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9-1976

## Water Current, Volume 8, No. 5, September/October 1976

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"Water Current, Volume 8, No. 5, September/October 1976" (1976). *Water Current Newsletter*. 107.  
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# Water Current

Millard W. Hall, Director  
Volume 8, Number 5

Karen E. Stork, Editor  
September/October 1976

## FROM THE DESK OF THE DIRECTOR . . .

The enforcement of the new Safe Drinking Water Act and 208 areawide planning activities will bring into focus various problems associated with water supply and wastewater disposal in rural areas. A number of states are already beginning to experience conflicts arising between the use of rural water supplies for irrigation or energy production and household or domestic use. Rural water problems are becoming increasingly important, and the development of means for dealing with these problems is still in its infancy.

Because of the importance and timeliness of this topic, the Nebraska Water Resources Research Institute will sponsor a conference on "Water Problems in the Rural Environment -- Alternative Solutions for Water Supply and Wastewater Disposal" on November 4-5, 1976 at the Villager Motel in Lincoln, Nebraska. The objective of the conference is to describe the current rural water situation, including both water supply and wastewater disposal and aspects of quality and quantity; discuss both the socio-economic and technological aspects of rural water problems and the various impacts involved in changing or improving the current situation; and discern future research and related needs to solve various rural water problems. The conference will focus on domestic and farmstead use of water and discussion will range from small community systems to individual systems.

The conference registration fee is \$35 which includes a copy of the proceedings, registration, two luncheons and a banquet.

For further information or to request a copy of the program brochure, contact: Millard W. Hall, Director, Nebraska Water Resources Research Institute, 310 Ag. Hall, University of Nebraska, Lincoln, Nebraska 68583.



NEBRASKA WATER RESOURCES RESEARCH INSTITUTE



ON THE HOMEFRONT

OPENING FOR FACULTY POSITION IN WATER RESOURCES

The Nebraska Water Resources Research Institute (NWRRI) has an opening for a faculty position in water resources. This is a reclassification of the previous announcement for Research Associate.

This is a twelve-month appointment with the Institute. The person selected for this position will participate in all aspects of the Institute's programs. Primary responsibility will include assisting the Director in planning, coordinating and administering research in water resources. Additional responsibilities will include assisting with the dissemination of water resources research results and the training of water resources specialists. This is a full-time, permanent position with the possibility of tenure in a related academic department.

Qualified candidates must possess a terminal degree in a field related to job responsibilities as well as extensive work experience related to water resources systems. Work experience must include modeling and analysis of water resources systems. Ability to work in a multidisciplinary coordinative mode is essential.

Interested applicants should send resume and references to: Millard W. Hall, Director, Nebraska Water Resources Research Institute, 310 Ag. Hall, University of Nebraska, Lincoln, Nebraska 68583.

The University of Nebraska is an Equal Opportunity Affirmative Action Employer.

MATCHING GRANT PROPOSAL DEADLINE

The Nebraska Water Resources Research Institute (NWRRI) has just been informed by the Office of Water Research and Technology in Washington, D.C., that the deadline for receiving matching grant proposals for fiscal year 1978 funding (beginning October 1, 1977) is December 1, 1976.

Principal investigators interested in submitting a proposal under this program should make an appointment immediately to discuss their ideas with the Institute Director. A rough draft of the proposal will be due in the Director's Office by November 1, 1976 to allow sufficient time for review, preparation of budgets, etc. to meet the OWRT December 1 deadline.

The deadline for receipt of new annual allotment proposals in the Director's Office will be approximately January 15, 1977.

For further information, contact the Director's Office, NWRRI, 310 Ag. Hall, University of Nebraska, Lincoln, Nebraska. Telephone (402) 472-3305.



## WATER RESEARCH IN NEBRASKA

### BUREAU OF RECLAMATION

#### Hydrology - Nebraska Mid-State Division and Associated Area

This report presents data on, and analysis of, hydrologic conditions and water-resource developmental trends pertinent to future studies of the environmental impacts of the proposed Nebraska Mid-State Division of the Pick-Sloan Missouri Basin Program. Described in the report are the following: The Platte River drainage basin with emphasis on streamflow characteristics in the Nebraska part of the basin (exclusive of areas drained by the Loup and the Elkhorn Rivers and Shell and Salt Creeks); the ground-water resources of the Nebraska Mid-State Division; the water-quality characteristics of streams and ground water in the Nebraska part of the Platte River drainage basin; the climate of the Nebraska part of the Platte River basin with emphasis on the climate of the Mid-State Division; and the legal constraints relating to water-resource developments in Nebraska.

