

WATER RESOURCES RESEARCH INSTITUTE

OF THE UNIVERSITY OF NORTH CAROLINA

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EDITORIAL A CALL FOR PAPERS

By Neil S. Grigg, Director

You'd be surprised at how many people actually read this newsletter. It acts to collect and summarize a mass of information. Dave Howells and now Jim Stewart deserve a lot of credit for editing it.

We want to make it better. As the WRRI is in the business of translating technology (hard and soft) for use, we desire to carry more *articles* of interest. These can be contributed by anyone with a water related interest. Examples might be a faculty member condensing his research into management language; an agency person describing a water problem which needs attention; a public interest group expounding on an issue; an engineer or planner describing a new technique; or someone describing a research need. Letters to the Editor are also encouraged.

Articles should not exceed about 450 words (to fit on one newsletter page). We can handle diagrams and photos too. Your remarks will reach an influential audience of at least 1400 water professionals.

ACTION ON WATER CONSERVATION

The Environmental Management Commission has expressed interest in water

conservation as an alternative means of extending available water supplies, reducing water supply and water pollution control costs, and conserving energy associated with water heating.

Former Institute Director David H. Howells spoke to the Commission at its October 13 meeting on the importance of water conservation - the more efficient use of existing water supplies - to future economic development and environmental quality in North Carolina. Howells traced water use patterns from an earlier era of plentiful supplies, low cost, and water rates designed to promote water use, to the present experience of increasing shortages and conflict between supply and demand. The current escalation of land cost, construction cost, high interest rates on borrowed capital, and operating costs have created a new scenario, he said. "The question is, do we choose to recognize it?"

Stressing that conservation is a positive - not a negative concept - Howells said that it doesn't require us to give up anything but waste. "We keep life's amenities. But we cut off the debilitating waste."

Among the water conservation techniques discussed were water accountability through municipal system maintenance and metering, a transition from promotional to conservation water rates, the use of water saving plumbing fixtures and household appliances, public education and regulation. Of the greatest potential in North Carolina, would be a restructuring of water rates, a change in building codes to require water saving fixtures, and sustained public education.

Following the presentation and discussion by commission members, Commissioner James E. Harrington introduced a resolution that was unanimously adopted. This is as follows:

RESOLUTION ON WATER CONSERVATION

WHEREAS, Periodic water shortages, together with upward trends in water use, population and economic growth, appear to signal increasing conflicts between the available water supply and increasing demand.

Past efforts to cope with water shortages have been directed toward the capital - intensive development of additional supplies with little attention to the modification of demand.

Conservation has considerable potential for moderating demand, extending the use of existing supplies, and avoiding, reducing or postponing new capital investment in water supply development.

Water conservation also means reduced volumes of wastewater and capacity for waste treatment facilities.

Conservation is the least costly alternative to increased investment in new facilities for water supply and water pollution control and is deserving of greater emphasis in water resource planning and management.

The more efficient use of water resources through conservation will extend the natural resources base of North Carolina and contribute to economic growth and environmental quality.

NOW, THEREFORE, BE IT RESOLVED THAT, The Environmental Management Commission endorses the concept of water conservation as an alternative means for bringing water demand into balance with available supplies and reducing the cost of water supply and wastewater treatment systems.

The Environmental Management Commission encourages the Governor of the State of North Carolina, the Secretaries and heads of applicable state agencies, associations of local government, local officials, industrial leaders, builders, engineers and architects to give greater visibility to the concept of water conservation and to actively facilitate its implementation.

Encouragement be given to the review and modification of water rate structures to move from promotional to conservation practices, review and modification of state and local building codes to encourage the installation of more efficient plumbing fixtures, review and comment on engineering plans for water supply and wastewater disposal facilities with respect to opportunities to extend water use and reduce waste discharges, and public education emphasizing the importance of water conservation to the self interests of the citizens of North Carolina.

