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# Water Current

September/October 1985

## DIRECTOR'S REPORT

Groundwater quality will most likely be a top research priority during the next few years. Non-point source contamination will be second only to hazardous waste pollution.

Agriculture has become dependent on many different chemicals to sustain production. These "agri-chemicals" include fertilizers and pesticides (herbicides, insecticides and fungicides). There has been a dramatic increase in the use of agri-chemicals since the early 1970's. Nebraska uses 30 million pounds of pesticide and 200 million pounds of fertilizer annually.

Some of these chemicals are now beginning to appear in the groundwater used for drinking supplies. Nitrate in groundwater has been a problem for several years in Nebraska. Two out of 88 wells sampled by the U.S. Geological Survey in Nebraska have been found to contain the pesticide found in Lorsban. Nationally, 16 pesticides have been found in the groundwater of 23 states.

The public is becoming concerned. Several national symposia and conferences have been planned and will be held this fall. The National High School Debate topic is whether or not the federal government should establish a policy to protect the quality of water in the U.S. In Nebraska, the Ground Water Foundation has been formed and a symposium is planned for November 5 in Lincoln.

Strategies have been developed at both the state and federal levels. New state legislation regulating the use of agri-chemicals is presently being drafted. Such legislation needs to be based on good information about how these chemicals decay and move to and through the groundwater, i.e., their fate and transport. Thus, the need for research on groundwater protection will most likely be high on the water resources research list for some time both nationally and in Nebraska.



NEBRASKA WATER RESOURCES CENTER



## NEBRASKA GROUNDWATER FOUNDATION

The Nebraska Groundwater Foundation is a newly formed nonprofit educational foundation dedicated to educating Nebraskans about the utilization and conservation of their groundwater resource. The current educational programs of the Foundation include: an annual groundwater symposium featuring speakers on a variety of groundwater topics; *The Aquifer*, the Foundation's quarterly publication updating groundwater research and issues; and a library of groundwater information including books, tapes and newsclips.

The programs of the Nebraska Groundwater Foundation are directed by a statewide board of trustees, and the President is Susan Seacrest.

The first Groundwater Symposium will be held Tuesday, November 5, 1985 at the Nebraska Center for Continuing Education. The theme of the symposium is "Groundwater for the Future: Choice or Default." The keynote speaker will be Governor Robert Kerrey, and the luncheon speaker will be Senator Chris Beutler. Other speakers will include Vince Dreeszen, Roy Spalding and Jim Goeke from the Conservation and Survey Division. The registration fee will be waived for individual or sustaining members of the Nebraska Groundwater Foundation. Registration fee for non-members is \$15.00 with a \$6.00 luncheon fee. The symposium is co-sponsored by the Nebraska Association of Resources Districts.

For additional information about membership or the Groundwater Symposium, write to Nebraska Groundwater Foundation, P.O. Box 2558, Lincoln, NE 68502-0558, or telephone 423-4963.

## REPORT ON IRRIGATION TOUR

The September 8-13 irrigation tour, to study California irrigation and water resources development, was sponsored jointly by the Nebraska Water Conference Council and the University of Nebraska Institute of Agriculture and Natural Resources. It emphasized the differences between California crops and the major Nebraska crops. It also compared irrigation in California, the most highly irrigated state in the U.S., with about 10 million acres irrigated, and Nebraska, the second, with about 8 million irrigated acres.

The major contrasts in agriculture between the two states are water availability, the diversification of California's 210 crops compared with Nebraska's 10 main crops, lack of rainfall where water demands are the greatest and soil content.

"There's going to be a tremendous amount of mold occurring in the fields if we receive more rain or if the temperature stays on the cool side," Maurice Peterson, formerly of Axtell, NE, and professor emeritus of agronomy at the University of California at Davis, said.

Further down the road at Clarksburg, R.J. Cook echoed Peterson. Cook, who owns one of the 650 wineries in California, doesn't want rain. "The .03 inch of rain we had this morning could be a disaster for this year's grape crop," Cook explained. "Fungus rot gets into our vineyard if we don't have continually dry weather right before harvest."