#### Physiography, Geology, Soils, Agriculture: Nebraska Mid-State Division

This report deals with the physiography, geology, soils, and agriculture in an area comprising parts of Buffalo, Hall, and Merrick Counties, Nebraska. Its purpose was to assemble data that would be needed for a required evaluation of the environmental impact of the proposed Nebraska Mid-State Division. Much of the information presented is a synthesis of published data, but some is based on unpublished material on file at the Conservation and Survey Division.

Both reports were prepared for the Bureau of Reclamation by the Conservation and Survey Division, Institute of Agriculture and Natural Resources, University of Nebraska, Lincoln.

As was noted in the December issue of the "Water Current Newsletter," the Bureau of Reclamation was conducting baseline data studies on the Platte Valley as a part of the Environmental Study for the Mid-State Division. The previously-mentioned two studies, "Geologic, Physiographic, and Soil Resources (UN-L)," and "Water Resources (UN-L)," were incomplete at that time. These studies are now complete and available upon request from the Nebraska Reclamation Office of the Bureau of Reclamation, Second and Locust Streets or P.O. Box 1607, Grand Island, Nebraska 68801.

#### Infrared Imagery - North Loup Division, Nebraska Pick-Sloan Missouri Basin Program

The Bureau of Reclamation acquired infrared imagery of the North Loup Division, Nebraska, Pick-Sloan Missouri Basin Program on June 25, 1976. The area photographed includes parts of Merrick, Nance, Howard, Greeley, Sherman, Valley, Garfield, and Loup Counties.



Infrared coverage was obtained from an altitude of 30,000 feet. The imagery covers the drainage area of the Calamus and North Loup Rivers from a few miles northwest of Taylor, Nebraska to St. Paul, Nebraska. Then it follows the Loup River drainage from St. Paul, Nebraska to a few miles east of Fullerton, Nebraska. The scale of the imagery is 1:72,000.

The imagery is being used to document preproject conditions, land use in the project service area, and to help identify high water table areas located in the North Loup project area.

Anyone interested in viewing the film should contact the Nebraska Reclamation Office, P.O. Box 1607, Grand Island, Nebraska 68801.

#### FEDERAL HIGHLIGHTS

##### WATER MEASURES DEAD UNTIL NEXT CONGRESS

As the scheduled October adjournment date draws near for the current session of Congress, time for action on several pieces of water resources legislation has almost run out.

A bill (S 3142) sponsored by Sen. Frank Church, D-Idaho, would provide for a major restructuring of the U.S. Water Resources Council (WRC). The Church bill, which probably will be reintroduced next year, is in line for basic changes. As currently drafted, the bill would place the WRC within the Office of the President with an independent director, transfer Interior Department research programs (including the Office of Water Research and Technology) to the WRC, and increase federal grants to states for water planning.

The Church bill could be pushed to the background if Congress takes up wholesale reorganization of natural resources planning and management activities. A bill (S 2872) introduced this year by Sen. Abraham Ribicoff, D-Conn., would establish a Department of Energy and Natural Resources which would include the WRC. Although the bill is dead this year, it will undoubtedly resurface next year.

There is more uncertainty about consideration of federal water rights questions in the next Congress. Former Deputy U.S. Attorney General William Keichel Jr. was unable to find a sponsor this year for a water rights bill he drafted. Not much hope is expressed in Washington for support of the proposed legislation in 1977.

The Keichel draft would establish the concept of reserved federal water rights which would entitle the federal government to claim minimum water supplies for forest reserves, recreation, fish and wildlife, and other uses.

Major Indian water rights bills will also have to wait until next year for action. Following a Supreme Court decision March 24 (Akin v. U.S.) that said courts should have jurisdiction over Indian water rights cases when



states have a system for determining those rights in the same proceeding with other water rights, Sen. Edward M. Kennedy, D-Mass., held hearings to lay the groundwork for a bill providing exclusive federal court jurisdiction over Indian water rights cases. No hearings have been held on the House side, however, and any bill offered will face tough opposition from states.

