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Water Current

Millard W. Hall, Director
Volume 9 Number 1

Karen E. Stork, Editor
January/February 1977

NEBRASKA WATER RESOURCES CENTER

Annual Report - 1976

The Nebraska Water Resources Center (NWRC) was established in November 1964 as a result of state and federal actions authorized by the Water Resources Research Act of 1964. Activities during the past year have included programs in water research, education and information dissemination as well as various IANR staff functions.

Research: During the past year the Center sponsored and administered a research program involving 22 projects totaling \$1,131,720. This includes 11 annual allotment and six matching grant projects funded by the Office of Water Research and Technology, Department of Interior. A major project was conducted in cooperation with the Upper Big Blue Natural Resources District to develop a quantitative planning capability for the District. Other efforts included projects on artificial recharge and management of irrigated agriculture. In December, NWRC submitted nine new matching grant projects to the Office of Water Research and Technology totaling almost \$700,000. Presently work is in progress on three new research proposals totaling approximately \$400,000.

Education: During the past year, the Center sponsored the following educational activities: (1) an interdisciplinary Water Resources Seminar on "Water Resources Policy" offered for 1 or 3 hours credit during the spring semester; (2) a one-week Summer Institute on "Futures Planning" for water resources professionals; (3) a Groundwater Seminar for NRD managers; (4) a two-day Research Overview outlining the Center's research program and the water resources research programs of various state agencies; (5) a two-day conference on "Rural Water Problems" attended by over 130 participants from 18 states representing various local, state and federal agencies; and (6) various seminars on special topics including one by Dr. Poul Harremoes of the University of Denmark. NWRC also sponsored two foreign students studying at UNL -- Dr. T. K. Arasu from India who studied water law and institutions for six weeks, and Mr. Stefan Ignar from Poland who arrived in October and will be working with the Center staff for one year.



NEBRASKA WATER RESOURCES RESEARCH INSTITUTE

Information Dissemination: The Water Resources Center continues to publish a bi-monthly newsletter outlining water resources activities in Nebraska and elsewhere which is mailed both locally and nationally. The Center periodically distributed a publications list describing recent water resources related library acquisitions available for loan to interested persons. A Proceedings of the Water Resources Seminar series on "Water Resources Policy" was published and widely distributed, and the Proceedings of the Conference on "Rural Water Problems" will be published shortly.

IANR Staff Functions: In 1975, the Nebraska Unicameral gave special recognition to the Center's growing competence by designating it for increased funding through the Area of Excellence Program in Water Resources Management. These funds have been used to enhance and expand the Center's activities. An up-dated Area of Excellence Self-Evaluation Report was prepared in June 1976 in response to the earlier report of the Area of Excellence review team. NWRC staff have worked with other water-related University units and state agencies to define and resolve Nebraska's water problems.

The Director chaired a Water Quality Committee which has as its mission a review of water quality activities in the Institute of Agriculture and Natural Resources. He has also served as Assistant Director of the Agricultural Experiment Station, reviewing water-related projects and assisting with funding and policy. A committee has been established to review the Master's Program in Water Resources Planning and Management and several meetings were held during the past year to analyze the future of this program.

The Center Director also serves as Executive Secretary of the Universities Council on Water Resources (UCOWR) and much of its work is performed through the offices of the Center. For example, the Proceedings of UCOWR's annual conference and various other reports and publications were assembled and distributed through the Nebraska Water Resources Center.

ON THE HOMEFRONT

INTERDISCIPLINARY WATER RESOURCES SEMINAR

Once again the Water Resources Center is sponsoring an Interdisciplinary Water Resources Seminar series during the 1977 spring semester. The intent of these seminars is to bring together upper classmen, graduate students, professional persons, faculty and others interested in water topics.