CLEAN WATER BOND VOTE NOVEMBER 8

North Carolina voters will be asked on November 8 to approve the issuance of

\$230 million in State bonds for a five-year continuation of Clean Water Bond Programs. If approved, the bond funds would provide \$112.5 million for water pollution control projects, and \$110 million for the improvement of water supply systems. The remaining \$7.5 million would be placed in a contingency account for special projects.

If approved, the State will use the bond proceeds to make grants to local governments, which, in turn, would match or exceed the state grant with funds of their own, and apply to the federal government for additional funding.

PUBLIC MEETING ON REVISIONS OF WATER QUALITY STANDARDS

The Division of Environmental Management, North Carolina Department of Natural Resources and Community Development, will hold a public meeting Nov. 15, 1977, to review and revise the

North Carolina Water Quality Standards. This will represent the Division's first detailed review of the North Carolina Water Quality Standards since 1972. It

has developed proposals to revise those standards in order to incorporate new technologies, information, and federal and state water quality goals into the standards program. A public meeting has been scheduled in order to provide an opportunity for interested persons to comment on the proposed revisions and to suggest areas where additional changes are needed. In addition, any information regarding the social and environmental benefits of the proposed revisions and the anticipated cost of attaining the proposed standards is solicited. Public Hearings to consider the adoption of final proposals will be held at a later date.

The public meeting is scheduled for November 15 at 7:00 p.m. in the Utilities Commission Hearing Room, Room 217 Dobbs Building, 430 North Salisbury Street, Raleigh, North Carolina.

Listed below is a list of the most significant proposed changes:

- Considerations in assigning B and SB classifications
- Antidegradation statement
- Location of sampling sites and mixing zones
- Standards for toxic and other deleterious substances
- Chlorophyll α
- Effluent channels

For details regarding the Public Meeting contact Mr. David C. Park, Water Quality Management Planning Branch, Division of Environmental Management, Department of Natural Resources and Community Development, P. O. Box 27687, Raleigh, N. C. 27611.

TWENTY THOUSAND DOLLAR SEDIMENTATION FINE

A Boone developer, Joe Williams, has been assessed a fine of \$20,250 for allowing a grocery store site to erode Kraut Creek. The developer failed to control runoff over and away from the site and did not provide cover to prevent erosion. An appeal made to Howard Lee, Secretary of the Department of Natural Resources and Community Development, was denied. According to Lee, the developer had been given every opportunity to correct his problems. Control measures would probably have cost less than \$5,000 according to the State's land quality office. The case was referred to the State Attorney General's Office on October 1 for collection of the fine.

WATER RESOURCES MANAGEMENT LUNCHEON

The Institute is organizing a dutch treat luncheon for Thursday, December 8 for academics, government personnel, consultants, and private citizens interested in North Carolina water management. The objective is to increase communication and to make useful contacts.

An additional objective is to foster university - practitioner interchanges. The December 8 luncheon is to be held on a trial basis. If demand is sufficient we may continue on a monthly basis. Program for December 8 will be WRRRI Director Neil Grigg on the topics: (1) Is there a need for a North Carolina Water Resources Association and (2) The Great American Drought of the 1970's. Please call Eva McClung (737-2815) to indicate your attendance. Reservations are not necessary but helpful to arrange size of meeting room.

Tentative location: The Plantation Inn
Date: December 8, 1977

SOUTHERN ENVIRONMENTAL RESOURCES CONFERENCE SUPPORTS RESEARCH PROGRAM

This Southern Environmental Resources Conference in its annual meeting in Atlanta, Georgia adopted a set of resolutions addressing key water issues. Among those resolutions was one on water resources research. That resolution urged the President to request and the Congress to appropriate the full authorization specified in P.L. 88-379 so that each state, region, and the nation can have more adequate information to cope with existing and emerging critical water quality and quantity problems. Current funding is less than half the amount authorized.

