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Water Current

Volume 7 Number 3

March 1975

FROM THE DESK OF THE DIRECTOR . . .

by

William E. Splinter, Acting Director

One of the first major activities that I have been involved with since becoming Acting Director of the Nebraska Water Resources Research Institute was the "Research Overview" held March 20, 1975 at the Nebraska Center. In this session 18 project leaders reported on the results of their research activity for the past year. Although it is certainly a challenge to condense the results of a year's efforts to a 15-minute presentation, almost all of the participants were able to do so.

I was impressed by the scope of activities which are covered by the Nebraska Institute. Although I was previously aware of many of the projects (especially those concerned with irrigation or groundwater management), I was particularly impressed with the efforts directed toward biological control of blue-green algae in wastewaters. As everyone is aware, the lakes and ponds that have been constructed in eastern Nebraska over the last several years are highly subject to eutrophication because of erosion of the rich soils into the streams and thence into the ponds and reservoirs. Build-up of nitrogen and phosphorus is highly conducive to the generation of excessive algae with consequent reduction in the usefulness of these reservoirs for boating and fishing. The possibility of using biological controls to reduce the algal blooms is, in my opinion, a unique and interesting area of investigation. Speaking as a fisherman, I sincerely hope that the efforts of the researchers in this area will be successful.

All the project leaders are to be commended for the quality and depth of their undertaking, and although one could have wished for a greater turn out at the "Overview," we did have 35-40 people in attendance throughout the day.

I am finding the water resources research program quite interesting, and I can see that it can be very challenging professionally. I am hopeful, however, that my tenure as Acting Director will be relatively short and that we will be able to secure the services of a competent individual as Director within the near future.

NEBRASKA WATER RESOURCES RESEARCH INSTITUTE

ON THE HOMEFRONT

SEARCH FOR NWRRI DIRECTOR PROCEEDING

The Search Committee for a new Director for the Nebraska Water Resources Research Institute has been in operation now for one month under the chairmanship of Dr. R. W. Kleis. To date there are nearly 50 candidates for the position. The committee will proceed to act promptly in screening these candidates and selecting those for recommendation to Vice Chancellor Duane Acker. The committee intends to have its final report to the Vice Chancellor by April 14.

NEW ADDRESS FOR FORMER NWRRI DIRECTOR

Dr. Warren Viessman, Jr., former Director of the Nebraska Water Resources Research Institute, has the following new address:

Dr. Warren Viessman, Jr.
Senior Specialist in Engineering & Public Works
Environmental Policy Division
Congressional Research Service
Library of Congress
Washington, D. C. 20540
Telephone: (202) 426-5873

INSTITUTE PUBLICATIONS

The Nebraska Water Resources Research Institute announces a new publication entitled "NWRRI - A Profile." This brochure provides information on the objectives, administration, research program and education and technology transfer programs of the Institute. It will be useful to those interested in learning what the Institute does, what it has accomplished, and how it has helped to solve some of Nebraska's water problems.

Anyone interested in obtaining a copy of this publication should contact: Nebraska Water Resources Research Institute, 212 Ag. Engineering Building, University of Nebraska, Lincoln, Nebraska 68503.

REGIONAL NEWS

1975 NEBRASKA WATER CONFERENCE REVIEW

On March 10-11 the Nebraska Water Conference Committee and the University of Nebraska Board of Regents sponsored the 1975 Nebraska Water Conference with the theme "Land and Water Use Planning--A Case Study." Many vital issues related to the utilization and management of Nebraska's valuable water resources were discussed at the conference, and following are comments made by some of the conference speakers.

University of Nebraska Chancellor D. B. Varner presented the welcoming address and noted that "the investment of tax money by the State of Nebraska in research and pilot studies to develop methods of recharge which are feasible from engineering, economic and social viewpoints would be an investment in the future economic and social well-being of the people of Nebraska that would pay huge dividends for countless years to come." Dr. Varner touched on some encouraging developments for both agriculture and water resources interests in Nebraska including: (1) during the last two years the world has recognized the vital role of agriculture; (2) the climate for water resource projects is much better than it has been for years due to the lack of surpluses of agricultural commodities; (3) considerable progress has been made in achieving recognition by the many diverse interests in water that some new legislative guidelines are needed to protect and conserve groundwater supplies; and (4) the 1974 drought made it obvious that the total economy of Nebraska would have been much worse today were it not for the estimated five million acres of irrigated land in the state in 1974.