This year the series of seminars will focus on a number of the most important water resources planning and management issues facing this nation and Nebraska. The seminars will be held on Wednesday afternoons beginning January 19 from 3:00 to 5:00 p.m. in the East Campus Union building. The exact room number will be listed each week on the activities calendar in the Union. A listing of topics to be covered follows:

February 2	The Water Resources Picture --
February 9	National, Regional, State
February 16	Who Owns the Water
February 23	Water and the Economy
March 2	Major Components of the Federal Water Planning
March 9	and Management Structure
March 16	Major Federal and Regional Water Issues
March 23	Nebraska Water Conference
March 30	Major Components of the State Water Planning
April 6	and Management Structure
April 13	Spring Break
April 20	Major State Water Issues
April 27	Federal Management Procedures
May 4	State Management Procedures
	Quantitative Planning Approaches
	Financing, Implementation and Operation of
	Water Resources Projects
	TBA

WATER RESEARCH IN NEBRASKA

CONSERVATION AND SURVEY DIVISION

A pilot project is being initiated to examine the feasibility of using satellite imagery to monitor the level of Sand Hills Lakes and changes in their water quality. Since it is thought that the lakes and wetlands of the Sand Hills are a surface expression of the watertable, any significant lowering of the watertable would be visible and measurable from the Sand Hills Lakes. Additionally, previous evaluations have shown that surface water is readily defined on the imagery and that digital data can be used to approximate levels of dissolved ions (total concentration) in the lakes.

FEDERAL HIGHLIGHTS

OWRT SEEKS APPLICATIONS FOR ONE-YEAR APPOINTMENT AS RESEARCH SCHOLAR

The Office of Water Research and Technology is looking for someone who might qualify as an "in-house scholar." The applicant would be working and living in Washington for a period of one year starting the summer of 1977.

OWRT can work flexibly with the applicant's home institution so as to provide either full salary or a supplement for a partial salary such as might be needed during sabbatical leave. It is hoped that this post would appeal to senior scholars in the water resources field who wish to devote one year to a creative activity which would enhance water resources research.

Applicants must provide an outline of the kind of contribution they feel they could make to OWRT through activity of their chosen field of specialization. The selection will be announced before April 1, 1977, so interested persons should notify OWRT no later than March 1, 1977. Applications should be sent to: Dr. William S. Butcher, Director, Office of Water Research and Technology, U.S. Department of the Interior, Washington, D. C. 20240.

CARTER TRANSITION TEAM BLASTS BUREC, CORPS

The Carter transition team has recommended special reviews for more than 60 major federal water projects costing more than \$13 billion. The list was included in a briefing book prepared for Interior Secretary-designate Cecil Andrus (former Idaho Governor) by four members of the transition team's energy and natural resources section, headed by Katherine Schirmer.

Suggestions in the book include suspending or revising the outer continental shelf leasing schedule while public participation is sought on how to renew leasing. Dam projects have also been chosen for review.

Nebraska is included on the Transition Team's "Hit" List. Under the Bureau of Reclamation it is suggested that the North Loup project and the O'Neil Unit be reviewed.

It is reported that the briefing book suggests three water resource options to Mr. Andrus. They are: (1) comprehensive reform, including broad policy analysis in flood control, transportation, irrigation and erosion control, executive action to change project evaluation procedures and dam safety, and legislation to change payback provisions for water users, and to "de-authorize projects as appropriate;" (2) moderate reform, including cuts in 1978 funding for "uneconomic, unneeded or destructive projects," but no immediate broad policy changes; (3) keeping the status quo. The first and second options could result in a savings of up to \$500 million in the 1978 budget, with a long-term savings of billions.

The report suggests that the Interior Secretary consider reinstating the coal leasing moratorium until it can be reassessed; initiating a parks and wildlife program eclipsing the Ford Bicentennial Heritage Program; and re-establishing a general council in the Bureau of Indian Affairs.

The book also provides background explanations to Andrus of various critical issues he may have to deal with such as the recent Supreme Court affirmation of a Washington State court ruling on fishing rights which protects fishing rights of members of western Washington tribes in waters off their reservations.

