NEWS
WATER RESOURCES RESEARCH INSTITUTE
OF THE UNIVERSITY OF NORTH CAROLINA

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CONTENTS

THE GATHERING OF THE WATERS

The North Carolina Agricultural Extension Service has just published an outstanding booklet designed to help citizens understand many of the factors that influence water resources. Entitled "The Gathering of the Waters--A Look at Water Problems and Opportunities in North Carolina," the attractive publication presents a broad view of some of the significant problems and opportunities that influence future development of this important resource in North Carolina.

The author is Dr. James M. Stewart, Associate Director for Research Application of the Water Resources Research Institute. At the time of preparation, Dr. Stewart also served as Extension Community Development Specialist for the Extension Service.

Copies can be obtained from the North Carolina Agricultural Extension Service, North Carolina State University, Raleigh 27607. Dr. George Hyatt, Jr. is Extension Director.

DR. WARREN A. HALL SWORN IN AS DIRECTOR OF INTERIOR'S OFFICE OF WATER RESOURCES RESEARCH

Dr. Warren A. Hall took office as Director of the Interior Department's Office of Water Resources Research at swearing-in ceremonies at 11:00 a.m. Wednesday, September 12, in the office of Secretary of the Interior Rogers C. B. Morton.

Dr. Hall has been Acting Director of OWRR since October 25, 1972, when Dr. H. Garland Hershey resigned. Dr. Hall joined Interior as Associate Director of OWRR on September 19, 1972, after serving as Professor of Engineering at the University of California, Riverside.

Born in Hot Springs, South Dakota, on August 12, 1919, Dr. Hall earned engineering degrees at Santa Ana College, California, and the California Institute of Technology. He received his Ph.D. from the University of California, Los Angeles.

While on the faculty at the University of California, Los Angeles, Davis, and Riverside, California, Dr. Hall occupied professorial positions and served for several years in the posts of Director of the Drylands Research Institute, Director of the University's Water Research Center, and Assistant Dean, College of Engineering.

Dr. Hall spent the period from September 1969 to December 1970 in Washington, D. C., as Technical Assistant to the Director, Office of Science and Technology, Office of the President, and at the same time served as Chairman of the Committee on Water Resources Research of the Federal Council for Science and Technology with responsibility for the broad coordination and review of all Federal water resources research programs.

WATER RESOURCES RESEARCH PROPOSALS INVITED

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 1975 support, beginning July 1, 1974, 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

which hold promise of contributing to the solution of important water problems. In its fiscal year 1975 program, the Office of Water Resources Research proposes to emphasize support of research in the major subject fields listed below. However, any technical approach or idea which holds promise of contributing to the solution of the Nation's water problems will be given every consideration.

To allow sufficient time prior to July 1, 1974, for proposal review, contract negotiations, and transmittal to Congress for a 60-day period as required by Title II of the Act, it is requested that formal proposals be submitted so as to reach the Office of Water Resources Research by January 11, 1974. Although special proposals may be submitted to OWRR at any time, primary consideration for FY 1975 support will be given to those received by January 11, 1974.

OWRR Procedures Memorandum No. 73-2 giving detailed instructions and forms for the submission of proposals for consideration for funding under the Title II provisions of the Water Resources Research Act may be obtained from the Director, Office of Water Resources Research, U. S. Department of the Interior, Washington, D. C. 20240.

