

WATER RESOURCES RESEARCH INSTITUTE**OF THE UNIVERSITY OF NORTH CAROLINA**

NORTH CAROLINA STATE UNIVERSITY AT RALEIGH

UNIVERSITY OF NORTH CAROLINA AT CHAPEL HILL

Number 37

February, 1969

"WATER!" SCHEDULED FOR LOCAL TELEVISION

A 30-minute program featuring a presentation on North Carolina's water resources and the work of the Water Resources Research Institute by President William Friday of the University of North Carolina will be broadcast Monday, February 24, at 8:00 P. M. and Sunday, March 2, at 5:00 P. M. over University of North Carolina Television.

Joining President Friday in presenting the program, entitled "Water!", will be Dr. C. E. Bishop, vice president for public service programs of the four-campus University of North Carolina, and Professor David H. Howells, director of the University's Water Resources Research Institute based at North Carolina State University in Raleigh.

The program will depict the University's water research work in the coastal areas as well as in the lakes and rivers of the Eastern, Piedmont, and Mountain regions of North Carolina.

The UNC TV stations are WUND-TV, Channel 2, Columbia; WUNC-TV, Channel 4, Chapel Hill; WUNE-TV, Channel 17, Linville; WUNF-TV, Channel 33, Asheville; and WUNG-TV, Channel 58, Concord.

"Water!" was produced in color by WTVD, Durham, through the assistance of John Atkinson, program manager.

Through the cooperation of the North Carolina Association of Broadcasters and its member stations, "Water!" will be shown over a number of other television stations in the State. These scheduled showings will be announced later.

NEW INSTITUTE REPORTS - AVAILABLE UPON REQUEST

Report No. 17 - "Streamflow Routing" (with Applications to North Carolina Rivers) - Dr. Michael Amein and Mr. Ching Seng Fang, Department of Civil Engineering, N. C. State University at Raleigh.

A powerful analytical tool for the investigation of unsteady flows associated with flood routing, reservoir regulation, surges in canals, tidal flows, and so forth, is available in the equations of conservation of mass and momentum. Although approximate

solutions of these equations have been and still are used on a large scale, the advent of the digital computer has made it feasible to obtain complete solutions of the equations by numerical methods.

In this study Dr. Amein and Mr. Fang investigated three methods of solution - the explicit, characteristic, and implicit methods - applying them to artificial channels, and a reach of the Neuse River. While the three methods provided almost identical solutions, there is much difference among them so far as speed, reliability, simplicity, and convenience are concerned. The procedure for finding solutions by the implicit method, as developed by this project, proved to be fast, accurate, convenient, and highly suitable for problems involving flow in natural river channels of complex shape.

This study is the first in which this type of analysis has been used. The advantages of the implicit method make it feasible to use this sophisticated tool for the solution of flood routing and other unsteady flow problems on a routine basis.

Report No. 18 - "Textile Wastes - A Bibliography" - Mr. Charles D. Livengood, Department of Textile Chemistry, N.C.S.U.

Pollution from industrial wastes is one of the most challenging phases of the National program for water pollution control today. The textile industry, cognizant of this serious problem, has long been concerned about its stream pollution potential due to the prodigious quantities of water used in its processes. To alleviate this problem, many mills have built treatment facilities which are quite costly. Others are using municipal sewage treatment systems. These latter systems, in many instances, have become dangerously overloaded due to a steadily increasing population and industrial growth. Consequently, the industry is turning more and more to inplant control systems to reduce its total effluent.

Surveys have indicated that more than half of the stream pollution potential in textile finishing plants effluent is produced by the fabric desizing operation. Based on this survey data, in May 1965 a feasibility study concerning the recovery of wastes from the desizing of fabric as an approach to the alleviation of stream pollution by textile processing operations was initiated at North Carolina State University, School of Textiles. The study was sponsored by the Water Resources Research Institute. The objectives initially were to examine the potential for recovery of existing sizing agents and the possibility of using materials of known ease of recovery from aqueous solution as possible sizes. At the same time, a search of the chemical literature concerning sources of pollution from textile mills, especially warpsize wastes, was made for the period 1954-1964. It was found that essentially no effort had been made during this time in the field of recovery and reuse of chemicals as a means of abating stream pollution.