A visit to the 7,000-acre Murrieta Farms at Mendota provided a chance for the tour group to examine a cotton gin. This spread that grows cotton, wheat, tomatoes and alfalfa, has installed a selenium removal plant from England.

"Nebraska has the threat of nitrates in groundwater," commented Richard Bauer of Austria, who joined the tour in California, "while California is combating Kesterson Reservoir's selenium."

Other tour highlights included a visit to California State University at Fresno, visits to irrigated farms that grow rice, tomatoes, English walnuts, almonds, grapes, asparagus, celery and cotton, the Stockton elevator where ocean-going ships are loaded with grain, and the U.S. Army Corps of Engineers Bay Area project.

A former Lindsay, Nebraska irrigation manufacturing company owner, Bernard Zimmerer, now president of Zim Irrigation, Fresno, greeted the group in Fresno with lunch and a tour.

Les Sheffield, UNL farm management specialist and tour coordinator, announced that the 1986 Nebraska Irrigation Tour will be in western Nebraska and eastern Wyoming.

Pat Larsen  
Communications Specialist



## MEETING OF NEBRASKA WATER CONFERENCE COUNCIL

The fall meeting of the Nebraska Water Conference Council was held on October 5, 1985. Council members heard updates on various water-related topics and agency activities. The Program Planning Committee, with William Miller (Department of Agricultural Economics, UNL) as chairman, has begun planning for the 1986 Nebraska Water Conference. The theme of the conference will be "Profit in Agriculture Through Soil and Water Conservation." More information about the conference will appear in the next issue of WATER CURRENT.

## MEETING OF UNIVERSITY-WIDE FORUM ON WATER POLICY

The first of two fall meetings of the University-Wide Forum on Water Policy met October 1 at the UNMC Continuing Education Center in Omaha. Speakers at this meeting reviewed the water-related activities of their various units. Half of the delegates spoke at the October 1 meeting. The remainder of the Forum delegates will discuss water-related activities of their units at the second fall meeting to be held Tuesday, November 12 at the East Campus Union.

The purpose of the Forum is to provide for an exchange of information and ideas on water resources and water policy issues among the faculty of the University of Nebraska. Each campus in the University system appointed delegates to serve on the Forum which currently consists of 32 members. The University Forum on Water Policy was endorsed by the Executive Council of the University of Nebraska.

The Forum will meet twice each year. The meetings are open to all faculty in the University system and will consist of (1) updates on water resources activities within the research community and local, state and federal water agencies; (2) discussion of reports from Forum task forces; and (3) discussion of potential and existing water policy issues facing Nebraska, the region and the nation. Following these fall meetings, a Forum planning committee will develop an agenda for the next meeting of the Forum.

For additional information, contact Bill Powers, Director, Water Resources Center.

## NEW BOOK ON WATER LAW

Recently there has been much greater interest, and in some cases even anxiety, over the management of Nebraska's unique water resources. A new book entitled *Nebraska Water Law and Administration* takes a hard look at not only Nebraska law but also the laws of many other states so comparisons can be made and recommendations for future action evaluated from a wider perspective.

The book's authors, Richard S. Harnsberger and Norman W. Thorson, professors of law at UNL, hope it will prove valuable to lawyers, farmers, engineers, legislators, water resources planners and managers, and anyone else interested in the future of Nebraska.

Chapter titles include: (1) Management and Classification of Water; (2) Riparianism; (3) Prior Appropriations; (4) Drainage and Diffused Surface Water; (5) Groundwater; (6) Public Rights in Nebraska's Water; and (7) Accretions, Embargoes and Interbasin Transfers. Over 2300 citations are contained in the book.

The book is published by Butterworth Legal Publishers, Mason Division, 366 Wacouta Street, St. Paul, MN 55101-1989 and may be ordered from them at a cost of \$79.50.