The Title II research program of the Office of Water Resources Research will be directed primarily toward support of certain current priority objectives of the Department of the Interior. These include:

- Solving of Energy Problems
- Encouraging Indian Self-Determination and Improvement in the Quality of Life on Indian Reservations
- Solving Land Use Problems
- Promotion of Efficient Allocation and Conservation of Scarce Water and Water-Related Resources in a Manner Compatible with Environmental Considerations. Developing means of achieving more efficient resource management such as reuse and recycling of water, reassessing the economic value of additional agricultural development and improved irrigation efficiencies in order to save resources, thus reducing the need for large capital investments of the future.
- Improving the Quality of our Physical Environment

In addition to the above Departmental objectives, OWRR has again identified the following general subject areas of prime interest:

1. Improvement of Water Resource Planning, Managerial, Financial, Operating, and Regulatory Policies
2. Water Resources Policy and Political Institutions
3. Hydrologic Systems Analysis
4. Urban and Metropolitan Water Resources Problems
5. Ecologic Aspects and Environmental Consideration of Water Resources Planning and Management

6. Evaluation of Economic Importance of Various Uses of Water, Cost Allocation, Cost Sharing, Pricing, and Repayment
7. Analysis and Evaluation of Water Resources Projects
8. Ground-Water Supply, Management, and Protection
9. Protection and Rehabilitation of Estuarine Resources
10. Thermal Loading Problems
11. Water Demand Considerations

PULP MILL POLLUTION ABATEMENT

Dr. Nils Hartler, Professor of Cellulose Technology, Swedish Royal Institute of Technology, will present a series of lectures on Pollution Abatement Technology in Sweden in Raleigh on October 18 and 19. Sponsors are the NCSU School of Forest Resources, Water Resources Research Institute of The University of North Carolina, and Triangle Universities Consortium on Air Pollution. Conference Chairman is Dr. I. S. Goldstein and Program Chairman is Dr. W. T. McKean.

The lecture and subsequent panel discussion on the Impact of Environmental Considerations of New Technology in the Pulping Industry will be held at the Velvet Cloak Inn. The registration fee is $35. Registration deadline is October 16. The fee includes reception and banquet on October 18, luncheon on October 19, and abstracts of lectures. Requests should be addressed to Mrs. Pat Roberts, Department of Wood and Paper Science, N. C. State University, Box 5488, Raleigh 27607. Checks should be payable to the Department. The program is as follows:

October 18	11:00-1:00	Registration (Velvet Cloak Inn)
	1:00 p.m.	Opening Remarks: Dr. Eric L. Ellwood, Dean, School of Forest Resources, North Carolina State University
	1:30 p.m.	Elimination of polluting waste water from kraft pulping: Closed loop systems - separation and purification of condensates: Press washing of pulp
	2:45 p.m.	Coffee
	3:00 p.m.	Effluents from bleaching of kraft pulps: Closed loop systems - benefits of oxygen bleaching - modified bleaching systems
	6:00 p.m.	Reception, Velvet Cloak Inn
	7:00 p.m.	Banquet, Velvet Cloak Inn Speaker: Dr. John F. Finklea, Director National Environmental Research Center, Research Triangle Park, North Carolina

October 19	9:00 a.m.	Problems associated with sludge: Characterization of sludge - thickening - disposal including recycling
	10:15 a.m.	Coffee
	10:30 a.m.	Air pollution abatement in kraft mills: Recovery furnace, lime kiln - additional points of emission - scrubbing of gaseous streams
	Noon	Lunch
	2:00 p.m.	Panel discussion: Impact of Environmental Considerations on New Technology in the Pulping Industry Moderator: Dr. R. Heath Reeves, North Carolina State University Panelists: Industry Representatives Active in Environmental and Pollution Problems

SHORE AND BEACH PRESERVATION

The 21st Annual Meeting of the American Shore and Beach Preservation Association will be held at the Blockade Runner Hotel, Wrightsville Beach, North Carolina, October 3-5. This meeting will feature speakers of national prominence speaking on the subjects of Shore Line, Coastal, and Inlet Management. Each of these subjects will include presentations on North Carolina as well as cases from other locations or informational and comparison purposes.

The speakers for this meeting have been selected for their thorough knowledge of the subject as well as ability to make outstanding presentations.

The meeting will be instructional to anyone having an interest in the preservation and management of the coastal area.

Hotel reservations should be made as early as possible with the Blockade Runner Hotel.

