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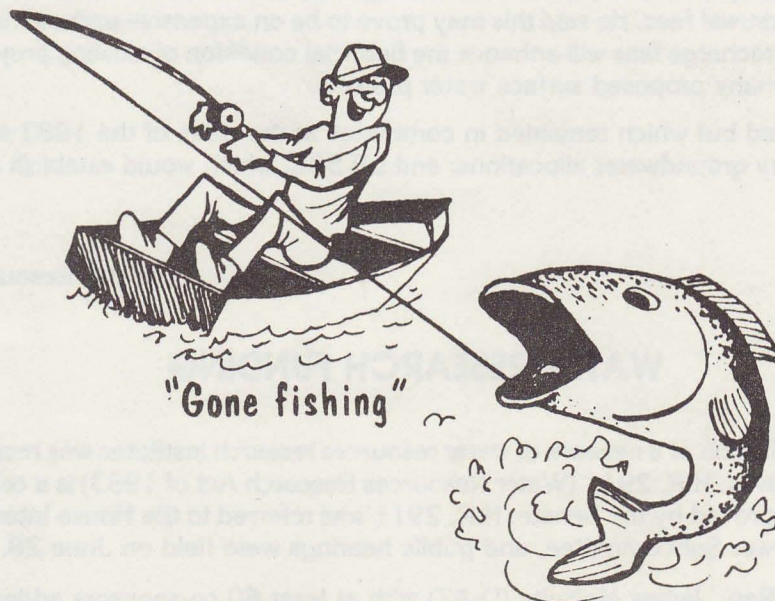
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Water Current

July/August 1983

FROM THE DESK OF THE DIRECTOR



NEBRASKA WATER RESOURCES CENTER

REORGANIZATION OF WATER CENTER STAFF

We are pleased to announce that Susan Miller has been promoted from Research Technician III (Office-Service) to Water Resources Specialist (Managerial-Professional). In addition to her new responsibilities, Susan will assume the duties of coordinator of the Water Center's activities in the State Water Planning and Review Process.

Bob Burns, current Water Resources Specialist (in planning), will be leaving the Water Resources Center on September 2, 1983 to pursue doctoral studies at Michigan State University.

We wish Bob the best of luck in his academic studies and congratulate Susan on her promotion.

1983 WATER LAW DEVELOPMENTS

Three new water-related bills were passed by the Nebraska legislature this past spring: (1) LB 21, Surface Water Right Transfers; (2) LB 380, Appropriation Cancellation Procedures; and (3) LB 198, Ground Water Recharge.

J. David Aiken, University of Nebraska water law specialist, said LB 198 was the most significant water-related bill to be enacted by the 1983 session. According to Aiken, the bill authorizes operators of surface water projects such as Lake McConaughy, the Tri-County Canal System or the proposed Little Blue Project to charge for withdrawal of any groundwater that has been recharged as a result of the project.

"Water leaking out of unlined canals and seeping from underneath irrigators' fields has caused considerable groundwater recharge in some areas of Nebraska," Aiken said, "and when irrigators begin pumping recharged groundwater instead of surface water from the project, this can pose serious problems for the project."

If, for example, 40 percent of the original land served by a project is now irrigated with recharged groundwater, Aiken said 40 percent of the project's original water rights are subject to cancellation by the Department of Water Resources (DWR). To avoid this, Aiken said LB 198 authorizes the DWR to recognize the joint use of surface and recharged groundwater and to modify the original appropriation accordingly. Modification by DWR will prevent the appropriation from being partially cancelled, Aiken said, and will allow the project operator to charge those using recharged groundwater a withdrawal fee of \$0.50 per acre.

Aiken said operators must prove to the DWR that recharge has occurred as a result of the project before they are allowed to charge withdrawal fees. He said this may prove to be an expensive undertaking. But if the recharge can be proved, Aiken said recharge fees will enhance the financial condition of existing projects and may increase the financial feasibility of many proposed surface water projects.

Two other bills introduced but which remained in committee at the close of the 1983 session were: LB 381, which addresses mandatory groundwater allocations; and LB 586, which would establish a Water Management and Development Fund.

Brad Gustafson
Water Resources Communications

WATER RESEARCH FUNDING

A bill to continue authorization of a network of water resources research institutes was recently introduced in the U.S. House of Representatives. H.R. 2911 (Water Resources Research Act of 1983) is a companion bill to S.684 which has already been approved by the Senate. H.R. 2911 was referred to the House Interior and Insular Affairs Committee, Water and Power Subcommittee, and public hearings were held on June 28, 1983.

The bill, introduced by Rep. James McNulty (D-AZ) with at least 60 co-sponsors added, would provide \$10 million for water research institutes and \$40 million for specific water studies on a dollar-for-dollar matching basis. An additional \$10 million is set aside for technology development. The \$10 million for water research institutes would require state cost sharing at a rising state/federal ratio and also provides for periodic review and evaluation of the state institute programs.