The Southern Environmental Resources Conference (SERC) is an associate of the Council of State Governments. The SERC was formed in the late 50's as a forum between agency personnel and legislators to discuss water law and legislative approaches for the solution of water problems. The secretariat for SERC is the Southern Office of the Council of State Governments operated out of Atlanta.

INCREASED REVIEW OF SEWAGE CONSTRUCTION PROJECTS RECOMMENDED BY GAO

The General Accounting Office (GAO) in a recent report recommended that EPA intensify its review of sewage construction projects and "insure that consulting engineers are held responsible" for malfunctions stemming from design errors. The GAO report says that EPA's current program controls "do not assure that project designs are complete and accurate or that plants, when constructed, will provide expected levels of pollution treatment." Normally federal or local funds are used to handle the deficiencies rather than suing or holding the consulting engineer accountable the GAO report says.

Recommendations from GAO are included in the report entitled "Multibillion Dollar Construction Grant Program: Are Controls Over Federal Funds Adequate?"

ROUTINE WASTEWATER CHLORINATION QUESTIONED BY GAO

The General Accounting Office has questioned the widespread practice of sewage treatment plant wastewater chlorination. GAO reasoned that most incidents of water borne disease outbreaks are transmitted in the drinking water and not wastewater sources. Treatment of drinking water is already occurring at the

water treatment plant. GAO also questioned the high use and frequent year round use of chlorine. While chlorine is not listed as a toxic substance it may combine with sewage to form chloroform which is toxic.

The GAO report says that alternatives to chlorination such as land application of wastewaters, wastewater treatment ponds, ozonation, ultra-violet radiation, and bromine chloride should be further explored.

**JOHN WHITE
NEW EPA REGIONAL
ADMINISTRATOR**

John White, native Georgian and former Region IV Deputy Administrator, is returning to Atlanta as EPA Regional Administrator. Until his recent appointment, he was serving in the same capacity with EPA in Dallas. White was born in Blackshear, received his bachelor's degree in engineering at the University of Alabama, and his law degree from Emory University.

**WATER OVERSIGHT
HEARINGS HELD IN
WASHINGTON**

Oversight hearings were held September 29 by the House Subcommittee on Water and Power Resources

concerning the programs of the Office of Water Research and Technology. Their authorization lapses at the end of FY 1978. Testimonies included the Assistant Secretary of Interior, Guy Martin, who discussed water research and desalination programs at great length. Key points of Mr. Martin's testimony included plans to continue the desalting plant at Wrightsville Beach as well as needed directions in the water research program. Mr. Martin's testimony was generally supportive of OWRT programs and promised to increase the emphasis on the matching grants research program as well as to continue to review and improve the State Institute program. Testimonies were also heard from Dr. Jack Gladwell, Chairman of the National Association of Water Institute Directors; General William Whipple and Dr. Millard W. Hall of the Universities Council on Water Resources; Mr. Jack W. Pepper, State Water Engineer of Mississippi; Dr. Ernest Smerdon of the National Association of State Universities and Land Grant Colleges; and North Carolina WRRRI Director Neil S. Grigg. Some excerpts form Dr. Grigg's testimony follow:

"I have requested an opportunity to testify because I believe you should know more about an essential area of service offered by some water resources research institutes which should be strengthened. This aspect of institute service has received far too little attention. I speak about the area of service which encompasses information dissemination, training, liaison and the range of activities called *technology transfer* for lack of a better name....

"...The water management community is uniquely fragmented, however, and except for the state institutes, lacks a formal organized linkage with the nation's centers of science and technology, the universities. This problem is especially acute at the working levels of state and local government....

"The pressing need is to analyze, process and deliver the knowledge available in a useful form. This is not to argue against the need for new research but to emphasize the importance of the transfer process. We urgently need new research on many water problems....

"The unique feature of the state water resources research institute lies in its role as a center for research, training and service in the interdisciplinary problem area of water resources management, committed to using university resources to meet state water needs....

