

# WATER RESOURCES RESEARCH INSTITUTE

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### RECREATION AREA SUGGESTED FOR CRABTREE

Results of an Army Corps of Engineer's study indicated that completion of SCS structures in the watershed coupled with flood plain zoning and protection are expected to reduce flood damages along the Crabtree Creek to the point that channelization and flood proofing would not be economically beneficial.

The Army Corps of Engineers did endorse tentatively the U.S. Interior Department's Bureau of Outdoor Recreation (BOR) plan for a 16-mile parkway from Umstead Park to the Neuse River. This project is expected to cost about \$1.8 million plus money for land acquisition. The BOR plan would include a hiking trail, bikeways, and four park areas along the Crabtree Creek bank.

## FEDERAL FUNDS CAN BE USED TO PURCHASE LAND FOR SLUDGE DISPOSAL

EPA will provide construction grant assistance funds for the purchase of land for disposal of wastewater treatment residues. Municipalities to be eligible for this method of disposal must still meet the requirements that this is the most cost-effective disposal method.

Eligible costs in addition to the cost of land includes buffers, dike drainage ditches and provisions for groundwater protection.

## WATER RESEARCH IN ACTION

The Office of Water Research and Technology has begun a new publication which summarizes completed research on specific subject areas. The publication titled *Water Research in Action* is a four-page summary of major research findings and application written in an easily understood style and is directed to a wide range of audiences. Dr. William S. Butcher, OWRT Director, stated, "it is our hope that the information will serve to stimulate interest in the early use and practical application of the described research. Whenever possible, a technical backup report will be identified and made available on request."

The May issue is directed to the topic of land application of wastewater and the June issue will be on waste heat utilization. Individuals who have an interest in the publication should contact the Institute for more details.

## EPA ISSUES FINAL FEEDLOT PERMIT REGULATIONS

The Environmental Protection Agency has issued final regulations, as directed by court order, establishing the conditions under which animal feeding operations are considered point sources of pollution and thereby subject to wastewater discharge permit requirements.

The agency estimates that of the 719,000 beef, dairy, and swine feeding operations in the U.S., only about 3,200 would be required to obtain permits. The regulations do not require permits for feedlots that do not discharge pollutants into navigable waters.

The basic provisions of the regulations are that:

- Feedlots with 1,000 or more animal units must obtain permits if there is a discharge of pollutants.
- Feedlots with more than 300 animal units but less than 1,000 are required to obtain a permit if the facility discharges pollutants by means of a man-made conveyance constructed for the purpose or if it discharges into waters that pass through or come in direct contact with animals in the confined area. Additional feedlots in this category, even if they do not meet the above criteria, may be

required to obtain an individual permit if circumstances warrant it, but only on a case-by-case basis and after an on-site inspection is made and written notice given.

- Feedlots with less than 300 units are not subject to the permit requirement unless designated on a case-by-case basis after an on-site inspection if the facility discharges through a man-made conveyance or into waters crossing the feedlot or coming into contact with the confined animals.

## GUIDELINES FOR DETERMINING FLOOD FLOW FREQUENCY

The U.S. Water Resources Council, has announced the publication of *Guidelines for Determining Flood Flow Frequency*. The new report is the culmination of several years work by the Council's Hydrology Committee, and this is Bulletin Number 17 issued by the Committee.

The *Guidelines* contain procedures for defining flood potentials - peak discharge and exceedance probabilities - for watersheds where systematic records of peak flood flows are available. Utilization of the procedures by the Council's member agencies and states will represent a significant step forward in defining and interpreting flood hazards in the flood plain areas of the Nation.

Procedures selected were based upon studies done at the Center for Research in Water Resources of the University of Texas at Austin and on studies by the members of the Council's Hydrology Committee.

Copies of *Guidelines for Determining Flood Flow Frequency* are for sale by the Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402. The stock number is 052-045-00031-2. The price is \$3.90.

## A "MAJOR FEDERAL ACTION" UNDER NEPA

It is hoped that a conclusive interpretation of "A Major Federal Action" under the National Environmental Policy Act (NEPA) will evolve from two cases now before the U.S. Supreme Court. These are Flint Ridge Development Company v. Scenic Rivers Association and Kleppe v. Sierra Club. The Solicitor General's present view is that NEPA does not apply to projects in which federal participation is minor even if the project itself may have major environmental effects. This may well be changed by the pending Supreme Court decisions.

