11-1985

Water Current, Volume 17, No. 6, November/December 1985

Water Current

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DIRECTOR'S REPORT

In order to strengthen and improve coordination of water programs at the University and provide a better focus for public information activities, the Nebraska Water Resources Center was merged with the Conservation and Survey Division as of July 1, 1984. However, until recently, the two units were still located separately. The physical relocation of the Water Resources Center has now occurred to make this a true merger.

The new address for the Water Resources Center is as follows:

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

The staff of the Nebraska Water Resources Center wish you all a HAPPY HOLIDAY SEASON AND A PROSPEROUS NEW YEAR.

CLARIFICATION OF SEPTEMBER/OCTOBER DIRECTOR'S REPORT

In the Director's Report of the September/October 1985 issue of WATER CURRENT, it was reported that the active ingredient in LORSBAN insecticide has been found in two out of 88 Nebraska wells sampled by the USGS. We have learned, however, that the residues detected in the water may have been due to an error in the way samples were taken. In both irrigation systems LORSBAN had been applied through the center pivot. The samples had been taken from faucets on the same plumbing through which the LORSBAN had been injected into the systems. Residue adsorbed to the walls of that plumbing were picked up in the water samples. Subsequent samples from other plumbing on the system revealed no LORSBAN residues in the water, while samples from the faucets on plumbing through which the injection was made had up to 11 ppb LORSBAN concentration. Thus, LORSBAN detected in the original samples actually came from residues in the faucets and fittings used for injection and were not contained in the groundwater. This case serves as a good example of how care must be taken when making and interpreting water samples. You must know the background and practices used with the system.

CALL FOR PROPOSALS

The U.S. Geological Survey has released guidelines for submission of research proposals for the Section 105 Matching Grant Program under the 1984 Water Resources Research Act (P.L. 98-242). This is a nationally competitive grant program open to water resources institutes, qualified educational institutions, private foundations, private firms, individuals, and agencies of local or state government.

The Water Center has issued a request for proposals for the Section 105 program. To be eligible, proposals must be received by the USGS no later than February 28, 1986. Proposals should be no more than three years in duration and should be within the range of $80,000 to $350,000 combined federal and matching funds. Matching funds must be on a dollar-for-dollar basis, but federal funds are limited to not more than $175,000.

The following program priorities are of particular interest in fiscal year 1986: (1) problems of groundwater quality; (2) enhancement of water use efficiency; (3) use of waters of impaired quality; and (4) climate variability and the hydrologic cycle.

For additional information and a copy of exact research proposal guidelines, contact the Nebraska Water Resources Center.

PROPOSALS FUNDED

We are pleased to announce that the following two research proposals from the University of Nebraska have been funded by the U.S. Geological Survey under the Section 105 (Matching Grant) program. USGS received over 300 proposals for this program and funded only 24.

(1) *"Development of Methodology and Criteria for Irrigation Under Limited Water Conditions,"* R.J. Supalla, Dept. of Agricultural Economics, and J.R. Gilley and D.L. Martin, Department of Agricultural Engineering.

(2) *"Aquifer Recharge—Electrical Resistivity Relationships,"* William Kelly, Department of Civil Engineering.

1986 NEBRASKA WATER CONFERENCE

The annual Nebraska Water Conference will be held March 18-19, 1986 at the Nebraska Center for Continuing Education in Lincoln, NE. The theme for the 1986 conference is "PROFIT IN AGRICULTURE THROUGH SOIL AND WATER CONSERVATION."

The Nebraska Water Conference Council Planning Committee is currently finalizing the program. Topics for discussion at the conference will include: (1) Profit Through Soil Conservation; (2) Profit Through Water Conservation; (3) Groundwater Management Planning; and (4) Agency and Legislative Updates. Governor Robert Kerrey has been invited to be the luncheon speaker on March 18.

It is anticipated that the registration fee will be $65. The final program for the 1986 Nebraska Water Conference will be available in January. Mark your calendars now!

WATER RESOURCES SEMINAR SERIES

Once again the Water Resources Center will sponsor a Water Resources Seminar Series to be held every Wednesday afternoon at 3:30 p.m. beginning January 15, 1986. This year the seminar series will be held in 117 Bessey Hall. The theme of the 1986 series is "WATER RESOURCES POLICY."

Water resources policy is being debated at all levels of government. LB 1106 was enacted by the State Legislature in 1984 and deals with many water policy topics including: (1) creation of a Water Management Board to review water development projects: (2) appointment of a director of natural resources by the Governor: (3) establishment of a Water Management Fund for large (over $10 million) water projects; (4) provision for instream flow appropriation; and (5) a requirement for groundwater management plans by natural resources districts. Presently the Department of Environmental Control is drafting three bills to meet their groundwater protection strategy goals. In addition, two other bills on underground chemical storage tanks (LB 217) and the chemigation bill (LB 284) will be considered in 1986. These bills, along with LB 1106, will establish water policy for Nebraska over the next several years and will have an impact on the citizens of the state, in particular the agricultural community. Thus, it was felt that water resources policy was a timely topic for discussion.