"If state Institutes do not meet the demands for information dissemination, liaison, and technology transfer the job will fall to other more fragmented sources. This will be a loss for the universities and for water management agencies and research programs will suffer accordingly. The water management agencies will lose a reliable, unbiased source of information, technology and training programs....

"I am convinced that the unique roles of state water resources research institutes lie in their linkages with state and local government. I am hopeful that this Committee will recommend strengthening the institutes and providing the incentives necessary to ensure that every state develops an effective program."

**WATER RESOURCES
COUNCIL EXTENDS
DEADLINE ON POLICY
REVIEW**

The Chairman of the Water Resources Council, Secretary of the Interior Cecil B. Andrus announced on August 26 a change in the schedule of the national water resources

policy review. He set November 20, 1977, as the date for the closing of the record for public comments on the option papers published in the *Federal Register* on August 19, 1977, Vol. 42, No. 161, page 41943. Previously, the time for completion of the review has been extended by 90 days, so that the President's decision in regard to policy changes would be made in February 1978.

**RECOMMENDATIONS
OF THE NATIONAL
ACADEMY OF SCIENCES
ON CONTAMINANTS IN
DRINKING WATER**

The National Academy of Sciences has completed a study on contaminants in drinking water. It was undertaken as a requirement of the Safe Drinking Water Act of 1974.

Interim Primary Drinking Water Regulations for contaminants affecting public health, which went into effect on June 24, 1977, are to be revised by the Environmental Protection Agency using the Academy's findings as a guide.

Emphasis is given to cancer-causing substances. A troublesome stumbling-block in assessing substances as possible cancer-causing agents is lack of information on long-term effects from small amounts present in drinking water.

It is not possible to guarantee complete freedom from contact with cancer-causing substances. Many are present in the environment and cannot be easily controlled. The benefits of some substances--such as drugs and pesticides--outweigh risks associated with their use.

The Academy recommends that attempts to assess substances in drinking water as *safe* or *unsafe* are futile; rather, they should be assessed in terms of probable human risk beyond specified contaminant levels.

Public water supply systems are basically doing a good job in controlling bacteria, viruses, and parasites. Waterborne disease outbreaks continue to occur, however, indicating that improvements are still needed.

Asbestos particles have aroused concern but there is as yet insufficient evidence to draw any firm conclusions on their effects.

Evidence concerning the human health effects of twenty-two inorganic substances and water hardness was examined. Lead, arsenic, and possibly nitrates were identified as definitely harmful to human health by their presence in drinking water. For the others either insufficient data exists to determine toxicity or the amounts found in most drinking water supplies are too small to cause any significant problem. Enough evidence exists on the effects of water hardness on human health to warrant further investigation.

Data on 129 organic solutes was examined for evidence of harmful effects on human health. Of these 74 were nonpesticides and 55 were pesticides. Approximately one-half of these were found to be hazardous in drinking water. Insufficient data exists for many of the rest to make any determination concerning their toxicity.

..... *Lyle S. Raymond*

**INCENTIVE FOR
SEDIMENT CONTROL
URGED**

The National Association of Conservation Districts recently urged the creation of a new federal

program and help implement non-point source pollution control at two important hearings held in Washington, D. C.

Vice-President Lyle Bauer testified before the House Agriculture Subcommittee on Conservation and Credit on H.R. 8150--a bill similar to S. 1280 introduced early this year by Sen. Dick Clark of Iowa. H.R. 8150, sponsored by Rep. Ed Jones (Tenn.) and Rep. James Jeffords (Vt.) calls for a new program to assist in control of agricultural and related pollutants. Long-term contracts with landowners, providing for appropriate technical and financial assistance, are the basis of the proposed program; these contracts would be based on conservation plans approved by conservation districts.