In 1968, again under the sponsorship of the Water Resources Research Institute of the University of North Carolina, the School of Textiles undertook to correct, update, and publish a bibliography of literature references relative to textile wastes as stream pollutants. No effort was made to include abstracts of literature published prior to 1954 as these were already available in other publications. This study includes abstracts published in the Chemical Abstracts, Textile Technology Digest, Shirley Institute Abstracts, and Water Pollution Abstracts through June, 1968.

This bibliography has been key-word coded and indexed to aid in the retrieval of information. The coding, wherever possible, was done according to the Thesaurus of Engineering Terms, published by the Engineers Joint Council, 345 East 47th Street, New York, New York. The abstracts are listed alphabetically by author's last name and are numbered consecutively under each letter of the alphabet.

4TH ANNUAL WATER RESOURCES RESEARCH CONFERENCE

The Fourth Annual Water Resources Research Conference sponsored by the USDI Office of Water Resources Research was held in Washington, D. C. on January 28-29, 1969.

In his review of the first five years of the Committee on Water Resources Research (Federal Council For Science & Technology) William C. Ackermann reported that while the Committee has identified priority areas of water resources research, it has not managed to shift Federal research into these areas, except for new agencies like OWRR which has adopted these priorities. The Committee, he said, has given very little attention to the interface between research and operating agencies. He proposed a redefinition of the President's office of Science and Technology to which the Federal agencies would submit their programs for approval or disapproval.

Ted Schad, the new Executive Director of the National Water Commission, reminded the participants that--"everything we do must be justified to Congress." The reason for gaps in the overall research program is the lack of adequate justification, he said. Schad noted that we need research on how decisions are made and that we need to ask ourselves what we should be doing with regard to water resources that we are not now doing.

Hyman A. Schwartz, Chief, Research and Education Branch, Corps of Engineers, and a number of other speakers pointed to the need to give greater attention to the channeling of research results into practice. This theme was later considered as the subject for an entire half-days discussion at which Harvey O. Banks, President of Leeds, Hill, and Jewett, Inc., reported preliminary results of a survey of Institute information exchange systems with State agencies and private industry. He found that about 50% of the responding State agencies could identify Institute research projects. There was a

unanimous desire to be better informed on research activities. Some of the suggestions for improvement included an Institute newsletter, extension, and other services.

There seemed to be a general concensus among participants as to a need for more direct contact between users and researchers including both the identification of research needs and the transfer of research results into practice.

Other sessions dealt with interdisciplinary research, input from social scientists, the current status of the Water Resources Scientific Information Center, and regional research activities.

ANNUAL REPORTS OF RIVER BASIN COMMISSIONS

President Johnson transmitted to the Congress recently the first annual reports of the four river basin commissions established under Title II of the Water Resources Planning Act of 1965. The four commissions that have been established to date include all or part of 21 States and are the Pacific Northwest River Basins Commission, the Souris-Red-Rainy River Basins Commission, the Great Lakes Basin Commission, and the New England River Basins Commission.

In transmitting these reports, the President stated:

"In the last few years we have become more aware than ever that the quality of American life depends largely upon how we use--and conserve--our natural resources. The river basin commissions assure that the people within each area will have a voice in deciding how these resources are used. This new approach to planning, if it is successful, promises more efficient use of America's great natural and man-made wealth, and more attention to preserving the beauty and vitality of our environment."

