

Number 31

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### NEW FEDERAL GRANTS AWARDED TO THE INSTITUTE

The Water Resources Research Institute has been advised of the award of \$100,000 in annual allotment funds and an additional \$291,238 in matching grants by the Office of Water Resources Research, U. S. Department of the Interior. The amount of the annual allotment is fixed by law. The matching grants are competitive among the institutes in the fifty states and Puerto Rico. North Carolina came out first in the amount received--nearly ten percent of the \$3 million national total. This is attributed to the quality of the proposals and the fact that they squarely related to recognized State and national water resource problems.

None of the matching grants could have been obtained, however, without the strong support of President Friday, Vice President Bishop, and the Institute Board of Directors under the chairmanship of Dean Ralph E. Fadum in obtaining the prerequisite non-Federal matching funds. Continuation of the new projects beyond the present fiscal year and the initiation of important new research is dependent upon the appropriation of funds by the State in partial support of the Institute's program.

The Institute's present research program can be separated into the following broad categories:

- I. Ground Water Problems in Eastern North Carolina
- II. Water Quality Control in Coastal Estuaries
- III. Water Quality Control in North Carolina Streams and Reservoirs
- IV. Water Quality Problems from Urban and Agricultural Land Runoff
- V. Water Problems of North Carolina Industries
- VI. Water Problems of Urban Areas
- VII. Water-Based Recreation
- VIII. Water Law
- IX. Water Resources Information

Descriptions of the individual research projects will be carried in this and subsequent issues of the News.

INSTITUTE'S RESEARCH PROGRAM

Part I. Ground Water Problems in Eastern North Carolina.

1. Use of Computers in Management of Ground Water Supply in Lower Coastal Plain

To most North Carolinians, the ground water difficulties related to phosphate mining in Beaufort County symbolize the State's water crisis. Protection of the ground water supply from salt water intrusion is essential to the continued development of Eastern North Carolina. This project involves the construction of a computer model that can be used to forecast and evaluate the response of ground waters to alternate strategies of development. It is being carried out in close association with the North Carolina Department of Water and Air Resources.

Principal Investigator: Dr. J. K. Sherwani, Department of Environmental Sciences and Engineering, University of North Carolina at Chapel Hill

Starting Date: January 1, 1968

Completion Date: June 30, 1970

2. Evaluation of Water Supply on the Outer Banks

The Outer Banks are of great importance to the State for their recreational value and protection of the mainland from the open seas. A key factor on both counts is the continued availability of a fresh water supply for domestic use and the growing of dune grasses for dune stabilization. It is imperative that a determination of the fresh water supply be made and that criteria for safe yield be determined to avoid overdraft resulting in salt water contamination. One method of determining the amount and movement of potable water is to model a cross-sectional area of the Outer Banks. If this model can be used to predict fresh water in one cross-sectional area, other areas can be easily modeled in the laboratory and expensive field investigations eliminated. Such a project is being carried out by the Institute in close cooperation with the District Office, U. S. Geological Survey.

Principal Investigator: Dr. George J. Kriz, Department of Biological and Agricultural Engineering, North Carolina State University at Raleigh

Starting Date: July 1, 1968

Completion Date: June 30, 1970

3. Water Level Control in Coastal Plain Soils

Present drainage practice in the coastal plain threatens the destruction of 1 1/2 million acres of organic soils through oxidation because of overdrainage. Drainage plans should

provide for water control--keeping the water level sufficiently low for agricultural use and high enough to prevent severe drying and oxidation. In the case of mineral soils, high productivity cannot be attained without proper irrigation and drainage. The extent to which the agricultural potential of the coastal plain is realized will depend upon good water management in both organic and mineral soils. Yet, no criteria exist for surface drainage, surface irrigation, or subsurface irrigation in this area. The purpose of this study is to develop such criteria.

Principal Investigator: Dr. George J. Kriz, Department of Biological and Agricultural Engineering, North Carolina State University at Raleigh

Starting Date: July 1, 1968

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#### LEAGUE OF WOMEN VOTERS SEMINAR ON WATER

The League of Women Voters Education Fund is sponsoring a three-state seminar on Land and Water for Tomorrow in Charlotte on October 8-10, 1968.