Inquiries should be addressed to Col. George E. Pickett, c/o Office of Water and Air Resources, NCDNER, Raleigh, N. C.

SHORT COURSE ON GROUND WATER

The District Office of the U. S. Geological Survey and the Division of Ground Water, OWAR-NCDNER have scheduled a short course on "Basic Training in Ground Water Techniques" for November 26-29. The program will include:

Introduction	Water Samples
Geology and Ground Water	Water Level Data
Well Records	Well Hydraulics
Well Cuttings	Yield Data
Well Logs	Well Construction

Inquiries should be addressed to Ralph C. Heath, District Chief, USGS, P. O. Box 2857, Raleigh, N. C. 27602.

WATER DATA AND INFORMATION

Many persons in North Carolina are still not aware of two computerized systems designed to make water data and information readily available. Some are still laboriously recompiling streamflow and climatological data for North Carolina from printed reports when it is readily available from the Hydrological Information Storage and Retrieval System (HISARS) developed by Dr. Edward Wiser, Department of Biological and Agricultural Engineering, NCSU. A manual describing the system and its use can be obtained from the Institute.

Professional personnel working for federal, State, and local agencies; private industry, and the University community will find the Southern Water Resources Scientific Information Center (SWRSIC) at NCSU's D. H. Hill Library a simple and economic means of searching the scientific and technical literature. Author and title printouts can be obtained at the terminal. Complete printouts of abstracts are usually available within a week from search.

Further information concerning HISARS or SWRSIC can be obtained from the Institute.

WATER QUALITY STUDY COMMISSION

The 1972 Federal Water Pollution Control Act established a National Commission on Water Quality to conduct a review of the benefits and costs of meeting goals set by that law. Members and key staff have now been appointed. The office is located at 1111 18th Street, N.W., Washington, D. C. 20036.

The Commission is made up of five senators, five representatives, and five members at large. Appointees are:

Senate	House	At Large
Jennings Randolph	Robert Jones	Gov. Nelson Rockefeller, Chairman
Edmund Muskie	James Wright	Dr. E. A. Gee, Sr. V-P, DuPont
James Buckley	James Grover	W. R. Gianelli, Dir., Cal. Dept. Water Resources
Howard Baker	John Blatnik	R. Kudukis, Dir., Cleveland Dept. Utilities
Loyd Bentson	William Harsha	C. E. Wright, Ch. Arkansas Dept. Pol. Control & Ecology

Lt. General Frederick J. Clarke, former Chief of Army Corps of Engineers, is Executive Director. Joe G. Moore, former Commissioner of the Federal Water Pollution Control Administration, is Program Director.

ENVIRONMENTAL INVENTORY

Wilmington District Engineer Col. Albert C. Costanzo has advised that the final atlas, Environmental Reconnaissance Inventory Pilot Test for the State of North Carolina, will be printed and available by Thanksgiving.

FALLS RESERVOIR IMPACT STATEMENT

A copy of the Corps of Engineers revised environmental impact statement for the Falls of the Neuse Reservoir project is available for review at the Institute reading room. The statement with its appendices comes in 5 volumes, weighs 13 pounds, and contains 2000 pages. It covers the environmental changes that will affect the flora, fauna, fish, and fowl in the 42,259 acres involved and downstream areas. Comments are invited by the Corps. These must be submitted to the District Engineer, Col. Albert C. Costanzo, by October 11.

DYES DON'T DIE FAST

A study completed recently by Dr. Jeff Porter of Clemson University (See EPA Research Report R2-73-058) shows that 36 of the most common commercial textile dyes lost only 40 percent of their color after 200 hours of exposure to artificial light in water. In sunlight the degradation was 10 times slower. This means that a minimum of 80 days in a natural environment would be required to produce appreciable degradation of some dyes.

