

University of Nebraska - Lincoln

DigitalCommons@University of Nebraska - Lincoln

Water Current Newsletter

Water Center, The

5-1988

Water Current, Volume 20, May 1988

Follow this and additional works at: https://digitalcommons.unl.edu/water_currentnews



Part of the [Water Resource Management Commons](#)

"Water Current, Volume 20, May 1988" (1988). *Water Current Newsletter*. 168.

https://digitalcommons.unl.edu/water_currentnews/168

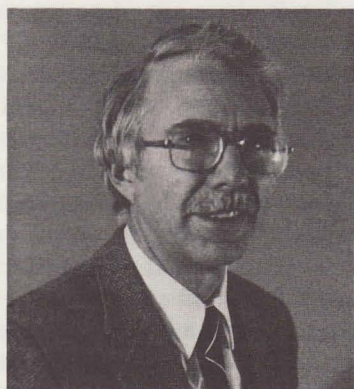
This Article is brought to you for free and open access by the Water Center, The at DigitalCommons@University of Nebraska - Lincoln. It has been accepted for inclusion in Water Current Newsletter by an authorized administrator of DigitalCommons@University of Nebraska - Lincoln.

Water Current

Nebraska Water Resources Center

May 1988

Major Changes in Water Center During Past Nine Years



Bill Powers

I have resigned as Director of the Nebraska Water Resources Center effective May 31, 1988. I will return to the Agronomy Department as a professor of Soil Physics. As the Center Director for about nine years, I have had the pleasure of working with many great people within the university, state government and national associations. But, just as at the end of a good hunt, I'm calling in the dogs, putting out the camp fire and heading back home. I am looking forward to teaching and research in water quality and agricultural relationships.

Since my arrival in the fall of 1980 there have been some major changes in the Water Center. The one having the greatest impact on the center's program was the merger with the Conservation and Survey Division in 1984. Two or three percent reductions and reallocations in the University of Nebraska budget every year from 1981 through 1986 required the administration to search for ways to reduce operating costs. One such plan was to merge Water Resources Center with the Conservation and Survey Division on July 1, 1984. It was felt

that by combining these two units, some savings could be realized by reducing the total support staff. In addition, it was felt that the total water research program could be strengthened by combining the scientific staffs of the two units. However, continued budget cuts in fiscal year 1985 and 1986 retarded the growth of this water program.

As the public concern over groundwater quality emerged as a national issue and 10 or 11 groundwater quality bills appeared in Congress in 1987, it was apparent that a more visible focal point for the coordination of research and teaching activities in water resources was necessary. In May of 1987 a review team led by the U.S. Geological Survey recommended that the University of Nebraska consider alternative administrative structures that would

—See p. 4

ANNOUNCEMENTS

June 1—Roger Gold becomes interim director of the Nebraska Water Resources Center.

June 7-9—Great Plains Agricultural Council meets in Las Cruces, New Mexico

July 14-15—Nebraska Water Resources Tour of eastern Nebraska.

Sept. 10-17—Nebraska Irrigation Tour to the Pacific Northwest.

Water Law Expert Says Policies May Cause Pollution

More production, more subsidies and more ag chemicals. A water and agricultural law specialist says that this trend may cause groundwater pollution in Nebraska.

"The present farm policies indirectly encourage groundwater pollution," J. David Aiken, University of Nebraska-Lincoln, told a Water Resources Seminar Series in April. "Less chemicals would be used and would get into groundwater if crop producers had to live with a market price instead of a subsidy price," he said.

He said that Nebraska and most states have been reluctant to deal with groundwater pollution from pesticides. "Now the Environmental Protection Agency (EPA) requirements are very likely to address this important environmental issue."

States that already have pesticide regulations include California, Florida, Wisconsin, Arizona and Iowa. Regulations vary from complete bans on certain pesticides to taxes paid by manufacturers to fund pesticide and water quality research.

EPA would rather have states administer federal pesticide regulations and is likely to give states the option to tailor national regulations to better fit local conditions through a state pesticide management plan, he said.

