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WATER RESOURCES NEWS

NEBRASKA WATER RESOURCES RESEARCH INSTITUTE
212 AGRICULTURAL ENGINEERING BUILDING

THE UNIVERSITY OF NEBRASKA
LINCOLN, NEBRASKA 68503

Volume 5 Number 5 May 1973

FROM THE DESK OF THE DIRECTOR . . .

Technology transfer is an important part of the total research process. It is simple in concept but more elusive in practice. Involved is a mix of the producer and his needs with the researcher and his limitations. There are language barriers, fiscal barriers, prejudices and other hurdles. Blending research and application requires skill and patience. Researchers need to be more aware of this. Guidelines to be followed include:

1. Identify User Organizations

   Successful research application requires identification of target groups to be served.

2. Involve User Organizations

   Technology transfer must be designed to include agencies, public interest groups, elected officials, community leaders and others along with the research team. Specific views of users and researchers must be coordinated.

3. Respond to Users' Needs

   Researchers often do not concern themselves with how conclusions or products of their research will be used.

4. Form Producer-User Teams

   Research producers and users should be brought together as a team in the problem-definition stage. The producer (researcher) must be motivated to seek the advice of the user in identifying problem areas that should receive attention.

5. Provide Adequate Educational Opportunities

   Research application is an educational activity. Its aim is to produce a change in the water resource environment by producing a change in people who manage water resources.

6. Provide Readable Reports and Encourage Users to be Report Readers

Many users are not qualified to read and digest highly sophisticated scientific publications. Reports that are both condensed and readable must be developed. Interest on the part of water users must also be generated so that they will take time to read and become better informed.

7. Resist Over-Researching New Technology

Frequent assessment must be made of on-going research to extract the most meaningful and useful technology at the time of need. The temptation to continue to refine is great. When results have been developed to the stage of utility, they should be put to work while improvements are being made.

8. Develop Active Rather than Passive Programs

Mere information dissemination is not enough because technology must be packaged in a form palatable to the user. Materials must be highly accessible.

9. Design Research Effectively

Projects should be designed for total problem solution. Perhaps the reason for inadequate technology transfer is the fact that there is no technology to transfer. Findings are sometimes difficult to put into use because research projects are not complete; the gaps have not been filled in. Individual projects may be relevant but difficult to transfer into use because they focus on only a component of the problem rather than the problem itself.

While some of these ideas might not fit all research programs, there are ample opportunities in the applied research field to provide a greater service and more rapid implementation of results.

REGIONAL

Deadline for Matching Grant Proposals

The deadlines for filing research proposals with the Water Resources Research Institute have now been established. Matching Grant proposals must be received not later than September 15, 1973 and Allotment proposals not later than December 15, 1973.

Prospective principal investigators should make an appointment to discuss their proposals with the Institute Director before they begin writing.

For further information, contact: Dr. Warren Viessman, Jr., Director, Water Resources Research Institute, University of Nebraska, 472-3307.

Institute Activities

The Nebraska Water Resources Research Institute has been awarded a two-year grant from the Office of Water Resources Research (OWRR) for a regional research project entitled "Identification and Analysis of Selected High Priority Water Problems and Related Research Needs of the Missouri River Basin." This project is a cooperative effort involving states in the Missouri River Basin: Nebraska, Colorado, Missouri, Kansas, Wyoming, Montana, Iowa, South Dakota and North Dakota.

The project objectives are: (1) identify the principal water resources problems of the Missouri River Basin; (2) determine the most reasonable alternatives for solving these problems; (3) identify research needed to permit cost-effective solutions; (4) evaluate mechanisms to implement the needed research; and (5) assign priorities, estimate approximate costs and evaluate funding opportunities.

Dr. Warren Viessman, Director of the Nebraska Institute, will act as coordinator and provide administrative support for the project. Gary Lewis, Associate Professor of Civil Engineering at UNL, will be assigned on a part-time continuing basis to compile information from the various states, effect liaison with the Missouri River Basin Commission staff, and assist in conducting Basin-wide Directors' meetings plus regional workshops to explore problem identification and research design.