It is still uncertain whether Congress will have to deal next year with extensive "mid-course corrections" in the Federal Water Pollution Control Act. The House wants to move ahead with changes this year and the Senate wants to wait. A House-Senate conference committee was formed recently to resolve the differences between a sweeping bill (HR 9560) passed by the House and a limited measure (S 2710) passed by the Senate.

#### SECTION 80(c) DISPUTE CONTINUES

The dispute continues between member agencies of the Water Resources Council (WRC) and the Office of Management and Budget (OMB) over the recommendations made by WRC in their Section 80(c) study regarding the level of federal versus non-federal cost sharing on water resources projects. WRC recommends maintaining a high level of federal cost sharing while OMB favors forcing states and private interests to assume most of the costs of water projects.

The Section 80 study was authorized under the Water Resources Development Act of 1974 and assigned by the President to WRC. It is believed to be the most comprehensive and far-reaching study the federal government has ever conducted on water planning objectives, discount rates for water projects and cost sharing. WRC completed the study in nine months and sent it to the President in December 1975. OMB officials held the recommendations for four months and in April 1976 requested that the WRC review the cost sharing proposals which, in OMB's view, were little more than a continuation of current policies by which the federal government subsidizes 90 to 100 percent of current water project costs.

The Water Resources Council declined to restudy the cost sharing issue but did conduct a one-month impact analysis confirming their earlier recommendations and rejected OMB counter-proposals.

In his January budget message, President Ford announced that the administration recommendations on the Section 80 study would be sent to Congress this year. However, unless the cost sharing issue is quickly resolved, it is unlikely that Presidential recommendations can be transmitted to Congress by December.

#### HOUSE SUBCOMMITTEE CONSIDERS EASING IRRIGATION LIMITATION

A House subcommittee has been holding hearings on a bill (HR 13101) that would permit relaxation of the Bureau of Reclamation's long-standing 160-acre individual irrigation limitation. The concept behind the bill is "meritorious", stated Assistant Secretary of the Interior, Jack O. Horton.



This bill would only apply to areas with a frost-free growing season of less than 180 days. Wyoming is a good example of this. Irrigation of more than 160 acres of less productive types of farmland would be allowed.

The Ford Administration is opposed to the passage of this bill until further study can be completed. Ass't. Secretary Horton said in his statement to the House Interior Subcommittee on Water and Power Resources, "The Administration does not believe that sufficient consideration has been given to the overall impacts of this bill or to the broader question of what exactly should be changed or applied with respect to acreage limitations. I personally hope the impact study can be completed within a month, but I won't hold (Bureau of Reclamation Commissioner Gilbert G. Stamm) to that."

Bureau of Reclamation officials are supporting the proposal within the Interior Department. The Interior Department report to the subcommittee stated, "While consideration can be given to the economic productivity of a project farmer's land in establishing the project construction charge assessment, under general reclamation law, an individual farmer is limited to a project-irrigated holding of 160 acres regardless of the productivity of his land."

Commissioner Stamm opposed substituting higher limits, such as 200 acres, if the acreage limitation is removed in selected cases. He believes limitations should be set at an economic equivalent to 160 acres of Class I farmland. He also stated that 1.2 percent of all Bureau of Reclamation lands would be affected by the bill and there would be no increase permitted in the amount of water used in each irrigation district.

#### USGS 1977 BUDGET TOPS \$300 MILLION

The fiscal year 1977 appropriation for the U.S. Geological Survey, Department of the Interior, totals \$350,896,000--an increase of \$33,060,000 over fiscal year 1976.

The increase is aimed at strengthening the Survey's ability to provide information and analyses on the land and its fuel, mineral, and water resources; to supervise mineral leasing operations on all federal lands; and to carry out investigations leading to a reduction of hazards posed by earthquakes, volcanic eruptions, and other geological and hydrological disasters.