And he specified state management plans that would include a variety of regulations to prevent pesticide use from polluting groundwater:

- Additional pesticide user training and certification
- Groundwater quality monitoring
- Pesticide use best management practices
- Integrated pest management

—See p. 4

Director's Report A Glance Back

Have you ever glanced back at your desk on the way out the door to see what you had accomplished that day and what you had left for tomorrow? This is a glance back on my way out the door to a new assignment.

To assess a unit's accomplishments, one could count publications, grant dollars, meetings conducted or the number of courses taught. Another approach is to review the Center's activities and program accomplishments over the past nine years.

The Center has served as a university-wide coordinator of many water-related activities. These activities include:

- The Director is the chair of the Kremer Lecture Series Committee which brings nationally known water scientists to the campus to give seminars and meet with small groups of students.
- The Director initiated and chairs the University of Nebraska Water Policy Forum which meets each fall to discuss water issues of interest to Nebraska.
- The Center initiated the Hydrology Ad Hoc committee which evolved into a committee appointed by the Chancellor of UNL to develop a plan that would strengthen the water science program. This committee's

effort resulted in a resolution by the Board of Regents on January 18, 1986 recognizing the importance of a strong water science graduate program at UNL and endorsing the plan to strengthen the hydrology graduate program.

As is true of other units of the University of Nebraska, the Nebraska Water Resources Center has been a facilitator of some significant research efforts. Of these, the most prominent is the Burlington Northern Foundation Water Quality Project. Early in 1984, the Water Center learned that the Burlington Northern Railroad Foundation was interested in funding a research and education project to help sustain the quantity and quality of Nebraska's water. The Center solicited proposals for submission to the Burlington Northern Foundation which selected one submitted by Dr. Roger Gold, then the Director of Environmental Programs. The project was funded in the amount of \$200,000 annually for five years and is now in its fourth year.

The Water Center Director serves as the project officer and Dr. Gold is the principal investigator. This project promises to yield valuable information of the fate and transport of some commonly used fertilizers and pesticides. In addition, the project should provide important data on the reliability of check valves in preventing backflow of chemicals into wells used for chemigation. The project also promises to show how various pumping techniques might help to clean up an accidental backflow.

Other important projects include the completion of a groundwater recharge study to determine the legal, economic and technical feasibility of artificially recharging the groundwater. Approximately \$750,000 from a number of agencies was used to fund this project. The Agricultural and Water Research Fund supported a project on the Economic, Environmental and Financing Optimization Analysis of Platte Development Options. This project led

—See p. 3

Sheffield announces tours for July and September

Get out your calendars now and mark off July 14 and 15 and Sept. 10 through 17. Les Sheffield, University of Nebraska farm management specialist, has announced a tentative itinerary for the annual tours.

July 14 and 15: This Nebraska Water Resources Tour will hit the high spots and points of interest in four Natural Resources Districts:

- The Lower Platte South,
- The Lower Big Blue,
- The Nemaha, and
- The Papio.

Overnight, the 14th, will be in Omaha.

September 10-17: The Nebraska Irrigation Tour to the Pacific Northwest will be "one of the best irrigation tours yet" according to Sheffield who tied up loose ends on arrangements the last week of May.

Information and cost will be available about June 1 and the trip will be limited to the first 80 applicants.

A highlight of the trip to Oregon and Washington will be a luncheon address by former UNL Institute of Agriculture and Natural Resources Vice Chancellor Roy Arnold who is at Oregon State University now as Dean of Agriculture.

Irrigation districts, farms, dams, reservoirs, the Bonneville and Grand Coulee Dams are included in the itinerary. One point of interest includes a stop at the Othello, Washington farm of Pete Taggaris. Taggaris has a "large operation" that includes a cattle feed lot, potatoes and alfalfa. He produces potatoes in the Bassett, Nebraska area.



Cindy LeGrande

On the other end of the phone

Cindy LeGrande has been with the Nebraska Water Resources Center for about a year and a half. She has been in the University system for nearly nine years and is a native of Lincoln.

Her husband, Tim, is in the construction business and they have two sons, Matt, 5, and Josh, 2.

Cindy will move with the Water Center and looks forward to her new office on East Campus. She has been assisted parttime by Audrey Schardt, who has also been editorial assistant to the Water Current editor.

