NEWS
WATER RESOURCES RESEARCH INSTITUTE
OF THE UNIVERSITY OF NORTH CAROLINA

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EDITORIAL

NORTH CAROLINA ECONOMIC DEVELOPMENT

By Neil S. Grigg, Director

Economic development means jobs and the increased potential for citizens to improve their lives. Governor Hunt organized a successful statewide conference on the subject in Charlotte January 9-11.

"Water and Sewer" -- these words, along with transportation and training needs, echoed in the halls at the breaks as local leaders asked how they could offer reliable service at reasonable costs to industry. Along with this, the general subject of waste management is of concern to everyone: the state, cities, counties, and industry.

North Carolina water managers, state and local, can get together and develop strategies to work for economic development at the same time that water is conserved and the environment protected. The University and WRRI are ready to carry out the research needed. We welcome any ideas on this subject.

EDITORIALS

STATE'S PRECIOUS RESOURCE

Times - Fayetteville, North Carolina

While much attention is naturally focused on problems of energy conservation, specifically on the petroleum supply, the issue of water conservation is also a growing one, especially in North Carolina.

Within a few years, water experts predict that urban areas of the state will need to find new sources of water through so-called "inter-basin transfers," taking water from one water basin to supply another. The Cape Fear River Basin, for instance, might need to be tapped to supply the Yadkin-Pee Dee or the Neuse basins. While the current water-planning effort for North Carolina puts inter-basin transfer into a future beyond the 1980's, the era has already begun in northeastern North Carolina where Virginia seeks such transfer from rivers which rise in that state but flow through North Carolina.

Short of interbasin transfer, however, is a whole field of water conservation which is only just being entered, and which deserves public attention.

The idea that water needs to be conserved is alien to much thinking and to tradition in North Carolina. The state has a relatively abundant supply of water in most areas. Only areas of intense urban growth even encountered the distant early warning of troubles ahead.

Yet while the supply of water continues to be abundant, the cost of providing water to large urban populations is growing. Moreover, the energy shortage adds further urgency, for the cost of energy and its relative scarcity is the major element in the rising cost of supplying water.

The North Carolina Environmental Management Commission, which directs water quality control efforts in the state, has recently launched a public awareness effort to point out the elements of good water conservation for the state and its people.

The commission has urged state and local governments, public and private agencies, and business and industry, to begin moving toward:

- Water rate structures based on conservation rather than profligate use (charge more for more, less for less).
- Water-saving plumbing devices encouraged through building codes, regulation, and public awareness.
- More public education of the cost factors in many current water-use practices, especially in the construction of treatment facilities and far-flung supply lines in sprawling subdivision development.

Water is so obviously a resource of immense significance and one of the few natural resources that North Carolina has in relative abundance these days, that the state ought to be on the cutting edge of best possible stewardship of it.

Before it is faced with the more expensive alternatives such as interbasin transfer, the state has the time and the ability to find a better way, to develop sound plans, and to build the base of public understanding and support for carrying out effective water conservation efforts.

The Environmental Management Commission has proposed three sound approaches. They deserve to be seized upon widely as approaches with great potential for improving the life of North Carolinians through better control of water supply and quality.

David Howells, retired director of the UNC Water Resources Institute, put it well when he said the goal of water conservation is: "We keep life's amenities. But we cut off the debilitated waste of water."

The commission resolution followed the same theme, saying:

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

Water conservation is good government. It is surely good business. It would save money for a low-income state, and promote the sort of economic growth needed to raise that income. At a time when resource conservation is the major thrust of public policy, North Carolina needs to concentrate on her most important and abundant natural resource, water.

DON'T BUILD ON FLOODPLAIN

The Times-News - Hendersonville, North Carolina

The question of TVA dams is coming up again in bits and places. It is all the result of flash flooding earlier in November. The question came up in the early 1960's and went down to defeat in the early 1970's.

When the dams were conceived, they had a three-fold purpose: 1. Boost the economy with jobs for construction workers and service personnel for the recreation industry that would result; 2. Prevent flooding in the Upper French Broad River basin; 3. Provide quality water for draw-down purposes to the Tennessee Valley Authority.

TVA would build the dams, we'd get the benefits of flood control and recreation, and TVA would get the water it needs to keep downstream quality high and the river at moderate levels in dry months. It looked like a good trade out.

Then came prosperity without the TVA dams. When it became apparent that the dams would do more destruction to farmlands and communities than good, the people rose up. When it became apparent that flood control could be obtained by not building in floodway or plain, the public began turning thumbs down. As usual, whenever a minor or major flood takes place, there is a call for dams. Hominey Valley in Buncombe County wants relief.

