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# Water Current

University of Nebraska Water Center/Environmental Programs

Vol. 26 No. 3  
June 1994

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## Tour to take look at flood recovery

After 22 years of exploring western and Great Plains states, the annual Nebraska Water Resources Tour this year will head east for the first time. Flood recovery efforts will be the focus of the trip, which will take participants through Iowa, Illinois and Missouri July 25-28.

"Special emphasis will be on agricultural recovery," said Dayle Williamson, director for the Nebraska Natural Resources Commission. The commission is co-sponsoring this year's tour with the Nebraska Water

Conference Council, the Institute of Agriculture and Natural Resources and the Water Center/Environmental Programs unit at the University of Nebraska-Lincoln.

Stops will include the Des Moines, Iowa, water plant, where new protective measures have been put in place to avert future disasters, farmland restoration efforts and levee repairs on the Mississippi, Illinois and Missouri rivers.

In Missouri, 81,000 acres of farmland may be abandoned due to flood damage. Some land has

four to six feet of sand on top of the once fertile soil, and it costs \$3,200 per acre to move one foot of sand, Williamson said. Stops will be made in several small towns that have been abandoned because of flood damage. Relocation efforts are under way, and the floodplain buyout program will be explained.

The tour also will feature Lock and Dam 26 on the Mississippi River near Alton, Ill., a U.S. Army Corps of Engineers project. When construction was in full swing, it was reported to be the largest

**See Tour, Page 5.**

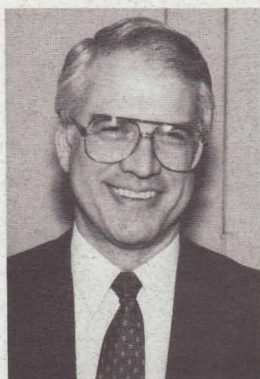


Arlene Hanna, NU Southeast Research & Extension Center, Lincoln, demonstrates the groundwater flow model at the Water Center/Environmental Programs booth. More than 600 people attended the Sunday with a Scientist/Earth Day Fair April 10 in Morrill Hall, UNL.

Water  
education  
for all ages



# From the Director



**Bob G. Volk**

Les Sheffield will retire July 1. He had agreed to help with the irrigation tour and the water conference for a year or two, but his recent illness and subsequent operations have curtailed his activities. We all wish him a speedy recovery.

"Has the national environment for water resources research institutes changed to the point where they will become extinct?" asks Robert Ward, institute director at Colorado State University.

The administration has submitted a budget to Congress that eliminates federal funding for the national water institute program of which we are a part. Faculty compete for those funds, which have supported important research projects of benefit to Nebraskans.

We receive approximately \$100,000 a year from that program for water-related research and publications, as do 54 other institutes. A list of current projects being supported is on Page 3.

"Pollution prevention" and "integrated watershed management" are Washington buzzwords. It is difficult to see why the national water institute program, which has integrated disciplines dealing with water and water-related subjects, should be eliminated.

The institutes have supported numerous students, which have been employed by private and governmental agencies.

Please let your congressional delegate know that you support continuation of the funding for the national water institutes program.

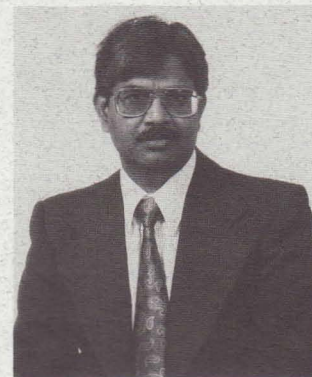
## Kamble recognized

Shripat Kamble, pesticide assessment specialist in the Water Center/Environmental Programs unit at UNL, has received a regional award.

Kamble, an associate professor of entomology, received the 1994 Recognition Award in Urban Entomology from the North Central Branch of the Entomological Society of America at the NCB-ESA annual conference in March in Springfield, Ill.

He was recognized for more than a decade of research and service in urban entomology. Kamble also is the NCB-ESA nominee for the national award.

Kamble has developed extension programs and publications for safe and



**Shripat Kamble**

effective pest control in the urban environment. He has coordinated and collected pesticide-use data affecting urban and agricultural settings to contribute to the federal and Nebraska Pesticide Impact Assessment Program.

Letters of support from both industry and academia described Kamble as "an enthusiastic and innovative researcher and an extension specialist with a deep sense of commitment."