## RESEARCH REVIEW

Project Title: *Interpretation of Vegetation Encroachment and Flow Relationships in the Platte River by Use of Remote Sensing Techniques*

Principal Investigators: *Jeffrey S. Peake and Michael Peterson, Remote Sensing Applications Laboratory, Department of Geography-Geology, University of Nebraska at Omaha*

Over the past several decades there has been considerable vegetation encroachment along the channel of the Platte River in central Nebraska. The precise reasons for this are not entirely known, but it is suspected that there is a relationship to the changing flow characteristics experienced on the Platte over the past half century. Irrigation development along the Platte in recent decades has placed a greater demand upon the available flow. The encroachment of vegetation and decrease in channel width have also been of concern to wildlife conservationists and managers.

The purpose of this project was to identify and measure the various habitat/land cover types along the Platte River between Brady and Chapman and to determine what changes have occurred over the past 100 years. In addition, any spatial variations in the rate of change were also determined for each individual habitat type.

To produce a usable body of work, it was felt that the project results should be in both a cartographic and tabular format and that all data should be in a computer retrievable form. Towards this end, land survey maps from the mid-1800's and aerial photographs from 1938, 1957 and 1983 were analyzed, and 14 habitat/land cover types (two for the 1800's period) were mapped out on mylar sheets at a scale of 1:24,000. Twenty-four maps were produced for each of four time periods for a total of 96 maps. These maps were then digitized and the data placed in a computer file.

To date all interpretation, digitizing and accuracy checks have been completed. Final map production and generation of statistics still remains to be finished. Based on subjective examine of the work produced to date, the following are likely to be the major findings:

- (1) There has been relatively little change in the location of the Platte River channel over the past century.
- (2) Considerable channel narrowing has occurred. Vegetation has encroached on the channel as sandbars have established themselves in the channel, become vegetated, and through accretion have attached themselves to the banks.
- (3) In most areas there has been a systematic succession from water to sandbars, grasses, shrubs and finally, trees.
- (4) While the past 40 years have been a period of considerable change, there is evidence that the channel narrowing process began previous to 1938.

This project will result in a comprehensive accurate data base showing how the Platte River and its associated vegetative habitats have changed over time. This will be important as the development of the state's water resources is likely to be one of the major issues of the next few decades, and the Platte River is likely to be at the center of the debates that will result from the choices that will need to be made.



## **JOBS AVAILABLE**

The University of Colorado at Boulder has two position openings.

A tenure track position in water resources engineering is available in the Department of Civil, Environmental and Architectural Engineering. Duties include teaching at both the undergraduate and graduate levels in courses such as fluid mechanics, hydrology, open channel hydraulics, statistical hydrology, water resources project analysis and groundwater. The successful candidate is expected to develop a sponsored research program in water resources and/or hydrology, including ongoing research in alpine hydrology with the University's Mountain Research Station. The appointment will be effective January 1986 or later. Interested candidates should send resume and names of three references to Chairman, Water Resources Engineering Search Committee, University of Colorado, Boulder, CO 80309-0428. Closing date for applications is November 30, 1985.

A tenure track position in environmental engineering is also available in the Department of Civil, Environmental and Architectural Engineering. Duties include teaching at both the undergraduate and graduate levels in courses such as engineering applications of environmental chemistry, fate and effects of pollutants in the aquatic environment, and computer modeling of chemical transport. The successful candidate is expected to develop a sponsored research program in environmental engineering. The appointment will be effective January 1986 or later. Interested candidates should send resume and names of three references to Chairman, Environmental Engineering Search Committee, University of Colorado, Boulder, CO 80309-0428. Closing date for applications is November 30, 1985.

The University of Colorado is an Equal Opportunity and Affirmative Action Employer.

## **CALL FOR PAPERS**

The American Society of Agricultural Engineers, along with various other cooperating organizations, is sponsoring a National Symposium on Water Resources Law to be held December 15-16, 1986 in Chicago, IL. The purpose of the symposium is to discuss critical issues dealing with (1) reallocation of water in a limited resource environment, including adjudication and inventories; (2) groundwater pollution from agricultural sources; and (3) surface water quality as related to agricultural use.

Papers are being solicited which emphasize issues as they deal with decisions based on litigation or adjudication proceedings and serve as benchmarks for the future. Proposals for papers must be received no later than DECEMBER 1, 1985. The original and three copies of an abstract are requested.