## 1975 NATIONAL CONFERENCE ON WATER SUMMARY AVAILABLE

The U.S. Water Resources Council, has announced the availability of the *Summary, 1975 National Conference on Water*.

The 1975 National Conference on Water was called because of the many serious debates about conflicts over energy, food production, transportation alternatives, land

use, our environment, and the social costs of economic development, as they all relate to water and related land resources. The responsibility for these resources is shared by private enterprise, State and local governments, and several Federal departments and agencies. Over 900 participants from a wide variety of backgrounds and philosophic viewpoints joined in the Conference. The speakers included then Secretary of Interior Rogers C.B. Morton, and then Secretary of Army Howard Callaway, Secretary of Agriculture Earl Butz and Chairman of the Council on Environmental Quality Russell W. Peterson.

The *Summary* is a compilation of the conclusions of the eight panel discussions, papers presented at the eight panels, speeches given by the high-ranking officials present, and an executive summary.

The Council is considering sponsoring another National Conference on Water in 1977 but no further details on the projected Conference are yet available.

The 230-page *Summary, National Conference on Water* is available through the Superintendent of Documents. Please write: Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402. The stock number to be used in ordering is 024-001-02798-4. The price is \$3.80.

#### SECTION 404 AMENDMENTS OPPOSED

EPA Administrator Russell E. Train advised Senator Muskie in an April 27 letter that any "premature" amendment of the basically sound program goals embodied in section 404 (P.L. 92-500) would result in further delays and create dangerous inconsistencies in the statutory scheme. The section is presently being used to deal with Kepone found in James River (Virginia) sediments.

#### DAVID A. ADAMS JOINS DNER

David A. Adams will join the North Carolina Department of Natural and Economic Resources on June 1 as Assistant Secretary for Resource Management. Dr. Adams is currently the President of the Coastal Zone Resources Corporation in Wilmington. He will replace Dr. Arthur W. Cooper who will return to North Carolina State University as a member of the Forestry Department.

#### PUBLIC MEETING ON LUMBER RIVER BASIN - NORTH CAROLINA AND SOUTH CAROLINA

The Charleston District, Corps of Engineers, has been authorized and directed to conduct an investigation of the Lumber River Basin, North and South Carolina, to determine the feasibility of providing flood protection on the Lumber River and its tributaries, and on that reach of the Little Pee Dee River which would be affected by possible improvements, and to develop a plan for the maximum utilization of water resources of the basin.

A public meeting has been scheduled on May 27, 1976, at 7:30 p.m., at the O. P. Owen Agricultural Center, Intersection Hwys. 72 & 711, Lumberton, North Carolina.

#### AREAWIDE WASTEWATER MANAGEMENT STUDIES

According to an EPA review of "Section 208" projects under the Federal Water Pollution Control Act, areawide wastewater management studies should focus on nonpoint source pollution problems under programs tightly coordinated by the individual states.

Problems examined include: ill-prepared EPA policy, guidance, organization, and resources; overly ambitious expectations of the program; inexperienced and understaffed "208" agencies whose accomplishments were sometimes limited by local "political realities"; complex requirements; and insufficient lead times.

The study team reported that other water pollution control efforts have outdistanced the "208" agencies making some of their actions duplicative and disruptive of ongoing efforts.

Of the 149 local agencies approved for funding by EPA, 135 have been funded.

#### CARCINOGEN MONITORING REQUESTED

The federal EPA has been asked by the Environmental Defense Fund (EDF) to establish a point source monitoring program for carcinogens and other toxic chemicals. This came in a letter pursuant to citizen suit provisions of P.L. 92-500 - which requires 60 days notice before filing suit to compel EPA to perform a non-discretionary duty. EDF said that many carcinogenic and toxic chemicals, not regulated by the federal permit system, are discharged into river segments classified as public water supply sources.

#### HOW TO WRITE BETTER TECHNICAL REPORTS

The Center For Management Development, Wake Forest University, has scheduled a 2-day seminar on June 23-24 on how to write better technical reports.

This seminar will teach how to:

- Organize a report for maximum impact
- Define, measure and improve report readability
- Keep sentences and paragraphs concise
- Apply easy-to-use standards for correctness in grammar
- Analyze every technical writing situation
- Choose the most effective words for your purposes
- Follow a systems approach in carrying out technical writing assignments

Who should attend?