The Administration generally has not supported funds for water research, although Congress has provided \$13 million for FY 1983 and \$14 million is proposed for FY 1984.

CONFERENCE ON PICK-SLOAN PLAN

The Missouri Basin States Association (MBSA) is sponsoring a Conference on the Pick-Sloan Missouri Basin Plan August 10-11, 1983 in Des Moines, Iowa. The registration fee for the two-day conference is \$30.

The purpose of the conference is (1) to acquaint basin residents and others with the background of the Pick-Sloan Plan—why and how it came to be; (2) to review the details of the Plan; and (3) to assess the current status of the Plan—what projects and programs have been completed and what remains undone.

For additional information contact the Missouri Basin States Association, 10834 Old Mill Road, Suite 1, Omaha, NE 68154. Telephone: (402) 330-5714.

CALLS FOR PAPERS

ASCE Specialty Conference

The Water Resources Planning and Management Division, American Society of Civil Engineers (ASCE) is soliciting papers for a conference on "Urban Water '84 — A Time for Renewal" to be held May 29-31, 1984 in Baltimore Maryland.

Examples of sessions which may be organized for the conference and for which abstracts will be accepted are: Case studies in urban watershed management; Urban flood plain management; Drought management in urban areas; Case studies in water policy making; Water supply in urban areas of lesser developed countries; Acid rain and regional water resources management; Groundwater and toxics in urban areas; Surface water and toxics in urban areas; Urban nonpoint source pollution—case studies; Recent changes in federal water policy; and Conventional and innovative financing schemes.

Abstracts of not less than 200 words should be mailed to: Harry Tuvel, ASCE, 345 East 47th Street, New York, N.Y. 10017 by October 1, 1983. No conference proceedings will be published.

For additional information, contact: Technical Program Chairman, Harold J. Day, College of Environmental Science, University of Wisconsin, Green Bay, WI 54301. Telephone: (414) 465-2250.

Water Reuse Symposium III

The third International Symposium on Water Reuse will be held August 26-31, 1984 in San Diego, California. Water Reuse Symposium III will be dedicated entirely to renovation and reuse of wastewater from all sources and the recycling of water by individuals, municipalities, industries or agriculture.

Papers are sought which cover case histories, new applications, innovative solutions to resource management, new treatment developments, performance data, research developments, pilot plant studies and new practical applications. While abstracts from all areas of the water reuse field are desired, special attention will be given to the following topics: System design, Health effects, Criteria and standards, Regulatory considerations, Financing and management, Institutional aspects, Groundwater recharge, Analysis and monitoring, International applications, Research needs, Industrial recycling, Treatment, Potable reuse research, and Dual distribution systems.

Abstracts must include the following information: title of paper; name, title and affiliation of all authors; name, title, affiliation, address and phone number of presenter; date of completion of research work; and indication of prior presentation or publication (journal or meeting name, date and location). Ten copies of abstracts, not to exceed 500 words, must be submitted prior to October 31, 1983 to: Jon DeBoer, Water Reuse Symposium III, AWWA Research Foundation, 6666 West Quincy Avenue, Denver, CO 80235. Telephone: (303) 794-7711.

AWRA Symposium

A Symposium entitled "A Critical Assessment of Forecasting in Western Water Resources Management" will be held June 11-13, 1984 in Seattle, Washington. Sponsored by the American Water Resources Association (AWRA) the general theme is the science of water hydrologic and demand forecasting and its relationship and significance to operational, planning, and policy decisions by both the public and private sectors in the western United States.

In the area of Operation of Water Resource Systems, presentations are to focus on the use of very short-term hydrologic and demand forecasting for the improved operation of existing systems. Topics may include advances

in: Short-term river flow/river forecasting techniques; Long-term (monthly to season) runoff forecasting techniques; Assessing the value of hydrologic forecasting; Methods to incorporate forecasts and forecast uncertainty in system operation policies; Integration of short-term demand forecasts into system operations; and Case histories of modern operational forecasting systems.

In the area of Capital Program Planning and Implementation, presentations are to focus on the use of long-term hydrologic and demand forecasting in the planning of capital facility expansion for water resource systems. Topics of interest may include advances in: Long-range water demand forecasting techniques; Data requirements and collection systems for demand forecasting; Assessing the value of improved data bases and forecasts; Incorporation of uncertainty into demand forecasting; Evaluation of conservation potential and its incorporation into demand forecasting; Risk management strategies for dealing with forest uncertainty; Methods for evaluating the economic loss from failing to meet demand growth; and Case histories illustrating the relative worth and effect of hydrologic and water demand forecasts on capital program decisions.