First, it must be understood that no matter the number of dams, there will always be flash flooding in coves and hollows if there is sufficient rain. Western North Carolina is built that way. Second, there will always be flood damage if buildings are built in the floodway and plain.

THE CLEAN WATER ACT OF 1977

By Neil S. Grigg, Director

We are pleased to see the Congressional consensus on passage of the Clean Water Act of 1977. Substantial agreement was evident in both the House and Senate in the December passage of the bill. President Carter signed it readily.

We may not agree on the particular details of the consensus approach, but having a clear mandate from the federal government will make the job of State and local officials a lot easier in the next few years. It will be particularly useful to have information about the financial provision for pollution control activities. We note particularly Senator Jennings Randolph's (D-WV) comments about the relevancy of the bill to states with large rural populations and its emphasis on the need for developing less costly methods for sparsely populated areas. The emphasis of North Carolina on decentralized approaches and on land application has attracted national attention.

Now it's time to get back to work on the problem of clean water.

KNIGHT RETIRES FROM ENVIRONMENTAL MANAGEMENT

W. E. Knight, the State's top career environmental official, retired at the end of December. Knight has been director of the Division of Environmental Management of the Department of Natural Resources and Community Development since 1975.

During Knight's period as administrator, the state's first water and air resources section was established; the State took over the administration of the federal wastewater discharge permit system, which included the first requirement for discharge limitations; began enforcement of oil pollution control laws; completed a draft water resources framework study; reclassified all of North Carolina's streams; administered State and federal clean water funds that allowed the planning or construction of 400 clean water projects; and established a refinery licensing process. In addition, the State was able to convince the vast majority of North Carolina's industries--including many previously major polluters--to install the necessary clean water equipment to meet the July 1, 1977, clean water deadline.

McRORIE NAMED ACTING DIRECTOR OF ENVIRONMENTAL MANAGEMENT

A. F. (Mac) McRorie was named acting director of the State Division of Environmental Management effective January 1, 1978. The announcement was made by Howard N. Lee, Secretary of the N.C. Department of Natural Resources and Community Development. Lee said McRorie will serve for at least 90 days while a search committee produces a list of candidates to replace W. E. Knight, who retired December 31.

As acting director of the division, McRorie will supervise the State programs for water and air quality, water resources planning, and groundwater management. McRorie, 49, has held a number of environmental engineering and administrative positions in state and local government throughout North Carolina. A native of Taylorsville, he holds bachelor's and master's degrees from North Carolina State University. McRorie was assistant director of public utilities for the City of High Point for several years. He has held field positions and administrative positions with the Division of Environmental Management dating back to 1958.

WATER, WASTEWATER PRICING WORKSHOP SCHEDULED FEB. 21

A one-day workshop on water and wastewater pricing, sponsored by The UNC Water Resources Research Institute, N.C. Section American Water Works Association, N.C. County Commissioners Association, UNC-CH Department of Environmental Sciences and Engineering, Farmers Home Administration, N.C. Department of Human Resources, N.C. League of Municipalities, N.C. Local Government Commission, N.C. Department of Natural Resources and Community Development, and N.C. Utilities Commission - Public Staff, has been scheduled for the McKimmon Center at North Carolina State University on February 21st.

The Workshop will address the need for revising traditional approaches to rate setting because of: inflation, growth management, federal regulations, energy conservation, chemical costs, and the need for conservation.

The general objective is to provide a forum for North Carolina leaders to discuss these issues and to hear experts discuss national trends.

The program for the Workshop consists of:

8:00	*REGISTRATION*
8:45	Welcome
9:00	Advanced Trends in Pricing - *Steve Hanke, Johns Hopkins University, Baltimore, Md.*
9:30	Practical Approaches - *R. F. Banker, Black & Veatch Consulting Engineers, Kansas City, Missouri*
10:00	BREAK
10:30	North Carolina Pricing Situation and Constraints - *Sherman Pickard, League of Municipalities*
11:00	Panel Discussion by Above Speakers Responding to Questions
11:30	Why Consider Conservation - *William E. Sharpe, Pennsylvania State University*
12:00	LUNCH - Fiscal Responsibility and Effective Management - *Harlan Boyles, State Treasurer*
1:30	Practical Problems Needing Attention in North Carolina (Panel of Representatives from Sponsoring Organizations)
2:30	BREAK
3:00	Panel Discussion - Response with Solutions to Practical Problems - *Previous Speakers* - *Certified Public Accountants* - *201 Representative* - *Consulting Engineers*
4:30	Where to With Additional Training, Workshops, and Policy Needs - *Tom Bruce, City of Durham*

The intended audience for the Workshop would include utility directors, elected officials, city and county managers, finance directors, and consulting engineers. For additional information, contact WRRI (919) 737-2815.

