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Water Current

May/June 1982

Director's Memo

Federal Funding for Water Research

Congress has renewed interest in funding the Nebraska Water Resources Center and the 53 other water institutes at land-grant universities in the U.S. Two bills are now being considered.

Senate Bill (S.) 2494 was reported out of the Senate Environment and Public Works Committee in early May, just in time to meet the May 15 deadline for new appropriations measures. Senator James Abdnor (R-SD) is sponsor of this bill that would authorize \$8.1 million annually from 1983 through 1987 for the 54 water institutes.

Abdnor's bill requires a one-to-one match of non-federal with federal dollars for 1983-1984, a three-to-two match in 1985 and 1986 and a two-to-one match in 1987. The legislation would also authorize \$13 million on a one-to-one matching basis for institutes and other private and public institutions for research on specific problems. Projects in this category would be selected on a competitive basis nationally.

House Bill (H.R.) 6087, sponsored by Representative Les AuCoin (D-OR) is still in a subcommittee of the House Interior and Insular Affairs Committee. This bill essentially extends the present authorization for two additional years.

AuCoin's bill would provide \$110,000 for each of the 54 water institutes on a matching basis (a total of \$6.1 million annually). It also authorizes \$5 million for institute matching grants for 1983 and 1984, \$3 million for institutes and other organizations for nationally focused research in each of the two years, \$7.5 million for saline water conversion research and \$3.5 million for administration, technology transfer and information dissemination.

AuCoin's bill has several cosponsors, but the measure has not moved out of the Interior Committee's Water and Power Subcommittee. Even if reported out

of committee in the Appropriation Committee's Interior Subcommittee chaired by Sidney Yates (D-IL). Senator Yates has been a critic of the Office of Water Research and Technology (OWRT) program, which has historically disbursed funds to the 54 water institutes. However, the two bills do not specify that OWRT undertake the program. Furthermore, it has been proposed that OWRT be transferred into the Bureau of Reclamation.

The OWRT program has been criticized for producing a diffuse and duplicative research effort. To help alleviate this, the National Association of Water Institute Directors met in Washington, D.C. in early May to draft a plan for improved management of the program. A proposed system of peer review and regional coordination was developed similar to that used successfully by the network of agricultural experiment stations at the land-grant universities. The details of this system can hopefully be completed and incorporated into any rules and regulations associated with the proposed legislation.

The passage of the Senate bill seems more likely than the House bill. However, by meeting the May 15 deadline for introduction of new funding bills, it is more likely that the 54 water institutes may be funded through a continuing resolution in the fall if Congress fails to appropriate funds for the federal budget by Sept. 30, 1982.

I feel that the news from Washington is more encouraging than last year. If either of the proposed bills were passed, the Nebraska Water Resources Center could continue to participate in the national program by meeting the matching requirements.

—William L. Powers
Director



NEBRASKA WATER RESOURCES CENTER

Phase Three of Plan Done

The fruits of planning are becoming apparent as Phase III of the Water Center's effort to update its research and information programs nears completion.

The planning began in September when 50 water-wise citizens were invited to a workshop and asked to list, by importance, Nebraska water problems. Phase II began in February when University of Nebraska scientists were invited to a second workshop. They examined a list of 13 high-priority problems generated in September, identified information that already exists about the problems and suggested research that is needed to develop more information.

In Phase III, the Water Resources Center drafted a research plan. Those who attended the second workshop are now reviewing it.

The plan describes seven research programs that are designed to obtain information that can be used to address Nebraska's water problems and opportunities. The seven programs are:

- Water Quality: Nitrogen management for the protection and improvement of ground water quality

- Water Quantity: Technical, economic and political consideration of potential water development in Nebraska

- Water Quantity: Surface and ground water interactions

- Water Resources Management—Land use: Best management practices for land and water in fragile areas of Nebraska

- Water Resources Management—Conservation: Water conservation through ground water management and irrigation scheduling

- Legal, Institutional, Economic, Social and Political: Legal and institutional structure for water management in Nebraska

- Basic Research

The plan will advise public and private funding agencies of water research needs in Nebraska and how these needs can be met. The Water Resources Center will also use the plan to inform scientists of the center's research thrusts and to solicit research proposals.