Copies of these reports may be obtained by writing to the river basin commission chairmen as follows: Mr. Charles W. Hodde, Chrm., Pacific Northwest River Basins Comm., 1 Columbia River, Vancouver, Wash., 98660; Mr. Gordon K. Gray, Chrm., Souris-Red-Rainy River Basins Comm., Suite 6, Professional Bldg., Holiday Mall, Moorehead, Minn., 56560; Mr. R. Frank Gregg, Chrm., New England River Basins Comm., Rm. 1615, Post Office and Court House Building, Boston, Mass., 02109; Mr. Verne M. Bathurst, Acting Chrm., Great Lakes Basin Comm., Rm. 4102 1ST Building, 2200 North Campus Blvd., Ann Arbor, Mich., 48105.

MUNICIPAL WATER SUPPLY AND WASTE DISPOSAL

The December issue of the NEWS carried a brief summary of the December 4 Symposium on Better Water and Sewer Systems. With the distribution of the Proceedings this month, it is timely to call attention to some of the principal points made at the Symposium. These are:

1. The numerous deficiencies in North Carolina's community water and sewer systems due to poor planning, lack of cooperation between communities, and inefficient operation of systems.

2. The economic and other advantages of areawide water and sewer systems.
3. The need to attune local water development plans to regional needs and water availability.
4. The need for a sound and politically acceptable Statewide program within which local government could construct and operate areawide water and sewer systems.
5. Lack of an established procedure to assure that actions taken at the local level are coordinated or that alternative arrangements for the provision of services are considered in advance.
6. The absence of clearly established responsibility for comprehensive planning of water and sewerage services throughout the State.
7. The need for the early completion of a State Water Plan relating the available water supply to existing and future demands as a framework for the efficient utilization of both ground and surface water resources.

Copies of the proceedings are available upon request to the Institute.

COST STUDY SHOWS NATION FALLING BEHIND ON POLLUTION ABATEMENT

An updated study by the Federal Water Pollution Control Administration reports that the nation will fall behind in its efforts to provide municipal waste treatment facilities unless the rate of capital investment is substantially increased. The report, "The Cost of Clean Water and its Economic Impact," updates information on National requirements, cost estimates, and economic impact of water pollution control.

The report states: "---the levels of investment outlined in the State Program Plans, and strongly conditioned by the availability of Federal Grant Funds, are roughly equivalent to those of the last six years. These proposed investment levels indicate that unless the rate of capital investment is increased, the nation will fall behind in its goal of providing and maintaining adequate waste treatment for its sewered population." Municipal investment, the report said, was less than half the amount assumed necessary on a five year basis.

FEDERAL GRANTS FOR WASTE TREATMENT IN NORTH CAROLINA

The following grants for the construction of municipal waste treatment works in North Carolina were announced by FWPCA this month:

| | <u>Grant</u> | <u>Total Project</u> | |
|-------------|--------------|----------------------|--|
| Durham | \$500,000 | \$1,986,000 | Interceptor Sewer |
| Jonesville | 63,420 | 211,400 | Secondary treatment facilities |
| Spring Lake | 70,920 | 236,400 | Expansion of secondary treatment plant |

FUNDS BUDGETED FOR FEDERAL POLLUTION CONTROL PROGRAMS

The President's budget for the Federal Water Pollution Control Administration in FY 1970 of \$305,972,000 represents an increase of \$5,122,000 over the current fiscal year. The \$214 million requested for waste treatment construction grants is the same as for FY 1969. The figures for FY 1970 are as follows:

| | |
|------------------------|--------------------|
| Research & Development | \$45,494,000 |
| Planning & Training | 37,496,000 |
| Enforcement | 3,700,000 |
| Executive Direction | 5,282,000 |
| Waste Treatment Works | <u>214,000,000</u> |
| | \$305,972,000 |

WATER RESOURCES ABSTRACTS

Selected Water Resources Abstracts published semimonthly by the Water Resources Scientific Information Center, U. S. Department of the Interior are routinely distributed through the Institute to the following libraries or offices where they are available to interested persons:

University of North Carolina Libraries

Chapel Hill
Charlotte
Greensboro
Raleigh

Duke University Library

East Carolina University Library

N. C. Department of Water and Air Resources

Water Resources Research Institute

This Journal includes abstracts of pertinent monographs, journal articles, reports and other publication formats. The contents of these documents cover the water-related aspects of the life, physical, and social sciences as well as related engineering and legal aspects of water resources conservation, use, and management.