- Anyone - especially engineers and technicians - for whom writing reports represents as much as a fifth of the job
- Technical writers and others who write extensive reports
- Technical editors
- Anyone who supervises personnel doing considerable amounts of writing

For further information call: Seminar Administrator 919/725-9711 Ext. 493.

## WATER RESOURCES RESEARCH GRANTS

Applications from faculty members of the senior colleges and universities in North Carolina for grants under the Institute's Fiscal Year 1977-78 Matching Grants Program will be accepted until October 1, 1976. No exceptions will be made to this cutoff date.

The purpose of the Matching Grants Program is to provide long-term research support (two to three years) for projects directed toward the solution of State-Regional water resources problems. Highest priority will be given to proposals which deal with problems of recognized regional as well as State significance. A report on Water Resources Problems and Research Needs of North Carolina is available from the Institute upon request. The Institute is currently involved in the analysis of regional problems in cooperation with other Institutes of the South Atlantic-Gulf Region. A summary of regional water resources research needs is available upon request. Investigators are encouraged to discuss their research interests with the Institute Director in advance of proposal preparation.

Federal funds are requested the Office of Water Research and Technology (OWRT), U.S. Department of the Interior. The Institute will assume responsibility for non-federal matching funds for projects approved by OWRT. Projects not funded under this program will subsequently be considered under the Institute's Annual Allotment Program without further initiative by the investigator.

Particular attention is called to those sections of the proposal dealing with objectives, procedures, and literature review. These are inadequately treated in most proposals and the principal cause of disapproval. Research objectives and procedures must be explicit and sufficiently detailed to give a convincing picture of work to be undertaken. Search of the literature and related discussion must be rigorous enough to satisfy reviewers that investigators are familiar with past and current work and have taken this into consideration in the preparation of proposals. A thorough job in the preparation of proposals greatly enhances probability of approval. Proposals must cover all items, included in the instructions.

The federal fiscal year has been changed from July 1 - June 30 to October 1 - September 30. This should be taken into consideration when submitting proposals.

Copies of instructions for preparation of proposals can be obtained from the Institute by calling 919/737-2815 or writing to the Office of the Director, 124 Riddick Building, Raleigh, NC 27607.

#### SUMMER INSTITUTE PLANNED

The Nebraska Water Resources Research Institute is sponsoring a one-week Summer Institute August 9-13, 1976. This year's theme is "Futures Planning - With Special Emphasis on Water, Land and Related Natural Resources." This short course is designed to acquaint planners, decision makers, educators and water resources technicians with state-of-the-art technology for "futures" planning in water and related resources. Various techniques for determining and evaluating alternatives, objectives and goals in "futures" planning (including trend impact analysis, delphi technique, cross-impact analysis, scenario generation, simulation and optimization) will be reviewed and their application illustrated through case studies and workshops. Strengths and weaknesses of each technique will be highlighted and their most effective use in the planning context presented.

The fee will be \$350 before July 15 and \$400 thereafter. Special rates will be available for a limited number of academic personnel on a first-come, first-served basis. Staff will include Dr. Warren Viessman, Jr., Senior Specialist in Engineering and Public Works, Library of Congress; Dr. Warren A. Hall, Elwood Mead Professor of Engineering at Colorado State University; Jared L. Cohon, Assistant Professor of Geography and Environmental Engineering at Johns Hopkins University; and Lewis D. Walker, Deputy Assistant Director for Planning, Water Resources Council.

For additional information contact: Millard W. Hall, Director, Water Resources Research Institute, 310 Agricultural Hall, University of Nebraska, Lincoln, Nebraska 68583, Telephone 402/472-3305.

#### BILL TO AMEND WATER RESOURCES PLANNING ACT INTRODUCED IN SENATE

A bill that would amend the legislation governing the operation of the Great Lakes Basin Commission, other river basin commissions, and the US Water Resources Council (WRC), was introduced in the US Senate March 16 and referred to the Senate Committee on Interior and Insular Affairs.

Senate Bill 3142 would amend the US Water Resources Planning Act of 1965 (P.L. 89-80) by strengthening the role of states in the activities of WRC and increasing federal planning grants to states. The bill would further amend P.L. 89-80 to provide a full-time chairman for WRC and move WRC to the Executive Office of the President.

