wind their way back toward Kearney, lunch will be at the new visitor's center at Lake McConaughy, where University of Nebraska lake and environmental researchers will brief participants on a collaborative effort to solve dissolved oxygen problems threatening Lake Ogallala trout.

The tour expects to conclude mid-afternoon Thursday, July 25.

Tour cost is expected to be in the $400 to $450 range, depending on final arrangements and motel occupancy. Registration includes all food, motel, and motorcoach expenses. Registration is through the Kearney Area Chamber of Commerce. Contact them at (800)652-9435 or the UNL Water Center at (402)472-3305 for more information.

Registration information and materials will be sent to past tour participants in an upcoming mailing.

Sponsors are Central Nebraska Public Power and Irrigation District; Nebraska Public Power District; EA Engineering, Science and Technology; Kearney Area Chamber of Commerce; Gateway Farm Show; and UNL's Institute of Agriculture and Natural Resources, Water Center and Conservation and Survey Division.

April Water Faculty Forum in Lincoln

The UNL Water Center is sponsoring a forum for faculty researchers in the water sciences on Tuesday, April 9, at Lincoln's Embassy Suites Hotel and Convention Center.

This is the first faculty forum the Water Center has held since October, 1999.

"We've been receiving lots of comments that research faculty wanted an opportunity to get together to compare notes on research projects and to get to know one another better," said Mike Jess, Water Center Acting Director.

In addition to giving faculty an opportunity to get better acquainted, the forum plans to showcase current research and cooperative extension programming across a broad range of water science disciplines. Fifteen to 20 minute presentations by faculty researchers will comprise the bulk of the forum's morning session.

In the afternoon, participants will break into small groups to brainstorm on possible "Big ticket" collaborative research programming.

Welcome and opening remarks will be delivered by Jess. During the noon break, Prem S. Paul, NU Vice Chancellor for Research will present the forum charge, "Charting Future Research Courses and Collaborations."

"We welcome faculty and graduate students to bring and present posters," Jess said. The forum's schedule will provide ample opportunity for attendees to view posters.

The forum begins at 9 a.m. and will adjourn by 4:15 p.m. A registration fee of $40 covers continental breakfast, lunch and breaks. Register by contacting the Water Center at (402)472-3305 or sress1@unl.edu by March 29.

"We encourage you to make a short presentation and/or bring a poster, which will greatly add to the quality of our forum," Jess said.

Additionally, the forum takes the place of the Water Center and Nebraska Water Conference Council's annual spring water conference, normally held in mid-March.

"We want to do some long range planning on topics that will be of broad interest for future conferences. We fully expect the annual conference to return as a spring event next year," Jess said.

Guest Column:

Kansas v. Nebraska and Colorado

by Don Blankenau

In 1998, Kansas requested leave from the U. S. Supreme Court to file a "Bill of Complaint" against Nebraska. This "Bill of Complaint" alleged that Nebraska violated the Republican River Compact by failing "to deliver water to Kansas in the quantities allocated under the Compact" resulting in Kansas having "suffered grave and substantial injuries." While Kansas did not identify what those injuries were, the primary focus of the Complaint is Nebraska's use of groundwater.

Signed into law in 1943, the Republican River Compact is an agreement between Nebraska, Kansas and Colorado to share the waters of the Republican River. In rough terms, the Compact grants Colorado the right to beneficially consume approximately 11 percent of the annual flow of the river, Nebraska receives the right to consume approximately 49 percent and Kansas approximately 40 percent.

While the United States Supreme Court is the only court with the authority to hear cases that involve disputes between states, it is not obligated to exercise its exclusive jurisdiction in such cases. Before agreeing to hear a case between two states, the Court considers the seriousness and dignity of the claims in the Bill of Complaint. With that in mind, Nebraska argued the case should not be heard because Kansas had always received what it was entitled to under the Compact.

Nebraska noted that since 1959, Kansas received from Nebraska over four million acre-feet of water in excess of its allocations and more than nine million acre-feet than it could use. In 1999, despite Nebraska's arguments, the Court agreed to allow Kansas to present its case.