The seminars are open to the general public. Students may register for one hour's credit through the Department of Forestry, Fisheries and Wildlife (FFW 415/815), Geography or Geology.

A preliminary schedule of seminar topics will be mailed early in January.

KREMER LECTURE SERIES SPEAKER

The Kremer Lecture Series on Water Resources, sponsored by the UNL Institute of Agriculture and Natural Resources, was established in 1983 to honor former State Senator Maurice A. Kremer. Often called "Mr. Water" of Nebraska, Kremer was elected to the State Legislature in 1962 and served as chairman of the Legislature's Public Works committee from 1973 until his retirement in 1982.

Istvan Bogardi, an internationally known expert on agricultural water management, flood control systems and river basin management, is the Maurice A. Kremer lecturer for 1985-86. Dr. Bogardi is in Nebraska for two years and compares Nebraska's water resources with his native Hungary's water resources. "Hungary has good soil, with a climate similar to Nebraska's and agriculture as its main industry," he said.

Dr. Bogardi noted that the management of natural resources such as water, land and minerals faces multiple conflicting objectives, stochastic elements and "fuzziness." Bogardi described multiple objectives in Nebraska and Hungary as economic elements, or cost and revenue, and environmental objectives such as water quality or soil erosion. "Stochastic elements include rainfall, temperature and topography." "Fuzziness" is present when imprecise goals' formulation takes place, he explained. Bogardi addressed these topics and others with real-life examples when he presented the Kremer Water Resources lecture for the fall semester on December 5.

Bogardi has lectured in European, Canadian, and U.S. universities, and he is currently visiting professor in the UNL Department of Civil Engineering. He will teach stochastic hydrology during the spring 1986 semester and a follow-up course dealing with water resources systems in the fall of 1986. He will also be lecturing classes on UNL and the University of Nebraska at Omaha campuses.

GREAT PLAINS SYMPOSIUM ON TRANSITION TO DRYLAND AGRICULTURE

The economics of irrigation could force dryland farming to replace irrigated farming, experts told the Symposium on Causes and Consequences of the Transition to Dryland Agriculture held in Denver, CO, October 29-31. The symposium was sponsored by the Water Resources Committee of the Great Plains Agricultural Council and the Water Resources Center. The Great Plains Ag Council is an organization of state and federal agencies that addresses current and emerging ag problems. Montana, North and South Dakota, Wyoming, Colorado, Kansas, New Mexico, Oklahoma, Texas and Nebraska had representatives at the symposium.

"Economics in capital letters," is how Jay Spiers, a banker from Yuma, CO, described dryland farming conversion. "It's like a tailgunner in World War II; we know where we've been, but we don't know were we're going."

Leo Lucas, Dean of the Cooperative Extension Service at UNL, noted that there are alternatives to irrigated agriculture and that economics "will drive the decisions that are made." He said that many farmers don't know the costs of production. "The in-put costs are greater than the out-put," Lucas said. He said that the Cooperative Extension Service has worked with about 2,000 farm and ranch families this past year to help them make "good decisions," and he forecast that about the same number in 1986 will need help with financial planning decisions.

Water policy needs were assessed by Maurice A. Kremer, retired Nebraska state senator from Aurora, who said that there will always be irrigation in Nebraska but it will probably be more limited than it is now. "The Midwest holds the key to furnishing food for mankind," he said. "In Nebraska we need to practice conservation, build storage, make plans and continue research that will make farming with less water possible and profitable," Kramer noted. Misunderstanding and conflict about resources always cause stress. "Now is the time for cooperation and foresight," he said. "We must plan for future generations and their water supply."

Pat Larsen
Communications Specialist

RESEARCH REVIEW

Project Title: Nitrate Removal from Groundwater Supplies Using Biological Denitrification

Principal Investigator: M. F. Dahab, Ass't Professor, Department of Civil Engineering, UNL

Nitrate concentrations in groundwater supplies throughout Nebraska as well as other areas in the U.S. have steadily increased well past the maximum contaminant level as established by the Safe Drinking Water Act. Although nitrates can be removed or reduced using chemical and physicochemical methods, most of these treatment processes are not very efficient in addition to being cost-prohibitive. Biological denitrification, while being an efficient nitrate reduction method, has been exclusively associated with waste-water treatment and has not been applied to potable water treatment.

The basic objective of this study was to explore the potential for using columnar biodenitrification in the treatment of high nitrate groundwater supplies using static as well as fluidized-bed reactors. A secondary objective was to develop a rational basis for the design of such reactors when applied to small or medium-sized communities. Several parameters were routinely monitored during this study, including influent and effluent nitrate and COD concentrations, effluent total and volatile suspended, solids, pH, and turbidity.