Previous studies showed that the 10 million pounds of dye discharged yearly to natural waters by the textile industry are not effectively removed by biological treatment. Since the dyes linger in the receiving waters, waste treatment engineers have their work cut out for them. (Wayne Garrison 404/546-3187)

SIMULATION MODELS - URBAN AREAS

The Waterways Experiment Station (WES) of the Corps of Engineers has undertaken a state-of-the-art survey of existing simulation models and computer programs useful in planning studies of urban areas. The scope of this survey will cover a broad range of topics. Included are land use analysis models, quality and quantity models for water supply and wastewater management and flood control models. Models dealing with the socio-economic and environmental problems of urban areas are of prime interest. In addition to any computer programs or models, WES is also interested in any new methodologies for including these areas in the planning process.

If readers have worked on or have knowledge of any models or programs in this area of interest, WES would appreciate any information that can be provided. This can be mailed to: USAE Waterways Experiment Station, ATTN: PFC Mike Walsh, athematical Hydraulics Division, P. O. Box 631, Vicksburg, MS 39180. PFC Walsh can be reached by phone at 601-636-3111, Ext. 2511.

The state-of-the-art survey is the first phase of a multi-phase project for the Corps of Engineers' Urban Studies program. Further phases of this study will involve making selected models available for use by the Corps' field offices in their specific urban study projects and to develop new models for those areas lacking adequate models.

WATER AND LAND RESOURCES MEETING REGISTER

A "Meetings Register" has been established by the U. S. Water Resources Council to provide information on major meetings in the water and related land resources field. The Council has established a special phone number (202-254-6394) so that interested parties may call to either obtain meetings schedules or to add meetings to the Register.

In recent times many organizations and individuals have noticed the need for an up-to-date, easily available central listing of meetings in the water and related land resources field. With the interest in man's relation to his environment increasing, the number of public and professional meetings and seminars has increased correspondingly. It has become increasingly difficult to avoid schedule conflicts. Since many of the meetings and seminars are of interest to the same group of people--those involved in plans and projects in the water resources field--something had to be done to facilitate attendance and avoid the scheduling of two or three major meetings on the same day.

The Water Resources Council, after receiving various suggestions, decided to establish a "Meetings Register." The purpose of the Register is twofold: to provide wider dissemination of meeting information and to provide a vehicle which could, if used properly, avoid duplication and schedule conflicts. The format of the Register is simple. Each listing is by date, and contains as much of the following information as possible: date of the meeting, name of the sponsoring organization, contact person, subject of the meeting, meeting place, city, and state.

The Council tentatively plans to publish a periodic listing of meetings. However, the principal use of the Register should come through the special telephone number set aside by the Council for the exclusive use of those seeking information on meetings. The number (AC 202-254-6394) may be called weekdays from 8:30 a.m. to 4:00 p.m. to either report meetings or obtain information on existing meetings. The Council stressed that the Meetings Register will be a useful tool only if it is used by all those scheduling meetings in the water resources field.

It is hoped that such use will be made and that the Register will be able to serve as an aid to those planning meetings in the water resources field.

NATIONAL WATER COMMISSION REPORT

Commencing with the June issue of the News, the Institute started to summarize the more important findings and recommendations of the National Water Commission. This issue continues the chapter-by-chapter review.

Chapter 3

Water and the Economy

Water is basic to economic growth. No economic activity takes place without it--or with too much of it. But water generally has been very inexpensive and is often used very extravagently. This chapter examines the great paradox of water, an indispensable but relatively inexpensive natural resource. Assessments are made of the economic value of water in serving the diverse purposes of society and of the role of water development in influencing where people will live and how their regions develop.

Conclusions on Water Value

The comparison of water values in alternative uses will become increasingly important in the years ahead, as growing demands compete for limited natural supplies and values in use increase. The opportunities for net gains by better allocations will be much greater. Not only will efficiency in design of facilities be important, but also efficiency in allocation of the water itself. Economic values provide the best general indication of the basic worth of water if appropriate attention is given to protection of environmental values. Pricing policies, discussed in Chapter 7, can be most helpful in improving the allocation of water. A systems framework is important, as is appropriate measurement of values in use not only in terms of quantity but also quality and timing and location of return flows.

