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WATER RESOURCES NEWS

NEBRASKA WATER RESOURCES RESEARCH INSTITUTE
212 AGRICULTURAL ENGINEERING BUILDING

THE UNIVERSITY OF NEBRASKA
LINCOLN, NEBRASKA 68503

Volume 2 Number 10

November 1970

N.W.R.R.I. DIRECTOR NAMED EXECUTIVE SECRETARY OF UNIVERSITIES COUNCIL ON WATER RESOURCES

On January 1, 1971, Dr. Warren Viessman, Jr. will become Executive Secretary of the Universities Council on Water Resources. This is a voluntary organization of the universities actively engaged in education and research in fields related to water resources development and utilization. Organized for the purpose of concerted action in whatever ways may seem desirable for the encouragement of such education and research. There are currently 61 American university members and affiliate memberships in Australia, Canada, Israel, Thailand, and the Netherlands. UCOWR has been an important factor in the development of such legislation as the Water Resources Research Act of 1964 and in proposals for new legislation relating to university involvement in water resources.

1971 SUMMER INSTITUTES PLANNED

The Water Resources Research Institute will sponsor two one-week Summer Institutes to be held this summer. The first Institute, entitled "Optimal Analysis of Water Resources Systems", will be held from July 18-23. The second Institute, entitled "Simulation of Water Resources Systems", will be held from July 25-30. Detailed information on program content will be included in a later issue of the Newsletter.

RESEARCH AND DEVELOPMENT SOURCES SOUGHT

Firms are invited to submit their qualifications for consideration to "Develop a Procedure for Acquiring and Disseminating Information on Water Use". The objective of this program is to create a system based upon the determination to user needs for information on water supply, efficiency of water, water demand, extent of reuse, and change in quality and quantity through use.

Prospective offerors must show extensive experience in planning and design of water resources data systems with demonstrated competence in economic evaluation of water data needs. Telephone inquires will not be honored. Responses shall be in one copy to the following address:

U.S. Geological Survey, Bank of Contracts, Room 1312 Interior Bldg., 18th and F Streets, N.W. Washington, D.C. 20242, Attn: J. C. Sowers.

N.W.R.R.I. PROPOSALS SUBMITTED

N.W.R.R.I. matching grant proposals submitted to Washington for consideration for funding for Fiscal Year 1972 include:

Otis E. Cross, University of Nebraska, "Animal Waste Utilization for Pollution Abatement -- Technology and Economics. Phase 2"

Loyd K. Fischer, University of Nebraska, "Problems and Potentials of Multipurpose Districts As Agencies for Managing Water and Related Resources -- the Natural Resource Districts of Nebraska, A Case Study"

Dale R. Henning, University of Nebraska, "Prehistoric Reaction to Climatic Change - A Guideline for Contemporary Water Resources Planning"

Norman J. Rosenberg, University of Nebraska, "Alteration of the Surface Energy Balance with Reflectant Materials to Increase Water Use Efficiency in Irrigation Agriculture"

James R. Steadman, University of Nebraska, "Pollution of Irrigation Waters by Plant Pathogenic Organisms"

Alvin J. Surkan, University of Nebraska, "Dynamic Model for Urban Hydrologic Systems"

Charles R. Wallace, Kearney State College, "Ecologic Implications of Large Scale River Water Diversion"

N.W.R.R.I. Title II proposals submitted to Washington for consideration for funding for Fiscal Year 1972 include:

Dr. Edward J. McPartland, Doane College, "Measuring and Developing Methods of Attitude and Motivational Change In Implementing the Big Blue River Basin Water Plan"

FWQA BOOKLET ON FISH MORTALITIES

The Federal Water Quality Administration has published a new booklet, entitled "Investigating Fish Mortailities". The 21-page pamphlet is a comprehensive guide for the field investigator in procuring samples, preparing specimens for analysis and evaluating data to determine the cause of fish deaths.

The FWQA has established voluntary reporting procedures with the States through its nine regional offices to provide a swift response to fish kills. Although the States exercise primary responsibility for investigating fish kills within their boundaries, the FWQA shares this responsibility where interstate waters are affected.

Copies of "Investigating Fish Mortalities" may be obtained from the Office of Public Information, Federal Water Quality Administration, U.S. Department of the Interior, Washington, D.C. 20242.