UPPER FRENCH BROAD PROJECTS

The President's budget for the 1970 fiscal year beginning in July requests \$3.3 million for TVA to begin on-site construction of a cooperative multipurpose water control system in the Upper French Broad basin in western North Carolina. The proposed system will consist of 14 relatively small dams, 74 miles of channel improvements, and a levee along the Asheville waterfront. Initial construction will begin on the Mills River Dam and Reservoir in Henderson County. In fiscal year 1969, TVA was given \$250,000 to begin design work on the system. A portion of these funds will be used this spring for surveying and mapping work in the Mills River area. Land acquisition and preliminary on-site construction will start when appropriations are received. Major construction is not expected to begin before April 1970.

THERMAL POLLUTION CONFERENCE

Water pollution officials and other interested persons from North Carolina met at the University of Virginia in Charlottesville with people from other mid-Atlantic states on February 10 and 11 to increase their understanding of heat pollution, how it affects water, and ways it can be avoided.

Heat pollution, or thermal pollution, has been a minor but growing problem for a number of years. When the natural temperature of a stream or river is significantly increased, a chain reaction occurs in the various water life forms that disrupts water life.

The purpose of the meeting was to acquaint power production engineers, state and local officials, and others concerned with the problem, with the latest technical information available and an assessment of future problems of heat pollution.

USGS REPORT ON WATER RESOURCES CONDITIONS IN NORTH CAROLINA

The January report by USGS on Water Resources Conditions in North Carolina disclosed normal streamflow in the mountains, below normal but not deficient in the Piedmont, and deficient (lower 25% of record) in the Coastal Plain.

Groundwater levels in selected observation wells rose in the mountains, western Piedmont, and Coastal Plain, and declined in the eastern Piedmont. In general, ground water levels were above average in mountains and Coastal Plain and below average in the Piedmont.

WATER RESOURCES LEGISLATION IN THE CONGRESS

Bills Introduced - House

- | | |
|-----------|--|
| H.R. 25 | To establish a <u>Council on Environmental Quality</u> |
| H.R. 68 | To amend the act of March 3, 1905, relating to the <u>dumping</u> of |
| H.R. 460 | certain <u>materials into navigable waters</u> . |
| H.R. 1231 | |
| H.R. 1246 | |
| H.R. 3838 | |
| H.R. 71 | To declare and determine the policy of the Congress with respect to |
| H.R. 916 | the <u>primary authority of the states to regulate fish and wildlife</u> . |
| H.R. 119 | To amend the River and Harbor Act of 1958 with respect to control and |
| H.R. 833 | <u>eradication of obnoxious aquatic plants</u> . |
| H.R. 120 | To amend the Federal Water Pollution Control Act relating to area acid |
| | and other <u>mine water pollution control demonstrations</u> . |
| H.R. 145 | To authorize the Secretary of the Interior to study the most feasible |
| H.R. 727 | means of establishing certain portions of tidelands and other coastal |
| | and Great Lakes waters as <u>marine sanctuaries</u> . |

H.R. 176 To amend the Internal Revenue Code of 1954 to encourage the construction
H.R. 290 of pollution control facilities.

H.R. 299

H.R. 316 H.R. 512 H.R. 567 H.R. 828 H.R. 1386 H.R. 4138
H.R. 409 H.R. 544 H.R. 808 H.R. 1137 H.R. 3263 S. 702

H.R. 442 To amend the FWPC Act to establish standards and programs to abate
and control water pollution by synthetic detergents.