The Nebraska Institute held a state workshop on regional research planning at the Nebraska Center on May 21, 1973. This meeting was attended by persons from both the academic community as well as representatives of key state and federal agencies interested in water resources management and development.

The purpose of the workshop was to test a problem-analysis format developed by Dr. Warren Hall of OWRR, as well as to identify major water resources problems in Nebraska and the Missouri River Basin. After considerable discussion, the participants identified the following as critical issues in the Missouri Basin: efficiency of water use; policies for land use planning; meeting water requirements; maintenance of environmental quality; nonpoint source pollution; legal and institutional aspects of water use; estimating water requirements; energy and related water needs; instream management of water; understanding groundwater-surface water relationships; water quality needs; erosion; how to involve public in planning process; and, flood damage mitigation.

These problems will be used by the Nebraska Institute to guide the development of its future research program.

Summer Institutes Announced at the University of Nebraska

Two one-week Summer Institutes for practicing professionals and academicians have been announced for the summer of 1973 at the University of Nebraska. The first Institute will be held from July 16-20 and will be entitled "Planning and Management of Urban-Metropolitan Water Systems." Topics to be discussed include urban hydrology, quantity and quality modeling, water supply, waste disposal, regional management of urban and industrial wastes, recycling and reuse and land disposal techniques. In addition, discussions on use of optimization techniques as tools for urban water planning and management will be included.

The second Institute will be held from July 23-27 and is entitled "Multiple Objective Water Resources Planning Techniques." Included in this Institute will be discussions of topics such as goals related to water resources, impact of water resources activities on quality of life aspects, the nature of ecologic systems, dynamic considerations in environmental assessments, techniques for determining environmental impact, and the multiple objective planning process.

Further information on these Institutes may be obtained by writing Dr. Warren Viessman, Jr., Director, Nebraska Water Resources Research Institute, 212 Agricultural Engineering Building, University of Nebraska, Lincoln, Nebraska 68503. Complete announcements are available; including course outlines and fees.

Increasing Irrigation Efficiency

The Department of Agriculture will conduct a $117,000 research project this spring at Grand Valley, Colorado aimed at increasing irrigation efficiency and reducing saline drainage.

USDA scientists plan to irrigate more often using less water to reduce the volume of water returning to the river; and, at the same time, cut the volume of salt in the drainage water.

This concept has been tried in smaller experiments, but this will be the first large-scale field study of the idea. The work will be conducted through the ARS area office at Fort Collins, Colorado.

Black Hills Natural Sciences Field Station

The universities and colleges in the state of South Dakota announced the formation of the Black Hills Natural Sciences Field Station. It will operate on and off the South Dakota School of Mines and Technology Campus. Campus facilities will be made available for use during the summer program in Biology, Geology, and Anthropology.

Courses will be taught in the varied field environments located within driving distance of the campus. Extended field trips are planned for some courses and lodging will be arranged.

Facilities made available for student use include classrooms, dormitories and recreational accomodations.

To obtain information on fees, admissions and course outlines, contact Dr. S. G. Froiland, Director, Black Hills Natural Sciences Field Station, Division of Natural Sciences, Augustana College, Sioux Falls, South Dakota 57102.

Construction or Destruction?

Nebrask's proposed Mid-State Reclamation Project has been included by the Environmental Policy Center in a list of what it terms the nation's 13 "most economically wasteful and environmentally destructive" water development projects. Other projects singled out for criticism include: Trinity River Canal in Texas, Cache River Channelization in Arkansas, Central Arizona Project, Garrison Diversion Project in North Dakota, Tennessee-Tombigbee Waterway in Alabama and Mississippi, Teton Dam in Idaho, Oakley Dam in Illinois, Central Utah Project, Sprewell Bluff Dam in Georgia, New Melones Dam in California, Duck River Dams in Tennessee, and Meramec Park Dam in Missouri.