URBAN WASTEWATER RENOVATION THROUGH AGRICULTURE

The FWQA has awarded $2 million in grants to Muskegon County, Michigan, for a system which will utilize urban wastes for the reclamation of marginal agricultural land.

The Muskegon plan calls for the collection and primary treatment at several points in the county of the area's entire daily output of 32 million gallons of wastewater. The wastewater will then be piped to a central point for treatment in oxidation lagoons.

Use of this wastewater to irrigate 10,000 acres of marginal land completes the treatment of the wastes by removing the nutrients and depositing them in the soil for use by plants.

The project will demonsrate how to replace valuable resources, how to manage wastes better and, at the same time see if this can't be done at a profit by producing marketable agricultural products.

CONTROL OF OIL POLLUTION

The Coast Guard has been assigned responsibility to manage and conduct a study concerning limitation of liability and financial responsibility of vessels, onshore facilities and offshore facilities for the cost of removing oil spills from the navigable waters or the contiguous zone and paying resulting damage.

Captain Wallace C. Dahlgren, USCG, has been designated as study manager.

ENVIRONMENTAL EDUCATION BILL TO WHITE HOUSE

The House has agreed to Senate amendments to a bill (HR 18260) which would establish educational programs to encourage understanding of policies and support of activities designed to preserve and enchance environmental quality and maintain ecological balance.

Under this measure, the Commissioner of Education would award grants and contracts to institutions of higher education and other public and private non-profit agencies for research, pilot programs, demonstrations, and operational programs to educate the public on the problems of environmental quality and ecological balance. This includes: development of curriculums; preservice and inservice undergraduate and postgraduate training programs for educational personnel to prepare them to teach in areas related to environmental quality; community education programs; and dissemination of information about environmental education.

Authorizations of $6 million for Fiscal Year 1972 and $10 million for each of the succeeding Fiscal Years through 1974 would be provided to carry out the provisions of the bill.

TITLE II AWARDS FOR FY 1971

Walter J. Hickel, Secretary of the Interior, recently announced the selection of 20 additional research projects for Fiscal Years 1971, authorized under Title II of the Water Resources Research Act of 1964. He also stated that these 20 projects are directed

primarily at urban and metropolitan water problems.

The Title II program provides funds to support the work of highly skilled and knowledgeable water research organizations and individuals, both academic and non-academic, in undertaking research that seeks solutions to urgent water problems throughout the Nation.

A list of the proposed research awards follows:

The Dow Chemical Company, Midland, Michigan -- An Economic Analysis of Erosion and Sediment Control Methods for Watersheds Undergoing Urbanization - $72,427

North American Rockwell Corporation, Canoga Park, Califonia -- Urban Water Development and Management in Arid Environments - $63,655

West Virginia University, Morgantown, West Virginia -- Water Service Prices: A Principal Component and Regression Analysis of Determinants - $30,428

Engineering-Science, Inc., Arcadia, California -- Management of Surface Runoff in Urban Areas - $75,000

Battelle Memorial Institute, Columbus, Ohio -- Urban Policy and Political Institutions in Managing Water Quality for Lake Erie - $60,930

Analytic Sciences Corporation, Reading, Massachusetts -- Develop a Model of Institutional Relationships in Highly Urbanized Areas - $88,600

ENWATS, Cambridge, Massachusetts -- Control Methodology for Storm-Drainage Systems - $100,000

Urban Systems Research and Engineering, Inc., Boston, Massachusetts -- Relationship Between Housing and Water Resources Planning and Development - $97,993

Metropolitan Washington Council of Governments, Washington, D.C. -- Analysis of the Joint Interactions of Water Supply, Public Policy, and Land Development Patterns in an Expanding Metropolitan Area - $109,808

Century Research Corporation, Arlington, Virginia -- Social Aspects of Urban Water Conservation - $24,992

National Association of Counties Research Foundation, Washington, D.C. — Develop Understanding and Action for Urban Areas in Water Resources Planning - $99,747

Massachusetts Institute of Technology, Cambridge, Massachusetts -- Forecasting and Control of Urban Runoff - $94, 290