Lyle expressed strong support for the concepts of H.R. 8150 and especially its emphasis on enduring conservation practices. He recommended, however, that the bill be amended to authorize the Secretary of Agriculture to contract with conservation districts and state soil conservation agencies to administer all or part of the program established under the proposed act.

A similar bill was considered along with other water quality measures yesterday by the House Public Works and Transportation Committee. This is the so-called "Culver amendment" contained in Sec. 26 of the Senate version of H.R. 3199.

Sec. 26 would authorize \$600 million for incentives to landowners to establish soil and water conservation measures needed to improve water quality.

..... *Tuesday Letter*

**NEW SLIDE SET--
SECTION 208 AND
CATTLE INDUSTRY**

Local involvement by livestock producers in Section 208 areawide water quality planning is important to assure that

proposed water pollution control programs are workable, effective, affordable, and widely understood. Still, most livestock producers lack a basic understanding of what Section 208 planning is, how it works, and how it can affect land management options and local taxes.

A new slide set "Section 208 Planning and the Cattle Industry" is now available on loan from the National Cattlemen's Association, 1001 Lincoln Street, Denver, Colorado 80203. The slide set (with cassette tape) describes the 208 planning process, agricultural nonpoint source problems, and potential abatement alternatives. It is designed to help individual cattlemen become involved in local 208 planning activities. Such participation is supposed to form the backbone of successful 208 planning between now and next year when river basin plans are due for completion.

**DUAL WATER
SYSTEMS**

Is there a potential for dual water systems? The National Science Foundation in conjunction with the RANN program has supported research to investigate the feasibility of dual

or multiple water systems. The goal of that effort has been to develop the necessary information to help cities, consulting engineers and other planners to decide whether the multiple supply approach to water management will be beneficial. Weston, a consulting firm, is examining dual water supply alternatives for technical and economic advantages over conventional systems under the NSF research effort.

What is a dual water system? According to Arun K. Deb, Principal Environmental Systems Engineer for Weston Environmental Consultants and Designers, a dual water supply system consists of two grades of water--one potable and the other potable--supplied through separate distribution mains to consumers. The potable water can come from protected, naturally pure sources or from unprotected sources treated extensively beyond present standards to assure highest quality for ingestion.

The second subpotable supply, providing the bulk of the water, can be of questionable quality in terms of trace chemicals, but it would be bacteriologically safe through conventional treatment that includes disinfection. In fact, the subpotable supply would be what some cities are now providing, and occasional ingestion would create no problem.

The balance between potable and subpotable supply will vary for each community depending on its residential, industrial, commercial and public water demands, and the components of each. For instance, in residences the possibilities for potable water range from supplying all needs except toilet flushing and exterior uses, to providing only potable drinking and cooking water, and using subpotable water for the rest of household uses. The breakdown of potable vs. subpotable water for each demand in combination with the total levels of water usage will determine the character of the dual water system.

The National Science Foundation is sponsoring a workshop intended for potential users of dual water supply systems methodology such as water utility managers, local state and federal water planning and management personnel, consulting engineers and university faculty and students. The workshop is scheduled for Friday, November 4, 1977, at the Weston Corporate Headquarters Campus, West Chester, Pennsylvania.

Dr. Daniel A. Okun, Kenan Professor of Environmental Engineering, University of North Carolina, is the workshop chairman.

HOW MUCH WATER IN A 12-OZ. CAN?

A 12-ounce can of beverage, of course, contains 12 ounces. But according to the U.S. Geological Survey (USGS) in its 1976 Annual Report, it takes about 66.6 quarts

of water to get the can and its contents to the supermarket.

REPORTS ON WATER CONSERVATION

Several cities in N. C. are faced with the problems of rapid growth and an insufficient supply of resources to support that growth. One example is the recurring water shortage experienced by several Piedmont towns. These problems point to the potential for water conservation and water saving devices. We have recently received several publications from the Pennsylvania State University Institute for Research on Land and Water by William E. Sharpe which address the subject of water conservation. One report, *The Impact of Water Saving Device Installation Programs on Resource Conservation*, discusses the Washington Suburban Sanitary District's and the Pennsylvania State University's experience with water saving devices and water conservation. In both of these cases, substantial water savings were realized. Concomitantly, energy resources and fiscal resources were both conserved through this water conservation program.