At the urging of the Court, Nebraska next filed a Motion to Dismiss all claims related to the use of groundwater. Nebraska's motion argued that:

(1) at the time the Compact was entered, neither Kansas nor Nebraska law allowed the regulation of groundwater;

(2) the Compact's legislative history in Nebraska and Kansas contains no mention of an intent to change groundwater law to allow for regulation;

(3) various courts have concluded that statutes, similar to the Compact, do not allow the regulation of groundwater even if such regulation is necessary to protect the hydraulically connected surface water.

After Nebraska filed its Motion to Dismiss, the Court appointed Vincent McKusick, Portland, ME, to serve as Special Master over the proceedings. A retired judge of the Maine Supreme Court, McKusick conducted a hearing on Jan. 4, 2000, in Kansas City, MO, to consider Nebraska's Motion.

Just three weeks later, on January 28, McKusick issued his First Report to the Supreme Court in which he recommended the Court deny Nebraska's Motion and find the use of groundwater, to the extent it diminishes streamflow, is regulated by the Compact.

Several months later, in a highly unusual move, the Supreme Court issued a one-sentence order denying Nebraska's Motion but failing to adopt the full recommendation of the Special Master.

Since the denial of Nebraska's Motion to Dismiss, McKusick has issued two Memoranda of Decisions. These contain interim rulings yet to be reviewed by the Court. They are, however, considered significant and include the following findings:

(1) the Republican River Compact Administration's (RRCA) past determinations of water supply, allocation and consumptive use are conclusive;

(2) a state may not consume water allocated to another state even if the latter would not put the water to beneficial use;

(3) a complaining state need not show injury to obtain prospective relief; and

(4) the RRCA engineering committee's adjustments to each state's allocations for the years 1959-1977 are binding.

Additional interim rulings by the Special Master can be expected prior to trial, which is scheduled for March, 2003.

In other developments, the three states have agreed to discuss the possibility of settlement. The initial meeting between the states occurred Oct. 4, 2001. Additional meetings are being planned. As with most settlement negotiations, the discussions are highly confidential at this point.

The "Special Master" effectively serves as a judge, empowered to conduct hearings, take evidence and make reports directly to the Supreme Court. They are not a mediator, negotiator or facilitator as commonly reported. Unlike other federal or state court judges, special masters are also authorized to charge litigating parties for their services.

(Editor's Note: Blankenau is an attorney in the firm of Fennemore Craig, P.C., focusing on water and environmental law. He serves as a Special Assistant Attorney General for the State of Nebraska in this litigation).

Community Options for Wellhead Protection Areas

by J. David Aiken,
Water and Agricultural Law Specialist
UNL Department of Agricultural Economics

The Wellhead Protection Area Act of 1998 authorizes public water suppliers to designate wellhead protection areas (WHPA) to protect community water supplies from pollution.

If a community's water violates drinking water standards, the community can operate only under a Nebraska Department of Health and Human Services System administrative order until the violations are corrected. Nitrate is Nebraska's most widespread groundwater contaminant. If community water exceeds 10 parts per million (ppm), the nitrate standard set for safe drinking water, a community may use a WHPA program as a long-term solution to nitrate contamination, avoiding costly replacement of existing wells or developing advanced water treatment systems to the contaminant.

This WHPA can be used as long as nitrates are less than 15 ppm and the community provides bottled water to infants and pregnant women.

This article examines the wellhead protection area program and evaluates different community legal authorities to protect the community's drinking water supplies for first and second class cities and villages.

WHPA Act Process Overview Summary

1. Have a wellhead protection area delineated.
2. Inventory potential contaminant sources within the WHPA.
3. Describe the program to protect the water supply from such contamination (including contingency plans for location of alternate drinking water supplies in the event of contamination).
4. Propose the controls necessary to provide protection from contaminants.
5. WHPA program submitted to DEC for approval.
6. If program approved, adopt program by ordinance.