Devoted to Virginia, North Carolina, and South Carolina, the seminar is one of a series sponsored by the fund for selected community leaders nominated by universities, chambers of commerce, labor groups, conservation associations, trade groups, garden clubs, farm organizations, local agencies, service clubs, and news media. The purpose is to increase public knowledge of environmental problems, possible solutions, and ways for citizens to obtain the improvements they want.

At the seminar, experts will deal with the problems and potential of the area. In order to achieve a wide citizen understanding of and participation in the land and water decisions which are crucial to this area, each participant will be expected to carry on some follow-up activity in his own community. Mrs. Carrol K. Davis of Charlotte is chairman of the project.

#### NON-DEGRADATION ISSUE

In a speech before the Conference of State and Federal Water Officials last month, Commissioner Joe Moore, Jr., Federal Water Pollution Control Administration, defended the four significant requirements for State anti-degradation provisions, which are:

1. Commitment to the preservation of high quality waters.
2. Best practicable degree of treatment for wastes discharged into high quality waters.
3. Degradation only where necessary economic or social development is demonstrated.
4. Some procedural commitment so that the Department of the Interior can be assured that the degree of treatment is adequate and degradation is "necessary."

Moore said, "We are not going to quarrel with the semantics of an anti-degradation statement. We are interested only in its intent, its objectives, and its realization. We seek to work honestly and cooperatively with all States to help them implement such commitments."

RESEARCH PROPOSALS NOW BEING RECEIVED BY INTERIOR DEPARTMENT

The Office of Water Resources Research, U. S. Department of the Interior, Washington, D. C. 20240, is now accepting unsolicited research proposals in the field of water resources for consideration for fiscal year 1970 support, beginning July 1, 1969, pursuant to Title II of the Water Resources Research Act of 1964, as Amended.

Title II of the Act authorizes the Secretary of the Interior to make grants, contracts, and matching or other arrangements with educational institutions, private foundations or other institutions, with private firms or individuals whose training, experience, and qualifications are, in his judgment, adequate for the conduct of water research projects, and with local, State, and Federal Government agencies to undertake research into any aspects of water problems related to the mission of the Department of the Interior which he may deem desirable and which are not otherwise being studied.

Within the broad research program authorized by Congress, the Office of Water Resources Research desires to encourage and support research investigations dealing with major water problem areas and which hold promise of contributing to the solution of important water problems. In its fiscal year 1970 program, the Office of Water Resources Research proposes to emphasize support of research in the following major subject fields:

1. Analysis of Planning, Managerial, Financial, Operating and Regulatory Policies of Water Resources Institutions.
2. Hydrologic Systems Analysis.
3. Urban and Metropolitan Water Resources Problems.
4. Ecologic Impact of Water Resource Development.
5. Evaluation of Economic Importance of Various Uses of Water, Cost Allocation, Cost Sharing, Pricing and Repayment.
6. Evaluation of Social Objectives in Water Policy.
7. Water Research Needs of the Great Lakes and Other Major Water Resource Regions.

To allow sufficient time prior to July 1, 1969, for proposal review, contract negotiations, and transmittal to the Congress for a 60-day period as required by Title II of the Act, formal proposals must be submitted to the Office of Water Resources Research by November 15, 1968, in order to be eligible for fiscal year 1970 funding. Although proposals may be submitted to OWRR at any time, those received after November 15, 1968, will be held for future consideration for support. Detailed instructions and forms may be obtained from the Director, Office of Water Resources Research, U. S. Department of the Interior, Washington, D. C. 20240.

If you have previously submitted a Title II proposal to the Office of Water Resources Research and desire your proposal to be given further consideration for support, please notify that office prior to November 15, 1968, and provide any additional information or revisions you wish to have incorporated in your proposal.

WATER RESOURCES COUNCIL PROPOSES NEW DISCOUNT RATE FOR USE IN FORMULATION AND EVALUATION OF WATER AND RELATED LAND RESOURCES PROJECTS

The Federal Water Resources Council has proposed a new formula for determining the discount rates for use by Federal agencies in the formulation and evaluation of proposed projects for use and development of water and related land resources, according to Henry P. Caulfield, Jr., the Council's Executive Director.