Water Resource Engineers, Inc., Springfield, Virginia -- Importance of Economic Factors in Urban Surface Water Supply Systems - $68,220

Indiana University, Bloomington, Indiana -- Institutional and Legal Prescriptions of Urban Water Use and Management - $34,152

Regional Science Research Institute, Philadelphia, Pennsylvania -- Optimal Patterns of Urban Land Use for Preservation of Water Resources - $90,000

Environmental Dynamics, Inc., Los Angeles, California -- Synthesis and Evaluation of Urban-Regional Hydrologic Rainfall Runoff Criteria - $85,000

Utah State University, Logan, Utah Social Impact of Water Resource

Development Projects and Their Implications for Urban and Rural Development: A Post-Audit Analysis - $82,869

Cornell University, Ithaca, New York -- Evaluation of Water Resource Investments: Including Water Resource Projects in an Urban Setting - $48,584

Colorado State University, Fort Collins, Colorado -- Metropolitan Water Intelligence Systems: The Development of Criteria and Rationale for the Establishment of Centralized Metropolitan Water Intelligence Systems in Urbanized and Urbanizing Areas - $100,000

Desert Research Institute, Reno, Nevada -- Development and Management of Ground-Water and Related Environmental Factors in Arid Alluvial and Carbonate Basins in Southern Nevada - $24,950

CASE STUDIES IN WATER RESOURCES SYSTEMS ANALYSIS

The Hydraulics Division of the Water Resources Systems Committee is developing a program for the publication in ASCE journals and for conference presentation of papers describing case studies in water resource systems analysis. The case study papers should involve the direct application of the mathematical techniques of systems to actual water resources problems. Emphasis is to be on examples where the use of systems analysis has been implemented and has influenced the planning, design and/or operation of a water resource system.

Case studies in the systems areas of ground water, surface water, water quality, desalination, power generation, and similar areas are desired. Case studies which include other disciplines such as ecology and biology as they affect water resource systems are also encouraged. Papers or abstracts should be submitted directly to Professor John A. Dracup, Publications Committee, Hydraulics Division, 7620 Boelter Hall, University of California, Los Angeles, California 90024.

NATIONAL ENVIRONMENTAL POLLUTION CONFERENCE

The U.S. Department of the Interior, in cooperation with other Departments and agencies, sponsored a four-day National Environmental Conference and Exposition in the Nation's Capital on September 29-30 and October 1-2. The objective: Through timely discussion and related exhibits to develop positive, constructive and cooperative actions of government, organizations, educators, industry, scientists and the general public to halt this national crisis.

During the four-day Conference and Exposition, government officials-federal, state and local--considered environmental standards, legislation and enforcement measures. Industry leaders presented technological equipment and techniques for combating pollution. Scientists and educators discussed anti-pollution requirements and ethics. Organizations and institutions determined ways and means to mobilize public action and influence for improving

our total environment. Speakers at the sessions represented all levels of government, industry, organizations, institutions and public interests. Exhibitors included manufacturing, servicing and consulting firms, organizations and institutions involved in pollution abatement and research.

UCOWR ANNUAL MEETING HELD IN VIRGINIA

The Universities Council on Water Resources held its 1970 Annual Meeting in Blacksburg, Virginia. The theme of the meeting was "The University's Role in National Water Policy". Dr. Gilbert F. White of the University of Colorado gave the key-note address -- "The University and National Water Policy."

The Annual Business Meeting of the Universities Council on Water Resources was held on Tuesday, July 29. In addition to its regular business, the Council passed a number of resolutions resulting from the discussions of the previous two days:

1. Resolution on National Policy Concerning Safety of Public Water Supplies
2. Resolution on Pollution from Industrial Wastes
3. Resolution on Water Pollution Control Legislation
4. Resolution on Water Resources Evaluation
5. Resolution on Technology Assessment
6. Resolution on Patent Policy of the Office of Water Resources Research
7. Resolution on The Support and Use of the Behavioral Sciences in Water Resources
8. Resolution on Interdisciplinary Discussion
9. Resolution on Interdisciplinary Approach to Water Resources and Social Goals
10. Resolution on Water Resources Planning Principles and Guidelines
11. Resolution on Appraisals of the Alternatives Approach
12. Resolution on Water Quality Bench Marks

REORGANIZATIONAL PLANS FOR ENVIRONMENTAL PROGRAMS

The President has submitted to the Congress Reorganizational Plans Nos. 3 and 4 of 1970, establishing the Environmental Protection Agency (EPA) as a new, independent agency within the Executive Branch, and the National Oceanic and Atmospheric Administratic (NOAA) in the Department of Commerce.