WHPA Boundary Delineation: A WHPA is a community well's groundwater recharge zone. Most are based on a 20-year time of travel. This means a contaminant deposited on the edge of the WHPA would take up to 20 years to reach the water well. The Nebraska Department of Environmental Quality (NDEQ) will delineate a community's WHPA in cooperation with the community. They may also be delineated by the Nebraska Rural Water Association. Some Natural Resource Districts (NRDs) will delineate WHPAs, as well.

Contaminant Source Inventory: Potential contaminant sources include fuel, oil and chemical storage, chemical use, dumps and waste collections, storage and disposal. NDEQ has WHPA inventory forms. Inventories can be conducted as a school science project or by a community service group.

WHPA Plan Preparation: NDEQ staff have prepared a sample WHPA plan for communities to use. Sample WHPA protection ordinance checklists are being developed for NDEQ.

Possible Control strategies: NDEQ has identified steps a community could take to protect local groundwater supplies from contamination. These include 1. establish setbacks for certain potential contaminant sources; 2. require connection to municipal water supply system with five years; 3. NDHHS water well inspections every five years; 4. require connection to municipal sewer system within five years; 5. establish building permit program; 6. establish well permit program, including extraterritorial wells; and 7. WHPA zoning overlay district.

Community WHPA Legal Authorities

Under existing Nebraska statutes, communities and other public water suppliers can engage in education activities publicizing the WHPA and what activities and practices will help prevent WHPA contamination. Communities may also regulate activities threatening public water supplies as public nuisances.

Police Power Regulations: Examples of WHPA police power regulation might include setback requirements and prohibiting the location of specified facilities or activities within a WHPA. First class cities (population 5,001 - 100,000) may establish police power regulations within their community limits and up to two miles outside them. Second class cities (population 801 - 5,000) and villages (population 800 or less) may establish police power regulation only within their municipal limits. Police power regulation of property for second class cities and villages may be extended for one mile beyond city or village limits but may not interfere with existing farming, livestock operations, business or industry.

Sanitary and Water Ordinances: Rural communities are authorized to establish sanitary regulations and to protect city water supplies. First class cities may regulate waste disposal for two miles and may adopt sanitary regulations and regulate nuisances for two miles. Second class cities and village may extend one mile.

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Second class cities and villages may regulate to prevent pollution of the municipal water supply 15 miles. Second class cities and villages have explicit well regulatory authority.

Public Nuisances: Cities and villages may regulate public nuisances to the limits of their zoning jurisdiction. This includes authority to define what constitutes a nuisance, to require that nuisances be controlled and to require that nuisances be terminated. Nuisances need only interfere with the public health, welfare or convenience. Anything threatening the municipal water supply would clearly be a public nuisance.

Livestock Nuisance Exceptions: There are two livestock nuisance exceptions on municipal public authorities, however, under either statute, the livestock operation must have been in existence before the community in order to qualify for the exception.

Zoning: Municipalities may establish land use zones and regulate land use through zoning regulations after preparing a comprehensive plan. First class cities may zone for two miles and smaller communities may zone one mile beyond their border. Zoning regulations supersede less strict state regulations, but stricter state requirements supersede zoning regulations. Municipal building permits may be required without zoning.

Other Issues: NRDs may regulate agricultural chemical use and manure application in groundwater management areas to protect groundwater quality. Some NRDs trigger groundwater quality protection regulations sooner within designated WHPAs. Communities may purchase land within a WHPA in order to control the use of the land (e.g. putting land into pasture or leasing the land to farmers who follow specified ag chemical management practices). Communities may also purchase conservation easements from land owners to protect public water supplies if the owner agrees to certain land use restrictions designed to protect community water supplies. Communities may also provide cost-sharing assistance to farmers to implement agricultural chemical best management practices to reduce or prevent pollution of municipal water supplies.