## Water Current

is a publication of the Water Center/Environmental Programs at the University of Nebraska-Lincoln.

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# Glossary



## of water-related terms

*Editor's Note: This is the first excerpt of the "Glossary of Water-Related Terms," published as NebGuide G93-1191-A by Cooperative Extension, UNL.*

*The guide was co-authored by William Kranz, David Gosselin, DeLynn Hay and James Goeke.*

*The definitions provide working knowledge of Nebraska's water and could be defined differently to describe water issues in other locations.*

**Absorption** is the process by which chemicals in gaseous, liquid or solid phases are incorpo-

rated into and included within another gas, liquid, or solid chemical. For example, sponges absorb water.

**Acre-foot** is the volume of water (325,851 gallons of water) required to cover one acre of land with 12 inches of water.

**Adsorption** is the adherence of gas molecules, ions or solutions to the surface of solids. For example, odors from freezers and refrigerators are adsorbed to baking soda.

**Aquifer** is the saturated underground formation that will yield usable

amounts of water to a well or spring. The formation could be sand, gravel, limestone or sandstone. The water in an aquifer is called groundwater. A saturated formation that will not yield water in usable quantities is called an **aquiclude**. Most Nebraska aquifers may be categorized into **confined and unconfined aquifers**.

• **Confined aquifer** (artesian aquifer) is the saturated formation between low permeability layers that restrict movement of water vertically into or out of the saturated formation. Water is confined under pressure similar to water in a pipeline. Drilling a well into this type of aquifer is analogous to puncturing a pressurized pipeline. In some areas confined aquifers produce water without pumps (flowing artesian well). When

pumping from confined aquifers, water levels often change rapidly over large areas. However, water levels will generally recover to normal when pumping ceases.

• **Unconfined aquifer** (water table aquifer) is the saturated formation in which the upper surface fluctuates with addition or subtraction of water. The upper surface of an unconfined aquifer is called the water table. Water, contained in an unconfined aquifer, is free to move laterally in response to differences in the water table elevations.

**Artificial recharge** is the unnatural addition of surface water to groundwater. Recharge could result from reservoirs, storage basins, leaky canals, direct injection of water into an aquifer, or by spreading water over a large land surface.

## Six scientists receive U.S.G.S. grants

Six University of Nebraska-Lincoln researchers have received 1994 U.S. Geological Survey 104 grants for water-related projects.

Dennis Schulte, Department of Biological Systems Engineering, received funds for his project "Measuring Groundwater Quality Impacts from Feedlot Runoff Retention Ponds and Waste Lagoons Using Integrated Geophysical and Bottom Sampling Methods."

Blair Siegfried, Department of Entomology, received funds for his research on "Mechanisms of Atrazine Selective Toxicity in Freshwater

Algae."

Thomas Franti, Department of Biological Systems Engineering, received funds for his project "Predicting Pesticide Runoff Losses from Four Tillage-Pesticide Management Practices."

Rollin Hotchkiss, Department of Civil Engineering, received funds for the project "Initiating a Decision Support System for the Platte River Basin."

Wayne Woldt, Department of Biological Systems Engineering, received funds to continue his project "A Non-Intrusive Landfill Hazard Ranking

System: Application of Geoelectric and Soil Vapor Analysis Methods" in the second year.

Steve Comfort, Department of Agronomy, received funds to continue his project on "Predicting Pesticide Degradation and Transport Characteristics in the Vadose Zones of the Platte River Valley" in the second year.

These grants are awarded on a competitive basis from recommendations of a review panel. Faculty from state universities are eligible to apply. The Water Center/Environmental Programs unit targets the funds to

newer faculty as seed funds to assist them in initiating their research program.

Also, faculty who are redirecting their research efforts to the water sciences are eligible to receive support.

For more information on the U.S.G.S. grant cycle or the 1994 projects, contact the Water Center/Environmental Programs unit.



# Calendar

## Trust needs advisers

The Nebraska Environmental Trust is compiling a directory of potential advisers.

Geology, hydrology, life sciences and agriculture are examples of the disciplines which could be called upon to review applications and projects.

Organizations employing experts in relevant fields are invited to submit names and qualifications to the Trust for inclusion in the directory.

The Trust is also compiling a list of interested applicants for the 1994 award cycle.

To receive an application form, write to the Nebraska Environmental Trust, 2200 N. 33rd, Lincoln, NE 68503 or call (402) 471-5409.