H.R. 475 To amend the FWPC Act to establish incentive award program for industries
and local government demonstrating excellence in pollution abatement.

H.R. 483 To amend the FWPC Act relative to the financing construction of
H.R. 2184 waste treatment plants.

H.R. 641 To establish a Federal Water Commission to provide for development,
utilization and control of water resources.

H.R. 1052 To amend the Oil Pollution Act, 1924.

H.R. 1057 To amend the act of August 1, 1958, to prevent or minimize injury
to fish and wildlife from pesticides.

H.R. 1058 To amend the Fish and Wildlife Coordination Act to protect fish, wild-
life and recreation from discharge of heated effluents.

H.R. 1060 To require certain vessels operating on the navigable waters of the
U.S. to conform to standards of waste disposal.

H.R. 1061 To amend the Fish and Wildlife Coordination Act to require permits for
exploring or mining oil or gas underlying navigable waters.

H.R. 1062 To expand and improve existing law and to provide for regulations to
control pollution from vessels and certain other sources in Great Lakes
and other navigable waters.

H.R. 1244 To amend the Federal Power Act with respect to jurisdiction of the
Federal Power Commission over streams and other bodies of water.

H.R. 1370 To amend the FWPC Act to authorize a program of research and demon-
H.R. 2802 stration for the control of pollution in lakes.

H.R. 2133 To transfer functions relating to financial assistance for water
facilities to HUD and for sewerage facilities to Interior.

H.R. 2155 To give the President authority to alleviate threats posed by releases
H.R. 2156 of fluids or other substances carried in ocean-going vessels.

H.R. 2157 To provide the Coast Guard with authority to conduct research and
development to deal with the release of harmful fluids from vessels.

H.R. 2505 To authorize the Secretary of the Interior to establish, coordinate,
and administer programs for the reclamation, acquisition, and conser-
vation of lands and waters adversely affected by coal mining operations.

H.R. 3122 To amend the FWPC Act to prevent pollution of water by oil and establish
a revolving fund for removal of oil discharges.

H.R. 4607 Amend Consolidated Farmers Home Administration Act of 1961 to make
interest income on water and waste disposal loans sold out of the agri-
cultural credit insurance fund subject to Federal income taxes and for
other purposes.

BILLS INTRODUCED - SENATE

- S. 544 To amend the FWPC Act to provide for:
Performance standards to control vessel discharges
Control of oil discharges
Demonstration of control of acid mine water pollution
Compliance with water quality standards by Federal licenses
(thermal pollution).

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

- "Codified and Uncodified State Laws and Municipal Ordinances Bearing on Water and Related Land Resources in Minnesota," compiled by William C. Walton, Raymond A. Haik, and David L. Hills, Water Resources Research Center, University of Minnesota Graduate School (Bulletin No. 9, 1968)
- "Development of Water Resources in Appalachia," 1st & 2nd Draft, Main Report - Part II, Chapters 7 & 8, U.S. Army, Corps of Engineers, Office of Appalachian Studies, Cincinnati, Ohio 45201.
- "Local Action and Acceptance of Watershed Development," by Kenneth P. Wilkinson, Social Science Research Center, Mississippi State University, State College, Mississippi 39762, July 1966.
- "Great Lakes Basin Commission Annual Report 1968," Institute of Science & Technology, 2200 North Campus Boulevard, Ann Arbor, Michigan 48105.
- "New England River Basins Commission Annual Report," fiscal year 1968, Boston, Mass., 02108.
- "Lectures on Water Conservation," Report No. 7, October 1968. Institute of Water, The University of Connecticut, Storrs, Connecticut 06268.
- "The Tsunami of the Alaskan Earthquake, 1964: Engineering Evaluation," Tech. Memo. No. 25, Coastal Engineering Research Center, Corps of Engrs., Washington, D. C., May, 1968.
- "Water and Choice in the Colorado Basin," Nat'l. Academy of Sciences, 2101 Constitution Ave., Washington, D. C. 20418 (\$2.50)