May 1988



Nebraska Water Resources Center

William L. Powers
Director

Pat Larsen
Water Current Editor

**113 Nebraska Hall
University of Nebraska
Lincoln, NE 68588-0517
Phone (402) 472-3305**

Director's Report from p. 2

by Dr. Raymond Supalla determined how some of the many water projects proposed for use of Platte River water could be financed. The report on this project has been reprinted several times.

The Center joined with the Nebraska Natural Resources Commission and other state agencies in a similar study triggered by the competition for Platte River water. In this Water Policy Issue Study, the University worked with the Commission to develop alternative water management options for consideration by the state legislature. The Water Resources Center provided the leadership in the study on Water Use Efficiency. The purpose of this study was to examine the technical, political, social and economic feasibility of several alternatives for increasing the efficiency of water use in Nebraska.

The Center also worked with the Commission and the U.S. Fish and Wildlife Service to develop a mathematical simulation model to predict the effect of various diversion projects along the Platte River on agricultural production, municipal water supplies, industrial development, wildlife habitat and the economy of the state. This effort was

called the Platte River Forum. A "Nebraska Core Team" led by the Director of the Water Resources Center and with the assistance of the U.S. Fish and Wildlife team, developed a model for one segment of the Platte River. Models could now be developed for other segments.

The Center's involvement with national associations has been noteworthy. Until August of 1987, the Center was the home office for the Universities Council on Water Resources (UCOWR) and the Director of the Center was the Executive Secretary of UCOWR, an organization of 80 universities. During the last nine years, the activities of UCOWR increased several fold. Three federal agency/UCOWR Fellowships were established for university faculty interested in water-related research, education and public service to serve a year with a federal agency. The Center developed a computerized expertise directory of water resources scientists from UCOWR-member universities.

This directory was used by the Center staff to select reviewers of research proposals submitted for funding under Section 105 of the National Water Resources Research Act

of 1984. This activity was in conjunction with a contract between the U.S. Geological Survey and UCOWR. The U.S. Geological Survey later adopted the key word list from the directory. Other activities initiated during the last nine years by UCOWR and administered by the Center included the Ph.D. thesis award program.

The Center has also been an active member of the National Association of Water Institute Directors (NAWID). This organization has been the primary force in securing the reauthorization and yearly funding of Water Resources Research Act of 1984. This act authorizes funds for water research and education nationally and has provided an average of about \$200,000 in research support annually for Nebraska. The Center Director has been active in NAWID, serving as the representative to the council from the Missouri River Basin Region, secretary of NAWID, chair-elect and now as chair of NAWID.

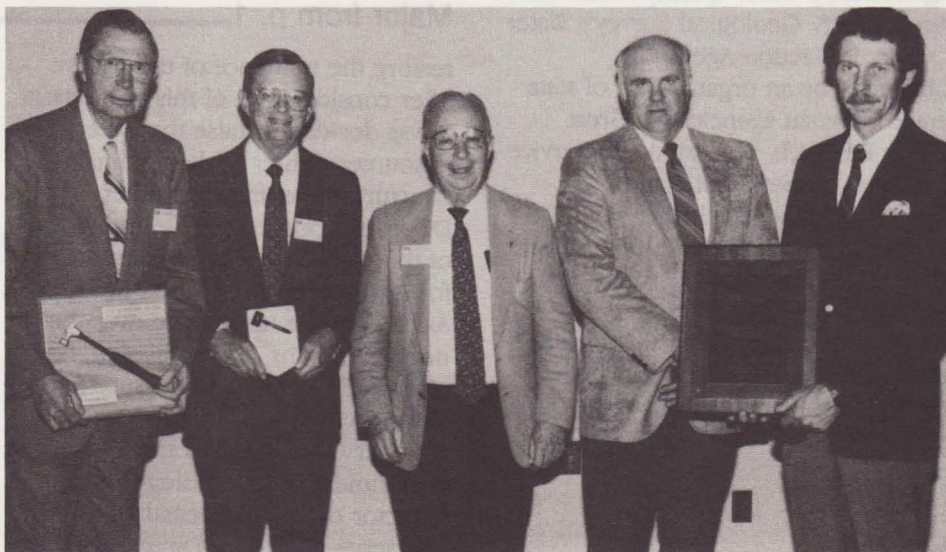
So, as I turn to glance at the director's desk on my way out, I still see a pile of work to be done just as I have seen each evening for the past nine years, but I also realize much has been accomplished.