(Editor's Note: Taken in part from "Cornhusker Economics," Nov. 28, 2001, University of Nebraska-Lincoln Cooperative Extension and Institute of Agriculture and Natural Resources. For more information on this topic, Aiken can be reached at (402)472-1848 or daiken@unl.edu).

Build on Missouri River Benefits (continued from page 2)

Wildlife Service, American Rivers and others want to change the balance by requiring higher flows in the spring, the spring rise, and reduced flows in the summer (resulting in a split navigation season). In effect, this would give species needs greater priority. Farm Bureau believes such changes upset the balance the Corps is seeking to achieve and very likely would reduce the flood control, navigation and hydropower benefits we have come to enjoy.

Flood control is critical to communities along the Missouri River including Omaha, South Sioux City, Nebraska City, Plattsmouth, and Blair, not to mention the thousands of farmers and property owners along the river. Deliberately causing river levels to rise during the spring months when rains and floods threaten most could damage nearly 1.4 million acres of farmland in Nebraska, Iowa, Kansas and Missouri. Flooded farmland translates into lower tax revenues for local and state governments and less spending in local communities. Research by the Iowa Farm Bureau Federation suggests flooding caused by the spring flow would result in reduced production for farmers and translate into a local economic impact in Iowa of about $40 million.

Low flows in the summer months would also curtail hydroelectric power production. Less electricity will be generated at exactly the time when demand is greatest. The demand by air conditioners and irrigation pumps peaks during the hot summer months. Less power will force local utilities to replace the lost power by purchasing it from wholesale markets. Ask California consumers about the cost of purchasing additional electricity when demand is high. The last thing Nebraska farmers need are higher electric bills in a drought year. And the last thing state and local governments need, given their tight budgets, is higher energy costs.

We must also consider the impacts of low flows on navigation. Critics of navigation argue that barge traffic is insignificant, but they ignore the impacts changes in flows would have on the Mississippi River. The Mississippi carries more than 60 percent of our nation's export grain products, nearly 30 percent of our nation's coal supplies, 25 percent of our petrol-chemical products, and thousands of tons of other essential commodities. The Missouri River at its mouth provides a significant amount of the Mississippi's flows, in some years providing up to one-half of the Mississippi's flows at that point. Lower summertime flows could shut down the Mississippi River to barge traffic during critical shipping times.

Additional support for wildlife and recreation development along the river should focus on voluntary habitat conservation and enhancement activities, along with prudent planning. Future management decisions for the river should not ignore or reduce the flood control, hydropower and navigation benefits we have come to enjoy. Let's build upon these benefits to protect and enhance species, not tear them down, and in so doing, threaten the people and communities along the river.

UNL Laboratory Analyzes, Teaches Groundwater's Story (continued from page 1)

It is equipped to fulfill it's detective role with a Dionex Done DX-120 Ion Chromatograph for analyzing anions; a Varian 220FS Atomic Absorption Spectrometer with SP-5/SIPS automated sample injection system; a GTA-110 graphite furnace; a VGA-77 vapor generation unit for cation and trace metal analysis; and a Cary-50 UV-visible Spectrometer for analyzing silica and phosphorous. It also contains necessary wet-chemical equipment for titrimetric determination of dissolved oxygen, alkalinity and hardness.

"Our major emphasis is in analyzing primary cation, anion and trace metals present in water samples," Harvey explained.

Examples of current projects the GCL is conducting or assisting with include:

- Investigating interaction between groundwater and Republican River surface water and the impact of irrigation practices on river levels.
- Determining the origin and evolution of isotopically depleted, high sulfate groundwaters in the Dakota aquifer in northeastern Nebraska.
- Determining the seasonal isotopic composition of precipitation across the state, for use in recharge and groundwater/surface water studies.
- Determining possible impacts of aqueous copper concentrations on fish populations.
- Analyzing the physical and chemical composition of rare saline wetland ecosystems in eastern Nebraska.
- Using rubidium to "label" corn rootworms and European corn borers so they can be easily traced and recaptured for ongoing research.
- Mapping and determining concentrations of salt brine seeps on outcrops of the Pierre Shale near southern Nebraska's Harlan County Lake.
- Assessing hydrology and hydrogeochemistry of wetland fens in western Nebraska's Sand Hills.
- Using stable and radioactive isotopes to better understand groundwater and surface water interaction beneath irrigation canals near Scottsbluff.