INTERSTATE CONFERENCE WANTS WRC DIRECTLY UNDER PRESIDENT

Clair P. Guess, Jr., Executive Director of the South Carolina Water Resources Commission and Vice Chairman of the Interstate Conference on Water Problems (ICWP), called a meeting of 20 national leaders to help formulate a proposal to call on Congress to replace the Water Resources Council (WRC) with a water resources office directly under the President. This action came after the Federal Office of Management and Budget recommended that Congress not appropriate money for the WRC in the next fiscal year. ICWP participants hope that a direct line to the oval office would prevent OMB from being of future influence over its existence.

Sen. Frank Church, Chairman of the Interior Sub-committee on Energy Research and Water Resources, reintroduced a bill that would make the Water Resources Council an independent agency reporting directly to the President.

With the reorganization plan, the office's director would be advised by two groups--federal and state. The federal group would be composed of representatives of the Departments of the Interior, Agriculture, Housing and Urban Development, Commerce, and Transportation, the Army, Environmental Protection Agency, and the Federal Power Commission. The state group would be composed of 12 people representing river basin groups and the National Governors Conference.

The conference has recommended that Congress authorize money for the office amounting to \$100,000 per state. From that, a fund would be available for a federal-state cost-sharing program for water planning in which the federal government would put forth two dollars for every dollar offered by the state.

NATIONAL WATER INFORMATION NETWORK OPENS LOCAL CENTERS

The U.S. Geological Survey, Department of the Interior, has announced a new service--the National Water Data Exchange (NAWDEX)--which will provide local assistance to governmental agencies and the public in identifying, locating, and acquiring available water data. It is centrally managed by a program office at the USGS National Center in Reston, Virginia, and now provides local services through a national network of 51 Local Assistance Centers located in 45 states and Puerto Rico. These Centers, linked by computer terminals, provide rapid access to information about the availability of more than 1 billion measurements of streamflow, groundwater levels, sediment discharges, and the quality of surface and groundwaters.

For services or information, contact: NAWDEX, U.S. Geological Survey, 421 National Center, Reston, Virginia 22092. Telephone: (703) 860-6031.

CONFERENCES

MUNICIPAL WASTEWATER SYMPOSIUM

Philadelphia, Pennsylvania will be the site for the symposium on "Municipal Wastewater and Sludge Recycling on Forest Land and Distributed Land." It will be held at the Marriott Motel on March 21-23, 1977.

The symposium will review and discuss current knowledge related to the environmental impact resulting from the application of municipal sewage effluent and sludge in forest ecosystems. Several sessions will be devoted to discussions on the utilization of sewage effluent and sludge for revegetation of land disturbed by mining activities.

The conference is being sponsored by The Pennsylvania State University, The Pinchot Institute for Environmental Forestry Research of the Northeastern Forest Experiment Station and the Environmental Protection Agency.

For more information, contact: Dr. William E. Sopper, Institute for Research on Land and Water Resources, The Pennsylvania State University, University Park, Pennsylvania 16802.

IRRIGATION RETURN FLOW QUALITY MANAGEMENT

Colorado State University and the U.S. EPA are sponsoring a national conference on "Irrigation Return Flow Quality Management," at Colorado State University, Fort Collins, Colorado on May 16-19, 1977. The conference will begin at 1:30 p.m. on the 16th and adjourn at 12:30 p.m. on the 19th.

The program will begin with the latest technical developments in irrigation return flow pollution and move on to a presentation of case studies of the Rio Grande Valley, San Joaquin Valley, Wellton-Mohawk Irrigation District, and Grand Valley. A banquet speaker from EPA will discuss the latest thinking in regard to non-point pollution sources and the P.L. 92-500, Section 208 Water Quality Management Planning activities and their role in irrigation return flow quality management. The last day of the program will deal with implementation.

