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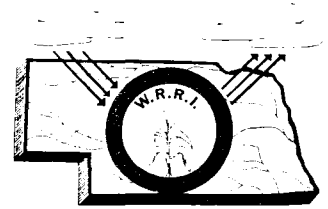
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WATER RESOURCES NEWS

NEBRASKA WATER RESOURCES RESEARCH INSTITUTE
212 AGRICULTURAL ENGINEERING BUILDING

THE UNIVERSITY OF NEBRASKA
LINCOLN, NEBRASKA 68503



Volume 5 Number 8

August 1973

FROM THE DESK OF THE DIRECTOR . . .

This is the second review of the National Water Commission Report. Chapter 2, entitled "Water and the Natural Environment," discusses the environmental effects of water projects and water use. In order to protect and achieve environmental quality, the Commission believes that it is necessary to (1) understand and be able to predict the primary environmental effects which a particular water program, project, or use, and the alternatives to it, including no development, may produce; (2) assess the secondary effects which are likely to be produced and the broader environmental costs and benefits which are likely to result; and (3) take environmental values and processes into account in selecting among alternatives, so as to accommodate those values or processes, or, where a conflict of values is necessarily present, to reach an informed and balanced judgment as to what will best serve the public interest.

In this chapter the Commission discusses the environmental effects of reservoir development, estuaries and the coastal zone and channelization. Potential water resources programs and projects need to be approached carefully and analyzed comprehensively so they do not produce unexpected and environmentally unacceptable results. The discussion and recommendations in this chapter apply only to environmental considerations.

The following conclusions and guidelines on water development projects are presented in Chapter 2: (1) Develop an adequate data base. (2) Conduct further research into the environmental impacts of water resource development. (3) Utilize planning techniques which are sensitive to ecological processes and environmental values. (4) Develop rigorously and present as clearly as practicable the environmental impacts associated with a proposed water resources project and the available alternatives. (5) Reach a decision. (6) Monitor environmental consequences.

One of the major premises of the Commission report is that water resources and water quality planning must be integrated with land-use planning. This is especially true in the coastal zone and

in upstream areas where land use affects estuaries. Decisions about where, whether, and how to dredge and fill, develop real estate, preserve natural systems, locate industries, and dispose of wastes determine to a large extent the possible uses and the environmental health of the waters and associated shorelands of the coastal zone.

The Commission recommends that "water resources development plans and projects should include measures to protect the estuarine and coastal waters and marshlands. The cost of measures required for such protection should be included in the joint costs of proposed projects and borne by the beneficiaries of the projects, except where federal policy authorizes nonreimbursable allocations to be borne by the federal government for benefits of widespread or national scope that cannot be traced to particular beneficiaries."

With regard to channelization, the Commission believes that most such projects produce both beneficial and detrimental effects, just as do all other measures used in developing water resources. The evidence placed before the Commission makes it impossible to avoid the conclusion that in many cases insufficient weight has been given to the detrimental consequences of channelization, and particularly to losses not readily expressible in monetary terms. They recommend that "all agencies responsible for planning and carrying out channelization projects should broaden and otherwise improve their evaluation procedures, making a special effort to reflect in the cost estimates damages caused by increased downstream flooding and sedimentation, lowering of groundwater levels, and loss of fish and wildlife habitat and esthetic values. The full cost of continuing maintenance should also be reflected." The Commission also believes and recommends that as another means of insuring that future channelization projects are truly in the national interest, the direct beneficiaries thereof should be required to assume any costs properly allocable to the purpose of increasing the value of private lands. This would serve to dampen the desire of landowners to make more intensive use of wetlands and of lands subject to frequent inundation.

REGIONAL NEWS

Underground Dam Provides Water Supply

The U.S. Geological Survey recently reported that the serious water supply shortages of the mid-60's at the Mount Rushmore National Memorial, South Dakota, have been alleviated by a well that taps water backed up behind a natural underground rock dam.

A 50-page report has been published by the U.S. Geological Survey entitled "Water Resources and Geology of Mount Rushmore National Memorial, South Dakota." It is complete with detailed maps of the geology and hydrology of the Mount Rushmore area and describes the water resources and geologic history of the area.