The GCL has collaborative relationships with the Environmental Isotope Laboratory, University of Waterloo, Tritium Analytics at Purdue University and several other national and international laboratories, Harvey said.

Harvey operates the laboratory with help from research technician Kelli Warren.

The GCL is located at 113 Nebraska Hall on the UNL City campus. For further information email feharvey1@unl.edu or visit http://csd.unl.edu/csd/lab/gwlab.html.

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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Meet the Faculty

Thomas G. Franti (continued from page 3)

education and sustainable development of the Platte River valley.

Publications:

— Franti, T.G., D.L. Devlin, F.W. Roeth and C.W. Rice, 2000. *The Blue River Basin Project: Partnerships in Watershed Extension Programming*. Presented at the 2000 ASAE Annual International Meeting, Milwaukee, WI. ASAE Paper No. 00-7019.

— Franti, T.G., D.L. Devlin, C.W. Rice and F.W. Roeth, 2000. *Improving Water Quality in the Big Blue River Basin, Nebraska and Kansas: An Extension and Research Case Study.* Proceedings of the International Symposium on Conservation Tillage, Sinaloa, Mexico.

— Franti, T.G., J.M. Laflen and D.A. Watson, 1999. *Predicting Soil Detachment From High-Discharge Concentrated Flow*. Trans. of ASAE, 42(2) 329-335.

— Franti, T.G., S.J. Smith and S. Comfort, 1999. *Evaluating the Impact of Initial Soil Water Content, Residue Cover and Pre-Applied Rainfall on Observed and Simulated Atrazine and Metolachlor Runoff.* Presented at ASAE Annual International Meeting, Toronto, Canada, Paper No. 992126.

— Franti, T.G., C.J. Peter, D.P. Tierney, R.S. Fawcett and S.A. Myers, 1998. *Reducing Herbicide Losses From Tile Outlet Terraces*. Journal of Soil and Water Conservation 53(1) 25-31.

— Gorneau, W.S., T.G. Franti and B.L. Benham, 1998. *Evaluation of Tillage and Herbicide Application Practices Using a Calibrated GLEAMS Model*. Presented at Mid-Central ASAE Meeting, St. Joseph, MO, Paper No. MC98-184.

— Gorneau, W.S., T.G. Franti and B.L. Benham, 1998. *Evaluation of Best Management Practices for Reducing Herbicide Loading to Interstate Waters NE-KS*. Presented at ASAE International Meeting, Orlando, Fl, Paper No. 98-2223.

— Lingle, G.R. and T.G. Franti, 1998. What is the *"Cooperative Agreement" for Endangered Species Habitat Along the Central Platte River?"* NF98-375. Nebraska Cooperative Extension.

— Franti, T.G. and B.J. Dorn, 1998. *Blue River Basins Agricultural Survey Herbicide and Insecticide Use.* NF98-368. Nebraska Cooperative Extension.

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J. Michael Jess (continued from page 3)

of Law; the second is an under-graduate and graduate interdisciplinary discussion of water resources issues. Also, coordinate speakers for the UNL Water Center's spring semester Water Resources Seminar.

Publications:

— *Satisfying Contemporary Water Needs - Reflections on Market Driven Water Rights Exchanges*, J. Michael Jess, Nebraska Tax Research Council, Inc., 2000.

— *Nebraska State-led O'Neill Unit Alternative Study*, J. Michael Jess and H. Lee Becker, Nebraska Department of Water Resources, 1985.

— *Surface Water Use in Nebraska's Platte Valley*, J. Michael Jess and Stanley M. Christensen, Nebraska Department of Water Resources, 1980.