The Mid-State Project is located in the Grand Island area and is designed to divert water from the Platte River into reservoirs for irrigation and to arrest the declining water table. Opponents declare this would destroy a major Great Plains wildlife habitat which serves major bird populations including: sandhill cranes; white-fronted geese; whooping cranes and bald eagles. The Environmental Policy Center also questioned the validity of congressional action (1967) authorizing Mid-State in view of the fact that the original project, with 23 reservoirs, has now been revised to three reservoirs.

Low Flood Losses

The flooding Missouri and Mississippi Rivers could have caused $2.5 billion in damages if not for the Corps of Engineers.

The $2.5 billion estimate was given to the Senate Public Works Committee by Lt. Gen. Frederick Clarke. At this time, Clarke said damages had been held to about $150 million. The Corps' projects that retained flood waters had cost $1.7 billion.

Chairman Jennings Randolph, D-West Virginia, welcomed Clarke's testimony and said it showed benefits are derived from works often described by critics as "pork barrel" projects.

Center for Environmental Studies

A recent development in South Dakota is the Center for Environmental Studies at the University of South Dakota.

This Center is an effort to coordinate information and activities in environmental areas and share the results with the public as well as the student body. It also attempts to stimulate interdisciplinary research and teaching programs in areas of environmental concern.

The goals of the Center are as follows: (1) development of sources of information in all listed areas of environmental concern; (2) maintenance of a list of speakers and consultants in each listed area; (3) sponsorship and conduct of seminars, workshops, and conferences concerning various pertinent environmental problems of the state of South Dakota; and, (4) sponsorship and development of interdisciplinary environmental research.

There are many areas of emphasis--including, geological, mineral and water resources; governmental research and environmental law; regional planning; zoning and land use; environmental public health problems; environmental education and information; air pollution and atmospheric problems; water pollution and waste disposal; business and economic resources and planning; student environmental concerns; American Indian environmental problems; outdoor recreation, sports and wildlife; highway beautification; human ecology and cultural environmental factors; and, ecological planning.

For further information about the Center, contact Webster H. Sill, Jr., Director, Center for Environmental Studies, University of South Dakota, Vermillion, South Dakota 57069, or phone (605) 677-5324.

Earth Tremor Control Method

U.S. Geological Survey scientists are confident they can control earthquakes to some degree by injecting and withdrawing water in deep wells.

Experiments performed at the Rangely oil field in northwest Colorado assure that some day it may be possible to prevent disasterous quakes along major faults such as the San Andreas in California by releasing built-up energy in small amounts.

Drs. C. B. Raleigh and J. H. Healy, USGS National Center for Earthquake Research, Menlo Park, California, and Dr. J. Bredehoeft of the Water Resources Division at Denver, successfully completed the first phase of earthquake research.

Dr. Raleigh said "Essentially, we have found that numerous small tremors can be stopped by the withdrawals of the water and tremors can be triggered by the injection of water."

These tests were prompted by the discovery that injection of liquid wastes into a deep well at the Rocky Mountain Arsenal near Denver seemed to trigger seismic activity.

Raleigh also stated that withdrawal of water from several wells at Rangely in 1970 was followed by a reduction in tremors. In 1971, water was injected, and the rate of small tremors increased.

NATIONAL

New Commissioner of Reclamation

President Nixon has appointed Gilbert G. Stamm as Commissioner of Reclamation. Stamm has been Acting Commissioner since April 1--succeeding Ellis L. Armstrong. He is a native of Denver, Colorado and has served with the Bureau since 1946.

The appointment is effective immediately but must be confirmed by the Senate. No opposition is expected.

Irrigation Considered Low Priority

Irrigating new lands for agricultural use is now considered "low priority" in government planning.

Warren D. Fairchild, Ass't. Reclamation Commissioner, told the American Water Works Association in Las Vegas that there has been a "major redirection" of the 71-year-old Bureau of Reclamation's planning programs.

Fairchild stated, "Investigations featuring irrigation of new lands for near and midterm requirements have a low priority today--if the objective is national economic development relating to the production of food and fiber. However, in selected areas, irrigation can be an extremely important objective in regional development."