Concerning the 1974 drought in Nebraska, Doug Murfield, state crop statistician, estimated that it caused a one billion dollar loss in the value of corn, sorghum, soybeans, wheat and hay. For example, if 1974 had been a normal year, corn grain yields would have been about 116 bushels per acre, irrigated; 74 bushels, non-irrigated; and 13 tons per acre corn silage. The value of these corn crops would have totaled \$2.158 billion.

Instead, Murfield related, irrigated corn produced 103 bushels per acre, non-irrigated produced only 26 bushels per acre, and silage yield were 7.5 tons per acre. Their value totaled \$1.647 billion, down about one-third from what would have been normal.

On the topic of land use, David Deal, staff counsel for regulations in the Interior Department's Office of Land Use and Water Planning, said that two bills have been introduced, one in the Senate and one in the House of Representatives, while the Department is readying a version which may become a Ford Administration-backed bill. Federal entry into the land use legislation field would make dollars and technical assistance available to resource-short states, Deal explained. One of the thrusts of the federal legislation would be to push states into a larger role in land use management and decision making.

Features of federal land use legislation awaiting consideration include development of land use policies which include economic, social and environmental concerns; a commitment of not just planning but also action; a framework which is reflective of state, regional and local goals; provision for intergovernmental coordination; consistency between federal and state land use planning concepts, with the federal government bowing to state policy on non-federally owned lands in a state; and meaningful public participation (the "open planning process") involving citizen input in the planning process.

Proceedings from the 1975 Nebraska Water Conference will be available for those who did not register to attend; however, charges have not yet been determined. To order a copy of the proceedings, contact: Dr. Leslie F. Sheffield, Coordinator; Irrigation Development Program; 106 Ag. Hall; University of Nebraska; Lincoln, Nebraska 68503.

UNDERGROUND WATER PUMPING BILL TO LEGISLATURE

LB 577, a bill setting up the mechanics for control of underground water pumping in water-short areas, has been sent to the floor of the Nebraska legislature by the Public Works Committee.

A principal control measure included in the bill is the equal allocation (or rationing) of water among all pumpers, regardless of the age of the well. It would allow new wells to be drilled in water-short areas and would allow new owners to pump water on an equal basis with older wells. The Public Works Committee defeated a proposed amendment which would have allowed control measures in water-short areas to include an allocation system based on the age of wells. Senator Maurice Kremer, chairman of the Committee, and others contend that up to 95 percent of Nebraskans favor a control system that allocates water evenly among all pumpers, regardless of when a well may have been drilled. The attorney general has issued an opinion that owners of older wells who are limited on the amount of water they can pump may be entitled to compensation, since underground water is a property right.

ENVIRONMENTAL SPECIALIST JOINS MRBC PLANNING STAFF

An environmental specialist has joined the planning staff of the Missouri River Basin Commission (MRBC). Donald A. Becker, 36, has been associate professor of biology at Midland Lutheran College, Fremont, Nebraska, for the past seven years. His duties included research as well as teaching.

As an environmental specialist in comprehensive river basin planning, Becker will evaluate effects of water and related land resources development and review, coordinate and prepare environmental statements. He also will serve as a liaison to ensure close cooperation among MRBC members regarding the Endangered Species Act.

Becker was a graduate of Valley City (N.D.) State College in 1960. He earned his master's degree (1962) and doctorate (1968) at the University of North Dakota in Grand Forks.