For additional information or to obtain a copy of the paper proposal form, contact: Swayne F. Scott, Program Chairman, Soil Conservation Service, P.O. Box 2890, Washington, D. C. 20013. Telephone: (202) 447-8723.

## **MEETINGS AND CONFERENCES**

- November 14-15, 1985 Conference on Education and Professional Development in Hydrology and Hydrogeology: Needs and Opportunities to be held in Las Vegas, NV. Contact: Program Coordinator, American Institute of Hydrology, P.O. Box 14251, St. Paul, MN 44114. Telephone: (612) 379-1030.
- December 9-13, 1985 American Geophysical Union fall meeting to be held in San Francisco, CA. Contact: AGU Meetings, 2000 Florida Avenue, N.W., Washington, D.C. 20009.
- December 16-17, 1985 National Conference on Advances in Evapotranspiration and Fifth International Symposium on Agricultural Wastes to be held in Chicago, IL. Both sponsored by the American Society of Agricultural Engineers. For additional information, contact: Loretta Dibble, ASAE, 2950 Niles Road, St. Joseph, MI 49085-9659.



## 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) *Effects of Land Use Practices on Water Resources in Virginia*, Bulletin #144, R.C. Jones and B.H. Holmes, Water Resources Research Center, Virginia Polytechnic Inst. and State University, Blacksburg, VA 24060.
- (2) *Lake and Reservoir Management*, Proceedings of the Third Annual Conference, held October 18-20, 1983 in Knoxville, TN, EPA Report 440/5/84-001, U.S. Environmental Protection Agency, Office of Water Regulations and Standards, Washington, D.C. 20460.
- (3) *Distribution and Relative Abundance of Fishes in Wisconsin*, V. Grant and Platte, Coon and Bad Axe and La Crosse River Basins, Technical Bulletin No. 152, Dept. of Natural Resources, Madison, WI 53707.
- (4) *The Effect of Soil on the Mutagenic Properties of Waste Water*, Research Report 195, M.J. Plewa and P.K. Hopke, Water Resources Center, University of Illinois at Urbana-Champaign, Urbana, IL 61801.
- (5) *A Nonlinear Programming Model of a Wastewater Treatment System: Sensitivity Analysis and a Robustness Constraint*, Research Report 196, J.G. Uber, E.D. Brill, Jr., and John T. Pfeffer, Water Resources Center, University of Illinois at Urbana-Champaign, Urbana, IL 61801.
- (6) *Ruffed Grouse Habitat Relationships in Aspen and Oak Forests of Central Wisconsin*, Technical Report No. 151, Department of Natural Resources, Box 7921, Madison, WI 53707.
- (7) *Methods of Computing Sedimentation in Lakes and Reservoirs*, Unesco, Paris, Stevan Bruk, Rapporteur, February, 1985, Jaroslav Cerni Institute for the Development of Water Resources P.O. Box 530, 11000 Belgrade, Yugoslavia.
- (8) *1984 Annual Report*, United States Department of the Interior, Bureau of Reclamation.
- (9) *US Army Corps of Engineers Water Resources Support Center, 1984 Annual Report*, The Hydrologic Engineering Center, 609 Second Street, Davis, CA 95616.
- (10) *Red River Gorge Residents: A Cultural and Historical Perspective*, Research Report No. 156, June, 1985, University of Kentucky, Water Resources Research Institute, Lexington, KY.
- (11) *Development of Procedures for Improved Resolution of Conflicts Related to Interjurisdictional Water Transfer*, September 1985, Bulletin 145, Virginia Water Resources Research Center, Virginia Polytechnic Institute and State University, Blacksburg, VA.
- (12) *Worldwatch Paper 67, Conserving Water: The Untapped Alternative*, September, 1985, Worldwatch Institute, 1776 Massachusetts Ave. N. W., Washington, D.C., 20036.
- (13) *Electrical Resistivity Investigation of Schofield High-Level Water Body*, O'Ahu, Hawaii, May 1985, Technical Report No. 169, University of Hawaii at Manoa, Water Resources Research Center, 2540 Dole Street, Honolulu, HI 96822.

## WATER CURRENT

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