Annual Awards Presented at Banquet

Fifty-two years of service to Nebraska water interests as Governor, legislator and legal counsel were recognized when the Nebraska Water Conference Council presented the Pioneer Irrigation Award at the awards banquet.

"Robert Crosby has had a leadership role in shaping the water laws and policies of Nebraska since 1937," Lee Orton, NWCC awards chairman, said at the annual Nebraska Water Conference Awards banquet.

Crosby said, "During my years in the Nebraska Legislature, two terms in the early 1940s before entering military service, I was active in water legislation. In fact," he said, "I successfully opposed Tri-County's legislation which would have



(From left to right) Hal Schroeder, chair-elect; Bob Petersen, past chair; Gov. Robert Crosby, Pioneer Irrigation Award recipient; Ron Jensen and Jerry Beck, president of the Nebraska Well Drillers Association, Progress Award recipient. (photo by Mark Hansen)

—See p. 4

Water Resources Program will Study Impact of Water Quality Legislation

Old, new and proposed federal legislation will restrict agrichemical use in the future. What new economic pressures on Great Plains agriculture will result?

When the Great Plains Agriculture Council meets June 7-9 in Las Cruces, New Mexico, the Water Resources Committee of the Council will present a program to discuss a few of the problems and options of the restricted agrichemical use in a session "Impact of Water Quality Legislation on Great Plains Agriculture Programs."

The Council, which was formed in 1938, provides an organization for cooperation and coordination to address current and emerging issues in Great Plains agriculture and natural resources. Meeting annually, representatives of agriculture research, extension and service agencies from the 10 Great Plains states discuss problems that arise due to the highly variable natural precipitation and a transition from crop to range agriculture.

Water Resources Committee Chair Bill Powers said that the June 8 topics include: An Overview of Water Quality Legislation, U.S. Environmental Protection Agency's Water Quality Protection Agenda, U.S. Department of Agriculture's Water Quality Protection Agenda, U.S. Geological Survey's Water Quality Protection Agenda, A Challenge by an organization of state environmental agencies for Great Plains Research, Extension and Service Programs, Experiment Station Response to the Challenge, Cooperative Extension Response to the Challenge and USDA's Responses to the Challenge.

For information about this meeting that will be at the Hilton Inn in Las Cruces, call Powers at 402-472-3305.

Water Law from p. 1

—Advanced notice of pesticide application

—Changes in method, timing or rate of application

—Drinking water well construction requirements

—Pesticide use bans within a certain distance of a drinking water well (well setbacks) or well recharge zone (wellhead protection area), and

—Broader pesticide-use bans.

He said that if these measures are not successful in preventing pesticide pollution of groundwater, the use of certain pesticides is likely to be prohibited locally or statewide. Groundwater quality monitoring to detect the presence of pesticides is likely to be increased with part of the expense paid by pesticide manufacturers.

Aiken said that in Nebraska, the pesticide applicator learns about EPA restrictions on the container label. Then hopefully he follows directions for application of the pesticide. "It's enforced on an honor system," he said. However, he said that for professional pesticide applicators, regulations are "more rigorous."

In the next couple of years, Aiken said, federal pesticide regulations will be more stringent. "It could come down to a complete ban of a certain pesticide by county." EPA is giving states an opportunity to establish regulations for safe use.

Major from p. 1

restore the influence of the Center. After consideration of this suggestion, it was decided to raise the Water Resources Center in the administrative structure by having the Center Director report directly to the Office of the Vice Chancellor of the Institute for Agriculture and Natural Resources. As this change takes place over the next 12 months, a new mission, new goals and operating procedure for the Center will be developed.

Roger Gold, Head of the Department of Entomology and Director of Environmental Programs, will serve as Interim Director of the Water Resources Center for at least the next 12 months as new plans for the Center's operation are developed. Dr. Gold will continue to serve as

Annual from p. 3

permitted transbasin diversion.

"However," he said, "I can defend my change of position."

Except for Crosby's first year of law practice in Omaha in 1936, his practice has always had water-related representation. Originally, he practiced in North Platte after World War II in the law firm of Crosby and Crosby, his father, a younger brother and Crosby.