The bill would further strengthen WRC by amending the US Water Resources Research Act of 1964 to transfer water research programs to WRC from the US Department of the Interior, Office of Water Resource Technology.

Requests for copies of S 3142, or comments regarding the bill, should be directed to Benjamin Yamagata, Senate Subcommittee on Energy, Dirksen Senate Office Building, Room 3208, Washington, DC 20510.

## COURSES, CONFERENCES, AND SYMPOSIA

### Evaluating the Effects of Land Use Changes On Stormwater Runoff and Quality

This course, scheduled for June 9-11, is being offered to assist engineers, scientists, and planners in gaining an understanding of environmental effects of land use changes and associated activities on stormwater. The course is designed for individuals with a science or engineering background who are interested in mathematical modeling of stormwater runoff. The course will consist of classroom instruction, interaction, presentations of the application of mathematical models to real world problems, and computer experiments.

The registration fee for the course is \$325 per person and includes the cost of the banquet and all needed materials for the course. Deadline for receipt of the completed registration form is June 4, 1976. The course will be offered to a minimum of 20 persons and a maximum of 30.

Registration should be made with the University of Tennessee, College of Engineering, 124 Perkins Hall, Knoxville, TN 37916.

### Virus Aspects of Applying Municipal Wastes to Land

This meeting is designed to bring together scientists and engineers concerned with the fate of virus particles in the environment. The symposium will address itself to the fate of virus particles in a soil, air and water environment. Emphasis will be placed on establishing the extent to which land spreading of municipal wastes can be used as a disposal technique. Sewage treatment procedures for virus inactivation will be discussed in relation to efficiency and surety of each process. Institutional and economic aspects of applying municipal waste to land will be discussed. Group workshops will be used to exchange research results and discuss future research needs.

Additional details on speakers can be obtained by contacting Dr. J. M. Davidson, 2169 McCarty Hall, University of Florida, Gainesville, FL 32611, Phone - 904/392-1951. The symposium will be held June 28-29, 1976.

Section 208 Areawide Waste Management Planning

This course will assist the participant in understanding the present and pending water quality management legislation, as well as techniques for developing required 208 Areawide Waste Management Planning. It is designed for consulting engineers, administrators of regulatory agencies at all levels, and regional planners. The 208 areawide plans currently being developed by designated state planning agencies apply in areas which, as a result of urban-industrial concentrations or other factors, have substantial water quality control problems. These plans must consider on an integrated basis such problems as municipal and industrial wastewater, sewer and urban storm water runoff, nonpoint source pollutants, and land use as it relates to water quality. The course gives special attention to the components of the 208 Plan, the collection of the required data, the various alternatives that are available for control of point and non-point sources, and a means of evaluating these various alternatives by the use of water quality models. The course considers the interrelationships among the 208 Areawide Plans, the 303 Basin Plans, and the 201 Facilities Plans. The National Pollutant Discharge Elimination System (NPDES) program and the new requirements for environmental impact statements will also be discussed.

Apply by letter, telephone, or purchase order to Continuing Engineering Education Program, George Washington University, Washington, DC 20052 (Area Code 202) 676-6106. The course is scheduled for June 14-16.

Planning Conference on Environmental  
Impact Statements and Assessments

The purpose of the Planning Conference on Environmental Impact Statements and Assessments is to bring together nationally known individuals, federal and state agency personnel, local planners, city and county administrators, and others interested in the field for an in-depth look at problems and solutions relating to the development of EIS's and EIA's. This conference will afford those persons with local responsibility for EIS's the opportunity to tap the knowledge and resources of leading experts and to question agency personnel who make the day-to-day decisions that directly affect those in the field.

All persons having interest in or responsibility for the development of EIS's and EIA's and with the environment as a whole are invited to attend this conference. Local and regional planners, city and county administrators, elected officials, attorneys, and the concerned public are especially urged to attend.

Inquiries and preregistration checks should be referred to: Jon B. Pierce, Coordinator, Rural Government Training and Assistance, Appalachian State University, Boone, NC 28608. The conference will be held May 27 and 28.