Water Quality Management

- "Agricultural Utilization of Sewage Effluent and Sludge, FWPCA, U. S. Dept. of Interior, January 1968, by James P. Law, Jr., Research Soil Scientist, Water Quality Control Research Program, Robert S. Kerr Water Research Center, Ada, Oklahoma.
- "Coarse Filter Media for Artificial Recharge" by Roger L. Thomas, Report of Investigation 60, State of Illinois, Department of Registration and Education, Illinois State Water Survey, Urbana, 1968.
- "The Effect of Turbulence on Bacterial Substrate Utilization," J. T. Marlar, WRC-0568; Ga. Inst. Tech., Atlanta, Ga., Dec. 1968.

"Determination, Evaluation and Abatement of Color in Textile Plant Effluents," by R. K. Flege, The A. French Textile School in cooperation with Water Resources Center, Georgia Institute of Technology, Atlanta, Georgia, December 1968.

"The Effect of Induced Turbulence on the Growth of Algae," L. W. Olinger, WRC-0468, Ga. Inst. Tech., Atlanta, Ga., Dec. 1968.

"Industrial Waste Guide on Thermal Pollution," Federal Water Pollution Control Administration, Northwest Region, Pacific Northwest Water Laboratory, Corvallis, Oregon, September 1968.

Catalog of Federal Pesticide Monitoring Activities in Effect July 1967, Federal Committee on Pest Control, December 1968, Washington, D. C. 20250.

"A Study of Federally Financed Research on Pests, Pesticides and Pest Control," Federal Committee on Pest Control, U.S. Department of the Interior, Office of Water Resources Research, Washington, D. C., January 1969.

"Preliminary Studies of Zooplankton Distribution with the Continuous Plankton Recorder," by Wayland R. Swain, Theodore A. Olson and Theron O. Odlaug, Bu. 7, Water Resources Research Center, University of Minnesota Graduate, Minneapolis, Minn., November 1968.

Water Quantity Management

"A reconnaissance of Coastal Erosion in North Carolina," by Jay Langfelder, Donald Stafford, and Michael Amein, December 1968, Civil Engineering Department, North Carolina State University, Raleigh, North Carolina 27607.

"Geology and Ground-Water Resources of the Murphy Area, North Carolina," Ground Water Bulletin No. 13, North Carolina Department of Water and Air Resources, Raleigh, August 1968, by Chester L. Dodson and R. L. Laney.

"The Availability of Ground Water in Kent County, Delaware, with Special Reference to the Dover Area," by R. W. Sundstrom and T. E. Pickett, Newark, Delaware, June 1968. (Water Resources Center - University of Delaware)

"Merrit Dam," Technical Record of Design and Construction, A Water Resources Technical Publication, Missouri River Basin Project, Denver, Colorado, October 1968. (Price: \$4.50)

Miscellaneous

Annual Reports - Water Resources Research Institutes

University of North Dakota

University of Kentucky

Iowa State University

Purdue University

University of Idaho

University of Arizona

Cornell University

Utah State University

Montana State University

Colorado State University

"Cooperative Water Resources Research and Training," 1968 Annual Report, U. S. Dept.

of the Interior, Office of Water Resources Research, Washington, D. C. 20240
(December 1968)

"Progress on Engineering Research," Annual Report, Bureau of Reclamation, 1967, A
Water Resources Technical Publication, Research Report No. 15, (For sale
by the Superintendent of Documents, U. S. Government Printing Office, Wash.,
D. C. 20402, or the Chief Engineer, Bureau of Reclamation, Attention 841,
Denver Federal Center, Denver, Colorado 80225. Price \$1.25)

"Water Research Summary," Oregon State University, Water Resources Research Institute,
No. 2, March 1968, Corvallis, Oregon, Mr. Emery N. Castle, Director.

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