Besides this award, the Progress Award went to the Nebraska Well Drillers Association for "60 years dedication to the promotion of education and encouraging professionalism in the water well industry."

Orton commended the Nebraska Well Drillers Association for its pioneering efforts in developing uniform specifications, standards and procedures for efficient and sanitary well construction.

"This dedicated association has helped to ensure safe and adequate water supplies for the citizens of Nebraska," Orton said. "For many years the association was sponsored by the Conservation and Survey Division at the University of Nebraska-Lincoln."

"In fact," Orton said, "in cooperation with the Department of Agricultural Engineering, UNL, Nebraska was the first state to adopt minimum standards for artificially gravel-packed irrigation wells."

Director of Environmental Programs and will also assume some of my previous duties as Interim Assistant Director for Water Programs in the Agricultural Research Division and the Cooperative Extension Service. An Interim Head will be appointed for the Department of Entomology. Roger is a good friend and an outstanding individual. A more qualified person to lead the Center during this transition would be hard to find.

As I said earlier, I have worked with some great people these past nine years. I especially appreciate the support of the best staff a director could ask for. I feel good about the new direction for the Water Resources Center, I leave it in good hands, and I wish the Center and its staff all of the best in the future.

Change Called for at Nebraska Water Conference

'Low-Input Agriculture' Can Help Stop Water Contamination

Nitrate levels in drinking water caused by agricultural nitrogen fertilizer application can be lowered significantly according to a University of Nebraska-Lincoln agronomist.

"Low-input agriculture can provide a series of alternative approaches to crop production which can help alleviate water contamination," Charles A. Francis, agronomist in the Institute of Agriculture and Natural Resources at the University of Nebraska-Lincoln, said.

However, low input does not mean low management, he said. "Just the opposite is true." Francis said that specific production practices based on research data and validated by farmer applications can be implemented for better water use and environmental quality.

"We have 70 years' research results on corn and 35 years' on grain sorghum and although yields continue to increase . . . the potential for a quantum leap in productivity and profitability is dependent on 'systems research'," Francis said. "Here is a place where we can make a contribution to better water use or environmental quality as a result of modified production practices."

Francis cited alternative farming options that can contribute to reduced pesticide use:

- Rotating crops to help prevent buildup of insects, weed seed or pathogens;

- Breaking the reproduction cycles of weeds or insects by rotating cereals with legumes, winter with summer crops, or annuals with perennials;

- Choice of pest resistant or tolerant crop species and varieties can help reduce pesticide need; and

- Insect and weed indices can determine economic damage and if a control measure is necessary.

"Water quality can be improved by adopting practices which reduce applied nitrogen fertilizers and make efficient use of other N sources," Francis pointed out. "We need to be equally concerned about pesticide residues in ground and surface waters."

by Pat Larsen

Changes in crop producing methods in the U.S. in the past 30 years have contributed to groundwater contamination, according to a medical researcher.

A University of Nebraska Medical Center professor, Dennis Weisenburger, said, "It's a growing problem and we're going to have to deal with it." He cited the significant use of pesticides, 30 million lbs. a year in the U.S. and fertilizer, 2 million tons.

And he used maps that showed concentrations of nitrates in the groundwater in the Central Platte River area in 1984. "What do nitrates do in the groundwater?" he asked the 17th annual Nebraska Water Conference.

"Nitrates convert to nitrosamines that cause cancer," Weisenburger said.

As nitrate intake increases, leukemia and lymphoma occurrence also increases, he said with illustrated maps and charts of research he has conducted. "Nitrates may present risks of increased birth defects," he said. He cited an Australian study of pregnant women who drank water containing between 5 and 15 parts per million nitrates. Their children had three times the amount of birth defects as others.

Another international nitrate study shows that in Japan, which has high nitrate levels, there is a high incidence of stomach cancer. Research from 1940 shows that in Iowa cyanosis in infants was caused by nitrates in well water.

The incidence of non-Hodgkin's lymphoma is double the expected rate in eastern Nebraska counties with high levels of nitrate contamination in groundwater, according to Weisenburger's research.

"I think we need to change our farming practices," he told the participants at the conference co-sponsored by the Institute of Agriculture and Natural Resources at UNL and the Nebraska Water Conference Council.