## POSITIONS AVAILABLE

A teaching position in Mexico for an expert in water reuse is available. For further information and application forms, contact: Ms. M. Gail Woodard, Director of Academic Affairs, Latin American Teaching Fellowships, Fletcher School of Law and Diplomacy, Tufts University, Medford, Massachusetts 02155, (Area Code 617) 623-8476.

The Civil Engineering Department at the University of Kansas has an opening at the Assistant Professor level for a person qualified in the water resources and water quality area. Qualified applicants should send a complete resume, along with the names and addresses of at least three references to: Dr. Stanley T. Rolfe, Department of Civil Engineering, The University of Kansas, Lawrence, Kansas 66045.

The Michigan State University, Department of Resource Development, has a position for an Assistant Professor of Water Resource Management. Contact: Dr. Eckhart Dersch, Chairman, Search and Selection Committee, Department of Resource Development, 324 Natural Resources Building, East Lansing, Michigan 48824. (Area Code 517) 355-3346.

The College of the Virgin Islands, St. Thomas, Virgin Islands, announced a vacancy for a Director to undertake an Ecological Research Program. Inquiries from or information concerning qualified applicants should be addressed to Dr. Norwell Harri-gan, Director, CRI, College of the Virgin Islands, St. Thomas, U.S. Virgin Islands 00801.

## WATER RESOURCES CONDITIONS IN NORTH CAROLINA FOR APRIL

Rainfall and streamflow were considerably below normal over most of the State during the month; and, according to the National Weather Service, this was the driest April since 1904. Rainfall in the Raleigh-Durham area was the lowest for April since 1887. Rainfall totals of less than  $\frac{1}{4}$  inch were reported for numerous eastern towns including Fayetteville, Enfield, Raleigh-Durham, and Elizabethtown. Monthly-mean streamflows at USGS index gaging stations ranged from about 10% below normal in the western Mountain region to deficient (lower 25% of record) in the eastern Piedmont and Coastal Plain regions. The monthly-mean flow, 474 cubic feet per second, at Neuse River near Clayton was the lowest mean for April since the station was established in 1927.

Streamflows at the end of April were only about 10% of normal at several gaging stations on Coastal Plain streams. Although flows were abnormally low by the end of April, they were well above (200% or more) the 7-day ten year minimum flows at all gaging stations.

Ground-water levels rose slightly in the Mountain region where most levels were also slightly above the long-term average. In the Piedmont and Coastal Plain regions, however, water levels declined and were below normal.

. . . U. S. Geological Survey

## WATER RESOURCES LEGISLATION IN THE CONGRESS

### Bills Introduced

#### Senate

S. 3263 To provide for consideration of the comparative productive potential  
H.R. 13101 of irrigable lands in determining nonexcess acreage under Federal  
reclamation laws.

#### House

H.R. 13189 To amend the Land and Water Conservation Fund Act to establish a  
program for the preservation of additional historic properties.  
H.R. 13227 To amend the Wild and Scenic Rivers Act by designating a segment of  
the New River in N.C. as a component of the National Wild and Scenic  
Rivers System.  
H.R. 13498 To amend the Water Resources Planning Act, the Water Resources Research  
Act of 1964, and for other purposes.

## 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 organization issuing the publication. The addresses are provided by the *News* for this purpose.)

Abbreviations used throughout as follows:

ARS	- Agric. Res. Service	NWC	- Nat'l. Water Commission
ASCE	- American Society of Civil Engr.	OWP	- Office of Water Programs
CEQ	- Council on Env. Quality	OWRT	- Office of Water Res. & Tech.
DEM	- Div. of Env. Mgt.	RTI	- Res. Triangle Inst.
EDS	- Env. Data Service	SCS	- Soil Conservation Service
EMC	- Env. Management Comm.	TVA	- Tennessee Valley Authority
EPA	- Env. Protection Agency	UNC-SG	- Univ. of N.C. Sea Grant
ERC	- Engr. Res. Center	USDA	- U.S. Dept. of Agriculture
ERS	- Economic Research Service	USDC	- U.S. Dept. of Commerce
GAO	- General Accounting Office	USDI	- U.S. Dept. of the Interior
IWR	- Inst. for Water Resources	USGPO	- U.S. Gov. Printing Office
NAS	- Nat'l. Academy of Sciences	USGS	- U.S. Geological Survey
NCDNER	- N.C. Dept. of Natural & Econ. Res.	WPC	- Water Pollution Control
NERC	- Nat'l. Env. Res. Center	WQS	- Water Quality Standards
NOAA	- Nat'l. Oceanic & Atmospheric Adm.	WRC	- Water Resources Council
NPS	- Nat'l. Park Service	WRRC	- Water Resources Res. Center
NSF	- Nat'l. Science Foundation	WRI	- Water Resources Res. Inst.
NTIS	- Nat'l. Technical Info. Service	WRSIC	- Water Res. Sci. Info. Center