He also noted, that in the future, the agency's water planning will focus on "such priority areas" as energy, land use and regional development.

Salinity Control Bill

Representative Harold T. Johnson, D-California, introduced a bill (H.R. 7774) to authorize a salinity control program for the Colorado River. Senator John V. Tunney, D-California, introduced it to the Senate (S.1807).

Representative Craig Hosmer, R-California, said the increasing salinity of the Colorado had "cast a shadow" over relations between Mexico and the United States and the $135 million program proposed in the bill would help alleviate the problem.

The program was developed by the Interior Department and approved by the Environmental Protection Agency. The bill authorizing the salinity control projects provides for the federal government to pay 75 percent of the costs with 25 percent to stem from revenues from federal dams in the Colorado River Basin. It also allows for immediate construction of the La Verkin Springs project on the Virgin River in Utah, the Paradox Valley project on the Delores River in Colorado and the Grand Valley irrigation improvement program in Colorado.

Streams Rich in Mineral Content

Storm runoff from city streets are adding noticeable amounts of lead, zinc and other heavy metals to the nation's waterways.

A report by the Environmental Protection Agency, released in April 1973, is based on studies conducted in 1971 in the following cities: San Jose, California; Phoenix, Arizona; Milwaukee, Wisconsin; Baltimore, Maryland; Seattle, Washington; Atlanta, Georgia; Tulsa, Oklahoma; and Bucyrus, Ohio.

The information presented in this report indicates that more attention must be paid to the problem of pollution from storm runoff, especially as wastes from industry and other municipal sources are reduced.

The 237-page report, "Water Pollution Aspects of Street Surface-Contaminants," No. EPA 23/2: 72-081, is available for $3 from the Superintendent of Documents, Government Printing Office, Washington, D.C. 20402.

Who Done It?

The Geological Survey reports that radiocarbon dating techniques can now be used to trace sources of industrial, municipal and agricultural carbon wastes in rivers.

Dr. Meyer Rubin, a USGS scientist, told the Geological Society of Washington that this method has been successfully tested on samples from the Potomac, Susquehanna and other eastern rivers.

Radioactive fingerprinting of wastes was made possible because organic wastes from sewage and feedlots contain radioactive carbon-14, and fossil fuel waste discharged by petrochemical plants does not. Scientists can tell how much waste comes from fossil fuel by measuring the carbon-14 concentration in a polluted stream.

Drastic Mineral Depletions Noted

A 722-page report, published by the U.S. Geological Survey, evaluates the nation's mineral resources. According to the study, minerals are seriously depleted and future supplies must come from sub-economic deposits or from potential resources yet to be discovered.

The nation is in excellent shape as far as evaporite salts, gypsum, sulfar and molybdenum are concerned, but there are only scant reserves of asbestos, chromium, flourine and mercury.

The report emphasizes that for most mineral commodities, our ability to meet projected needs to the end of the century will depend largely on the following: (1) development and continued application of new methods of finding ore in order to locate geologically available but as yet undiscovered sources; (2) development of new technologies for extraction of lower-grade ores; (3) finding sources of energy to make such low-grade extraction feasible; (4) recycling and conservation in mineral production and use; and, (5) imports from foreign sources.

A serious aspect of the mineral supply problem is the extent to which many commodity by-products are literally being wasted because there is no apparent economic incentive for recovering them during one processing. Some elements go into slurry ponds, slags, and up the flue. Examples of such commodities are vanadium in iron deposits; selenium, tellurium, and gold lost through in-place leaching of copper deposits; fluorine, vanadium, uranium, and rare earths in marine phosphate deposits; cadmium, bismuth, and cobalt in lead ores; and several metals in coal ash.

The report, "United States Mineral Resources," published as USGS Professional Paper 820, consists mainly of chapters written by more than 90 USGS geologists, most of whom have had many years of experience studying the geology of mineral deposits, and more particularly, the commodities about which they have written. Each chapter of the report contains not only a synthesis of the state of knowledge of the geology of the commodity, but also an appraisal of the known resources and an examination of the geologic possibilities for finding additional deposits.