Prepared in cooperation with the National Park Service, the report notes that a well drilled as a result of the USGS investigation has replaced the former spring water supply and is now producing about 8 million gallons per year to meet all the water needs at the Memorial. The well, and a companion well, as yet unused, are expected to meet the short-term water needs of about three million visitors each year at Mount Rushmore.

The report may be obtained on loan from the Nebraska Water Resources Research Institute, 212 Ag. Engineering, East Campus, University of Nebraska, Lincoln, Nebraska 68503 or phone 402-472-3307 or by contacting the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402. Specify Geological Survey Water-Supply Paper 1865 (\$1.25).

Northern Great Plains Resource Program Meetings Held

A federal-state interagency task force held a series of five informational meetings in five Northern Great Plains States during July to inform the public and gain information for a federal-state study of the vast coal deposits of that region and the potential effects of their development.

Robert L. McPhail, Program Manager of the task force's Program Management Team conducted the meetings. The format was informal and allowed the public to ask questions, express views, and make inputs into the study during this preliminary phase.

The Program Management Team is composed of representatives of the Interior and Agriculture Departments and the Environmental Protection Agency, and representatives of the states of Wyoming, Montana, South Dakota, North Dakota and Nebraska. Under the Program Management Team, seven work groups are composed of numerous federal and state agencies, industrial groups, Indian tribes, universities and environmental and citizens' groups. Besides McPhail, members of the Program Management Team are Robert Jones, Interior; Roger Bay, Agriculture; Edwin Royce, EPA; William Christiansen, Lieutenant Governor of Montana; Earl E. Stewart, North Dakota; Dan Bucks, South Dakota; J.D. Brunk, Wyoming; and Donald Nelson, Nebr.

The Program Management Team reports to an Inter-Agency Program Review Board headed by Dr. Laurence E. Lynn, Jr., Assistant Secretary of the Interior for Program Development and Budget.

Besides Dr. Lynn of Interior, the Board includes representatives of the Agriculture Department, and the Environmental Protection Agency-- and Governor Stanley K. Hathaway of Wyoming representing the five involved states.

The Northern Great Plains area is estimated to contain about 40 percent of the nation's coal resources, measured in trillions of tons of low-sulfur coal, of which about 35 billion tons are readily recoverable with existing technology. The coal is concentrated primarily in the Fort Union Formation in the Powder River Basin of Wyoming and Montana, and in the western part of the Williston Basin of Montana and the Dakotas.

FEDERAL HIGHLIGHTS

Russell Train Heads EPA

On July 26 Russell Train was named as new Administrator of the Environmental Protection Agency. Train succeeds William Ruckelshaus who is currently Deputy Attorney General in the Justice Department.

Representative Henry Reuss, D-Wisconsin, a leading critic of government environmental policies, said Train made the Council "a first-class agency" and is confident he will administer EPA with the same dedication to the conservation ethic.

Warren Fairchild New Director of Water Resources Council

Rogers C. B. Morton, Secretary of the Interior, has appointed Warren D. Fairchild as the new Director of the Water Resources Council.

Fairchild was formerly Assistant Commissioner for Resource Planning with the Bureau of Reclamation in Washington. Prior to his work in the Bureau, Fairchild served as Executive Secretary of the Nebraska Soil and Water Conservation Commission (renamed Nebraska Natural Resources Commission).

Morton said "Mr. Fairchild carries into his new position a broad background in water and land resources development and management at the local, state and federal levels of government and has a wide acquaintance with officials having responsibilities in those fields."

The Council is composed of the Secretaries of Interior, Agriculture, Army, HEW, Transportation and the Chairman of the Federal

Power Commission. Participants also include the Secretaries of Commerce and HUD, Administrator of the Environmental Protection Agency, Attorney General, Director of the Office of Management and Budget, Chairman of the Council on Environmental Quality and the Chairman of each River Basin Commission.

New Department Proposed

Interior Secretary Morton urged approval of the Administration plan for a new Department of Energy and Natural Resources in testimony July 25 before a congressional committee.

The reorganization would put a New Water Resource Administration in charge of these operations: Reclamation Bureau, Office of Saline Water, Office of Water Research, water activities of the Army Engineers and river basin surveys and big watershed projects of the Soil Conservation Service. Functions of SCS not related to water would stay in the Agriculture Department.