The general objectives of the conference will be to present the combined results of EPA's research program, to integrate recent research results into an interdisciplinary approach, and to provide a forum for presenting and discussing the alternatives for implementing a national program of irrigation return flow quality management.

Further information may be obtained from: The Agricultural Engineering Department, Colorado State University, Fort Collins, Colorado 80523.
Telephone: (303) 491-8367.

SUMMER INSTITUTE IN WATER POLLUTION CONTROL

The 22nd Summer Institute in Water Pollution Control will be held on May 23-27, 1977 at the Manhattan College, Bronx, New York.

Two one-week courses will be offered: (1) Biological Waste Treatment; and (2) Mathematical Modeling of Natural Water Systems.

For further information, contact: Kathryn King, Program Coordinator, Environmental Engineering and Science Program, Manhattan College, Bronx, New York 10471.

1977 ENGINEERING SUMMER CONFERENCE

The University of Michigan is sponsoring a 1977 Engineering Summer Conference entitled, "Fluid Transients in Closed Conduit Systems," to be held in Ann Arbor, Michigan on July 11-15, 1977. The fee is \$350.

For more information, contact: E. Benjamin Wylie, 300 Chrysler Circle, North Campus, The University of Michigan, College of Engineering, Ann Arbor, Michigan 48109. Telephone: (313) 764-8490.

PUBLICATIONS

"GROUNDWATER LEVELS IN NEBRASKA, 1975"

A new report entitled, "Groundwater Levels in Nebraska, 1975," has been published in cooperation with the Conservation and Survey Division of the University of Nebraska-Lincoln and the U.S. Geological Survey. The authors are Michael J. Ellis and Darryll T. Pederson.

The report includes information on the following subjects: (1) declining groundwater levels in 1975; (2) large-scale use of groundwater causing significant water-level declines; (3) below normal precipitation; (4) infiltration of surface water diverted for irrigation; (5) water-level measurements and water-level data; and (6) installation of new irrigation wells.

Copies of the report are available for \$2.00 each plus sales tax from the Conservation and Survey Division, 113 Nebraska Hall, Lincoln, Nebraska 68588 or phone (402) 472-3471.

1976 MRBC PROGRAM REVIEW AVAILABLE

A report entitled, "Missouri River Basin State and Federal Water and Related Land Resources Programs -- Fiscal Years 1977-1981," is available for public distribution on a limited basis. It is the 1976 combined federal and state program review in the Missouri River Basin, describing the various state and federal water and related land resources planning, development and management activities both present and planned within the Missouri River Basin.

Copies may be obtained from: William C. Ramige, Missouri River Basin Commission, Suite 403, 10050 Regency Circle, Omaha, Nebraska 68114.

POSITIONS AVAILABLE

CIVIL ENGINEERING RESEARCH ASSISTANTSHIPS

The Department of Civil Engineering at the State University of New York at Buffalo invites applications for graduate study and research in Water Resources and Environmental Engineering leading to M.S. and Ph.D. degrees. Several research assistantships are available beginning in September, 1977. Annual research stipends vary from \$2,600 to \$4,850 and usually include tuition waivers.

For details and applications, write to: Dr. Dale D. Meredith, Program Coordinator, Water Resources and Environmental Engineering, Department of Civil Engineering, State University of New York at Buffalo, 4232 Ridge Lea, Buffalo, New York 14226.

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CIVIL ENGINEERING FACULTY POSITIONS

The Department of Civil Engineering at Buffalo announces three faculty position openings beginning September 1977. They are as follows: (1) Hydraulic Engineering with background in hydraulic dispersion processes; (2) Environmental Engineering specializing in physical-chemical treatment processes and/or disposal of waste on land; and (3) Geotechnical Engineering with specialization in foundation mechanics and design. Duties in all three include teaching and student advisement at the undergraduate and graduate level and initiating and carrying out one's own research program. Salary and rank are commensurate with qualifications, with a junior-level appointment preferred. Doctoral degree required.