Water savings of as much as 60 percent were realized through the installation of flow control devices on showers in college dormitories. The gross economic benefits of this program were estimated to save as much as \$100,000 per year for the Pennsylvania State University system.

Other reports also received from Pennsylvania are entitled *Water Conservation Devices* and *Water Conservation with Water Saving Devices*. These discuss the availability of water saving devices and other commercially available products which may help to realize the goals of a water conservation program. Numerous other methods such as water recycling, water and wastewater flow reduction, and water pricing, may also help to realize the goals of conservation efforts. One final aspect of water conservation programs discussed is the implementation of a conservation program. Public involvement is critical to the program. In the Washington area, poster contests, bumper stickers, mass media programs, and extensive public relations efforts effectively involved various publics in the program.

The water supply problem continues to increase in significance. Water supplies are rapidly becoming less and less a limitless resource. Some states have gone so far as to declare that all water within the state is the property of the state and subject to state regulatory control over use. These actions are somewhat drastic, perhaps through water conservation and reductions in water use, these drastic measures will not be required everywhere. These reports from the Pennsylvania State University offer an alternative to state ownership of all waters within a state.

**LAND APPLICATION
OF WASTE WATER
BIBLIOGRAPHY
AVAILABLE**

Dr. James M. Stewart,
with the WRRRI of The
University of N.C.,
and Dr. Bobby L. Carlile,
NCSU Soil Science Ex-
tension, have recently

edited a Water Resources Scientific Information Center bibliography on the land application of waste water. The report contains 460 abstracts and is another in the series of planned bibliographies produced by the Water Resources Scientific Information Center from the files of Selected Water Resources Abstracts (SWRA). At present these files contain over 101,000 water related literature citations. Copies of the land application bibliography are available free from the Institute.

**CONFERENCES AND
WORKSHOPS**

The Environmental
Impact Statement
Process Under NEPA

will analyze actions taken during 1977 by federal agencies, the courts, and the states that have affected environmental impact statement assessment. By bringing together people involved in all phases of the NEPA process - attorneys from the public and private sectors, consultants, and federal, state and local administrators - the conference will give participants several different perspectives on the statute. Important recent developments will be described in detail, followed by an examination of the implications of these events. The conference is scheduled for November 7 and 8 at the Shoreham Americana Hotel, Washington, D.C. For details contact the conference sponsors: The Environmental Law Institute, 1346 Connecticut Ave., N.W., Suite 620, Washington, D.C. 20036. Phone: (202) 234-0700.

Environmental Law Course. The objectives of the complex field of environmental law have developed rapidly. Regulations are being promulgated in a continuing stream. Court decisions interpreting these laws and regulations are frequent. The problem is how to obtain a proper perspective of this dynamic and broad area without a severe loss of time. So, a concentrated course has been created with the objective to provide a comprehensive working knowledge of the numerous considerations for complying with this large body of law. This is a practical course oriented toward providing current information on environmental law for those who wish to grow professionally through continuing education.

1977 is a year of many new environmental developments, with the enforcement focus of the Carter Administration, and the new environmental legislation and regulations. The Environmental Law Course will provide an opportunity to analyze these developments.

The conference is scheduled for November 10-11 at Capital Hilton Hotel in Washington, D.C. For additional information contact: Nancy Mc Nerney, Government Institutes, Inc., 4733 Bethesda Ave., N.W., Washington, D.C. 20014, phone (301) 656-1090.

Second National Home Sewage Treatment Symposium.