WSSC ADOPTS CONSERVATION-ORIENTED WATER/SEWER RATES

The Washington Suburban Sanitary Commission has adopted a new conservation-oriented water and sewer customer rate schedule which became effective January 1, 1978.

Believed to be the first rate plan of its kind ever implemented by a major American water utility, the structure will apply a sliding schedule of rates per 1,000 gallons of use, with the level of charges to be determined by the customer unit's Average Daily Consumption (ADC) during each billing period.

Under the schedule, some WSSC customers will be paying substantially less per 1,000 gallons for water and sewer services than they now pay, if they maintain low levels of ADC. Other customers with higher levels of ADC will pay higher rates than they now pay per 1,000 gallons for their total consumption.

The range of rates on the new schedule will be 36 cents up to $1.05 per 1,000 gallons of water consumption and 45 cents up to $1.31 per 1,000 gallons for sewer use. The schedule starts at a base ADC of ten gallons a day, where the lowest water and sewer rates will apply, and moves up in ten-gallon increments (100 steps) to a top ADC threshold at 1,000 gallons or more, where the highest water/sewer rates will apply to total consumption by the customer unit.

As the conservation structure is phased in, the WSSC will phase out the 20 percent Summer Water Consumption Surcharge (an interim conservation measure implemented in 1976) and the annual Service Charge (based on meter size). The new customer rates have been designed to produce the required revenues, which no longer will be received from the summer surcharge and the service charges.

Adoption of the new rate schedule culminates more than a year of study, which led to a June 1977 report by a 12-member, bi-county WSSC Citizens Advisory Committee recommending an "increasing rate" designed to reward conservation and put a premium price on high levels of daily average consumption.

SURVEY OF 535 WATER SUPPLIES OF NORTH CAROLINA COMPLETED

A complete survey of 535 North Carolina municipal, sanitary district, and water supply systems has been completed by the consulting firm of Boney, Wiggins, Rimer and Associates for the Water Supply Branch of the Sanitary Engineering Section of the Department of Human Resources. The 13-volume survey contains descriptions of individual water supply systems and treatment facilities. Finished water samples were analyzed for bacteriological contamination, radiation, inorganics, and certain pesticides. The results of these analyses are presented in the survey along with the maximum allowable concentrations of these parameters as given in the *National Interim Primary Drinking Water Regulations,* which were printed in the December 24, 1975, *Federal Register.*

For each system in the survey, a list is provided of any deficiencies, exemptions and variances, and recommendations. A complete set of survey findings is available at the Institute for review. Additional details are available from the Water Supply Branch of the Sanitary Engineering Section, Department of Human Resources (919) 733-2321.

STATE ASSOCIATION OF SOIL AND WATER CONSERVATION DISTRICTS MEET

Over 400 representatives from the State's 97 Soil and Water Conservation Districts representing the state's 100 counties met in Asheville on January 8-11 for their annual conference and to develop its 1978-79 program objectives. High among these objectives of the Association were programs directed to maintaining adequate supplies of high quality water in the state. Erosion control received additional emphasis with strong support for such conservation practices as grassed waterways, diversions, field borders, minimum tillage, strip cropping, and general support for sediment control programs. It is expected that non-point pollution control efforts by the Soil and Water Conservation Districts will receive support with current amendments to the Federal Clean Water Act.

Stewart Adcock from Wake County was elected as president of the Association. The Gaston County and Wake County Soil and Water Conservation Districts won first and second places respectively in the Goodyear Awards for their outstanding soil and water conservation programs. Gaston County was also the national winner in the National Association of Conservation Districts Allis-Chalmers Award for its outstanding program in environmental education.

RESULTS OF NORTH CAROLINA WORKSHOP ON STORMWATER MANAGEMENT

On January 5, the WRRI hosted a workshop on the management of stormwater, sedimentation, and flood control at the Ramada Inn in Apex. Co-sponsors included the League of Municipalities, Association of County Commissioners, APWA, and UNCC. The nearly one hundred attendees consisted of academics, local government and state government practitioners, and professionals from the private sector. The objective of the workshop, which was focused entirely on the administrative and legal aspects, was generally to develop statements of policy and program needs for state government in the areas of stormwater management, sedimentation, and flood control.