Most applicants will go through a two-stage application process. Proposals are due Aug. 1, but will be accepted starting June 1.

Source: Nebraska Environmental Trust.

## July

**July 25-28:** Annual Water Resources Tour sponsored by Water Center/Environmental Programs unit, University of Nebraska-Lincoln, Nebraska Water Conference Council and Nebraska Natural Resources Commission. For more information, contact the Water Center/Environmental Programs unit.

## August

**Aug. 11-12:** First International Conference and Workshop on Groundwater Festivals, Lied Conference Center, Arbor Day Farm, Nebraska City. Contact Amy Killham, The Groundwater Foundation, Lincoln, NE, (402) 434-2740 or 1-800-858-4844.

**Aug. 30:** Turfgrass Field Day, John Seaton Anderson Turfgrass and Ornamental Research Facility, Mead. Contact Roch Gaussoin, UNL Dept. of Horticulture, (402) 472-8619.

## September

**Sept. 10:** Festival of Color. Open House, UNL Horticulture Department. Theme: Water Quality. John Seaton Anderson Turfgrass and Ornamental Research Facility, Mead. Contact Amy Greiving, UNL Dept. of Horticulture, (402) 472-1640.

**Sept. 24:** Annual Meeting, Nebraska Water Conference Council. 8 a.m. to 11 a.m., UNL, East Campus

Union. For more information, contact the Water Center/Environmental Programs unit.

**Sept. 27:** Annual Water Policy Forum for NU Faculty. Sponsored by Water Center/Environmental Programs unit.

## October

**Oct. 4-5:** Earth Jamboree, Adams County Fairgrounds.

**Oct. 14:** World Food Day. "Water: The Needs of Farms, Cities and the Environment in Growing Conflict." Contact Susan Miller, International Programs, UNL, (402) 472-2758.

**Oct. 16-18:** 39th Annual Midwest Ground-Water Conference, Bismarck, N.D. Sponsored by North Dakota State Water Commission, North Dakota State Geological Survey, University of North Dakota-Energy and

Environmental Research Center, U.S. Geological Survey, Water Resources Division and North Dakota Water Resources Research Institute. For more information, contact Robert B. Shaver, 900 East Boulevard, Bismarck, N.D. 58505-0850, (701) 224-2754.

**Oct. 18:** The Groundwater Foundation's Annual Symposium. "Drinking Water and Public Health." Ramada Hotel and Conference Center, Lincoln. For more information, contact The Groundwater Foundation.

## November

**Nov. 6-10:** American Water Resources Association 30th Annual Conference, Chicago. "National Water Quality Assessment." Contact General Chairman, Phillip E. Greeson, U.S. Geological Survey, Norcross, GA, (404) 409-7700.

## Center on gopher

The Water Center/Environmental Programs unit now has a section on the new gopher developed at the University of Nebraska-Lincoln, Institute of Agriculture and Natural Resources.

The section now contains an electronic version of the Water Current, news releases, a list of publications available and a calendar of events. More items will be added.

The path for this gopher is:

IANRVM. UNL.EDU

IANR Information

Water Center/Environmental Programs

For more information, contact the Water Center/Environmental Programs unit.



# For SAGE members, learning never stops

by Rachael Herpel  
Graduate Student,  
Community and Regional  
Planning, UNL

For the past three years the University of Nebraska-Lincoln has offered a special program to senior citizens. In Sharing Across Generations for Enrichment (SAGE), they can participate in discussions, study groups and tours on a wide variety of subjects.

Robert D. Kuzelka, assistant to the director of the Water Center/Environmental Programs unit, and I conducted a seminar on Nebraska rivers this past trimester. Participants chose topics of their preference.

SAGE focuses on the experience of discussing ideas and interests. This focus is supported by the

comfortable atmosphere of the newly remodeled SAGE room in the Clifford Hardin Nebraska Center for Continuing Education. A special sound system, comfortable chairs and a wide selection of visual aids are available.

"Rivers of Nebraska: Their History and Their Future" included topics such as municipal instream flow rights, which introduced class members to conjunctive use issues in the Platte River Basin.

The format encourages question-and-answer periods or general discussions. Diversity of topics and participants is also emphasized in SAGE. The range of participants varies from retired homemakers to retired teachers to retired engineers. It soon

became apparent that these people are greatly concerned about today's issues. Perhaps it was the nature of our topics that brought out the environmentalists/activists in the participants. Perhaps it was personal experience.