Morton encouraged the House Government Operations Committee to approve H.R. 9090, the measure incorporating an Energy Research and Development Administration and a new Nuclear Energy Commission.

Backlog of Water Projects

According to Gilbert C. Stamm, Reclamation Commissioner, many units in the Bureau of Reclamation's \$6.2 billion backlog of unfinished water projects will probably never be built.

Stamm told the Western States Water Council in Helena, Montana that the accumulation of unbuilt water projects is growing larger because of rising construction costs. He said "bringing this construction backlog within manageable limits will require the decision to eliminate, defer, reformulate or otherwise fund some of the projects that constitute this accumulated construction pool as well as cooperation of Congress for implementation. Even with such decisions and legislative support, greater levels of funding may be required to clean up the remaining backlog (which would then be composed of higher priority items) within a reasonable period."

National Water Commission Locks Up

The National Water Commission has closed up shop. Any further communication in connection with its final report should be addressed to the U.S. Water Resources Council, 2120 L St. N.W., Washington, D.C. 20037 (202-254-6453) or to the House of Senate Interior Committees, to which the report has been referred.

National Water Commission Short Sighted on Water Needs

Gilbert G. Stamm, Reclamation Commissioner, thinks the National Water Commission's report is too inflexible with respect to future water needs for food and fiber.

Stamm noted the report does not assume an agricultural water shortage before 2000. He said the conclusion, based on a single computer model study of limited scope, is already outdated. Stamm told the California Water Resources Association, "even in the short period since completion of the model, the nation's agricultural picture has changed dramatically."

He said out of 60 million acres in 1972, only 12 million will be out of production this growing season. If reversing to more traditional world trade failed to occur, it would be foolish not to have a plan to expand agriculture.

New Discharge Permits for Feedlots

Representative Henry S. Reuss, D-Wisconsin, Chairman of the Conservation and Natural Resources Subcommittee of the House Government Operations Committee, and Representative Guy Vander Jagt, R-Mich., contend the new Environmental Protection Agency's regulations that allow thousands of feedlots to operate without waste discharge permits are illegal.

The regulations were published in the July 5 Federal Register. They require discharge permits only for feedlots holding more than 1,000 slaughter steers and heifers, 700 dairy cattle, 2,500 swine over 55 pounds, 10,000 sheep, 55,000 turkeys, 5,000 ducks or 100,000 laying hens and broilers. EPA estimates that this would bring about 4,100 feedlot operators into the permit program.

The Congressmen said EPA's interpretation of the 1972 amendments to the Federal Water Pollution Control Act was "novel and strained." They said "the law requires that dischargers from point sources must obtain permits. It does not authorize EPA to include some point sources and exempt others."

EPA said by exempting thousands of smaller feedlots, it could handle the vast numbers of applications that would result from the larger feedlots.

The Congressmen agreed that EPA must have some discretion in determining who should be required to get a permit, but said this should not be determined on the basis of "administrative inconvenience."

Reuss and Jagt said they would probably call hearings on the problem in September or October.

Fiscal Year 1974 Title II Programs Announced

The selection of 25 research projects for the fiscal year 1974 water research program under Title II of the Water Resources Research Act of 1964 has been announced.

The Title II program--administered by the Office of Water Resources Research--provides for research grants, contracts, or other arrangements with educational institutions, private foundations or other institutions, and with private firms and individuals for the conduct of research that seeks solution to urgent water problems throughout the nation.

Dr. Warren A. Hall, Acting Director of OWRR, noted that the 25 proposals selected for support represent \$1.6 million of a \$3.1 million requested appropriation for the Title II program.