Water Resources Planning

- "Aerial Photography for Planning and Development in Eastern North Carolina: A Handbook and Directory," (UNC-SG-76-03), 4/76, by S. Baker, avail. from Sea Grant Program, 1235 Burlington Lab., NCSU, Raleigh, NC 27607.
- "Atchafalaya Basin Usage Study," 7/1/71 - 6/30/74, by L. D. Soileau, *et al*, avail. from LA Wildlife and Fisheries Commission, New Orleans, LA 70113.
- "Citizen Attitudes Toward Management of the Chesapeake Bay," (#96), 2/76, by L. A. Shabman, *et al*, WRRRC, VPI & St. U., Blacksburg, VA 24061.
- "Residential Water Conservation," (#35), 3/76, by M. Milne, CA WRC, U. of CA, Davis, CA 95616.
- "The Projected Economic Impact of the Richard B. Russell Dam and Lake upon South Carolina," (#60), 2/76, by J. M. Stepp, *et al*, WRRRC, Clemson U., Clemson, SC 29631.
- "Hydrologic and Economic Simulation of Flood Control Aspects of Water Resources Systems," (#43), 8/75, by B. Eichert, Research Br., The Hydrologic Engr. Center, U.S. Army Corps of Engrs., Davis, CA 95616.
- "Storm Drainage and Urban Region Flood Control Planning," (#40), 10/74, by D. Davis, Research Br., The Hydrologic Engr. Center, U.S. Army Corps of Engrs., Davis, CA 95616.
- "Sizing Flood Control Reservoir Systems by Systems Analysis," (#44), 3/76, by B. Eichert, *et al*, Research Br., The Hydrologic Engr. Center, U.S. Army Corps of Engrs., Davis, CA 95616.
- "Report of Proceedings at Public Hearing Concerning Proposed Revisions to the State's Continuing Planning Process for Water Quality Management," 4/76, DEM, NCDNER, P.O. Box 27687, Raleigh, NC 27611.
- "Quantification of Recreational Use of the Coralville Reservoir," (#185), 3/76, by T. E. Croley, II, *et al*, for OWRT, avail. from IA Inst. of Hydraulic Research, U. of IA, Iowa City, IA 52240.
- "Optimization of Real-Time Daily Operation of a Multiple Reservoir System," (UCLA-ENG-7628), 4/76, by W. W-G. Yeh, *et al*, for OWRT, avail. from Engineering Systems Dept., School of Engineering and Applied Science, U. of CA, Los Angeles, CA 90007.
- "HEC-5C, A Simulation Model for System Formulation and Evaluation," (#41), 3/74, by B. Eichert, Research Br., The Hydrologic Engr. Center, U.S. Army Corps of Engrs., Davis, CA 95616.
- "State Continuing Planning Process - Initial Draft," 4/76, by DEM, NCDNER, avail. from EMC, P.O. Box 27687, Raleigh, NC 27611.
- "Optimal Sizing of Urban Flood Control Systems," (#42), 3/74, by D. Davis, Research Br., The Hydrologic Engr. Center, U.S. Army Corps of Engrs., Davis CA 95616.
- "Waterway Commerce, National Priorities, and User Charges," 10/75, pub. by National Waterways Conference, Inc., 1130 Seventeenth St., NW, Wash., DC 20036.
- "Disposition of Water From Fruit Crops and Approaches to Increase Water Use Efficiency," (#33), 2/76, by J. F. Bartholic, *et al*, WRRRC, U. of FL, Gainesville, FL 32601.
- "An Exploratory Application of Two Methods of Analyzing Water Use Time Series," (#91), by J. E. T. Moncur, WRRRC, U. of HI, Honolulu, HI 96813.
- "Comparison of the Georgia Tech, Kansas, Kentucky, Stanford, and TVA Watershed Models in Georgia," (ERC-0476), 1/76, by A. M. Lumb, ERC, GA Inst. of Tech., Atlanta, GA 30332.