*It soon became apparent that these people are greatly concerned about today's issues.*

SAGE is founded on the idea that the educational experience should never end. The point of education is not to know it all but to keep your mind active. Reading, discussing, interacting and learning should never stop.

Interested Lincoln/Lancaster County residents may contact the Department of Evening Programs and Lifelong Learning Service, UNL Division of Continuing Studies, 162 NCCE, Lincoln, NE 68583-8900, (402) 472-1392.

## Water circular available

"Fundamentals of Groundwater Contamination" outlines the complexities of cleaning up or living with groundwater contamination.

Darryl Pederson, author of the 18-page circular, describes the hydrologic cycle, groundwater movement and types of contaminants as well as their possible behaviors.

Illustrations and maps depict the topography and bedrock of the Nebraska groundwater flow systems and various contaminant paths.

Cost per copy is \$4.50. Add \$1.50 for postage and appropriate city and state sales tax.

To order this publication (EC-11) write to Conservation and Survey Division, University of Nebraska-Lincoln, 113 Nebraska Hall, Lincoln, NE 68588-0517 or call (402) 472-7523.

## Water tour to head east for first time

### Tour. From Page 1.

single construction effort in process in the world. The tour will provide a dynamic view of the habitat restoration and a full description of the lock and dam system on the Mississippi River.

Historical stops along the way will include Hermann, Mo., an old German settlement, and the Missouri Governor's Mansion, one of the oldest governor's homes in the United States.

On the last day of the tour, participants will take a look at Brush Creek

Watershed Project, a flood control project in the Country Club Plaza area of Kansas City, Mo. A river walk, similar to the one in San Antonio, Texas, is planned.

"The tour will offer a unique opportunity to observe the aftermath of the flood of '93," said Robert D. Kuzelka, assistant to the director, Water Center/Environmental Programs.

Typically, representatives of state and federal agencies, irrigation districts, natural resources districts and farm and environmental organizations take part in the

annual tour, as do members of the public interested in water topics.

The tour is limited to 80 participants. Registration will take place on a first-come, first-serve basis, and a fee is charged.

A brochure about the tour was sent to the Water Center/Environmental Programs mailing list in mid-June.

For more information, contact Water Center/Environmental Programs, 103 Natural Resources Hall, University of Nebraska-Lincoln, NE 68583-0844, (402) 472-3305. Deadline for registration is July 18.



# Restoration project promising

## Microbes munch atrazine

Microbes already found in the soil are being harnessed to eat atrazine, a commonly used herbicide.

These newly isolated atrazine-eaters are the first microbes found to thrive in high concentrations of the pesticide, and one of the first that leave no potentially harmful by-products.

Most agricultural soils mineralize or completely break down less than 40 percent of the pesticide after one year. Added to atrazine-rich soil samples, the microbes ate 86 percent of the atrazine in just 150 days.

The researchers' next step is to find a way to apply the microbes to farm fields and pesticide spill sites.

For more information, contact Ronald F. Turco, (317) 494-8077 or Gary P. Carlson, (317) 494-1412.

Source: Conservation Impact, Jan. 1994

Nutrients are necessary, but in excess, they can become a nuisance and a threat.

Such is the case with the plant nutrient phosphorus. The runoff of agricultural chemicals leads to excess phosphorus in the soil and water in a process called nonpoint source contamination.

In lakes, excess phosphorus threatens the ecological balance of the food web. University of Nebraska-Lincoln aquatic ecologist Kyle Hoagland and graduate student John Holz have been studying ways of restoring contaminated lakes, and, after three years, their efforts appear promising.

The researchers apply aluminum sulfate, a non-toxic chemical, to the lake water.

The non-toxic chemical removes excess phosphorus and keeps it from recycling out of the sediment, Hoagland said.

"The effects of pollution seem to be reversible," Holz said.

The researchers first applied the technique to lake water in 15 250-gallon fiberglass tanks and then to contained cross-sections of the water in the lake. Research started at Lake Leba in the Sandhills and then continued at Fremont Lake No. 2.

The technique seems to offer an easily applicable,

affordable method of restoring lakes.

"In relation to other restoration techniques, it's cheap," Holz said.

The results also indicate an important scientific discovery: it is possible to invert the nutrient process. The same process that leads to changes in the aquatic community through the addition of nutrients seems to work in reverse when nutrients are withdrawn.