The following is a list of the fiscal year 1974 awards:

- Pennsylvania State University, "Effects of Spray Irrigation of Municipal Wastewater on the Physical Properties of the Soil," \$41,451;
- Utah State University, "Modeling the Total Hydrologic-Sociologic Flow System of Urban Areas-Phase III, \$72,265;
- Oregon State University, "Development of Environmental Strategies with Specific Application to Oregon Estuaries," \$54,338;
- University of Arizona, "Environmental Impact Statements in Water Resources Planning and Policy-Making," \$55,420;
- Oklahoma State University, "Improving the Quality of Water Releases from Reservoirs Using a Large Diameter Propeller Pump," \$97,400;
- University of Wyoming, "Stream Channel Modification to Maximize Available Trout Habitat Under Low Flow Conditions," \$69,500;
- Montana University Joint Water Resources Research Center, "Water Use and Coal Development in Eastern Montana: Water Availability, Water Demands, and Economic Impacts," \$69,236;
- Oregon State University, "Properties of Unsaturated Media from an Infiltration Model for Predicting Runoff and Infiltration," \$35,588;
- Center for Water Resources Research, University of Nevada System, "Arid Basin Management Model with Concurrent Quality and Flow Constraints," \$71,300;
- Doane College, Nebraska, "Institutional Behavior Concerning River Basin Management Legislation," \$32,757;

- Massachusetts Institute of Technology, "Exploration in Multiobjective Water Resources History," \$22,922;
- University of California, "Optimization of Real-Time Daily Operation of a Multiple Reservoir System," \$60,166;
- Princeton University, "Numerical Simulation of Salt-Water Intrusion in Coastal Aquifers," \$74,220;
- University of Missouri at St. Louis, "A Benefit-Cost Analysis of Alternative Land Disposal Waste Water Methods in an Urban Environment," \$32,926;
- University of Texas at Austin, "Technique for Projecting Alternative Futures for Water Resources Planning and for Estimating Flood Flow Frequencies," \$55,767;
- David M. Dornbusch & Company, Inc., "Development of a Generic Methodology to Forecast Aesthetic and Recreational Benefits of Proposed Urban Water Resource Projects," \$78,345;
- Hydrocomp, Incorporated, "Evaluation of the Effects of Urbanization on Aquatic Ecology and Hydrologic Regimes," \$65,944;
- Westinghouse Electric Corporation, "Transport of Chlorinated Hydrocarbons in Sediments of the Upper Chesapeake Bay," \$65,341;
- General Electric Company - TEMPO, "Management of Groundwater Basins to Inject, Store and Recover Useful Heat," \$76,313;
- Meta Systems, Inc., "An Operational Framework for Coastal Zone Management Planning," \$79,430;
- Systems Control, Incorporated, "Improved Methodology for Design and Operation of Water Distribution Systems," \$98,440;
- Enwats, "Combined Optimization of Storm-Drainage Design and Operation," \$99,737;
- City of Dallas, "Metropolitan Water System Operation: Continuous Modeling of Flow Quantity and Quality in the Supporting River Basin," \$80,439;
- Huron River Watershed Council, "Research and Development of Methods for the Protection, Improvement and Utilization of Small Urbanizing Watersheds," \$49,601;
- Quinault Indian Reservation, "Impacts of Forest Management Practices on the Aquatic Environment," \$60,045.

For further information on any of these Title II projects, contact the Nebraska Institute, 212 Ag. Engineering Building, University of Nebraska, Lincoln, Nebraska 68503. (472-3307)

PUBLICATIONS

Handbook for Water Measurement Standards

The U.S. Geological Survey has released a 415-page technical report entitled "Recommended Methods for Water-Data Acquisition."

The handbook is the result of studies by 70 scientists from 15 federal agencies. It describes methods for collecting, reporting and interpreting data on surface water, groundwater and water-borne chemicals, sediments and bacteria. A section on the use of automatic water-quality monitors is also included.

R. H. Langford, Chief of the USGS Office of Water-Data Coordination described the report as a big step forward in establishing standardized methods that could be used by federal, state, local and private organizations for measuring and analyzing water.

Copies of the report are available free of charge from: Chief, Office of Water-Data Coordination, U.S. Geological Survey, Room 102, 2100 M Street, N.W., Washington, D.C. 20244.

NWC Final Report Available

The final report of the National Water Commission, entitled "Water Policies for the Future," has been published. The report contains many recommendations for improvement of policies dealing with protection, development and use of the nation's water resources. The National Water Commission believes that adoption of these recommendations will lead to the utilization of the nation's water resources in ways that will make an optimum contribution to the welfare of its citizens.

The Nebraska Institute has two copies of the National Water Commission Report which are available for loan to interested persons. For further information, contact the Nebraska Water Resources Research Institute, 212 Ag. Engineering Bldg., University of Nebr., Lincoln, Nebraska 68503 or phone 402-472-3307.