Water Quality Management

- "Biogeochemistry of Deep Lakes in the Central Alaska Range," (#IWR-68), 2/76, by J. LaPerriere, *et al*, avail. from IWR, U. of AK, Fairbanks, AK 99701.
- "Effects of Cage Culture of Catfish upon Water Quality in Reservoirs," (#61), 3/76, by H. A. Loyacano, Jr., *et al*, WRRRC, Clemson U., Clemson, SC 29631.
- "Selective Toxicity of Detergents and Herbicides to Phytoplankton," (#71), 12/75, by C. A. Lembi, *et al*, WRRRC, Purdue U., West Lafayette, IN 47906.
- "Falls Lake Water-Quality Study; Hydraulic Laboratory Investigation," (Misc. Paper H-76-6), 4/76, by B. Loftis, *et al*, avail. from U.S. Army Engr. Dist., Savannah, P.O. Box 889, Savannah, GA 31402.
- "Land Treatment and Disposal of Municipal and Industrial Wastewater," 1976, by R. L. Sanks, *et al*, avail. from Ann Arbor Science Publishers, Inc., P.O. Box 1425, Ann Arbor, MI 48106.
- "Estuarine Shoreline Erosion in the Albemarle - Pamlico Region of North Carolina," (UNC-SG-75-29), 1/75, by V. Bellis, *et al*, avail. from Sea Grant Program, 1235 Burlington Lab., NCSU, Raleigh, NC 27607.
- "A Method for Monitoring Eutrophication in Rivers," 12/75, by M. G. Kelly, *et al*, Dept. of Environmental Sciences, U. of VA, Charlottesville, VA 22903.
- "Heat Dissipation From Turbulent Open Channel Flow," (ERC-0376), 1/76, by P. G. Mayer, *et al*, ERC, GA Inst. of Tech., Atlanta, GA 30332.
- "Geochemical Interactions of Heavy Metals in Southeastern Salt Marsh Environments," (EPA-600/3-76-023), 3/76, by H. L. Windom, for EPA, avail. from NTIS, Springfield, VA 22161.
- "Herbicide Toxicity in Mangroves," (EPA-600/3-76-004), 3/76, by H. J. Teas, for EPA, avail. from NTIS, Springfield, VA 22161.
- "Chemical Control of Lagenidium," (UNC-SG-76-02), 3/76, by C. E. Bland, *et al*, avail. from Sea Grant Program, 1235 Burlington Lab., NCSU, Raleigh, NC 27607.

- "An Evaluation of Land Treatment of Municipal Wastewater and Physical Siting of Facility Installations," (AD-A016 118), 5/75, by W. J. Hartman, Jr., for Office of the Chief of Engineers, avail. from NTIS, USDC, 5285 Port Royal Rd., Springfield, VA 22161, Price - \$4.75.
- "Review of Landspreading of Liquid Municipal Sewage Sludge," (PB-245 271), 6/75, by T. E. Carroll, *et al*, for NERC, avail. from NTIS, USDC, 5285 Port Royal Rd., Springfield, VA 22161, Price - \$5.25.
- "Effects of Mirex, Methoxychlor, and Malathion on Development of Crabs," (EPA-600/3-76-007), 3/76, by C. G. Bookhout, *et al*, for EPA, avail. from NTIS, Springfield, VA 22161.
- "Degradation of Pesticides by Algae," (EPA-600/3-76-022), 3/76, by J. C. O'Kelley, *et al*, for EPA, avail. from NTIS, Springfield, VA 22161.
- "Detection of Trace Phosphorus in Natural Waters by Graphite Oven Flame Analysis," (ERC-0276), 2/76, by Dr. R. Campbell, ERC, GA Inst. of Tech., Atlanta, GA 30332.
- "Poultry Processing Plant Wastewater Disposal on Sod," (#36), 7/69 - 6/75, by G. L. Miller, *et al*, WRRRC, U. of MD, College Pk., MD 20742.
- "Groundwater Pollution From Sanitary Landfill Leachate, Oahu, Hawaii," (#87), 4/75, by M. J. Chun, *et al*, WRRRC, U. of HI, Honolulu, HI 96813.
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