The Commission's conclusions can be summarized as follows:

1. In river basins where present and projected demands for water indicate some element of competition, the values of water in alternative uses (including environmental values) should be estimated as a part of planning studies and the resulting development plan should seek to maximize these values.
2. Water resources should be analyzed as individual hydrologic systems taking into account the value of the various aspects of water uses including their impact on quantity, quality, timing, and location. Proposed diversions and instream uses should be analyzed in these same terms and evaluated on the basis of their effects on subsequent uses within the system.
3. Values of water for fish, wildlife, and esthetics cannot now be satisfactorily determined directly by economic evaluation. However, they can be indirectly determined by considering the economic values of uses in the hydrologic system with and without these uses. These "with and without" values should be determined so that informed judgments can be made on balancing of all uses within the hydrologic system. The value of the uses preserved must be judged to equal or exceed the value of alternative uses foregone.

Conclusions on Regional Development

1. While water resources projects have had very significant impacts on regional economic development and population distribution in the past, they are not usually the most efficient way to accomplish these objectives and their importance is diminishing.

2. Under certain conditions, water development may be helpful as one of several ingredients necessary to encourage regional economic development and population growth, or to preserve existing development. However, water developments differ widely in the effects they induce. Congress, in making judgments as to whether water developments should be used to aid regional growth, should require evaluations of certain critical growth factors in order to enhance the effectiveness of developments and reduce offsetting losses in other regions. These factors include: market demands, availability of substitutes for water services, competitive advantage of the region, and the potential for capitalizing on growth opportunities.

3. Federal water programs can be easily adjusted to support whatever population distribution policy the Nation adopts. However, water programs are not, in and of themselves, adequate to effectuate a national policy concerning where people will live. Water programs should continue to accommodate future population growth and economic well-being by responding to the pattern of interregional population distribution. In some instances water programs may influence desired population distribution provided other controlling conditions are favorable. Where Congress has determined that the growth of a particular area should be promoted in the national interest such programs may be used if they provide the most efficient way to achieve that growth.

NEW RFF PUBLICATIONS

Resources for the Future has announced the following new publications of interest to North Carolinians:

Planning and Urban Growth
An Anglo-American Comparison by Marion Clawson and Peter Hall
314 pages, $12.50

NEPA in the Courts
A Legal Analysis of the Environmental Policy Act by Frederick R. Anderson
339 pages, $6.95 (paper) and $15 (case-bound library edition)

Planning and Urban Growth, a case study written in non-technical language so as to be accessible to the intelligent lay reader, is a comparative analysis of city planning, land use controls, and urban growth in Great Britain and the United States.

Marion Clawson in the United States and Peter Hall in the United Kingdom have worked as a transatlantic team on this study. Among their conclusions: "The urban planning systems of Britain and the United States, each in its own way, have produced inconsistent and perverse results. The British system has been more successful than the American in enforcing public policies; but since these policies have often

been ill-grounded and ill-related to the facts of the situation, like the looser American system it has produced an urban structure few among the public can be said to have chosen, and few would want if they were given the choice . . .

"One is tempted to ask: Which country did worse--Britain with a rather elaborate system of urban planning, which has produced results different from those its sponsors intended, or the United States, where city planning never really promised much, and never delivered much?"

The comparison of urban land development in two countries--similar in language and some inherited traditions, but totally different in their approaches to governmental processes and response to social change--provides a useful basis for examining the results of twenty-seven years of planning and non-planning as they appear in 1972.

NEPA in the Courts examines the paths of legal interpretation that the courts have followed in the first three years of NEPA's existence, the defeats and successes of citizens' actions in key cases, and the implications of court rulings for future effectiveness of the Act.