— *Use of Groundwater for Irrigation, Seward County, Nebraska*, J. Michael Jess, Water Survey Report 25, Conservation and Survey Division, University of Nebraska, 1970.

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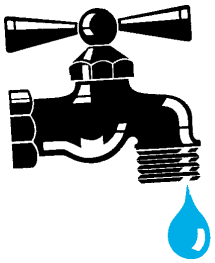
From the Director (continued from page 2)

July 22-25. At this juncture a complete itinerary has not be set, but the planning committee intends a four day excursion into the North Platte River drainage from Walden, CO downstream to North Platte.

Along the way we plan to inspect the Pumpkin Creek watershed south of Gering, where tensions between well water users and others dependent upon stream flows to meet irrigation needs prompted recent litigation.

Finally, a forum for water sciences faculty members, to highlight current research efforts and to identify future water research needs and funding opportunities, has been planned for April 9, in Lincoln. Details can be found elsewhere in this issue of the *Water Current* on both the summer tour and the faculty forum.

We have appreciated your comments on *Water Current* content and direction over the past few months and encourage you to continue giving us your impressions and criticisms. April's issue will include an annual reader survey that we hope you will take the time to fill-out and return to us.



Water News Briefs

Free Tabloids

Copies of *Wetlands — Understanding a Resource (1997)* and *Drinking Water-Understanding a Resource (1999)* are available 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 from our UNL East Campus offices. If you need copies shipped to you, we will only ask that you pay the actual costs of shipping/mailing.

If you want copies of either or both tabloids, call the Water Center at (402)472-3305 or email sress1@unl.edu. For a list of other free publications available through the Water Center, access us online at 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 get your water-related questions answered. Listings are by telephone and FAX number. If you would like a copy, phone (402)472-3305 or email me at sress1@unl.edu. They will be distributed on a first-come, first-served basis.

For a list of other publications available from the UNL Water Center, go to **http://watercenter.unl.edu** and let us know what you need. Most publications listed there are free for the asking.

Arsenic Standards

The standard for arsenic in drinking water has been reduced from 50 parts per billion (ppb) to 10 ppb, U.S. Environmental Protection Agency Administrator Christie Whitman announced on Oct. 31, 2001.

"This standard will improve the safety of drinking water for millions of Americans and better protect against the risk of cancer, heart disease and diabetes," Whitman said.

For information the new arsenic standards rule, go to www.epa.gov or contact the U.S. EPA Region Seven office, Kansas City, KS at (913)551-7372.

NACEE Conference

The Nebraska Alliance for Conservation and Environment Education (NACEE) will hold their first annual conference, April 12 and 13 at the Kearney Holiday Inn.

"Take Wing with NACEE: Building Capacity Through Increasing Diversity and Developing Partnerships," will explore topics ranging from wildlife management to groundwater to gyotaku. Corky McReynolds, University of Wisconsin-Stevens Point, will be the keynote speaker. McReynolds is former president of the Michigan EEA.

Other speakers include Steve Riley, Nebraska Game and Parks Commission Wildlife Division Administrator; award-winning photographer Mark Dietz, and Groundwater Foundation Executive Director Susan Seacrest.

Conference registration is $80 and includes Friday and Saturday dinners. For more information about the conference, contact Liz Martin at (402)558-8189 (ext. 217) or emartin@gpgirlscouts.org.

Journal Articles

Landon, M.K., Rus, D.L.and F.E. Harvey, 2001, *Comparison of In-Stream*

Methods of Measuring Hydraulic Conductivity in Sandy Streambeds, Ground Water, 39(6), p. 870-885.

Sibray, S.S. and Smith, F.A., *Scotts Bluff County Test-Hole Logs*, Nebraska Water Survey

Test-Hole Report No. 79, Sept. 2000

February

17-20: "Disinfection 2002," sponsored by the Water Environment Federation, St. Petersburg, FL. For registration and program information, go to http://www.wef.org/conferences/index.html, email confinfo@wef.org or call (800)666-0206.