Researchers don't know yet how long the effects of restoration last, but they have received funds from the Nebraska Department of Environmental Quality to treat and monitor the lake for two more years.

## Legislature enacts water quality laws

by Robert D. Kuzelka,  
Assistant to the Director,  
Water Center/Environmental Programs, UNL

In the final days of its second session, the 93rd Legislature of the Nebraska Unicameral passed important water-related legislation. The majority of the new laws reflect a continuing concern about water quality.

Changes in the state's Groundwater Management and Protection Act decreased the permissive nature of the quality amendments to the groundwater management plans of Nebraska's Natural Resources Districts (NRDs). The plan amendments must be submitted and approved by Jan. 1, 1996. Not meeting this deadline would prohibit access by an NRD to

certain state and federal funds. Plan implementation also is now mandatory by Jan. 1, 1997 [LB 480]. NRDs totally within a Special Groundwater Protection Area will not have to prepare amendments [LB 1017].

The Legislature strengthened the abandoned well program through a more precise definition and a state cost-sharing program [LB 981]. It extended the Erosion and Sediment Control Act to include certain types of construction in urban areas [LB 480].

From 1997 through 2000 fertilizer fees will be available to help NRDs fund water quality-related programs [LB 961]. The Nebraska Department of Environmental Quality will establish a remedial

action plan monitoring fund for use in cases of water pollution [LB 1349].

The Legislature also changed and redefined the size and functions of the Nebraska Aquaculture Board [LB 1165]. Private water companies in the state now may come under the regulatory authority of the Public Service Commission [LB 1002].

Legislation on other water issues such as water transfers, water rights and integrated management of groundwater and surface water was not enacted. These issues will be discussed in the months ahead as part of interim legislative study resolutions. In early 1995, these and other water issues probably will be found again in bills before the 94th Nebraska Legislature.



# 21,000 containers recycled

Participation in Nebraska's statewide plastic pesticide container collection and recycling program continues to steadily increase.

The program began in 1992 with two collection sites and a total of 7,000 containers. Last year, 21,000 2-1/2 gallon containers were collected and recycled at 11 sites throughout the state.

This year, 40 sites in 17 counties are expected to be available to the public, according to Larry Schulze, extension pesticide coordinator at the University of Nebraska-Lincoln. Of the 40 sites, 21 sites will be season-long inspection and collection sites. The remaining 19 sites will be available at specific dates and times only.

"Nebraska's program is unique because it offers both season-long and specific collection sites," Schulze said.

Before the containers can be accepted, they will

need to be inspected to determine if they have been properly rinsed. Producers may either triple-rinse or pressure-rinse the containers.

*"Nebraska's program is unique because it offers both season-long and specific collection sites."*

— Larry Schulze,  
pesticide coordinator,  
UNL

The NebGuide "Rinsing Pesticide Containers" (G93-1150-A) provides detailed guidelines for rinsing containers. Left-over pesticide concentrates are easy to remove if the containers are immediately rinsed. If the pesticide solution is allowed to dry inside the container, rinsing becomes more difficult and time-consuming.

Once the containers have been inspected and collected, they are recycled

into new ones, a process that saves raw materials and energy. After two inspections, the containers are chipped in Nebraska, consolidated at a regional site with chips from other states' recycling programs and ultimately transported to a plastic container manufacturer.

The Nebraska Pesticide Container Recycling Committee, a coalition of eight state agriculture and ag chemical organizations and four state and federal agencies, coordinated the original program when it began in 1992.

The Agricultural Container Research Council, a national coalition of agrichemical manufacturers, inspects the containers a second time and supports the cost of grinding and transporting the containers and reusing the plastic.

For a listing of collection sites, contact your local Cooperative Extension office.

## Call for papers

Aug. 29 is the deadline for submission of abstracts for "Water Conservation in the 21st Century: Conservation, Demand and Supply."

The symposium will take place April 23-26, 1995, in Salt Lake City, Utah. Contact: J. Paul Riley, professor emeritus, Utah State University, Logan, UT 84322-4110. Phone (801) 750-2738, Fax (801) 750-1185.

The deadline to submit abstracts to the American Water Resources Association's 31st Annual Conference and Symposium is Nov. 15.

The conference will take place Nov. 5-9, 1995, in Houston. Contact John S. Grounds III, Bechtel, 3000 Post Oak, Houston, TX 77252-2166. Phone (713) 235-4921.