The basic problem addressed was that four related programs are confronting local public works officials. They are: management of stormwater quantity, management of urban runoff quality, sedimentation and erosion control, and flood control with emphasis on urban areas. The state responsibilities for these four areas are not entirely clear, and different departments are concerned with different aspects. More support is needed for local government programs to assist in providing the needed regulation without undue burdens on either the local government or private land developers.

The outcome of the workshop will be a brief paper with U.S.-suggested policy and program needs which will be transmitted to state government, workshop proceedings, and follow-up studies and workshops initiated by WRRI and other attendees.

LEGISLATIVE WATER COMMITTEE MEETS

The Legislative Research Commissions (LRC) Committee on Financing of Water Development Projects held an organizational meeting on December 2. Representative Thomas Gilmore is the LRC's member in charge of the study. Co-chairmen of the committee are Representative Vernon James and Senator William Smith.

The committee heard a statement by Mr. H. A. "Jack" Smith, Deputy Secretary of the Department of Natural Resources and Community Development on current problems and status of financing development projects. The committee is currently considering the scope of their study and how to develop the most useful study results for the 1978 legislative session. The next meeting will be February 24 in Raleigh.

NEW INSTITUTE PUBLICATION

Water Quality in North Carolina Coastal Plain Streams and Effects of Channelization

A study directed by Dr. Edward J. Kuenzler, Department of Environmental Sciences and Engineering, UNC-CH, was made of the physical and chemical characteristics of seven small Coastal Plain streams of eastern North Carolina. Three natural streams which flow through relatively undisturbed bottomland hardwood forests were compared to four streams that had been channelized for the purpose of reducing agricultural losses caused by flooding. Two or three sampling stations were established on each stream. Some stations on natural streams were essentially pristine, but others received point-source inputs of sewage or livestock farm wastes. The natural streams had broad floodplains and low stream velocities even during flood stages. Spates (floods) occurred in all seasons, but high discharge, and concomitant flooding of natural swamps, was greatest during winter and spring. The waters of channelized streams, however, were restricted; they attained higher velocities, carried greater particulate loads, and were more turbid than natural streams.

The waters of the natural streams were darkly colored, moderately acid, low in conductivity, and very low in plant nutrients. Nitrate and filterable reactive phosphorus were especially low, much lower than the concentrations in rainwater of the region. A marked seasonal cycle existed in dissolved oxygen in natural streams, the concentrations becoming low during the summer-fall, low-flow period, and even undetectable in stagnant pools. These periods of low oxygen coincided with the periods of higher concentrations of ammonium, total organic nitrogen, particulate phosphorus, and iron in the water of natural streams. The waters of channelized streams, on the average, had lower color, higher conductivites, turbidities, pH's, and phosphorus concentrations, and were very rich in nitrate compared to natural streams. Dissolved oxygen was abundant throughout the year. Measurements during the course of one summer and one winter spate showed that peak concentrations of nitrate, ammonium, filterable reactive-P, particulate-P, turbidity, and particulate silicon, aluminum, and iron usually occurred 1 to 2 days before maximal discharge in both a natural and a channelized stream. Concentrations of soluble salts decreased slightly or remained about constant during the spate. Total elemental transport rates during the high discharge period of a spate were 10-1000 times the flux rates during normal-flow periods.

Weighted mean concentrations of the nutrient elements N and P were much lower in waters of unpolluted natural streams than in rainwater, and there was a net input of these nutrients to the watershed. Concentrations and fluxes of elements such as Ca, Mg, Na, K, and Cl, however, were higher in all streams, and the net fluxes of these elements were directed out of the watershed.

Copies of the Report No. 127 are available from the Institute free for North Carolina residents and $4.00 for out-of-state residents.

HEARING ON RULE CHANGES REGARDING CONFIDENTIALITY AND ACCESS TO PUBLIC RECORDS

A public hearing will be held by the North Carolina Department of Natural Resources & Community Development on behalf of the Environmental Management Commission concerning proposed rules relating to confidentiality and access to public records.

The proposed new rules establish procedures by which the public may obtain access to public records maintained under the authority of the Environmental Management Commission. The proposed new rules also establish mechanisms and procedures which may be invoked by the person submitting certain confidential information to protect that information from disclosure to the general public.