Mr. Caulfield stated that the Council's proposed new formula was in response to that part of the President's FY 1969 Budget Message which stated that "The interest rate now being used by Federal agencies in formulating and evaluating proposed water resource projects is significantly lower than the cost of borrowing by the Treasury. To improve the evaluation and selection of projects, administrative action is underway to relate this rate more closely to the average estimated current cost to the Treasury of long-term borrowing. The new interest rate, which will be higher than the rate now being used, will be applied in preparing future project evaluation reports."

The present discount rate of 3 1/4 percent is based upon the average rate of interest payable by the Treasury on interest-bearing marketable securities of the United States outstanding at the end of the fiscal year preceding such computation which, upon original issue, had terms to maturity of 15 years or more. This is usually called the "coupon rate." The new rate would be based upon the market yield of comparable Treasury bonds, usually called the "yield rate," and under the proposed formula would be 4 5/8 percent for fiscal year 1969.

In following years the rate for any year would not be raised or lowered more than 1/4 percentage point from that used during the previous year.

"The effect of higher discount rates," Caulfield said, "is to make borderline water projects 'uneconomic' and they also tend to give preference to projects which have an early economic return over those which have long-deferred benefits."

The Council is inviting all interested persons or organizations to submit written comments, suggestions or objections regarding the proposed discount rate formula during the next sixty days. After considering all comments, the Council will, with the approval of the President, issue a new regulation. It will apply to all Federal and Federally-assisted water and related land resources project evaluation reports submitted to the Congress, or approved administratively, after the close of the 90th Congress.

The Council is composed of the Secretary of the Interior, Chairman, the Secretary of Agriculture, the Secretary of the Army, the Secretary of Health, Education, and Welfare,

the Secretary of Transportation, and the Chairman of the Federal Power Commission. The Secretary of Commerce and the Secretary of Housing and Urban Development are Associate Members and the Attorney General and Director of the Bureau of the Budget participate in the work of the Council as Observers.

#### WATER DATA FOR URBAN AREAS

The U. S. Geological Survey has just issued a 397-page report, Water Data for Metropolitan Areas, which summarizes hydrologic problems, adequacy of data, and availability of USGS reports on local water resources for 222 major metropolitan areas.

"Many planners and engineers are unaware that such useful water data and information are available to help solve urban water problems," explained William J. Schneider, USGS research hydrologist, Washington, D. C. By turn of century, Schneider continued, "an estimated 2 million more acres will be swallowed up by urban expansion. Unless urban planners utilize all available water data this expansion will add to the present water problems of supply, flooding, drainage, pollution, recreation, and aesthetics."

"Most urban problems," Schneider said, "are combinations of management and supply problems. The available water must be protected from man's pollution and local water supplies often must be augmented with water from outside sources" since "eventually, urban pollution makes nearby water sources unusable."

Published as USGS Water-Supply Paper 1871, guidebook may be purchased from Supt. of Documents, Gov. Printing Office, Washington, D. C. 20402, for \$1.50.

#### WATER QUALITY STANDARDS REGULATIONS PROPOSED

Regulations providing for the establishment, revision and enforcement of water quality standards have been proposed by the Department of the Interior, Secretary of the Interior Stewart L. Udall announced recently.

Under the Water Quality Act of 1965, the Secretary of the Interior is empowered to establish Federal standards for interstate waters if he finds it necessary to disapprove some or all of the standards proposed by a State.

All fifty states and five other jurisdictions have exercised their option under the law to submit proposed standards for their interstate waters and forty-one of the standards packages have been approved in whole or in part by the Secretary. No standards have been disapproved by the Secretary so far.

If the Secretary finds some standards unacceptable or that none had been set by a State for an interstate stream, he could, under the proposed regulations, after reasonable notice prepare new or revised regulations.

Then, if the State does not submit acceptable standards within six months or petition for a public hearing, the Secretary would put these standards into effect.

If the affected State petitions for a public hearing, the Secretary would call a hearing before a five-member board. If the hearing board approves the standards established by the Secretary, the standards go into effect upon receipt of the board's recommendations. If, on the other hand, the hearing board recommends modifications, the Secretary is required to issue revised standards in line with the board's recommendations.

In the case of alleged violation of established water quality standards, the proposed regulations provide that the Secretary shall notify those persons responsible for the discharges causing the alleged violation. The Secretary will set a time and place for an informal hearing before him or his designee in order to try and reach a voluntary agreement for halting of the violation.