New Water Research Catalog

Interior Secretary Rogers C. B. Morton announced the new two-volume Water Research Catalog describing 7,298 research projects in 60 countries. The Catalog was prepared for the Office of Water Resources Research by the Smithsonian Science Information Exchange. It may be obtained from the Superintendent of Documents, Washington, D.C. 20420 for \$15.75 by mail and \$14.25 from Government Printing Office Bookstores. Specify Catalog No. I.1.94:8.

RESEARCH REVIEW

Project Title: "Water Quality Models for Urban and Suburban Areas"

Principal Investigator: Dewey R. Anderson, Associate Professor,
Department of Civil Engineering, University
of Nebraska-Lincoln

Limited data are available for evaluating the influence of nonpoint polluttional sources on water quality. The primary objective of this study is to develop mathematical models relative to the quality of runoff from urban and suburban areas so that its influence on the water quality of the receiving stream may be evaluated.

Since limited data were available, four drainage areas serving urban and suburban areas were selected for the collection of runoff samples. Runoff samples are collected during periods of runoff and analyzed for several polluttional parameters. These parameters include BOD, COD, solids, turbidity, conductivity, nitrogen, phosphorus, pesticides, weedicides, and coliform concentrations.

Rates of runoff from the selected drainage areas, which consist of three residential areas and one commercial area, are determined at the time of sample collection. Rain gage stations are also located on the drainage basins, thereby permitting correlation between runoff and rainfall. These data and a computer program developed by Dr. Alvin J. Surkan, Department of Computer Science, UNL, under OWRR matching grant B-016-NEB received through the Nebraska Water Resources Research Institute, are being used for modeling hydrographs.

A computer program is being developed for modeling the concentration of various pollutants in the runoff. Modeling of these pollutographs will provide a very useful tool in evaluating the quality of runoff from various urban and suburban land use areas and its influence on the water quality of receiving stream.

PUBLICATIONS RECEIVED BY INSTITUTE

1. Combined Effect of Thermal and Organic Pollution on Oxygen Sag Curve, K. Keshavan, G.C. Sornberger, Worcester Polytechnic Institute.
2. Water Pricing Policies as a Tool for Allocating Municipal Water Supplies, David F. Mazour, University of Nebraska.
3. Karst Hydrology in Eight Circum-Mediterranean Countries, Unesco, March 1973, Paris.
4. Glossary and Multilingual Equivalents of Karst Terms, Unesco, Paris, November 1972.
5. An Ecological Evaluation of a Thermal Discharge Part VII: Post-Operational Effects of a Power plant on Phytoplankton and Community Metabolism in Western Lake Erie, T.V. Kreh, Michigan State University, 1973.
6. Ninth Annual Report, The Nebraska Power Review Board, to the Governor of Nebraska, 1971-1972.
7. Physical Properties of Soil During Two Years of Large Applications of Manure from Cattle Feedlots, A.E. Tiarks, Thesis, University of Nebraska, July 1973.
8. Groundwater Pollution in the South Central States, M.R. Scalf, J.W. Keeley, C.J. LaFevers, for EPA, June 1973.
9. Control of Mine Drainage from Coal Mine Mineral Wastes, Z.V. Kosowski, for EPA, May 1973.
10. Ion Exchange Color and Mineral Removal from Kraft Bleach Wastes, R.L. Sanks, Montana State University, May 1973.
11. Identification and Control of Petrochemical Pollutants Inhibitory to Anaerobic Processes, J.C. Hovious, G.T. Waggy, R.A. Conway, for EPA, April 1973.
12. Demonstration of a Waste Disposal System for Livestock Wastes, C.R. Moore, for EPA, May 1973.
13. Methods for Pulp and Paper Mill Sludge Utilization and Disposal, T.R. Aspitarte, A.S. Rosenfield, B.C. Smale, H.R. Amberg, for EPA, May 1973.
14. Recondition and Reuse of Organically Contaminated Waste Sodium Chloride Brines, R.D. Fox, R.T. Keller, C.J. Pinamont, for EPA, May 1973.