The growth of public interest in the environment that developed in the 1960's resulted in, among other things, the National Environmental Policy Act (NEPA). This Act, passed in late 1969, established the Council on Environmental Quality and required all agencies of the federal government to consider the environmental impacts of their programs. A seemingly innocuous provision added to the Act late in the legislative process has prevented NEPA from becoming a mere noble expression of purpose. Section 102 (2)(C) requires all federal agencies to prepare a detailed statement on actions of theirs which might significantly affect the human environment. The courts have interpreted this section as requiring more than a pro forma statement and, with the active help of interested citizens, the courts have played a major role in shaping the meaning and effectiveness of the Act.

The study is primarily intended for lawyers, political scientists, policy analysts, and government administrators. There are discussions of judicial review, the requirement of strict compliance, circumstances requiring an impact statement, agencies to which NEPA applies, and the preparation and content of impact statements. The book also contains discussions of standing to sue under NEPA and commenting procedures which may be of interest to environmental activists as well. Appendices include the text of the National Environmental Policy Act and the guidelines of the Council on Environmental Quality.

In his concluding chapter, Anderson evaluates the effects of three years of litigation under NEPA. If the standard of achievement is the extent to which litigation has achieved a better environment through better federal decision making, then the litigation to date suggests that NEPA is no immediate remedy. Certain agencies

are still failing to take NEPA's requirements seriously and, in some cases, their compliance has consisted of superficial analyses of environmental impacts prepared after basic agency proposals were well on the way to being implemented. On the other hand, Anderson feels that the courts, by strictly enforcing NEPA's requirements, have gone a long way toward seeing that better results may be obtained from government agencies in the future.

Both publications can be ordered from the Johns Hopkins University Press, Baltimore, Maryland 21218.

UNDERSTANDING LAKE PROBLEMS

A new slide-tape set entitled, "Understanding Lakes and Lake Problems," has been received by the Institute. This is a 15-minute, 75-color slide set with accompanying tape narration and was prepared by University of Wisconsin Extension as a part of an Inland Lake Demonstration Project. The slide and tape set shows and discusses basic aspects of lake ecosystems, with emphasis on lake-related resource management issues. It will be useful for North Carolina audiences such as governmental officials, environmental groups, lake property owners, sportsmen's groups, and educators.

The slide set is available for purchase for $20 which covers the cost of reproduction and handling from the Bureau of Audio Visual Instruction, P. O. Box 2093, Madison, Wisconsin 53706. A copy of the narration is provided with each set so that slides and narrative of local problems can be inserted where appropriate. A 40-page companion booklet, "Understanding Lakes and Lake Problems," may be obtained for $1, plus postage, from the Agricultural Bulletin Building, 1535 Observatory Drive, University of Wisconsin, Madison, Wisconsin 53706. The Institute copy of the slide-tape program will be available for loan on a no-cost basis.

STATE OF UNION MESSAGE

In his State of the Union Message on September 10, the President asked Congress to enact legislation on land use, toxic substances, and drinking water controls.

While President Nixon said that land use policy is, and must remain, a primary responsibility of state and local governments, he stressed that the federal government should exercise leadership since land is part of the national heritage and land use decisions often exert effects much beyond local and state boundaries. He appeared to support legislation now before the Congress except for the "excessive financial burden" imposed on the federal government.

Nixon urged prompt action on toxic substances and drinking water bills. With respect to the latter, he cautioned Congress "not to impinge on state and local powers and not to shift the responsibility for financing this program to the federal government and away from the users, where it belongs."

POLLUTION PENALTIES

Federal Executive Order 11738 prohibits the award of federal contracts, loans, and grants to facilities found in violation of the Federal Water Pollution Control Act and the Federal Clean Air Act.

The Order is intended to assure that federal awards will result in effective enforcement of both air and water pollution control laws. It directs EPA to designate facilities convicted of air or water quality violations and prohibits awards to such facilities.