This limited investigation indicated that biodentrification using packed-bed reactors can be carried out successfully with nitrate removal efficiencies approaching 100 percent depending on the operating conditions under which the process is carried out. The general conclusion to be drawn from this study is that nitrates as high as 100 mg/L (as N) can be removed entirely as long as the operating conditions are properly selected. Although some soluble and suspended organic matter were added to the water supply, these solids were at fairly low concentrations and can be compared favorably to many surface water supplies currently being used throughout the country. It is anticipated that subsequent treatment methods such as coagulation/flocculation followed by carbon absorption will elevate the biodenitrification effluent quality to drinking water standards.

JOB ANNOUNCEMENT

The Department of Geography at the University of Iowa has an opening for a tenure-track assistant professor beginning in August, 1986. Salary is $23,000 to $25,000 (9-month basis). This position of Natural Resources Geographer will participate in an active program of research and teaching in environmental science focusing on water resources. Teaching responsibilities will include a mix of introductory courses in physical geography and natural resources and upper-level courses on water-related issues.

Candidate must have a strong background in hydrology and major research interests in one or more of the following: water management, water conservation, water development and impact assessment. Expertise in biogeography, fluvial geomorphology, remote sensing or technology assessment is desirable. Ph.D. required by time of appointment.

Screening will begin January 15, 1986. Applicants should submit a letter of application, curriculum vitae, and three letters of recommendation to: David R. Reynolds, Chair, Department of Geography, University of Iowa, Iowa City, Iowa 52242. Telephone: (319) 353-3132.

The University of Iowa is an equal opportunity employer and specifically invites and encourages applications from women and minorities.

MEETINGS AND CONFERENCES

January 26-31, 1986	ASTM International Symposium on Geotechnical Applications of Remote Sensing and Remote Data Transmission to be held in Cocoa Beach, FL. For additional information, contact: Symposium Chairman, A. Ivan Johnson, Woodward-Clyde Consultants, Harlequin Plaza — No., 7600 East Orchard Road, Englewood, CO 80111
January 27-31, 1986	Application of Technical Information in Decision Making, IFG 310. Topic: Negotiation and Conflict Resolution of Natural Resources Issues. Colorado State University, Fort Collins, CO. Sponsored by Instream Flow Group, USFWS. For additional information, contact: Helen Bundy or Carolina Frye, WELUT Courses, Office of Conference Services, Colorado State University, Fort Collins, CO 80523.
March 24-27, 1986	Federal Interagency Sedimentation Conference to be held in Las Vegas, NV. For additional information, contact: G. Douglas Glysson, Chairman, U.S. Geological Survey, WRD, 415 National Center, Reston, VA 22092.

PUBLICATIONS

The following publications have been received by the Water Resources Center. They have been forwarded to C.Y. Thompson Library on UNL's East Campus for cataloging. Persons on campus may obtain the publications through UNL's library system. Others are encouraged to request copies they desire from the organization issuing the publication.

(1) *Analysis of Wetland Trends and Management Alternatives for Georgia,* August 1985, ERC 01-85, Carl Vinson Institute of Government Institute of Natural Resources, The University of Georgia, Athens, GA 30602

(2) *Proceedings of a National Symposium on Institutional Capacity for Ground Water Pollution Control,* June 1985, conducted by University of Oklahoma in cooperation with Other Universities, sponsored by the U.S. Environmental Protection Agency.

(3) *Impact of Recreation Activity Specialization on Management and Program Support for Water Resources,* September 1985, Technical Report 172, Water Resources Research Center, Purdue University, West Lafayette, IN 47907.

(4) *Assessing the Feasibility and Potential Expansion of Large-scale Riparian Irrigation in Virginia,* Bulletin 146, 1985, Virginia Water Resoources Research Center, VPI & State Univ. Blacksburg, VA 24060.

(5) *Social Feasibility As An Alternative Approach to Water Resource Planning,* Bulletin 149, 1985, Virginia Water Resources Research Center, VPI & State Univ., Blacksburg, VA 24060.

(6) *Development of General Guidelines for the Planning of Stormwater Management Facilities: Application to Urban Watersheds in KY,* Research Report No. 157, 1984, Water Resources Research Inst., University of Kentucky, Lexington, KY 40506.

(7) *Investigation of Pollution in a Karst Aquifer Utilizing Optical Brightener,* Research Report No. 158, 1984, Water Resources Research Inst., University of Kentucky, Lexington, KY 40506.

(8) *Modeling of Overland Flow by the Diffusion Wave Approach,* Research Report NO. 159, 1984, Water Resources Research Inst., University of Kentucky, Lexington, KY 40506.

(9) *Predicting the Advective Flow Velocity in a Confined Aquifer Using a Single Well Tracer Test,* September 1985, Water Resources Research Center, Purdue University, West Lafayette, IN 47907.

WATER CURRENT

Water Current is published by the Nebraska Water Resources Center (NWRC), Conservation and Survey Division, which is a division of the Institute of Agriculture and Natural Resources at the University of Nebraska–Lincoln.

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