15. Cost of Waste Water Pollution Abatement in Poultry Processing and Rendering Plants in Georgia, W.R. Kerns, F.J. Holemo, University of Georgia, June 1973.
16. Improvements in Moving Sprinkler Irrigation Systems for Conservation of Water, D.L. Miles, Colorado State University, June 1973.
17. Coordination of Agriculture and Urban Water Quality Management in the Utah Lake Drainage Area, W.R. Walker, T.L. Huntzinger G.V. Skogerboe, Colorado State University, June 1973.
18. Tertiary Treatment of Combined Domestic and Industrial Wastes, J.W. Lee, Jr., for EPA, May 1973.
19. Effects of Copper on the Locomotor Orientation of Fish, H. Kleerekoper, for EPA, June 1973.
20. A Study of Selected Aspects of Rural Water System Development in Mississippi, P.J. Ross, R.N. Friery, J.H. Peterson, Jr., Mississippi State University, 1973.
21. Interaction Between Marine Organisms and Oil Pollution, M. Blumer, J.M. Hunt, J. Atema, L. Stein, for EPA, May 1973.
22. Research Program 1972-73, Virginia Water Resources Research Center, Wm. R. Walker.
23. Laws of the U.S. Relating to Water Pollution Control and Environmental Quality, Committee on Public Works, March 1973.
24. A Physics-Based Approach to Hydrologic Response Modeling: Phase II: Application, Completion Report, A. Freeze, June 1973.
25. Annual Report 1972, Agassiz Centre for Water Studies, University of Manitoba.
26. Stream Quality Preservation through Planned Urban Development, R.E. Coughlin, T.R. Hammer, for EPA, May 1973.
27. Water Policies for the Future, National Water Commission, Final Report, June 1973.
28. 1972 Annual Report, Nebraska Public Power District, December 1972.
29. Proceedings of the Eightieth Annual Convention, Nebr. State Irrigation Association, November 1972.

30. Herbicide Contamination of Surface Runoff Waters, J.O. Evans, D.R. Duseja, Utah State University, for EPA, June 1973.
31. Water Reuse: A Bibliography, Vol. II, U.S. Dept. of the Interior, June 1973.
32. An Investigation of the Nitrate Problem in Runnels County, Texas, D.C. Jones, Texas Water Development Board, for EPA, June 1973.
33. Mathematical Modeling of Water Management Strategies in Urbanizing River Basins, W.R. Walker, G.V. Skogerboe, Colorado State University, June 1973.
34. Evaluation of Urban Water Management Policies in the Denver Metropolitan Area, W.R. Walker, R.C. Ward, G.V. Skogerboe, Colorado State University, June 1973.
35. Temporary State Commission on the Water Supply Needs of Southeastern New York:
 1. Proceedings Special Conferences
 2. Proceedings Local Government Conferences
 3. Compendium of Water Supply Studies
 4. Proceedings State Agency Conferences
 5. Scope of Public Water Supply Needs
 6. Emerging Water Supply Technology

QUESTIONS AND INQUIRIES

Newsletter items and inquiries should be sent to Dr. Warren Viessman, Jr., Director, Nebraska Water Resources Research Institute, 212 Ag. Engineering Bldg., University of Nebraska, Lincoln, Nebraska, 68503 or phone 402-472-3307.

NEWSLETTER SURVEY

The Nebraska Institute is interested in obtaining your views, comments and questions on our Newsletter.

The following questions are designed to help the Institute develop a more interesting, useful and informative Newsletter. Please answer the following questions and return this survey to the Nebraska Water Resources Research Institute, 212 Ag. Engineering Bldg., University of Nebraska, Lincoln, NE 68503.

Is the Newsletter helpful and informative? Yes ___ No ___

Which of the following sections of the Newsletter are most interesting and/or informative?

Desk of the Director _____

Institute Activities _____

Regional News _____

Federal Highlights _____

Publications _____

Conferences _____

Research Review _____

NWRRI Publications _____

What additional sections do you think might be included in the Newsletter?

Do you feel a section entitled "Ask the Editor" would be helpful? This section would answer any questions you have in regard to education in water resources, research, Institute activities, research programs and water resources in general. Yes ___ No ___

What additional sections do you think might be included in the Newsletter?

Signed (optional)