FEDERAL HIGHLIGHTS

FY 1976 PROPOSED WATER BUDGETS

The Administration has submitted to Congress its recommendation for fiscal year 1976 water-related programs. Following its policy of recent years, the Administration has given priority to maintaining schedules for projects nearing completion and emphasizes energy production, municipal and industrial water supply and urban flood control. Following are some elements of the Administration's proposed budget:

Office of Water Research and Technology

The budget for the Office of Water Research and Technology (composed of the former Office of Water Resources Research and the Office of Saline Water) is \$18,327,000, a reduction of \$1,465,000 from FY 1975. Water Institutes in the 50 states and Puerto Rico would receive \$110,000 each for their annual allotment with the District of Columbia, Guam and the Virgin Islands funded at \$40,000 each, the same as last year. An additional \$3,000,000 has been proposed for matching grants.

Approximately \$3 million is requested for saline water research, and that amount is contained in H.R. 3109 "to continue the nation's commitment to research into and development of reclaiming sea and brackish water."

Bureau of Reclamation

The Bureau of Reclamation's proposed budget is over \$600 million. The Bureau's 12-month program calls for continued construction on 69 projects or major units or divisions of projects, for a total construction budget of \$403.3 million. The funds requested call for continuation of planning on 53 projects and initiation of planning on four others--two energy related developments (Upper Colorado Resource Study--feasibility; and Western Energy Expansion--appraisal), and two total water management studies covering the Lahonton Basin, California and Missouri River upstream of Gavins Point.

The overall FY 1976 request represents an increase of \$87.3 million over FY 1975. Of the increase, \$57.5 million is for construction activities, \$25 million for operation and maintenance, and \$1 million is for investigations.

Corps of Engineers

The appropriation requested for the Army Corps of Engineers in the 18 western states is about 30 percent of the total budget of \$2 billion. The budget for construction also includes \$4 million for small projects for flood control and \$1 million for emergency streambank and shoreline protection.

U. S. Geological Survey

The U.S. Geological Survey's proposed budget to cover investigations of the nation's water resources during fiscal year 1976 totals \$56,426,000--an increase of \$2,548,000 over FY 1975. This represents about 20 percent of the total USGS budget proposed for FY 1976.

The increase is primarily for obtaining water data needed for the development of new energy resources. During fiscal year 1976, the additional effort will be focused on water resources studies related to the development of oil-shale deposits, site selection for nuclear power plants and disposal of radioactive wastes.

Federal program funds will be used for water data collection, resources investigations and research activities in which the federal interest is paramount, including water resources investigations on public lands, studies of river basins and aquifers that cross state boundaries and other areas of international or interstate hydrologic concern.

Water Resources Council

The Administration has recommended a reduction of \$2 million from the amount authorized under Title III of the Water Resources Planning Act for fiscal year 1976. The total requested for the agency is \$9,670,000, of which \$2 million is for the National Assessment; \$1.8 million for Regional and River Basin Plans; \$1.3 million for River Basin Commissions; and \$1.5 for Administration and Coordination; and the \$3 million for planning grants.

WATER RESOURCES COUNCIL BEGINS STUDY ON COST SHARING

A special interagency team of the Water Resources Council has begun its study on Planning and Cost Sharing Options for Water and Related Land Programs. The major avenue for public involvement will be through the National Conference on Water scheduled for April 22-24 in Washington, D.C. The views expressed at the conference will be closely studied by the Water Resources Council.

According to the Plan of Study, the first step in the Cost Sharing investigation will be to summarize the current situation in federal and federally-assisted water resources programs. The purpose of this summary is to provide a perspective from which to view the subsequent parts of the study.

The second step will be the development of policy options. This will consist of an analysis of the major issues with particular emphasis on the relationship and significance of each issue (planning objectives, discount rate and cost sharing) to federal and federally-assisted water resources programs. On the basis of the analysis, alternative policy options for each study issue will be formulated.

In the third phase of the study, the policy options will be combined and evaluated as "policy option packages" for appropriate water resources programs. These policy packages will serve as a basis for analyzing major tradeoffs within water resources planning at both the project and programmatic levels.

The final step will be the summarization of the results of the analyses of the foregoing and the preparation of preliminary conclusions on which the Council of Members and the President will have sufficient information to make policy recommendations. The schedule is for the interagency team to complete a report by June 1 and for the Council of Members to make recommendations to the President by July 1.