COST EFFECTIVENESS - WASTE TREATMENT FACILITIES

The cost effectiveness of sewage treatment facilities has often been questioned. The EPA has now issued Guidelines for Evaluating the Cost-Effectiveness of facilities being constructed with assistance of federal funds. These become effective October 10. They were issued in response to the 1972 Act which requires that treatment facilities be as cost efficient as possible over their estimated life (40 CFR 35).

INDUSTRIAL PRETREATMENT

Guidelines for the pretreatment of industrial wastes discharged to municipal sewerage systems have been proposed by the Environmental Protection Agency. They will supplement pretreatment standards proposed earlier (40 CFR 128). Wastewater characteristics and pretreatment unit operations for 22 industrial groups are included. Copies can be requested from Mr. Jack Ravan, Regional Administrator, Environmental Protection Agency, Region 4, 1421 Peachtree St., N.E., Atlanta, Georgia 30309.

FINAL RULES ON PUBLIC PARTICIPATION

The Environmental Protection Agency has issued its final regulations (38 FR 22756) on public participation under the Federal Water Pollution Control Act of 1972. Final language states that public participation is an integral part of the overall state program. It provides for informational materials, assistance to the

public, consultation, notification, access to information, enforcement, legal proceedings, and rule making. Public efforts in reporting violations as a part of the enforcement program are to be encouraged.

NEW EFFLUENT GUIDELINES

The Environmental Protection Agency has proposed effluent limitation guidelines and new source performance standards for the cement, feedlot, and phosphate industries. The guidelines would establish the zero discharge standard for feedlots and phosphate production. They would impose limits on suspended and dissolved solids, acidity and temperature for the cement industry.

NEW PUBLICATIONS RECEIVED BY THE INSTITUTE

(Residents of North Carolina may borrow these from the Institute for a two-week period. Where individual copies are desired, readers are encouraged to request copies from the organizations issuing the publication. The addresses are provided by the News for this purpose.)

Abbreviations used throughout as follows:

EPA	- Env. Protection Agency	USDI	- U. S. Dept. of the Interior
NCDNER	- N.C. Dept. Nat'l. & Econ. Res.	USGPO	- U. S. Gov. Printing Office
NTIS	- Nat'l. Tech. Information Serv.	WPC	- Water Pollution Control
NWC	- Nat'l. Water Commission	WQS	- Water Quality Standards
OWP	- Office of Water Programs	WRC	- Water Res. Center
OWRR	- Office of Water Res. Research	WRRI	- Water Resources Res. Institute
USDC	- U. S. Dept. of Commerce.	WRSIC	- Water Res. Sci. Inform. Center

Water Resource Planning

"Attitudes, Values, and Perceptions in Water Resource Decision-Making Within a Metropolitan Area," (Pub. No. 29), June 1973, by E. R. Kaynor, et al, WRRC & Dept. of Pol. Sci., U. of MA, Amherst, MA 01002.

"The Sevier County Water Plan," (Water Res. Series #12) by J. W. Pinkerton, Div. of Water Res., 2611 West End Ave., Nashville, TN 37203.

"Catalog of Information on Water Data," (Water Res. Reg. 02), 1972, USDI, Geological Survey, Office of Water Data Coord., Wash., DC 20244.

"Catalog of Information on Water Data," (Water Res. Reg. 03) 1972, USDI, Geological Survey, Office of Water Data Coord., Wash., DC 20244.

"Catalog of Information on Water Data," (Water Res. Reg. 06), 1972, USDI, Geological Survey, Office of Water Data Coord., Wash., DC 20244.

"The Economic Effects of Pawtuckaway State Park: v. Effect of Park Use on Environmental Quality," (Res. Rep. No. 8) Dec. 1972, by C. T. K. Ching, et al, WRRC, U. of NH, Durham, NH 03824.

"River Recommendations for Improving the Valley Environmental Resources," (WI-223-001-71: VI-A) Dec. 1971, by O. S. Anderson, et al, College of Eng. & Arch., WRRI, ND St. U., Fargo, ND 58102.