Programs included in the Fiscal Year 1977 USGS budget include the following:

- ALASKA PIPELINE RELATED INVESTIGATIONS
- TOPOGRAPHIC SURVEYS AND MAPPING
- GEOLOGIC AND MINERAL RESOURCE SURVEYS AND MAPPING
- WATER RESOURCES INVESTIGATIONS
- CONSERVATION OF LANDS AND MINERALS
- LAND INFORMATION AND ANALYSIS
- NATIONAL PETROLEUM RESERVE



## REQUEST FOR INFORMATION ON FLOOD FLOW FREQUENCY TECHNIQUES FOR UNGAGED AREAS

The Hydrology Committee of the U.S. Water Resources Council has created an Interagency Work Group on Flood Flow Frequency for Ungaged Watersheds. The Work Group has initiated a study of techniques for determining flood flow frequency estimates at ungaged locations. The study will be limited to watersheds that have not undergone man-made changes such as urbanization. In order to develop a set of guidelines that will provide some uniformity in flood flow estimates, a review of the literature describing techniques and results of their application is currently being undertaken.

The Work Group would like to have as much input as possible from anyone involved in making flood flow estimates at ungaged locations, and thus is soliciting both published and unpublished reports that describe such techniques. Anyone having such reports are requested to forward them as soon as possible to Dr. Richard H. McCuen, Associate Professor, Department of Civil Engineering, University of Maryland, College Park, Maryland 20742.

## CONFERENCES

### SHORT COURSE ON FLOOD PLAIN PLANNING

A short course on "Flood Plain Planning" is being offered by Oklahoma State University November 15-19, 1976. The course will consist of workshops and lectures encompassing open channel flow, water surface profiles, flood plain determination, and flood plain insurance studies. Major emphasis will be placed on the utilization of the computer program HEC-2, developed by the Hydrologic Engineering Center of the Corps of Engineers.

For further information contact: Engineering Extension, 301 Engineering North, Oklahoma State University, Stillwater, Oklahoma 74074.

### 1977 NATIONAL CONFERENCE ON WATER

Chairman of the U.S. Water Resources Council, Secretary of Interior Thomas S. Kleppe, has announced that the Council will hold a National Conference on Water from May 23-25, 1977, in St. Louis, Missouri. Chairman Kleppe's Alternate on the Council, Assistant Secretary of Interior Jack O. Horton, will lead the Conference planning. Assistant Secretary Horton said the Council will welcome views and suggestions as plans for the Conference are formulated. Suggestions should be sent to: 1977 National Conference on Water, Water Resources Council, 2120 L Street, NW., Suite 800, Washington, D.C. 20037.

While the supply is limited, copies of the Executive Summary of the 1975 National Conference on Water are available from the Council upon request.



## CONFERENCE ON TRANSFER OF WATER RESOURCES KNOWLEDGE

The Second International Conference on Transfer of Water Resources Knowledge will be held at Colorado State University in Fort Collins, Colorado on June 29-July 3, 1977. Major themes of the conference will be: (1) management of research to provide mechanisms for the transfer of results; (2) transfer of knowledge to improve conditions for the rural poor; and (3) comparative merits of different computer-based scientific information systems.

Conference participation will consist of contributed papers, invited papers and workshop participation. The deadline for abstracts for conference papers has been extended to December 31, 1976.

For further information contact: Neil S. Grigg, Engineering Research Center, Colorado State University, Fort Collins, Colorado 80523.

## GROUNDWATER SYMPOSIUM

A Symposium on the Optimal Development and Management of Groundwater and a Workshop on Education in Hydrogeology will be held during the General Assembly of the International Association of Hydrogeologists at Birmingham University, Birmingham, England, July 24-30, 1977.

The main purpose of the Symposium is to assemble, discuss and summarize the results of applied investigations and research, as well as recent experience and new ideas for overcoming both natural and artificial obstacles to the optimal development and management of groundwater.

For further information contact: Dr. J.W. Lloyd, Organizing Secretary, IAH Symposium, Department of Geological Sciences, University of Birmingham, P.O. Box 363, Birmingham B15 2TT, England.

## SYMPOSIUM ON UNIFIED HYDROLOGIC STUDIES OF THE SATURATED-UNSATURATED ZONES

Washington, D.C. will be the site for a Symposium on Unified Hydrologic studies of the Saturated-Unsaturated Zones. Sponsored by the Section of Hydrology's Committees on Unsaturated Zone Water and on Groundwater, the symposium will be held as part of the Spring Annual Meeting of the American Geophysical Union during the period May 30-June 3, 1977.

The symposium organizing committee consists of James N. Luthin, Fred J. Molz, Jacob Rubin, Edwin P. Weeks, Wilem F. Brutsaert, and Joseph S. Rosenshein. Anyone interested in more details or in offering a paper for the symposium should contact Dr. James N. Luthin, Department of Land, Air, and Water Resources, University of California, Davis, California 95616.