Task Force Listens

The Sandhills Task Force spent June 3-4 at the Halsey 4-H Camp listening to people who work in the Sandhills express their concern about resource development and use in this region of the state.

Of important concern to extension agents, managers of natural resources districts and a Soil Conservation Service representative was the impact of irrigation development on water quality. Of particular concern was the possibility that nitrates and herbicides will move past the crop rooting zone into ground water. The officials also informed the task force that there is

a critical need for education related to managing resources and agrichemicals wherever irrigation development occurs.

Many of the 13 agents, NRD and SCS representatives present were worried about the social and economic impacts of irrigation development on Sandhills communities and the services the communities offer. Another concern was the impact of irrigation or other types of development on wet meadows, lakes and streams.

Wind erosion due to irrigation development, overgrazing, road systems and motorbikes was also a high-priority concern. Water erosion also was discussed.

The 13-member task force of faculty members from the NU Institute of Agriculture and Natural Resources will use the information it obtained in Halsey to identify future educational and research needs that IANR should address in the Sandhills.

Task force members are now studying the concerns that extension agents, NRDs and the SCS expressed at Halsey, and are compiling "mini-reports". Task force chairman Bill Powers, director of the Water Resources Center, said that the reports will be a final report for submission before the end of the year to IANR Vice Chancellor Roy Arnold.

Ecofallow & Irrigation Wed

A marriage has taken place between the ecofallow system of dryland farming and limited irrigation techniques in a newly initiated University of Nebraska research project.

Extension agronomist Gary Hergert of NU's North Platte Station revealed the objective of the study at the American Society of Civil Engineer's conference on water management here. The conference was held May 19-21 at the Nebraska Center for Continuing Education in Lincoln.

Ground water and surface reservoir declines in southwest Nebraska will seriously limit some irrigators in the coming years, Hergert said. A combination of ecofallow and limited irrigation may slow or stop the declines and prevent recently irrigated areas from reverting to dryland agriculture, he added.

Ecofallow is a dryland cropping system involving a rotation of wheat, followed by sorghum, soybeans, dry beans or corn. It was used on 900,000 acres in Nebraska last year, and projections indicate that farmers will use it on more than one million acres in 1982.

Reduced tillage is used in ecofallow to leave residues on the surface of fields. Residues catch snowfall, enhance the infiltration of precipitation into the soil, suppress evaporation and protect the soil from wind and water erosion. Weed control is critical to prevent using stored soil moisture, Hergert said.

Yields of corn and sorghum grown in an ecofallow system have surpassed dryland yields in 10 years of

research at the North Platte Station, Hergert said. Yields of about 65 bushels per acre were observed on the ecofallow acreage for both crops while 44 bushels per acre of sorghum and 35 bushels per acre of corn were produced on land farmed with conventional dry-land methods.

The research to date on limited irrigation indicates that crop yields are affected most by water stress during pollination and seed set, Hergert said. This new study of irrigation in an ecofallow system will determine when and how much water should be applied to obtain maximum yields. No more than six inches of water will be used for a crop.

Five crop rotations are being examined in the ecofallow-limited irrigation study, Hergert said. They include continuous no-till corn, continuous no-till winter wheat, and rotations of winter wheat-corn-soybeans, winter wheat-corn or winter wheat followed by soybeans. The wheat will be planted in these rotations immediately after the corn or soybeans are harvested.

The research project involves several NU specialists and spans several years.

"It would have been nice to start this five years ago because some farmers are already using some of the techniques we're researching out of necessity. Within five years, we will have results that may help farmers lengthen the life of their limited supplies of ground water," Hergert said.

Feds May Help PRF

Bereuter Sponsors Bills

Nebraska congressman Doug Bereuter has introduced two bills, one of which could provide funding for the Platte River Forum for the Future (PRF).