21: Ogallala Aquifer symposium, "Economics of the Ogallala Aquifer," Northeastern Junior College, Sterling, CO. For information, contact Joel Schneekloth at (970)345-0508.

22-23: Eighth Xeriscape Conference, Albuquerque, NM. Contact Scott Varner, at (505)294-7791 or go to http://www.xeeriscapenm.com.

25-March 1: "Adventures in Erosion Control," International Erosion Control Association, 33rd annual Conference and Expo, Orlando, FL. Contact IECA at (970)879-3010 or email ecinfo@ieca.org.

27: UNL Water Center Water and Natural Resources Seminar (Williams Lecture): TMDLs," Kenneth Reckhow, Director, Water Resources Research Institute, North Carolina State University, Raleigh, NC, 3 p.m., Room 116, L.W. Chase Hall, UNL East Campus.

27-March 1: Fifth National Mitigation Banking Conference, Washington, D.C. Contact: Carlene Bahler, Terrene Institute, 4 Herbert Street, Alexandria, VA, 22305; (703) 548-5473, cbahler@erols.com or online at http://www.terrene.org (click on National Mitigation Banking Conferences).

March

1-April 10: Grand Island to Kearney, spring crane and waterfowl migration season on the Platte River. To reserve space in a viewing blind, contact National Audubon Society-Lillian Annette Rowe Sanctuary at (308)468-5282 or rowe@nctc.net; Crane Meadows Nature Center at (308)382-1820 or info@cranemeadows.org.

4-6: Agriculture Environment Conference, Iowa State University, Ames, IA. Contact Richard Larson at (515)294-6429.

6: UNL Water Center Water and Natural Resources Seminar (Kremer Lecture):\ "Sustaining the Ogallala Aquifer: Colorado's Regulatory Approach," James Corbridge, University of Colorado, 3 p.m., Room 116, L.W. Chase Hall, UNL East Campus.

7-9: Great Plains Migrations interdisciplinary symposium, Lincoln. Contact the Center for Great Plains Studies at (402)472-3082 or cgps@unl.edu.

15-17: Rivers and Wildlife Celebration, Kearney. Contact Audubon Nebraska at (402)797-2301 or kpoague@audubon.org.

19: Children's Groundwater Festival, Grand Island. Contact the Groundwater Foundation at (402)434-2740 or info@groundwater.org.

24-27: Joint Management 2002, "Getting Better All the Time," Charlotte, NC. Eighth Water Environment Federation and American Water Works Association conference. For details and registration information phone (800)666-0206 or www.wef.org/Conferences.

27: UNL Water Center Water and Natural Resources Seminar: "Instream Flow Incremental Methodology: Quantifying Stream Flows for Fish and Wildlife, Ed Peters, UNL, 3 p.m., Room 116, L.W. Chase Hall, UNL East Campus.

April

3: UNL Water Center Water and Natural Resources Seminar: "Studying Lake Ogallala's Disappearing Oxygen," Kyle Hoagland and David Admiraal, UNL, 3 p.m., engineering laboratory of the Walter Scott Engineering Center, UNL City Campus.

10: UNL Water Center Water and Natural Resources Seminar: "Status of Litigation in Kansas v Nebraska," Don Blankenau, 3 p.m., Room 116, L.W. Chase Hall, UNL East Campus.

17: UNL Water Center Water and Natural Resources Seminar: "Confined Animal Feeding Operations," Ralph Summers, U.S. EPA, Region 7, 3 p.m., Room 116, L.W. Chase Hall, UNL East Campus.

23-27: "Landscapes in Transition: Cultural Drivers and Natural Constraints, the 17th Annual Symposium of the International Association for Landscape Ecology - U.S. Regional Assoc., Lincoln, NE. Contact Jim Merchant at (402)472-7531 or e-mail jmerchant1@unl.edu.

24: UNL Water Center Water and Natural Resources Seminar, "Revision of the Missouri River Master Manual, a panel discussion: Rob Robertson, Nebraska Farm Bureau; and Chad Smith, American Rivers, 3 p.m., Room 116, L.W. Chase Hall, UNL East Campus.