FEA PROJECTS RAIL AND BARGE SHORTAGES FOR COAL TRANSPORT

In back-up studies to support its "Operation Independence" recommendations, the Federal Energy Administration (FEA) has noted that increased domestic coal production is likely to cause more commerce than both railroads and barge carriers can currently accommodate. The FEA reported that the increased demand for coal carriage will probably be in direct competition with grain movement needs during certain times of the year.

The agency said that competition for barges and tows "is already fierce" on the Upper Mississippi at grain harvest time, and increased coal production in Montana, Wyoming and North Dakota will require major expansion by both the Western railroads and the Upper Mississippi Waterway.

CONFERENCES

ENERGY FORUM SET APRIL 8

A conference entitled "AAForum on Energy for Nebraska" to be held April 8 has been announced by Lt. Gov. Gerald T. Whelan and Dean George Hanna of the College of Engineering and Technology. The forum will be held at the Center for Continuing Education.

Governor J. James Exon will discuss "Nebraska's Future Growth and Needs" at the conference luncheon. The keynote address will be presented by Ralph Shaw, general manager of the Omaha Public Power District. The federal government will be represented by two Federal Energy Administration officials and by Deputy Assistant Secretary of Commerce Don Johnson. John Lagerstrom, Director of Engineering Extension at NU, will discuss Nebraska's energy balance. A panel featuring university faculty members, Lincoln City Council woman Sue Bailey and Tom Hirt of Northern Natural Gas will react to the speakers' remarks.

In announcing the forum, Whelan expressed the hope that it would do more than emphasize conservation and discuss the present crisis. "For instance, engineers at the university have done a remarkable job in developing

techniques and methods for conserving energy and tapping little known sources, all of which could be useful to Nebraska farmers," he said. "I hope this forum will be a kickoff for a major energy development effort in Nebraska," Whelan noted.

The forum will be followed by additional concentration on the energy topic at the university's annual Engineer's Week program, April 11- 12.

NATIONAL CONFERENCE ON WATER

As reported last month, the U.S. Water Resources Council is sponsoring a National Conference on Water to be held April 22-24 at the Washington Hilton Hotel in Washington, D.C. The program has now been formulated. Presiding at the opening plenary session will be John Nassikas, Chairman of the Federal Power Commission. The keynote address will be presented by Rogers C. B. Morton, Chairman of the Water Resources Council. Other presentations will be made by Howard H. Callaway, Secretary, Department of the Army; Earl L. Butz, Secretary, Department of Agriculture; and Russell W. Peterson, Chairman, Council on Environmental Quality.

The second day of the conference will consist of eight concurrent panel sessions on: (1) water and energy; (2) water, food and fiber; (3) water, transportation and commerce; (4) water and municipalities and industries; (5) water and environment and outdoor recreation; (6) flood damage reduction; (7) water laws, water rights and institutional arrangements; and (8) the role of federal, state and local governments.

The registration fee is \$35. If you have any questions on the conference, or if you want to observe, please write or call Mr. Richard Brown; National Conference on Water; U.S. Water Resources Council; 2120 "L" Street, N.W.; Washington, D.C. 20037, telephone (202) 254-6305.

WATER REUSE CONFERENCE

The Second National Conference on "Water Reuse: Water's Interface With Energy, Air and Solids" will be held May 4-8, 1975 at the Palmer House in Chicago. The conference is sponsored by the American Institute of Chemical Engineers and the Environmental Protection Agency.

Conference sessions will include: power generation; heavy metals in the environment; deepwater ports; land disposal of agricultural wastes; cooling towers; water reuse; land disposal of wastewaters and sludges; the air-water interface; energy; technology transfer in water reuse; water's interface with solids; treatment; processes; integrated systems; and many others.

For further information and a copy of the final program, contact: the American Institute of Chemical Engineers; 345 East 47th Street; New York, New York 10017.

ONE WEEK SUMMER PROGRAM

The R. M. Parsons Laboratory for Water Resources and Hydrodynamics at M.I.T. is presenting a special one-week summer program on "Engineering and Environmental Aspects of Heat Disposal from Power Generation" June 9-13, 1975.