The objectives of the Second National Home Sewage Treatment Symposium are to bring together university extension, teaching and research personnel; local, state and federal agency regulatory and research staff; consulting engineers; equipment manufacturers; and contractors to consolidate available information on home sewage treatment in order to develop design criteria and establish proper management procedures.

The Symposium is scheduled December 12-13, 1977, at the Palmer House, Chicago, Illinois and is sponsored by the American Society of Agricultural Engineers.

Questions about the Symposium, or arrangements should be directed to ASAE, Box 410, St. Joseph, Michigan 49085 or call (616) 429-0300.

A second ASAE sponsored symposium will be held Dec. 12-13 in the Palmer House. The National Symposium on Erosion and Sedimentation by Water will be held in the Monroe Room, Sixth Floor Monday at 9:30 through noon on Tuesday.

**WATER RESOURCES
CONDITIONS IN
NORTH CAROLINA**

Above normal rainfall during September ended the near-state-wide drought. In the eastern Piedmont and Coastal Plain

regions, numerous streams rose to normal levels for the first time since May. Runoff from heavy rains on the 9th caused minor flooding on small streams in Forsyth, Guilford, and Alamance counties. Heavy rains in the Mountains on the 15th and 16th also caused minor flooding in Transylvania and Haywood counties. Flood damages were light, however, and were confined largely to agricultural activities.

Monthly-mean flows for September ranged from over 3 times normal flow in most Mountain streams to slightly below normal in Coastal Plain streams.

Ground-water levels rose sharply in the Mountains and western Piedmont and declined slightly in the eastern part of the State. As compared to long-term records for September, levels were generally above normal in the western half of the State and below normal elsewhere.

.....U.S. Geological Survey

**POSITIONS
AVAILABLE**

The Connecticut River Basin Office of the New England River Basins Commission,

a joint federal-state agency responsible for the coordination and preparation of plans for the management of water and related land resources in New England, is seeking qualified personnel to fill one senior level staff position to provide staff support for interagency task groups and advisory

groups, to perform continuing comprehensive river basin planning and coordination functions, and to work on a special project with a combined water resources policy, planning and research orientation. For details contact David C. Harrison, Program Manager, NERBC-Connecticut River Basin Office, P.O. Box 651, 9 South Main Street, Hanover, New Hampshire 03755, as soon as possible. Telephone inquiries may be made to Mr. Harrison at (603) 643-5831.

The Institute of Natural Resources of The University of Georgia has an opening for Associate Director. This position is for a person with a background and interest related to those activities described as ENVIRONMENTAL ENGINEERING. Candidates must be willing to work with biologists, economists, lawyers, public and private sector officials and citizens on Institute projects. Interested candidates should send a vita, statement of interests and references (3) before October 30 to: Ronald M. North, Director, Institute of Natural Resources, Ecology Building, The University of Georgia, Athens, GA 30602.

The Water Resources Center, Desert Research Institute, University of Nevada System, has the following three positions: Executive Director, Hydrogeologist, and Research Associate in Water Resources. For details contact: Gilbert F. Cochran, Acting Executive Director, Water Resources Center, P.O. Box 60220 Reno, Nevada 89506, telephone: (702) 784-6955.

Expert in operational hydrology to work in Senegal. Candidates should have a university degree in mathematics, physics or civil engineering with specialization in hydrology. For details contact: The Secretary-General, World Meteorological Organization, Case Postale No. 5, CH-1211, Geneva 20, Switzerland.

The School of Engineering at the University of New Orleans has an immediate vacancy in Hydraulic Engineering and Water Resources. Inquiries and resumes should be sent to Dr. Saad E. Moustafa, School of Engineering, University of New Orleans, LA 70122.