PUBLICATIONS

SI METRIC BOOKLET AVAILABLE

UCOWR announces the availability of System International D'Unites -- Metric Measurement in Water Resources Engineering, authored by Peter C. Klingeman, Oregon State University, in consultation with members of the UCOWR standing committee on Engineering and Physical Sciences. The booklet has been prepared as a service to the members of UCOWR and to others engaged in water resources research and educational activities. Permission is freely given for its reproduction.

The booklet is available at the following rates: Single copies of the booklet are available free of charge. Multiple copies are 50¢ each with a minimum order of \$10.00 (20 copies). Make checks payable to the University of Nebraska.

The booklet may be obtained by writing: The Executive Secretary's Office; Universities Council on Water Resources; 310 Agricultural Hall; University of Nebraska; Lincoln, Nebraska 68583.

SECTION 80(c) STUDY RELEASED

Section 80(c) of the Water Resources Development Act of 1974 directed the President to "make a full and complete investigation and study of principles and standards for planning and evaluating water and related land resources projects." President Ford assigned responsibility for this study to the U.S. Water Resources Council.

While the President's recommendations to the Congress are not expected until later this year, the Council has released the 20-volume technical report which constitutes the background and the perspective from which the recommendations are to be made. The technical report studies the ways in which water resources activities in the federal government are financed and undertaken by various agencies, the range of purposes and the relative importance of different purposes in the various regions of the country, and it reflects the current federal involvement in water programs and projects.

All 20 volumes of the Section 80(c) study are available through the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

NEW AND REPRINTED WETLAND MONOGRAPHS AVAILABLE

A new monograph "MODELS FOR ASSESSMENT OF FRESHWATER WETLANDS" (WRC Publication No. 32) edited by Dr. Joseph S. Larson has been recently published at the University of Massachusetts. It is the final report of a multi-disciplinary wetlands research team and presents techniques for assessing freshwater wetlands for wildlife, visual/cultural, groundwater, flood control and economic values. The report is designed to be used by local and state officials who are faced with regulating the future alteration of wetlands.



An earlier report (WRC Publication No. 31) of the same research team "A GUIDE TO IMPORTANT CHARACTERISTICS AND VALUES OF FRESHWATER WETLANDS IN THE NORTHEAST" has been reprinted in response to requests from a wider audience of users. Both publications are available at a cost of \$3.00 from the Water Resources Research Center, University of Massachusetts, Amherst, Mass. 01002.

## POSITIONS AVAILABLE

### DIRECTOR OF THE WATER RESOURCES RESEARCH CENTER

The College of the Virgin Islands is seeking a Director for the Water Resources Research Center. Qualifications include a doctorate degree and experience in research and research administration, preferably gained at one of the State Water Resources Research Institutes.

Duties will include developing a Water Resources Center, within the Caribbean Research Institute. The purpose of the Center is to conduct research, both basic and applied, in all aspects (economic, biological, geographical, sociological, geological, ecological, chemical, engineering, legal, recreational, etc.) of the water resources of the U.S. Virgin Islands and to train scientists in the process. The Center will undertake research projects of immediate importance to the government and the community.

All interested applicants should contact: Dr. Norwell Harrigan, Director, Caribbean Research Institute, College of the Virgin Islands, St. Thomas, U.S. Virgin Islands 00801. Along with the application, applicants are asked to include on a separate sheet of paper or a card their "race, sex, and ethnic identity." This information will not be used to discriminate against applicants, but to provide data for "work force analyses" for the Federal government.

The College of the Virgin Islands is an equal opportunity employer.

### OPENING IN AQUEOUS GEOCHEMISTRY

The Department of Geology and Geophysics at the University of Minnesota invites applications for a faculty position in low temperature-low pressure geochemistry with major interest in water-mineral interaction, subsurface hydrogeochemistry and related problems.

In addition to teaching responsibilities in the general area of interest of the applicant, duties would include interaction with research programs in groundwater geology, limnology, sedimentology and hydrothermal ore deposits.

The position is at the assistant professor level. An associate professor level appointment (without tenure) may be considered for more experienced candidates.