The creation of EPA will have the following advantages:

-- It will upgrade the effectiveness of the Federal Government's major pollution control programs.

-- It will provide a central focus for an evaluation of all pollution related activities of the Federa Government.

-- It will service to upgrade the importance of environmental considerations and pollution programs within the Federal Government, and over a period of time tend to have a similar effect on program priorities within state and local governments.

-- It will clarify industry responsibility by providing consistent standards and a single enforcement agency.

-- State and local pollution control agencies will be able to look to one federal agency for all their financial support and technical assistance.

-- It will insulate pollution abatement standard-setting from the promotional interests of other departments.

The EPA will have an estimated FY 1971 budget of $1.4 billion and 5650 personnel, and consist of the following:

-- The Federal Water Quality Administration (FWQA), now in the Department of the Interior;

-- the National Air Pollution Control Administration (NAPCA), now in the Department of Health, Education and Welfare;

-- parts of the Environmental Control Administration (Bureaus of Solid Waste Management, Water Hygiene and a portion of the Bureau of Radiological Health), also from HEW;

-- the pesticides research and standard-setting program of the Food and Drug Administration, HEW;

-- the pesticides registration authority of the Department of Agriculture;

-- Authority to perform general ecological research, from the Council on Environmental Quality (CEQ);

-- certain pesticide research authorities of the Department of Interior;

-- the environmental radiation protection standard-setting function of the Atomic Energy Commission;

-- the functions of the Federal Radiation Council (FRC).

The mission of NOAA is to organize a unified approach to the problems of the ocean and the atmosphere and to create a center of strength within the civilian sector of the Federal Government for this purpose.

The NOAA will have an estimated 1971 budget of about $270 million and over 12,000 personnel and will consist of the following:

-- The Environmental Science Administration, already a part of the Department of Commerce;

-- most of the Bureau of Commerical Fisheries, now in the Department of the Interior;

-- the Marine Minerals Technology Program of the Bureau of Mines in the Department of the Interior;

-- the marine sports fishing program of the Bureau of Sports Fisheries and Wildlife in the Department of the Interior;

-- the Office of Sea Grant Programs of the National Science Foundatio

-- elements of the United States Survey of the Department of the Army.

Upon establishment of NOAA, the following programs will be

transferred to it by executive action. (No legislative authority is required to effect these transfers):

-- The National Oceanographic Data and Instrumentation Centers of the Department of the Navy;

-- the National Data Buoy Program of the Department of Transportation.

NATIONAL WATER COMMISSION STUDIES

The original tenative program of 31 "Special Studies" developed early in 1969 by the National Water Commission was reviewed and revised by the Commission at its December 1969 meeting. The revised program calls for 22 Special Studies, a number of which will be carried out by contract, and numerous report development studies which will be carried out largely by the staff. The "outside" studies underway are primarily Special Studies. The following table lists the outside studies initiated to date.

Subject of Study	Field	Principal Inv.
Water systems in water-short regions	Legal	C.J. Meyers
Riparian and permit systems in humid regions	Legal	N.W. Hines
Federal-State relations in water rights	Legal	F.J. Trelease
Interbasin transfers of water	Legal	R.W. Johnson
Ground water management	Legal	C.E. Corker
Administrative allocation of water	Legal	E.W. Clyde
Market allocation of water	Legal	C. J. Meyers
Water pollution controls	Legal	N.W. Hines
Weather modification	Legal	R.W. Johnson
Interstate compacts, etc.	Legal	J.C. Muys
Regional corporations, etc.	Legal	R.A. Solomon
River basin commissions, etc.	Legal	G.W. Hart
Authorization of Federal projects	Legal	Northcutt Ely
Governmental structures for metropolitan regions	Legal	O.E. Delogu
Public participating in planning	Social	S. Marquis
Value of water in alternative uses	Economic	R. B. Held
Appraisal of loss-prevention programs	Program Appraisal	D. G. Arey
Effects of water programs	Economic - Historical	J. G. Leger and G.E. Holt
Balancing quality and development	Environmental	C. R. Goldman
Water as a landscape component	Environmental	R. B. Litton, Jr.
Classification of waters	Environmental	A. Wilcox
Metropolitan water problems	Problem Appraisal	M. Roberts (Urban Systems)
Forecasting methods	Forecasting	J. Wilkinson (A.D. Little)
Short-range technological effects	Forecasting	C.W. Howe (RFF)
Long-range technological effects	Forecasting	NAS Committee