Under the law the Secretary can ask the Justice Department to file a court action if the standards violation is not corrected within 180 days after the alleged violator has been served notice.

The proposed water quality standards regulations were published in the Federal Register on July 25 and interested persons were given 30 days from this publication date to submit comments to the Secretary of the Interior. These rules will become effective after y comments are considered and the regulations are published in the Federal Register.

#### NEW GUIDELINES ON EROSION CONTROL

Guidelines to minimize soil erosion and water and air pollution during construction of Federally-assisted local conservation projects involving earth moving have been issued for first time by U. S. Dept. of Agriculture.

Guidelines apply to watershed projects and similar construction being carried out by local sponsoring organizations with Soil Conservation Service technical and financial assistance. D. A. Williams, administrator of SCS, said SCS surveys and site investigations will "include information required to design measures that will provide adequate pollution and erosion control for a site," and that such measures required during construction "must be clearly outlined in construction contracts." Guidelines to be basis for plans and specifications on all projects assisted by SCS are:

1. Reduce by greatest extent practicable the area and duration of exposure of readily erodible soils;
2. Protect soils by using temporary vegetation or mulch or by accelerating establishment of permanent vegetation;
3. Mechanically retard rate of runoff from construction site and control disposal of runoff;
4. Trap sediment resulting from construction in temporary or permanent debris basins;

5. Sprinkle or apply dust suppressors, or otherwise keep dust within tolerable limits on haul roads and at site;
6. Use temporary bridges or culverts where fording of streams is objectionable, avoid plans for borrow pits where pollution from operation is inevitable;
7. Use temporary measures to keep erosion under control if construction is suspended for any appreciable length of time;
8. Provide for protection against such pollutants as chemicals, fuel, lubricants, and sewage;
9. Time construction to avoid rainy seasons;
10. Prohibit locating sanitary facilities over or adjacent to live streams, wells, or springs;
11. Prevent grass or brush fires which render areas vulnerable to erosion.

----Air/Water Pollution Report

RESEARCH REPORT ON GROUND WATER YIELDS AVAILABLE

Copies of the project completion report for research on "Ground Water Yields in the Raleigh Quadrangle," by Dr. Charles W. Welby, Department of Geosciences, North Carolina State University, are now available. WRI Report No. 8 of the Institute numbered series describes one approach to the problem of predicting well yields in crystalline rocks. The model used is analogous to a tank with an intake pipe near the base with a pump discharging over the rim. The report describes the theory, techniques, and results obtained. In the opinion of the author, the concept utilized represents a closer approximation to actual conditions than does the assumption of an homogenous aquifer for crystalline rocks. A copy of the report can be obtained from the Institute upon request.

ADVANCED WASTE TREATMENT REPORT PUBLISHED

A summary of a technical report on advanced waste water treatment studies has been published by the Department of the Interior's Federal Water Pollution Control Administration. The report discusses various systems of providing high degree treatment of waste water. FWPCA has sparked a major drive to find improved means of treating waste water in order to provide better water pollution control and to develop methods for renovating waste water for agricultural, industrial, and other uses.

The report, "Summary Report--Advanced Waste Treatment--July 1964 - July 1967," states that considerable progress has been made in the development of the more promising treatment methods. A number of these have reached the stage of pilot investigation.

Single copies of this report may be obtained by writing to the Publications Office, Ohio Basin Region, Federal Water Pollution Control Administration, Cincinnati, Ohio 4522.



## WATER RESOURCES LEGISLATION IN THE CONGRESS

### New Public Laws

- H.R. 15979 To prevent and minimize injury to fish and wildlife from use of pesticides (P.L. 90-394).
- S. 1401 Land and Water Conservation Fund amendments (P.L. 90-401).
- S. 660 Granting the consent of Congress to a Great Lakes Basin Compact.

### Bills Passed - Senate

- S. 3206 Amended, proposed Water Quality Improvement Act, adopting amendments to the committee amendment, and an amendment to the title of the bill. (S. 2525 was indefinitely postpone, having been adopted as an amendment.)
- H.R. 25 Amended, authorizing cooperation with the States in protecting and developing estuarine areas of the counties which have sporting, scenic, or recreational value.

### Bills Passed - House

- H.R. 729 Pollution Abatement Incentive Act.
- S. 827 To establish a nationwide system of trails.
- H.R. 11026 Amended, regarding facilitating the conduct of the fish and wildlife conservation and rehabilitation program.