### Mailing List Update

We are updating our mailing list. If you have a change of title, name, and/or address, or would like to have your name added or removed from the Water Current mailing list, please complete this form. If you know of individuals who might be interested in receiving our publications, please submit their names.

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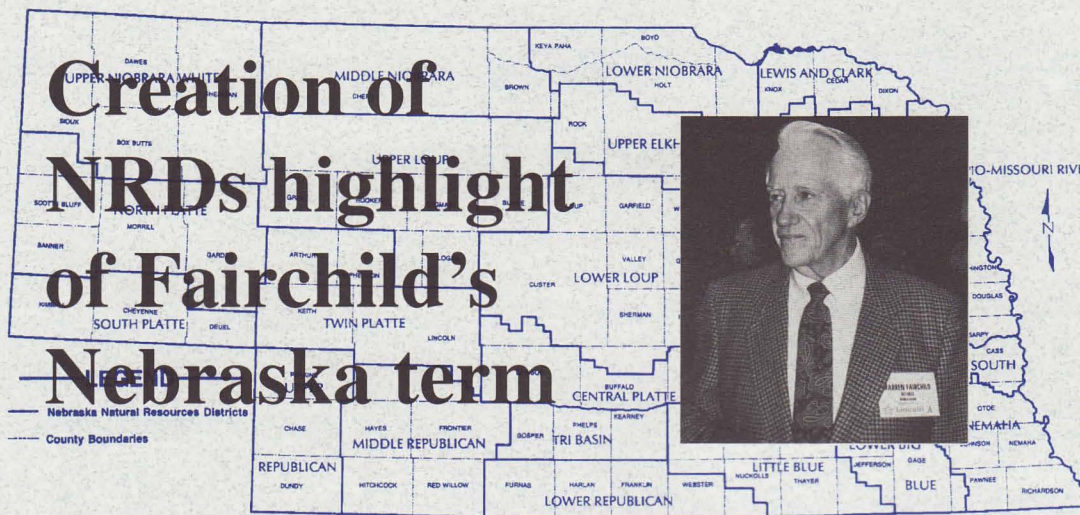
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Phone (402) 472-3305; Fax (402) 472-3574





# Creation of NRDs highlight of Fairchild's Nebraska term

by Bettina Heinz Hurst

The creation of the Natural Resources Districts in 1969 is his fondest memory of his Nebraska career, Warren Fairchild said.

The former executive secretary of the Nebraska Soil and Water Conservation Commission was the keynote speaker at the annual Nebraska Water Conference in March in Lincoln.

To this date, the NRD structure is unique in the nation.

"We're just real fortunate that we have this vehicle in the state," Fairchild said. Whether Nebraska or Bangladesh,

local control is vital, said Fairchild, who oversaw international water projects at the World Bank.

"Locally implemented programs are just much more sustainable," he said.

The NRD proposal received support from governors and legislators across parties.

"It was never a partisan program," he said.

That may be why other states have not adopted the structure yet.

Other states' legislatures are more partisan than Nebraska's, and legislators may think they won't be able to get such a proposal through their legislature, Fairchild

suggested.

"It passed in Nebraska because we had the nonpartisan Unicameral. That's the missing ingredient in other states," he said. However, other states may still adopt the program in the future, he said.

Another factor to consider is that it was just the right time and place to pass the NRD proposal. Today, it might be more difficult here, too, he said.

The NRD proposal was hotly debated in Nebraska.

"There was significant opposition," Fairchild said. Most of the opposition stemmed from those who did not want consolidation of the hundreds of smaller

## Warren Fairchild

1949-1957: U.S. Soil Conservation Service, Soil Scientist and Gage County Work Unit Conservationist

1957-1970: Nebraska Soil and Water Conservation Commission, Executive Secretary

1970-1973: U.S. Bureau of Reclamation, Assistant Commissioner

1973-1976: U.S. Water Resources Council, Director

1976-1992: World Bank, Principal Water Specialist  
1993: Retired

resources districts and feared losing local control.

Fairchild supports using the NRD structure for a variety of tasks, including water quality testing.

When the NRDs were created, their scope of programs was kept extremely broad on purpose to allow for unforeseen future needs, Fairchild said.

Nebraska needs to update its state water plan, make it more policy-oriented and initiate basin-wide planning, he said.

### WATER CENTER/ENVIRONMENTAL PROGRAMS

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