The program is designed for engineers, ecologists, educators, members of the utility industry and regulatory agencies who are concerned with the problem of heat disposal associated with fossil and nuclear power generation. Topics will include: mathematical and physical modeling of once-through cooling systems in lakes, rivers, estuaries and the ocean; heat dissipation in cooling ponds, spray modules, wet and dry cooling towers; analysis of potential ecological effects; field measurement of physical and biological parameters; regulatory legislation and procedures.

For further information, please contact: Director of the Summer Session; Room E19-356; M.I.T.; Cambridge, Massachusetts 02139.

WATER RESOURCES INSTITUTE PLANNED

Colorado State University is sponsoring an Institute on Application of Stochastic Methods to Water Resource Problems June 30-July 11, 1975. The purpose is to provide an overall perspective or integrative framework of the basic concepts, principles and methods involved in the practical application of stochastic methods to water resources problems. This will include a reasonably comprehensive review of the state-of-the-art in applying stochastic methods, illustrations of the practical usefulness of stochastic processes to water resources problems and a description of the potential and limitations of using stochastic methods and future research directions in this area.

Participants will include individuals dealing with various aspects of water resources problems. The course content is "application oriented." Tuition is \$550 per person plus room and board, and attendance will be limited.

For additional information, contact: Dr. H. W. Shen; Professor of Civil Engineering; Engineering Research Center; Colorado State University; Fort Collins, Colorado 80523, telephone (303) 491-8552.

WATER RESOURCES MANAGEMENT CONFERENCE

"A Better Life Through Water Resources Management" is the theme of a specialty conference to be held July 9-11, 1975 at Colorado State University, Fort Collins, Colorado. The conference is sponsored by the Technical Council on Water Resources Management and Planning of the American Society of Civil Engineers.

The conference, which will be followed by scenic and educational tours of the Rocky Mountains and major water resources projects in that area, will stress the positive effect that proper water management and development can have on the environment, ecology and social conditions. Sessions will include: Legal Aspects of Water Management; Theoretical and Practical Aspects of Analysis of Large-Scale Water Resource Systems; Innovations in Water Resources Planning; Experiences in Applying Systems Analysis Techniques; Innovations in Urban Water Planning; Integrated Operations of Small Agencies in Large Systems; Bringing Water Resources Practitioners into Research Planning; Operations Feedback to Planners; and Big Issues in Water Resources.

For additional information and reservations, contact: Dr. Neil S. Grigg; Professor of Civil Engineering; Water Resources Systems Program; Engineering Research Center; Foothills Campus; Colorado State University; Fort Collins, Colorado 80523.

PUBLICATIONS

USGS BEGINS DIRECT SALE OF EARTH-SCIENCE REPORTS

Beginning April 1, 1975, publications of the U.S. Geological Survey, previously sold by the Government Printing Office, will also be available directly from the USGS.

Reflecting greatly increased interest in earth-science reports, the USGS will become one of the few agencies authorized to act as an agent of the Superintendent of Documents, U.S. Government Printing Office, in the sale of federal reports. The move is expected to provide faster order-filling service and to increase the availability of earth-science information to both the scientific community and the general public. At the same time the USGS will be able to stock and sell many of the out-of-print reports no longer carried by the Superintendent of Documents.

The USGS publishes hundreds of scientific books as well as thousands of maps every year, covering a wide range of topics, including earthquakes, volcanos, floods, local geology and water supplies, worldwide energy and mineral resources, U.S. gold deposits, dinosaurs, geology of the Moon, and the Ice Age.

Pre-paid mail orders for these publications, as well as requests for additional information, should be sent to the Branch of Distribution; U.S. Geological Survey; 1200 South Eads Streets; Arlington, Virginia 22202. Orders may also be placed through the USGS Public Inquiries Offices in Washington, D.C., Los Angeles, San Francisco, Denver, Dallas, Salt Lake City, Spokane, and Anchorage. Checks or money orders should be payable to U.S. Geological Survey, and publications should be identified by title, series, and number.