H.R. 6188 would authorize \$350,000 for the Bureau of Reclamation (BuRec) and Nebraska Natural Resources Commission to begin a border-to-border study of the Platte River in Nebraska. Some of the funds might be used for the PRF study of the central Platte River (See March/April *Water Current*).

The second bill, H.R. 6187 entitled the *Great Plains States Ground Water Demonstration Program Act of 1982* would authorize the BuRec to study the potential for ground water recharge in eight Great Plains states.

If approved, the BuRec would plan and establish demonstration projects for recharging aquifers in the geologically and hydrologically diverse states of Colorado, Kansas, Nebraska, New Mexico, Oklahoma, South Dakota, Texas and Wyoming. The BuRec would consult with the states, the U.S. Geological Survey and other departments in carrying out the study.

The study would include at least 12 sites for demonstration projects. These sites would be confined to areas having a declining water table, an available sur-

face water supply and a high probability of physical, chemical and economic feasibility for recharge of the ground water reservoir.

The states would be contracted to study, identify and evaluate alternative means by which the costs of ground water recharge projects could be allocated among the project beneficiaries. The economic feasibility and legal authority for using ground water recharge in water development projects also would be evaluated.

The two bills that Bereuter introduced are scheduled for hearings in June before the House Interior Subcommittee on Water and Power Resources.

Research Review

Project Title: *Evaluation of Legal and Institutional Arrangements Associated with Ground Water Allocation in the Missouri River Basin States*

Principal Investigators: J. David Aiken and Raymond J. Supalla, Associate Professors, Department of Agricultural Economics, University of Nebraska-Lincoln

The objectives of this project were: 1) to describe, compare and evaluate existing legal and institutional arrangements associated with ground water allocation for each state in the Missouri River Basin; and 2) to identify legal and institutional arrangements in selected states outside the Missouri River Basin which appear to effectively address basin ground water allocation problems, develop new legal and institutional arrangements and evaluate those alternatives, including implementation considerations.

Key ground water allocation issues include: (1) the legal theory for ground water allocation; (2) well interference conflict resolution policies; (3) ground water depletion policies; (4) resolution of conflicts between surface and ground water users; and (5) integration of water allocation and water quality protection policies.

In most Missouri River Basin states, a state license or permit is required before ground water can be used for most purposes. This gives the state a means of controlling ground water development and use. Well interference conflicts (and to a lesser degree, ground water depletion and surface-ground water use conflicts) are anticipated in many basin states by conditioning the issuance of a ground water use permit on the basis of injury to other water users.

Ground water depletion policies are not well defined. Some basin states have "critical area" legislation, which allows special regulation of ground water development and use when ground water depletion is occurring. Colorado policies are the most definite: ground water use permits are issued only where depletion rates have not been exceeded. Depletion rates are based on the economically recoverable quantity of water in the aquifer and recapturing the investment

costs of water extraction and use facilities.

Surface-ground water conflict resolution policies are to an extent anticipated in some basin states by conditioning the issuance of a ground water use permit on the basis of harm to an existing surface water use. Colorado policies again are the most definite: a proposed ground water user must make sufficient supplemental water available to compensate for the stream depletion effect.

Most basin states protect ground water quality through well drilling regulations.

This research project primarily evaluated state (and federal) policies relating to ground water allocation. If state legislatures are evaluating whether a ground water allocation statute should be enacted or modified, the research suggests what issues the statute should address and alternatives for addressing those issues.

If state administrative agencies are evaluating their administrative rules and regulations, the research results identify what approaches have been tried in other states related to similar ground water allocation issues.

Four publications were developed as part of this project: (1) Aiken and Supalla, *Ground Water Mining and Western Water Rights Law*, 24 South Dakota Law Review 607, 1979; (2) Aiken, *The National Water Policy Review and Western Water Rights Reform*, 59 Nebraska Law Review 327, 1980; (3) Aiken, *Nebraska Ground Water Law and Administration* 59 Nebraska Law Review 917, 1980; and (4) Aiken, *Ground Water Mining Law and Policy*, 53 Colorado Law Review, 1982 (in press).