Abstracts should not exceed 200 words and must include the paper's title, all author(s) name(s) and their affiliations(s). The senior author must include on a separate page the full mailing address and phone numbers for all authors. Three copies of the abstracts are to be submitted by November 1, 1983 to: General Chairperson, Gary R. Minton, President, Resource Planning Associates, 113 Lynn Street, Seattle, WA 98109. Telephone: (206) 282-1681.

12th Annual AWRA Conference and Symposium

The American Water Resources Association (AWRA) will hold its 12th Annual Conference August 13-16, 1984 in Washington, D. C. The conference theme is "Overcoming Institutional and Technical Constraints to Water Resources Management." Papers are invited in the following three areas:

(1) Institutional Aspects of Water Management — Institutions for managing regional water resources systems; Models for coordination of water resources plans and programs; State-federal relationships—assignment of responsibilities; Settling priorities for water resources investments; The problems of decaying urban water infrastructures; and Organizing study teams to conduct regional analysis.

(2) Water Management Technology — Case studies demonstrating the potential for improvement in water management through analysis of existing systems; Analytical methods for analyzing the performance of water resources systems; and Innovative and novel approaches to water management.

(3) Data, Research and Assessment Needs — Research needs to support improved water management; Data needs for analyzing system performance; and Future directions for assessing the nation's water resources.

The AWRA conference will also include a Symposium on August 15, 1984 with the topic "Options for Reaching Water Quality Goals." Papers are invited on two topics: (1) Surface Water Quality — Institutional and technical aspects of control of pollution from point and nonpoint sources; Monitoring for water quality; Water quality-quantity relationships; Alternative and innovative technology for pollution abatement; and (2) Ground Water Quality — Prevention and cleanup of contaminated underground aquifers; Institutional and technical aspects of controlling ground water pollution; Ground water/surface water interrelationships.

The deadline for submission of abstracts is November 15, 1983. The same abstract qualifications apply as listed above for the AWRA Symposium in Seattle, WA. Conference abstracts should be submitted either to: Warren Viessman, Jr., Dept. of Environmental Engineering Sciences, University of Florida, A.P. Black Hall, Gainesville, FL 32611, or Claire Welty, U.S. Environmental Protection Agency, (WH-565B), 401 "M" Street, S.W., Washington, D.C. 20460. Symposium abstracts should be submitted to: Theodore M. Schad, National Academy of Science, 2101 Constitution Avenue, Washington, D. C. 20418.

CONFERENCES AND MEETINGS

- Sept. 19-22 24th Annual Interstate Conference on Water Problems, Oklahoma City, OK. Topics will include congressional activities, water project financing, ground water, water shortages and weather modification. Contact: James R. Barnett, Oklahoma Water Resources Board, P. O. Box 53585, Oklahoma City, OK. (405) 271-2551.
- Oct. 18-20 International Symposium on Lake and Reservoir Management, Knoxville, TN, presented by North American Lake Management Society. Registration fee for members \$50, for nonmembers \$65. For additional information, contact: Wayne Poppe, TVA, 248 401 Bldg., Chattanooga, TN 37401.
- Oct. 25-28 National Water Resources Association 1983 Convention, Tulsa, OK. Contact National Water Resources Ass'n, 955 L'Enfant Plaza, S.W., Washington, D. C. 20024.
- Oct. 26-28 28th Annual Midwest Groundwater Conference, Champaign, Illinois. Registration fee \$40. Contact Steven D. Hilberg, Illinois State Water Survey, P. O. Box 5050, Station A, Champaign, IL 61820.

RESEARCH REVIEW

Project Title: *Water and Energy Conservation Using Center Pivot Irrigation and Reduced Tillage Systems*

Principal Investigator: *James R. Gilley, Professor, Dept. of Agricultural Engineering, UNL*

The basic goal of this project was to develop and evaluate crop production systems which have the potential to reduce both water and energy consumption in irrigated agriculture without adversely affecting water quality. A combination of field experimentation and computer modeling was undertaken to determine the quantity and quality of runoff water from reduced-pressure center pivot irrigation systems, to determine the water and energy savings from these systems, to develop mathematical models of these systems, and to determine the feasibility of using these systems in other locations.

Reducing the pressure of center pivot systems can save significant amounts of energy; however, improper site selection for some types of these systems may result in increased runoff. The increased runoff will lower the irrigation efficiency and the potential energy savings will be reduced, nullifying part of the energy savings gained through pressure reduction. The incorporation of modified tillage practices will greatly reduce the runoff problem.

Mathematical models of the water application characteristics of center pivot systems and soil infiltration rates were used to develop criteria for proper site selection of reduced pressure systems. These criteria can be used to determine the feasibility of using the various reduced pressure devices as a function of soil intake families.