Interested applicants should submit resume and references to: H.O. Pfannkuch, Chairman Search Committee, Department of Geology and Geophysics, University of Minnesota, Minneapolis, Minnesota 55455.

The University of Minnesota is an Equal Opportunity Employer.



ASSISTANT DIRECTOR, WATER RESOURCES RESEARCH INSTITUTE, RUTGERS UNIVERSITY

Available July 1, 1977, will be the position of Assistant Director for the Water Resources Research Institute, Rutgers - The State University. Duties include becoming familiar with all phases of the institute's operation and administration, and also participating in research appropriate to his or her discipline. The yearly salary will be approximately \$20,000. Interested applicants should contact: William Whipple, Jr., Director, Water Resources Research Institute, Rutgers University, Box 231, New Brunswick, New Jersey 08903.

Rutgers in as equal opportunity employer.

RESEARCH REVIEW

PROJECT TITLE: Validation and Implementation of a Simplified Streamflow Simulator.

PRINCIPAL INVESTIGATOR: Alvin J. Surkan, Associate Professor  
Department of Computer Science  
University of Nebraska-Lincoln

The surface water modeling program package, HYDRA, for simulating the response of channel systems to moving or stationary storms, has been extensively tested and fully documented. Test data that were used came from the following drainage basins: (1) Hooper (Eagle, Nebraska); (2) Oakdale (Chicago, Illinois); (3) Tar Branch (Winston-Salem, North Carolina); and (4) the Salt Creek area of Nebraska. Testing is mostly complete for the case of stationary storms. In this case, the assumption must be made that the available gauging stations can supply representative values for the spatially uniform rainfall intensity variations.

Results of studying the effects of changing the direction of travel for moving storms confirm that storms traveling downstream at a speed approximately equal to that of the flow in the network lead to the most extreme responses. For stationary storms, the effect of the shape of the drainage area has also been explained. The key finding for stationary storms is that the shape is important only relative to the position at which the response is observed.

The documentation of design refinements, testing and application of HYDRA has received prime emphasis in the current phase of this research project. Continuing efforts are directed at identifying and apprising those organizations in industry and government that might benefit most from exploitation of the results of applications of the HYDRA modeling package.

The experience in creating the distributed network simulator is now being exploited for streamlining the distribution of programs and communicating algorithmic procedures to be followed for going from the map of an area of interest to a representation of a network's hydrologically significant numerical values in a digital computer. Through the combined use of observed rainfall and runoff data for storms available for several years at different natural watersheds, the stability of four watershed parameters has been studied.



Results of these studies yield quantitative answers on the predictability of watershed responses to storms in the context of the information typically available for estimating the overall distribution of the rainfall. At the same time, the production of these results indicate the utility of pattern-matching algorithms as a source of feedback information for optimizing the four parameters used for describing the performance characteristics of distributed network systems. The pattern-matching algorithm has been incorporated in the HYDRA package and provides an essential element required for applying the package on-line in an automatic flood forecasting system.

## PEOPLE IN THE NEWS

### WARREN D. FAIRCHILD TO LEAVE COUNCIL

Mr. Warren D. Fairchild, Director of the U.S. Water Resources Council since September 2, 1973, is leaving the Council. Mr. Fairchild will join the Washington staff of the World Bank as Mission Leader for the Pakistani National Water Plan in the Bank's Southern Asian Division.

Asked what he felt were the Council's key successes during his directorship, Mr. Fairchild pointed to the increased role and participation of the Council's members in the decision process. This member input has resulted in a stronger Council program as reflected in such activities as the Section 80(c) Study, the Water Assessment and Appraisal Program, the ongoing revision of the Principles and Standards and many others. The Council's members represent: Agriculture, Army, Commerce, Environmental Protection Agency, Housing and Urban Development, Interior, Transportation and the Federal Power Commission.

Mr. Fairchild assumed his duties at the World Bank approximately September 1, 1976.

## QUESTIONS AND INQUIRIES

Newsletter items and inquiries should be sent to: Editor, Nebraska Water Resources Research Institute, 310 Ag. Hall-East Campus, University of Nebraska, Lincoln, Nebraska, 68583, or phone (402) 472-3305.

## NEWSLETTER ITEMS SOLICITED

The Water Current Newsletter will publish without charge, announcement programs for up-coming conferences, employment opportunities or other newsworthy items on hydrology, water resources or related topics.



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