RESEARCH REVIEW

Project Title: "Influence of Fertilizer Practices on Water and the Quality of the Environment

Principal Investigator: Professor Robert A. Olson

Dates: July, 1970 to June, 1972

Nation-wide concern about the quality of our streams and lakes is growing. A problem which is particularly troublesome is that of the increasing rate of eutrophication of many of our prized waters. The removal of nutrients which stimulate algae and other forms of plant life is not a simple matter. Nutrients which are derived from sewage disposal systems, livestock feedyards, and from the agricultural enterprise in general all contribute to the problem. The news media are filled with claims and counterclaims of responsibility. All agree, however, that the Number One culprit in this respect is soluble Phosphorous.

It is imperative that a thorough understanding be developed concerning the source of nutrients responsible for eutrophication. If farmer fertilizer use practices are contributing significantly to the problem, this should be fully elucidated so that corrective measures can be developed. In view of the very large contribution that fertilizers make to our total agricultural productivity, it would be disastrous to our food production chain if a misinformed public were to impose ill-conceived controls which restricted the efficient use of fertilizer chemicals.

It is very important that the manner and magnitude of nitrogen and phosphorous movement be understood from the zone of placement in the soil. Particular attention should be paid to the "gray zone" between the soil profile and the water table. Practices which will retain the nutrients in the rooting zone for maximum crop utilization and minimum loss to drainage waters should be evaluated and promoted; similarly, those management practices responsible for greatest losses should be brought into focus and discouraged.

This research is designed to determine the fate of nitrogen and phosphorous fertilizer applied to soils under various conditions of management. The results should be of considerable practical value to those vitally engaged in water quality management.

Nebraska has an ideal environment for conducting the type of study proposed. It has a climatic range of semi-arid to sub-humid. Associated are vast areas of native range, of dry-farming, of intensive sub-humid cropping, and of very intensive irrigation agriculture. Results obtained should prove distinctive for these ecological regions and are expected to have full application for similar land types in adjacent states of the northcentral U.S. This research is considered to be of regional and national significance.

NEW PUBLICATIONS RECEIVED BY INSTITUTE - NOVEMBER

1. "Improvements in the Van Bavel-Myers Automatic Weighing Lysimeter", N. J. Rosenberg & K. W. Brown, University of Nebraska, August, 1970.
2. "Stream Pollution and Abatement From Combined Sewer Overflows", Federal Water Quality Administration, Water Pollution Control Research, November 1969.
3. "Engineering Investigation of Sewer Overflow Problem", Federal Water Quality Administration, Water Pollution Control Research, May 1970.
4. "The Economic Value of Streams for Fishing", D. H. Bianchi, University of Kentucky, 1969.
5. "Man and Aquatic Communities", Water Resources Research Institute, Oregon State University, Spring Quarter 1970.
6. "Proceedings Seventh Biennial Conference on Ground Water", Water Resources Center, University of California, September 10 & 11, 1969.
7. "Annual Report", University of California, Water Resources Center, September 1970.
8. "Annual Report - Fiscal Year 1970", Water Resources Center, University of Delaware, September 1970.
9. "Legal Aspects of Water Supply and Water Quality Storage", W. R. Walker, W. E. Cox, Virginia Polytechnic Institute and State University, August 1970.
10. "Comments on 'Time-Capacity Expansion of Urban Water Systems' by Russel F. Scarato", Marshall Gysi, Cornell University, June 1970.
11. "A Methodology Study For Evaluation of Wild and Scenic Rivers", Water Resources Research Institute, University of Idaho, September 1970.
12. "A Methodology Study to Develop Evaluation Criteria For Wild and Scenic Rivers", E. H. Swanson, Jr., University of Idaho, September 1970.
13. "Projects of the Industrial Pollution Control Branch", Water Pollution Control Research, July 1970.
14. "Anticipations of Change: A Socio-Economic Description of A Kentucky County Before Reservoir Construction", C. R. Smith, 1970, University of Kentucky.
15. "Part I. Controlling the Soil Moisture Environment of Transpiring Plants", "Part II. Prediction of Leaf Temperature Under Natural Atmospheric Conditions" C. T. Haan, B. J. Barfield, R. Edling, University of Kentucky, 1970.
16. "Factors Influencing Rural Water Purchase", C. R. Rosenstiel, University of Kentucky, 1970.
17. "Analysis of Solutions For Surface Active Agents", H. H. Bauer, University of Kentucky, 1970.
18. "An Approach to the Selection of a Streamflow Base Period", W. N. Embree, University of Wyoming, July 1970.
19. "Water Resource Observatory Wind Data Water Year 1969 and Prior", V. E. Smith, University of Wyoming, September 1970.
20. "Surface Water System Operational Handbook", W. N. Embree, University of Wyoming, July 1970.
21. "Computer Determination of Flow Through Bridges", Bill Eichert, John Peters, U.S. Army Corps of Engineers, Sacramento, Calif., Technical Paper No. 20.