ENERGY RESEARCH NEEDS

The proceedings of a workshop conducted by the University of Illinois at Urbana-Champaign to define research needs related to water for energy are now available. Among the research needs considered most important were the following: (1) determining availability and quality of water for energy conversion plants, taking into account the legal, social and environmental implications and developing methods to conserve water; (2) studying the character, transport, fate and environmental impact of coal conversion waste products; (3) evaluating and developing waste treatment methods and methods of recycling wastewater; (4) analyzing techniques for and effects of heat dissipation from energy conversion plants, with emphasis on water conservation, meteorological effects and other environmental impacts; (5) studying the overall energy budget for conversion processes to ensure optimum utilization of energy resources and developing energy conservation techniques; and (6) assessing the probable socio-economic impact of expanding the coal mining and conversion industries.

Copies of Research Report No. 93 may be obtained by writing the Water Resources Center; University of Illinois; 2535 Hydrosystems Laboratory; Urbana, Illinois 61801.

RESEARCH REVIEW

Project Title: Biophysical Control of Water Loss

Principal Investigator: Charles Y. Sullivan, Associate Professor of Agronomy, USDA-ARS

This project was designed to give a better basic understanding of the biophysical and physiological aspects of plant water utilization. Emphasis has been placed on mechanisms in corn and sorghum. Others have given attention to measurement of water utilization by plants and the environmental conditions which contribute to high water use through evapotranspiration, but relatively little attention has been given to the physiology of the plant in controlling water loss. The objectives of the projects are: (1) to investigate the nature of plant water conservation mechanisms and physiological responses to water deficits on processes such as photosynthesis, respiration, flowering and development of the fruiting body; (2) to relate these responses to the physiological and biophysical mechanisms of drought resistance; and (3) to use this knowledge in the development of practical methods of selecting and plant breeding of genotypes which economically produce with minimum water use.

Stomatal closure is the primary means by which plants control water loss. Under controlled conditions it was found that corn stomata closed at slightly higher water potentials (less stress) than those of sorghum. On subsequent drought and rewatering cycles, sorghum stomata remained slightly open for longer periods of water stress than those of corn which

remained closed. When sorghum stomata closed they were more effective in retarding water loss. Quantitative measurements of extractable leaf cuticular substance from corn and sorghum showed that the sorghums had significantly more "waxy" substances covering the leaves. Also, measurements of cuticular substance from thirteen field grown sorghum genotypes showed that some genotypes had over three times as much cuticle as others.

Since control of water loss from corn is less effective after stomatal closure than in sorghum, leaf drying continues and cellular desiccation injury often occurs. It has been shown that corn cells have an inherent mechanism to tolerate the greater desiccation stress, but it is often inadequate to prevent serious leaf injury. A leaf disc technique has been developed to select plants with greater cellular adaptation to desiccation and heat tolerance.

When transpiration is reduced and evaporative cooling decreases, leaf temperatures usually increase and secondary heat injuries may result. The leaf disc technique was used to select several sorghum lines with high, medium and low desiccation and heat tolerances. Hybrids made from these selections showed a good correlation between heat tolerance levels during drought and high temperature stress periods and yield in 1974. Leaf diffusive resistance to water loss and leaf temperatures were higher during stress periods in those with higher tolerance levels. Parent lines of some of the tolerant hybrids were also shown to maintain higher photosynthesis rates at higher temperatures and under greater water stress than control commercial hybrids.

The study indicates that selections can be made for plant mechanisms which help control water loss, but the results also point to the importance of considering other responses that may occur as a result of the selection.

PEOPLE IN THE NEWS

BUTCHER NAMED WATER RESEARCH DIRECTOR

Dr. William S. Butcher of Austin, Texas, has been named Director of the Office of Water Research and Technology (OWRT), Secretary of the Interior Rogers C. B. Morton has announced.

Dr. Butcher comes to the post from The University of Texas at Austin, where he was Professor of Civil Engineering. From January 1971 to January 1973 he served as Assistant to the President's Science Adviser in the Office of Science and Technology, Executive Office of the President. He was Associate Director of the Water Resources Research Center of the Desert Research Institute, University of Nevada, Reno, from 1967 to 1969.

"We are fortunate to find such a highly qualified person as Dr. Butcher," Morton said, "He has the scientific background, the executive experience, and the academic stature required to direct OWRT's programs."