Please direct inquiries to: George C. Lee, Chairman, Department of Civil Engineering, State University of New York at Buffalo, Buffalo, New York 14214.

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ENVIRONMENTAL ENGINEERING TENURED FACULTY POSITION

The University of Minnesota is offering a tenured position in the Department of Civil and Mineral Engineering, beginning September 16, 1977, in the area of water supply and pollution control engineering, emphasizing water and wastewater treatment. Duties will include teaching at the undergraduate and graduate levels. A strong commitment to research is expected. Applicants with a B.S. degree in Engineering and Ph.D. in Environmental Engineering (Water Resources) are preferred.

Submit letter of application, resume and the names of three professional references to: Professor C. Fairhurst, Head, Department of Civil and Mineral Engineering, 112 Mines and Metallurgy Building, Minneapolis, Minnesota 55455.

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RESEARCH REVIEW

Project Title: "Pollution of Irrigation Reuse Water by Plant Pathogens"

Principal Investigator: James R. Steadman
Department of Plant Industry
University of Nebraska-Lincoln

The critical need for irrigation water, emphasized by the recent drought and the need to increase irrigation efficiency have increased the pressure for reuse. An inevitable consequence of reuse is that water, after passing through fields with diseased plants or infested soil, may contain and thus disseminate the disease-producing organisms. The objectives of the project are (1) determine the extent of organismal contamination of irrigation reuse water and (2) develop methods to minimize plant pathogen pollution of irrigation water.

Systematic sampling of irrigation runoff and reuse systems in Nebraska demonstrated contamination of this water with plant pathogenic fungi, bacteria and nematodes. Inadvertent reuse of runoff water in the North Platte Project was found to be a primary source of phytopathogenic fungal and nematode pollution from 1972 to 1975. Phytopathogenic bacteria such as Xanthomonas phaseoli, cause of common blight disease of bean, also were detected in this project. In 1975 from over 50 samples collected in west central, central and eastern Nebraska, nearly 60% of corn fields showing symptoms of Goss's bacterial wilt (Corynebacterium nebraskense) had runoff or reuse samples which were positive for the bacteria in a bioassay test. In two instances detection of the organism preceded observation in the field. In 1976 the evidence of reuse water contamination by C. nebraskense was negligible due to low incidence and severity of Goss's wilt disease. However, bacterial survival studies and the design of reuse systems indicate that these organisms can be readily disseminated from one corn field to another.

Various methods could be used to minimize plant pathogen contamination of reuse water, but chlorination may be the simplest and least expensive. Selective assays for many phytopathogens are not available and attempts to find a simple test of water contamination analogous to the coliform test were unsuccessful. Thus, the development of an assay for antibiotic resistant mutants of X. phaseoli and C. nebraskense enabled experiments to be run in natural irrigation reuse water. Chlorine sensitivity of phytopathogenic bacteria was similar to the coliforms when tested in sterile distilled water. With most samples of irrigation reuse water used in the chlorine sensitivity experiments, a level of 2-12 ug/ml (ppm) is

is adequate to kill the bacteria. However, if irrigation water which has been injected with fertilizer is tested, much higher chlorine levels are needed for elimination of phytopathogenic bacteria. Extensive reuse water quality (pH, turbidity, alkalinity, hardness, solids, phosphate, etc.) assays have been conducted but have not been tested for interference with chlorination. Survival of phytopathogens protected in infected tissue and higher dosage rates needed to kill fungal resting structures and resistant spores are two problems that will have to be considered in further experiments. A field test of chlorination of contaminated corn reuse irrigation water also is planned.

QUESTIONS AND INQUIRIES

Newsletter items and inquiries should be sent to: Editor, Nebraska Water Resources Center, 310 Ag. Hall, East Campus, University of Nebraska, Lincoln, Nebraska, 68583, or phone (402) 472-3307.

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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