22. "Hydrologic Simulation In Water-Yield Analysis", Leo R. Beard, U.S. Army Corps of Engineers, Sacramento, California, Technical Paper No. 10.

23. "Proceedings of a Seminar on Reservoir Systems Analysis", U.S. Army Corps of Engineers, Davis, California, November 4-6, 1969.

24. "Storm Water Pollution from Urban Land Activity", Federal Water Quality Administration, July 1970.

25. "Oxygenation of Ferrous Iron", Federal Water Quality Administration, June 1970.

26. "Quality of Stormwater Drainage From Urban Land Areas in North Carolina", E. H. Bryan, University of North Carolina, North Carolina State University, June 1970.

27. "Hydrography of the Pamlico River Estuary, N.C.", J. E. Hobbie, University of North Carolina, North Carolina State University, August 1970.

28. "Water Resources Development in Australia", C. H. Munro, University of New South Wales, August 1962.

29. "A Soil Water Model for Two Contrasting Tillage Systems", V. O. Shanholtz, J. H. Lillard, Virginia Polytechnic Institute and State University, October 1970.

30. "A State-of-the-Art Review of Metal Finishing Waste Treatment", U.S. Department of the Interior, Water Pollution Control Research, November 1968.

31. "Geology and Ground-Water Resources of Linn County, Iowa", R. E. Hansen, U.S. Geological Survey, 1970.

32. "Geology and Ground-Water Resources of Cerro Gordo County, Iowa", H. G. Hershey, Iowa Geological Survey, K. D. Wahl and W. L. Steinhilber, U. S. Geological Survey, 1970.

33. "Annual Report Fiscal Year 1970", Water Research Institute, West Virginia University, 1970.

34. "Inventory of Water Resources Coursework and Personnel State University of New York", R. H. Hawkins, State University College of Forestry, September 1970.

35. "A New Simulation Technique for Estimating Catchment Yield", W. C. Boughton, University of New South Wales, February 1965.

36. "Improved Techniques for E timating Runoff With Brief Records", F. C. Bell, University of New South Wales, June 1966.

37. "Lage Time of Natural Catchments", A. J. Askew, University of New South Wales, July 1968.

38. "Flood Estimation for Ungauged Rural Catchments", C. G. Coulter, University of New South Wales, April 1961.

39. "Gaging Stations and Water-Quality Stations Operated by the Nebraska District, 1971, F.Y.", U.S. Geological Survey, Lincoln.

40. "Water For Texas", Texas Water Development Board, October 1970.

41. "Design of Water Quality Surveillance Systems", U.S. Department of the Interior, Federal Water Quality Administration, August 1970.

NEWSLETTER ITEMS

Newsletter items and inquires should be sent to: Dr. Warren Viessman, Jr., Director, N.W.R.R.I., 212 Agricultural Engineering Building, East Campus, Lincoln, Nebraska 68503.