The Secretary noted that OWRT's programs include more than a thousand research projects in the 50 states, Puerto Rico, the Virgin Islands, and Guam. The research is designed to assist in meeting rapidly growing demands for water resources, clean streams, and new water supplies. OWRT awards grants and contracts to State research institutes, universities and private firms. The Office also directs the Federal Government's projects in desalination of sea, brackish and waste water.

QUESTIONS AND INQUIRIES

Newsletter items and inquiries should be sent to: Newsletter Editor; Nebraska Water Resources Research Institute; 212 Ag. Engineering Building-East Campus; University of Nebraska; Lincoln, Nebraska 68503; or phone (402) 472-3307.

NEWSLETTER ITEMS SOLICITED

The Water Current Newsletter will publish, without charge, announcements, programs for up-coming conferences, employment opportunities or other newsworthy items on hydrology, water resources or related topics. To insure timely publication, submit items before the 25th of every month.

PUBLICATIONS RECEIVED BY THE INSTITUTE

C. Y. Thompson Library

1. Eutrophication of Lake Tahoe Emphasizing Water Quality, Charles R. Goldman, National Environmental Research Center, Office of Research and Development, U.S. Environmental Protection Agency, Corvallis, Oregon, December 1974.
2. Acid Mine Water - A Bibliography, Water Resources Scientific Information Center, Office of Water Resources Research, U.S. Department of the Interior, Washington, D.C., February 1975.
3. Automated Analysis of Individual Refractory Organics in Water Polluted, W. Wilson Pitt, Robert L. Jolley, Sidney Katz, Office of Research and Development, U.S. Environmental Protection Agency, Washington, D.C., August 1974.
4. Influences on Wastewater Management on Land Use: Tahoe Basin 1950 - 1972, James E. Pepper, Robert E. Jorgensen, Office of Research and Development, U.S. Environmental Protection Agency, Washington, D.C., October 1974.
5. The Significance and Control of Wastewater Floatables in Coastal Waters, Robert E. Selleck, Lloyd W. Bracewell, Ralf Carter, Office of Research and Development, U.S. Environmental Protection Agency, Washington, D.C., January 1974.
6. Modal Cities, George B. Pidot, Jr., John W. Sommer, Office of Research and Development, U.S. Environmental Protection Agency, Washington, D.C., October 1974.
7. A Generic Methodology to Forecast Benefits from Urban Water Resource Improvement Projects, prepared for the Office of Water Research and Technology, U.S. Department of the Interior, by David M. Dornbusch & Company, Inc., San Francisco, California, November 1, 1974.

NWRRI Library

1. The Vulnerability of Crop Production to Energy Problems, Barry Commoner, Michael Gertler, Robert Klepper, William Lockeretz, Center for the Biology of Natural Systems, Washington University, St. Louis, Missouri, January 1975.
2. Analyses of the Effect of Urbanization on Rainfall Characteristics - I, Ramachandra A. Rao, R. G. Srinivasa Rao, Purdue University, Water Resources Research Center, West Lafayette, Indiana, December 1974.
3. Probabilistic Analysis and Simulation of the Short Time Increment Rainfall Process, Ramachandra A. Rao, B. T. Chenchayya, Purdue University, Water Resources Research Center, West Lafayette, Indiana, December 1974.
4. Division of Earth Sciences - Annual Report July 1973-June 1974, National Academy of Sciences, Washington, D.C.
5. Research Reports Supported by the Office of Water Research & Technology Under the Water Resources Research Act of 1964, U.S. Department of the Interior, Office of Water Research & Technology, Water Resources Scientific Information Center, Washington, D.C., Received during the period of July - December 1974.
6. Attitudes Toward Water Use Practices Among Southeastern Idaho Farmers: A Study on Adoption of Irrigation Scheduling, John E. Carlson, Idaho Water Resources Research Institute, University of Idaho, Moscow, Idaho, January 1975.
7. Arid Lands Research, University of Arizona, Tucson, Arizona, 1975.
8. Our Natural Resources: The Choices Ahead, U.S. Department of the Interior Conservation Yearbook Series No. 10, U.S. Department of the Interior, Washington, D.C., 1974.