"River Recommendations for Improving the Valley Environmental Resources Administrative Report," (WI-223-002-73: VI-A) July 1973, by O. S. Anderson, et al, WRRI, ND St. U., Fargo, ND 58102.

"The Effects of Water Management Practices on the Movements of Largemouth Bass," (Environmental Impact) July 1973, by W. J. Lorio, et al, WRRI, MS St. U., MS St., MS 39762.

"Final Environmental Impact Statement, South Dade County, Florida, C120377," Aug. 1973, EPA, Reg. IV, 1421 Peachtree St., N.E., Atlanta, GA 30309.

"Final Environmental Impact Statement, Central Dade County, Florida," Aug. 1973, EPA, Reg. IV, 1421 Peachtree St., NE, Atlanta, GA 30309.

"Final Environmental Impact Statement, Hollywood, Florida C120369 C120333 and Pembroke Pines, Florida C120334," Sept. 1973, EPA, Reg. IV, 1421 Peachtree St., N.E., Atlanta, GA 30309.

"Draft - Environmental Statement - (Revised) - Falls Lake, Neuse River Basin, N. C.," Aug. 1973, U. S. Army Eng. Dist., Wilmington Corps of Eng., P. O. Box 1890, Wilmington, NC 28401.

"Environmental Statement - (Revised) - Appendix I, Falls Lake, Neuse River Basin, N. C.," Aug. 1973, U. S. Army Eng. Dist., Wilmington Corps of Eng., Wilmington, NC 28401.

"Environmental Statement - (Revised) - Appendix II & III, Falls Lake, Neuse River Basin, N. C.," Aug. 1973, U. S. Army Eng. Dist., Wilmington Corps of Eng., Wilmington, NC 28401.

"Environmental Statement - (Revised) - Appendix IV, Falls Lake, Neuse River Basin, N. C.," Aug. 1973, U. S. Army Eng. Dist., Wilmington Corps of Eng., Wilmington, NC 28401.

"Environmental Statement - (Revised) - Appendix V, Falls Lake, Neuse River basin, N. C.," Aug. 1973, U. S. Army Eng. Dist., Wilmington Corps of Eng., Wilmington, NC 28401.

"A Proposal for Improving the Management of the Great Lakes of the United States and Canada," (Proj. No. C-2145), Jan. 1973, for OWRR, USDI, by Water Res. and Marine Scs. Cntr., Cornell U., Ithaca, NY 14850, Price: $2.

"Mathematical Management Model of Parts of the Ogallala Aquifer (Groundwater), Texas," (No. 14-31-0001-3363), July 1973, by F. A. Rayner, et al, High Plains Underground Water Cons. Dis. No. 1, and TX Tech U. WRC, Lubbock, TX 79408.

"Verification of Groundwater Capital Costs," (Tech. Paper No. 2), March 1973, WRRC, U. of NH, Durham, NH 03824.

"Development of a Prototype Search and Retrieval Network for Water Resource Information," (14-31-0001-3743), Feb. 1, 1972, to Jan. 31, 1973, by J. L. Morrison, et al, The U. of OK Res. Inst., Stillwater, OK 74074.

"Private Sector Reaction to Normal Political Institutional Procedures and Outcomes When Water is an Issue," (Rpt. No. 37), June 1973, WRRI, Clemson U., Clemson, SC 29631.

"Federal Register, Water and Related Land Resources - Establishment of Principles and Standards for Planning," (Vol. 38, No. 174, Pt. III), September 1973, The Nat'l Archives of the US, Wash., DC.

"Development of a Dynamic Water Management Policy for Texas," (TR-52), June 1973, by W. L. Weier, et al, TX, WRI, College Sta., TX 77843.

Water Quality Management

"Optimal Procedures for the Processing of Waste Activated Sludge," (Bulletin 61), Aug. 1973, by C. W. Randall, et al, VWRRC, VPI & St. U., Blacksburg, VA 24060.

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