Director of the Water Resources Research Institute, Associate Professor or Professor, Clemson University, Clemson, South Carolina. The Director will be responsible for carrying out a program of water

resources research, training of water scientists, and technology transfer, meeting all requirements of Public Law 88-379 and subsequent amendments relative to the establishment and continued operation of the Water Resources Research Institute. For additional details contact: Dr. Luther P. Anderson, Dean, College of Agricultural Sciences, 101 Barre Hall, Clemson University, Clemson, South Carolina 29631, telephone: (803) 656-3015.

Water Resources Technology Transfer Specialist with the Water Resources Center, a division of the Institute of Agriculture and Natural Resources, University of Nebraska-Lincoln. Responsibilities will include assisting in planning and coordinating water resources information dissemination and technology transfer programs. Duties will include working with the Cooperative Extension Service, Agricultural Communications, ETV and others as appropriate; assisting Center researchers in developing information on research results of utility to various identified user groups; assisting in the development of Center publications; and assisting in the organization and publicity for various Center conferences and seminars. For details contact: Dr. Millard W. Hall, Director, Nebraska Water Resources Center, 310 Agricultural Hall, University of Nebraska, Lincoln, Nebraska 68583, telephone: (402) 472-3305.

**WATER RESOURCES
LEGISLATION IN
THE CONGRESS**

BILLS INTRODUCED

Senate

S. 2083 To establish a uniform and comprehensive legal regime governing liability and compensation for damages and cleanup costs caused by oil pollution.

NEW PUBLIC LAWS

House

H.R. 7553 Making appropriations for Public Works for water and power development and energy research for fiscal year 1978. (Public Law 95-96)

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.)

Water Resources Planning

- "Manual of Treatment Techniques for Meeting the Interim Primary Drinking Water Regulations," (EPA-600/8-77-005), 5/77, by EPA, Cincinnati, OH 45268.
- "Fourth Report to Congress - Resource Recovery and Waste Reduction," (SW-600), 8/77, by USEPA, Washington, DC 20460.
- "A Linear Programming Model for Assessing the Regional Impacts of Energy Development on Water Resources," (#126), 7/77, by G. Provenzano, Water Resources Center, U. of IL, 2535 Hydrosystems Lab., Urbana, IL 61801.
- "Future Problems and Water Resources Research Needs of the Illinois River System," (#6), 6/77, by P. C. Welch, Water Resources Center, U. of IL., 2535 Hydrosystems Lab., Urbana, IL 61801.
- "Modernization and Improvement of New York's Riparian Law," (PB-251-029), 12/74, by W. H. Farnham, avail. from NTIS, Springfield, VA 22151.
- "Proceedings of the Southern States Recreation Research," (SE-9), 6/76, by USDA, avail. from NCSU, Dept. of Recreation, Resources Admin., School of Forest Resources, Raleigh, NC 27607.
- "Public Involvement in Natural Resource Planning and Decision Making: A Selected Bibliography," (#1097), by D. L. Erickson, avail. from Council of Planning Librarians, P.O. Box 229, Monticello, IL 61856, Price - \$1.50.
- "Research and Development in the Environmental Protection Agency," (Vol. III), 1977, by Comm. on Nat. Res. and the Steering Committee for Analytical Studies, avail. from Printing and Publishing Office, National Academy of Sciences, 2101 Constitution Ave., Washington, DC 20418.
- "Selecting and Planning High Country Reservoirs for Recreation within a Multipurpose Management Framework," (#78), 7/78, by R. Aukerman, *et al*, for EPA, avail. from NTIS, Springfield, VA 22151.
- "Swift Creek Watershed Draft Environmental Impact Statement - Pitt, Beaufort, and Craven Counties North Carolina," (USDA-SCS-EIS-WS(ADM)-77-1-(D)NC), 9/77, by USDA, SCS, P.O. Box 27307, Raleigh, NC 27611.
- "Planning for Proper Use of Land and Water," (WR 023-77), 7/77, by WRRRI, OR St. U., Corvallis, OR 97331.
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WATER RESOURCES RESEARCH INSTITUTE
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N. C. STATE UNIVERSITY
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