May

9-10: 29th Annual Conference on Ecosystems Restoration and Creation, Hillsborough Community College, Tampa, FL. Deadline for abstracts is Jan. 31, 2002. For more information, email fwebb@hcc.cc.fl.us or pcannizzaro@hcc.cc.fl.us.

13-15: "Coastal Water Resources," American Water Resources Association Spring Specialty Conference, New Orleans, LA. Contact AWRA at (540)687-8390 or pat@awra.org.

June

3-7: Forty-seventh Institute in Water Pollution Control, "Water Quality Modeling and Treatment of Contaminated Waters," Manhattan College, Riverdale, NY. For a brochure and information, contact Nafeeza Altaf, Environmental Engineering Dept., Manhattan, College, Riverdale, NY 110471 or email naltaf@manhattan.edu.

July

1-3: AWRA Annual Summer Conference, "Groundwater/Surface Water Interactions," Keystone, CO. For information, phone (540)687-8390 or mike@awra.org.

10-13: Energy, Climate, Environment and Water: Issues and Opportunities for Irrigation and Drainage, San Luis Obispo, CA. Contact Larry Stephens at (303)628-5430, email stephens@uscid.org or go to http://www.uscid.org/-uscid.

22-25: UNL Summer Water and Natural Resources Tour. Follows the North Platte River basin in Colorado, Wyoming and Nebraska. For information or registration materials, phone the Kearney Area Chamber of Commerce at (800) 652-9435 or the UNL Water Center at (402)472-3305.

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Discarded Computers and Cell Phones Pose Potential Risk to Groundwater

The digital age's promise to make life easier comes at a cost with the road to the promised land littered with dead computer monitors, obsolete PCs and printers, etc.

No ordinary stuff, this is high-tech litter with harmful chemicals that pose environmental hazards. The chemical and metal by-products of discarded computers can end up contaminating soil, groundwater and air.

The problem is growing: consider studies showing that in the United States in 1998 about 21 million personal computers became obsolete, with only 2.3 million or 11 percent being recycled. Experts predict that technological changes will likely result in another 315 million PCs becoming obsolete by 2004.

The component that is one of the worst offenders is the cathode ray tubes, or CRTs, the technical name for the glowing screens used in computer monitors and televisions.

The average 14-inch monitor uses a tube containing about five to eight pounds of lead.

Dumped in a landfill, this lead can seep into groundwater. Crushing or burning the tube can release pollutants into the air.

The Silicon Valley Toxics Coalition, a grassroots organization concerned about the environmental and human health problems caused by the electronic industry, provides a lengthy roster of computer pollutants. According to the coalition, modern electronic computer equipment includes more than 1,000 different materials, including lead and cadmium in computer circuit boards, lead oxide and barium in computer monitors' CRTs, mercury in switches and flat screens, brominated flame retardants on printed circuit boards, cables and plastic casing, photoactive and biologically active materials and chromium in the PC's steel exterior.

Legal efforts are underway to control dumping of computer equipment.

Legal efforts are underway to control dumping of computer equipment. U.S. Environmental Protection Agency regulations prohibit businesses from dumping computers into the trash. The California Department of Toxic Substances Control considers monitors hazardous waste and state law there prohibits the dumping of computers monitors into landfills.

The European Parliament has taken more extreme measures.

Recent legislation requires manufacturers of electrical and electronic equipment to reduce hazardous substances by paying recycling costs of their products. Almost every electrical item, including PCs, is included.

Cell phones also pose possible risks to groundwater when discarded in landfills since these devices contain many toxic materials including mercury, cadmium and lead.

Cell phone users tend to upgrade their units every 18 months,. With an estimated 40 million cell phones in the U.S. last year replaced by new and improved versions.

Worldwide, the number of cell phone users is expected to climb from the current 600 million to an expected one billion by this year.

(Editor's Note: Taken in part from Arizona Water Resource, September-October 2001).

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