Copies of the report may be purchased from the Superintendent of Documents, Government Printing Office, Washington, D.C. 20402, for $9.15 per copy domestic postpaid.

EPA Ordered to Release $6 Billion

The Environmental Protection Agency has been ordered to release $6 billion in waste treatment grant funds which were impounded by the White House.

On May 8, U.S. District Judge Oliver Gasch stated that he had "no choice" but to require EPA to release the funds as directed by Congress in authorizing appropriations of $11 billion for fiscal 1973 and 1974 under the Water Pollution Control Act Amendments of 1972.

Gasch said the language of the pertinent sections of the act clearly indicated the intent of Congress to require the administrator to release, at favorable times, the full sums authorized to be appropriated.

Gasch's ruling resulted from a suit brought by the city of New York in an effort to free funds frozen by the White House's plan to hold down federal spending.

Three federal courts have supported the fact that the President does not have the Constitutional power to confiscate funds alloted by Congress.

Senator Edmund S. Muskie, D-Maine, chief sponsor of the 1972 act said that this action confirms his belief that White House impoundment of appropriated funds is illegal.

Water Prospects in the West

In its April snowpack report, the Soil Conservation Service states that water shortages are "highly probable" this summer in parts of Oregon, Washington, central and northern Idaho, Montana and northern Wyoming. Because of below average snowpack, runoff from most streams in these areas will be from one-half to three-quarters of normal.

Above average snowpack in the Southwest means that snowmelt runoff in Arizona and southwestern Utah streams is expected to range from 2-5 times normal. The Rio Grande Basin has one of the highest snowpacks on record and Colorado and New Mexico may expect runoff of 1-1/2 to 3 times normal. Nevada and Utah can look ahead to "excellent" supplies and may even have high-water problems.

California's water supplies are expected to be adequate because of above normal snowpack in the mountains.

SCS notes that spring weather could still result in changes in forecasts.

RESEARCH REVIEW

Project Title: Measuring and Developing Methods of Attitude and Motivational Change in Implementing the Big Blue River Basin Water Plan

Principal Investigator: Edward J. McPartland, Assistant Professor, Department of Political Science, Doane College, Crete, Nebraska

Project Objectives:

1. To determine what demographic factors seem to be most related to people's attitudes toward water conservation.

2. To discover public attitudes toward various issues concerned with water conservation.

3. To test and compare methods of communicating knowledge about water conservation problems.

Research Results:

1. A close relationship to farming was less favorably associated with positive attitudes toward water resources use than any other demographic factor. This seemed to be due to the costs and interference with farming methods which the solving of some water resources problems might entail. Nevertheless, a majority of farmers had positive attitudes. They were simply less positive in degree than other groups which would be less affected by measures proposed in the questionnaire. Higher incomes, more years of formal education, younger age groups, and town residence were more closely associated with positive attitudes.

2. The most striking aspect of the results of specific issues was the generally positive nature of the attitudes. These concerned such issues as proper farming methods, small watershed development, and pollution abatement. Attitudes were positive, but to a lesser extent for recreational development. Farmers were divided over the issue of metering irrigation water and generally opposed government regulation of farming practices and the construction of large flood control reservoirs in their area.

3. Informational sources pervaded by personal contact and inducing personal involvement were more closely associated with significant short-term attitude change than more impersonal informational sources such as newspapers. In fact, there were 26.3 percent more instances of change associated with canvass and public meeting methods of communication. These results suggested that personalized informational methods may be the most effective means of communicating knowledge about water resources problems at the local communtiy level.

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INQUIRIES

Newsletter items and inquiries should be sent to Dr. Warren Viessman, Jr., Director, Nebraska Water Resources Research Institute, 212 Ag. Engineering Bldg., East Campus, Lincoln, Nebraska 68503 (402) 472-3307.