This study has shown that reduced-pressure center pivot irrigation systems do not have detrimental effects upon the soil rooting environment. Further, the crop yield results indicate that in none of the years was there any inherent difference in yield potential with the different methods of water application. Thus, other factors related to the type of center pivot irrigation system such as potential runoff and slope, irrigation efficiency, energy cost, and pumping plant size and cost should still be the major considerations when selecting the proper pressure for a center pivot system for a given site.

This study has provided a strong beginning to a research effort to develop recommendations regarding the proper selection of sprinkler equipment for center pivot irrigation systems. While the substantial energy savings from reduced-pressure has provided impetus to use or convert to low pressure, the potential runoff under these systems needs to be considered. This project has provided the initial efforts toward developing a systematic method of determining proper site selection of these systems.

PUBLICATIONS

- (1) *Major Dams, Reservoirs and Hydroelectric Plants - Worldwide and Bureau of Reclamation*, J.M. Tilsley, January 1983, Bureau of Reclamation, Technical Publications Branch, D-960, Engineering and Research Center, P.O. Box 25007, Denver, CO 80225-0007.
- (2) *Wastewater Treatment in Soil as a Function of Residence Time in the Root Zone*, Bulletin 137, March 1983, Dept. of Agricultural Engineering, Virginia Water Resources Research Center, VPI&SU, Blacksburg, VA 24060-3397.
- (3) *Technology Assessment of Irrigation Scheduling and Crop Response*, Warren Hall, February 1982, Dept. of Civil Engineering, Colorado State University, Fort Collins, CO.
- (4) *Impact of Artificial Recharge on Groundwater Quality of Gypsum Aquifer in Harmon County, Oklahoma*, Project A-107OKLA, June 1983, Oklahoma Water Resources Research Institute, Oklahoma State University, Stillwater, OK 74074.
- (5) *Hydraulic Analysis of Surcharged Storm Sewer Systems*, Research Report No. 137, March 1983, Water Resources Research Institute, University of Kentucky, Lexington, KY.
- (6) *Survey of Water Conservation Programs in the Fifty States—Model Water Conservation Program for the Nation*, August 1982, Environmental Policy Institute, 317 Pennsylvania Ave., S.E., Washington, D. C. 20003.
- (7) *A Plan for Research on Floods and their Mitigation in the U.S.*, Final Report to the National Science Foundation, SWS Contract Report 302, March 1983, Illinois State Water Survey Division, Dept. of Energy and Natural Resources, P.O. Box 5050, Station A, Champaign, IL 61820.
- (8) *National Statistical Assessment of Rural Water Conditions*, Joe Francis, Dept. of Rural Sociology, Cornell University, Ithaca, N.Y. 14851.
- (9) *Occurrence Probabilities of Antecedent Moisture Condition Classes in Indiana*, Project A-060-IND, June 1983, Water Resources Research center, Purdue University, West Lafayette, Indiana.
- (10) *Chemical Speciation of Leachates from Waste Disposal Sites*, Project A-066-IND, Report No. 158, April 1983, Water Resources Research Center, Purdue University, West Lafayette, Indiana.
- (11) *Development of a Chemical Analysis for Ultrarace Arsenic in Water*, Report No. 101, May 1983, Water Resources Research Institute, Clemson University, Clemson, SC 29631.
- (12) *Groundwater Quantity and Quality in Fractured Zones in Abbeville County, SC*, Report No. 102, May 1983, Water Resources Research Institute, Clemson University, Clemson, SC.
- (13) *Efficient Use of Water for Irrigation in the Upper Midwest*, Research Report 176, April 1983, Water Resources Center, University of Illinois, 208 No. Romine Street, Urbana, IL 61801.
- (14) *Post-Minint Neutralization of Acidic Surface Mine Lakes*, Research Report 178, April 1983, Water Resources Center, University of Illinois, Urbana, IL 61801.
- (15) *The Impact of Urbanization on a Flood-Plain Aquifer: Bloomington, Indiana*, Project A-062-IND, March 1983, Water Resources Research Center, Purdue University and Indiana University, Bloomington, Indiana 47405.
- (16) *Exposure to Microbial Aerosols from Activated Sludge Treatment*, Technical Report No. 145, November 1982, Water Resources Research Center, University of Hawaii at Manoa, Honolulu, Hawaii 96822.
- (17) *Wastewater Injection Well Problems, Processes and Standards*, Technical Report No. 146, Water Resources Research Center, University of Hawaii at Manoa, Honolulu, Hawaii 96822.
- (18) *The Biota of Oklahoma Springs: Natural Biological Monitoring of Ground Water Quality*, Project A-099-OKLA, May 1983, Water Resources Research Institute, Oklahoma State University, Stillwater, OK 74078.
- (19) *Effects of Coal Pile Runoff on Stream Quality and MacroInvertebrate Communities*, Water Resources Research Center, University of Maryland, College Park, Maryland 20742.

WATER CURRENT

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