### Bills Introduced

- S.J.Res. 188 Granting consent of Congress to the States of Maryland, West Virginia, Virginia, H.J.Res.1414 Pennsylvania, and the District of Columbia, as signatory bodies, for establishment of Interstate Commission on the Potomac River Basin.
- H.R. 18450,  
18451, 18452,  
18453, 18454,  
18495, 18664,  
18757 Relating to the dumping of certain materials into the navigable waters of the United States.

### NEW PUBLICATIONS RECEIVED BY THE INSTITUTE

(These may be borrowed from the Institute for a two-week period or may be ordered from the organization issuing the publication.)

#### Water Resources Planning

"The Effects of Geographical and Climatic Setting on the Economic Advantages of Alternative Flood Control Measures," C. R. Dempsey, WRI, Univ. of Ky., Lexington, Res. Report No. 10, 1968

#### Water Quality Management

"Migration of Bacteriophage T<sub>4</sub> in Percolating Water Through Selected Oahu Soils," R. M. Tanimoto, et al, WRRRC, Univ. of Hawaii, Honolulu, Hawaii, June, 1968.

NEW PUBLICATIONS RECEIVED BY THE INSTITUTE (cont.)

- "National Estuarine Inventory - Handbook of Descriptors," FWPCA-USDI, Wash., D.C., June, 1968.
- "Summary Report Advanced Waste Treatment," July 1964 - July 1967, Pub. WP-20-AWTR-19, FWPCA, USDI.

Water Quantity Management

- "A Hydrodynamic Study of Flow in Irrigation Furrows," O. C. Wilke, Tech. Rep. 13, Water Resources Research Institute, Texas A & M University, July, 1968.
- "Annual Maximum Flows from Small Agricultural Watersheds in the United States," ARS-USDA, June, 1958 (Reprinted 1968).
- "Bedrock Influence on Sediment Load of a Selected Hartwell Reservoir Tributary," P. K. Birkhead & J. S. Griffin, Jr., WRRI, Report No. 6, Clemson University, Clemson, S. C., July, 1968.
- "Conference Proceedings - Hydrology in Water Resources Management," WRRI, Report No. 4, Clemson University, Clemson, S. C., March, 1968.
- "Drilled Water Wells in New Hampshire," G. W. Stewart, Dept. of Resources & Economic Development, State of New Hampshire.
- "Evaluation of Runoff Coefficients from Small Natural Drainage Areas," C. F. Miller, WR, University of Ky., Lexington, Res. Report No. 14, 1968.
- "Ground Water Resources of Chowan County, North Carolina," Div. Ground Water, Bu. 14, N. C. Dept. Water & Air Resources, Raleigh, July, 1968.
- "Hydraulic Geometry of Illinois Streams," J. B. Stall & Y. S. Fok, Research Report No. 15, Water Resources Center, University of Illinois, July, 1968.
- "Hydraulic Investigations of Tainter Gates as Flow Measuring Devices," P. G. Mayer & B. R. Olmstead, Pub. WRC-0168, Water Resources Center, Georgia Institute of Technology, April, 1968.
- "Hydrologic Data for Experimental Agricultural Watersheds in the United States,"  
 Misc. Pub. 945            1956-59  
 Misc. Pub. 994            1960-61  
 Misc. Pub. 1070          1962
- "Monthly Precipitation and Runoff for Small Agricultural Watersheds in the United States," ARS-USDA, June, 1957 (Reprinted 1968).
- "Selected Runoff Events for Small Agricultural Watersheds in the United States," ARS-USDA, Jan., 1960 (Reprinted 1968).
- "Structural Behavior Measurements for Penstocks through Concrete Dams - Hungry Horse and Canyon Ferry Dams," Dams Br. Rep. No. DD-7, Bu. of Reclamation, USDI, Denver, Colo., April, 1968.

Miscellaneous

- "Annual Report of Activities for FY 1968," WRC, Univ. of Maine, Orono, Maine.
- "Compilation of Water Resources Research in South Carolina," WRRI, Report No. 5, Clemson University, Clemson, S. C., May, 1968.
- "Strategy for the Conquest of Hunger," Proceedings of a Symposium Convened by the Rockefeller Foundation, April 1-2, 1968.

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