'New Factors' Call for Teamwork and Change

New cards have been dealt in the water quality game, and the wild cards are going to have an impact on the future of Nebraska according to a panel that appeared at the 17th annual Nebraska Water Conference.

Gale Hutton, chief of the water quality division of the Nebraska Department of Environmental Control, said that Nebraskans must be willing to make change in order to ensure a healthy future.

"We've got a lot of water, now we have to determine the costs of keeping that water pure," Hutton said.

Les Sheffield, a charter member of the Nebraska Water Conference Council, co-sponsor of the annual Water Conference, said, "Changes have occurred in Nebraska that are inevitable—not all that are good, but we have to deal with them together as a team."

Sheffield, an extension farm management specialist at IANR, UNL, said, "We must have a new vision for our water supply. Things will not remain the same."

Perry Wigley, director of the Conservation and Survey Division, UNL, also stressed the new direction. "It's not going to be business as usual in water research at the University."

Short-term plans must be accompanied by long-term plans, he said. He pointed out that drought is reoccurring in Nebraska and said that we must be prepared for this in addition to water quality research.

At the business meeting of the NWCC, irrigation tours were announced for Southeast Nebraska, July 14 and 15; and the Pacific Northwest, Sept. 10-17. Hal Schroeder, retired manager of the Lower Platte South Natural Resource District, was elected chairman and Vince Dreeszen, former director of the Conservation and Survey Division, UNL, vice chair. The fall meeting will be Oct. 1.

The Nebraska Water Conference Council is composed of about 90 persons who have water interests throughout the state.

Nitrate Exposure Impacts Prenatal Mortality in Beef Cattle

by Craig Spencer

Kearney Hub Reporter

Excessive nitrate exposure can cause problems in cattle, according to five years of research at the University of Nebraska-Lincoln.

Norman Schneider, a veterinary toxicologist at UNL's Veterinary Diagnostic Center, told a Kearney State College class that "all ruminants have the potential to be affected by exposure to nitrates in their food.

"We see repeated evidence of excessive nitrate exposure in beef cattle, not only in this area, but in eastern and western Nebraska," Schneider said. "It's one of those things that a good manager who handles a cow-calf operation has to be aware of."

Schneider began researching nitrate exposure when he was at Ohio State University in 1972 and continued his work when he came to UNL in 1979. He said farmers' main concern seems

to be nitrate content in drinking water and its impact on animal and human health. However, water is only a minor part of the total nitrate intake.

Higher concentrations can be ingested from feed than from water, he said. "There is evidence that nitrates impact prenatal mortality in beef cattle," Schneider said that deaths probably relate to a lack of oxygen created by nitrate levels.

Researchers at UNL found 25 percent of the fetuses in a test group of cattle died within a day after the cows were fed sodium nitrate in a single dose. In a control group of five, all survived after being given distilled water. And, he said nitrates appear to accumulate in cattle fetuses.

Excessive nitrate exposure in cattle can result in economic losses. Cattle that eat feed with more than 5,000 parts per million of nitrates for prolonged periods can die, he said.

If the producer detects nitrates in cornstalks, he should consider other feed to reduce the overall nitrate content of the diet, make certain the vitamin mineral supplements are

adequate and confirm that the animals aren't carrying infectious disease.

Feeding cattle only cornstalks without knowing the nitrate content could be risky, he said. Cornstalks with no additional mineral supplementation or dietary source may not be the best choice. Other common sources of excessive nitrate could be sudan-sorghum hybrids which are put up in large, round bales and allowed to stand outside with no cover.

If the bales are exposed to moisture, nitrates can leech and become concentrated in the bottom third of the bales. When bales are broken for feeding, some cattle will get very low nitrate-content feed and some will get three times as much.

"Those animals are going to be exposed to excessive nitrate," he said. "It won't be the whole herd, just those who digested the lower portion of the bale."

The Institute of Agriculture and Natural Resources provides information and educational programs to all people without regard to race, color, national origin, sex or handicap.



Nebraska Water Resources Center
The University of Nebraska-Lincoln
113 Nebraska Hall
Lincoln, NE 68588-0517

NON-PROFIT ORG.
U.S. POSTAGE
PAID
Lincoln, Nebr.
Permit No. 46