Aquifer Symposium Slated

The Dakota Aquifer, a huge and very deep ground water reservoir underlying the Ogallala Aquifer, will be the subject of an Oct. 5-6 symposium in Lincoln.

Because of its depth, little is known about the Dakota Aquifer, which stretches from Canada to the High Plains. The U.S. Geological Survey, cosponsor of the symposium with the National Water Well Association, is now studying the formation.

The symposium sponsors have issued a call for papers. Suggested topics include conceptual models of the hydrologic system; aquifer evaluation and hydrology; natural water quality; water use; and aquifer protection.

For more information, contact Tony Vrana at the Nebraska Natural Resources Commission, State Office Bldg., 310 Centennial Mall So., P.O. Box 94876, Lincoln, NE 68509 (Phone: 402-471-2081). The agenda for the symposium will be published in *Water Current* when it becomes available.

Other Conferences

"Water Supply-The Management Challenge" is the subject of a March 14-16, 1983 conference at the Regency Hyatt Hotel in Tampa, Florida. The American Society of Civil Engineers is sponsoring this national speciality conference.

Program topics include: Ground water supply development and management; surface water supply development and management; impact and risk analysis; water law, policy, rights, regulation and management; system planning and analysis; water and energy relationships; reuse, recharge and waste disposal alternatives; water resources for developing countries; research, education and training; weather modifications to enhance water supply; innovative management techniques; and water conservation techniques.

Papers are invited and the deadline for submitting abstracts of 200-400 words is rapidly approaching. Send abstracts to ASCE Technical Program Chairman, William K. Johnson, Hydrologic Engineering Center, 609 Second St., Davis, CA 95616 (Phone: 916-756-3220).

"Global Water-Giving Life" is the theme of the 1983 International Safe Water Conference March 6-9 at the Hyatt Regency Hotel (Crystal City) in Washington, D.C. The objective of the conference is to promote worldwide development and deployment of safe water systems.

The deadline for submitting papers is Aug. 1. For topics or more information, contact Stephanie Loiacono, Global Water, Suite 300, 2033 M St., N.W. Washington, D.C. 20036 (Phone: 202-466-3528).

Gilley Serves on Board

James R. Gilley, an NU professor of agricultural engineering, has been appointed to the Irrigation Association's 12-member Board of Governors.

The board heads the new association-sponsored certification program for irrigation designers. It will test designers and make available to the public an annual directory of those it certifies.

Seminar Proceedings Available

Current Water Issues in Nebraska, the proceedings of the Nebraska Water Resources Center spring seminar series, are now available.

The 1982 seminars featured such timely topics as the High Plains-Ogallala Aquifer Study, interbasin transfers, the Norden Dam alternatives, irrigation in the Sandhills, and current state water legislation. Two or three seminars were devoted to most topics. In most cases, the topic was first introduced and explained objectively by a university staff member or a

representative of a state or federal agency. Succeeding seminars featured speakers with opposing views on the subject.

The NWRC staff hopes that the proceedings will serve as a useful reference on current water issues. The spectrum of viewpoints on each issue is presented side by side making the publication an especially informative document. Copies can be obtained at the NWRC office in Ag Hall.

Job Announcements

Position: Director, University of Wyoming Water Research Center.

Responsibilities: Plan, implement and coordinate the University of Wyoming Water Research program.

Training and Experience: Ph.D. with experience in water resources research. Successful development of contract and grant programs and outstanding publication record. Skills in interpersonal communication are essential. Research administration and graduate level teaching experience is desired.

Salary: Commensurate with qualifications.

Academic Rank: Commensurate with academic training and professional experience. This is an

11-month, tenure-track position; the director will be appointed within an appropriate academic department.

For a complete job description, contact the Water Resources Center or Dr. J. L. Smith, Search Committee Secretary, Depart. of Agricultural Engineering, 152 Vocational Annex Building, University of Wyoming, Laramie, WY 82071. Applications will be accepted until September 15, 1982.

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