The hearing is set for February 2, 1978, beginning at 10:00 a.m. in the Hearing Room, Room 6X, Archdale Building, 512 North Salisbury Street, Raleigh, North Carolina. Further information or copies of the rules may be obtained by writing or calling:

M. W. Puette, Enforcement Coordinator
Office of Enforcement
N.C. Department of Natural Resources
& Community Development
P. O. Box 27687
Raleigh, NC 27611

Telephone: 919/733-7247.

ANNUAL ALLOTMENT PROPOSALS DUE FEBRUARY 28

The Institute will be considering new research proposals on problems of state interest in its annual allotment program in February. You are encouraged to articulate what you see as a water resource problem needing research attention. Please call the Institute Director or Associate Director (919) 737-2815 to discuss a problem area in which you feel research should be conducted.

PRIVATE HELP FOR PUBLIC AUDITS

A recent *Wall Street Journal* article reports that private accounting firms are being drawn into the world of municipal finance. By act of Congress and in line with the mood of public accountability, local governments are being forced to have complete audits done by independent accountants.

One reason: A new provision in the federal revenue-sharing program taking effect in three years that will require all municipalities receiving at least $25,000 in federal revenue-sharing funds to have an "independent" audit done on their financial situation. For many municipalities, this procedure has never been followed.

FEDERAL GOVERNMENT TAKES OVER OPERATION OF FLOOD INSURANCE PROGRAM

Flood insurance is available to property owners in eligible communities at premium rates subsidized by the federal government. Property owners who purchase flood insurance are unlikely to ever see a federal agent, however. This is because flood insurance policies are purchased through local insurance agents just like other types of insurance.

How does the federal government actually subsidize flood insurance premiums? Where does the money change hands?

It was the intention of Congress from the beginning of the National Flood Insurance Program to encourage the participation of the private insurance industry to the maximum extent possible. Following passage of the National Flood Insurance Act of 1968, private insurance industry participation was obtained by creating a body known as the National Flood Insurers Association. Insurance companies wishing to offer subsidized flood insurance voluntarily joined the Association (or insurance pool).

The Department of Housing and Urban Development (HUD), as the representative of the federal government, negotiated a contract agreement with the Association for the payment of federal funds to subsidize flood insurance premiums. And that's how the flood insurance program has operated since 1969.

HUD has announced its intention to employ a private contractor responsible directly to HUD to service the flood insurance program with private companies rather than through the Association beginning January 1, 1978. The changes are not intended to involve local insurance agents or policyholders.

Why is HUD doing this? The situation boils down to a dispute between the federal government and the private insurance industry concerning the meaning of their contract agreement. HUD asserts that overall authority for the entire flood insurance program rests with the federal government under the National Flood Insurance Act, and this includes monitoring of the manner in which the private insurance industry is using federal subsidies. The private insurance industry resists this interpretation, maintaining that HUD's powers are limited to the terms of the contract agreement. HUD charges that mismanagement by the Association is giving the federal government less than its money's worth.

HUD's proposed takeover may be heading into troubled waters, however, as some members of Congress are calling for independent audits and studies before approving the changes.

Lyle S. Raymond, Jr.
Water Resources Information Specialist
Center for Environmental Research/
Cooperative Extension, Cornell University

EPA SLUDGE-DISPOSAL GUIDELINES

Technical guidelines for *land application of municipal sewage sludge* were published by EPA in the November 2 *Federal Register*. These guidelines are not mandatory, but will be used to evaluate EPA construction grants for sewage treatment plants and perhaps adopted in Section 208 water quality management plans. Copies are available from General Services Administration (8 FFS), Centralized Mailing Lists Services, Bldg. 41, Denver, CO 80225. (Ask for *Municipal Sludge Management: Environmental Factors*, Publication No. EPA 430/9-77-004.)

According to the EPA technical guidelines, *sludge should first be tested* for heavy metals (particularly zinc, copper, cadmium, nickel, and lead) and plant nutrients. Soils receiving sludge for agricultural purposes should be tested for phosphorus, potassium, pH, heavy metals and cation exchange capacity. Groundwater conditions should be investigated where sludge will be applied at greater than crop fertilizer rates. Leaching of most metal ions can be prevented by maintaining soil pH above 6.5.

The guidelines state, "...*Sludge application rates* should provide total plant available nitrogen equivalent to the nitrogen fertilizer requirement of the crop grown, ...(however) applying 1-1/2 to 2 times the crop's nitrogen fertilizer requirement has not lead to the development of groundwater problems. *Plant available nitrogen* includes that mineralized from the soil, (plus) the inorganic sludge nitrogen (ammonium and nitrate), plus a *mineralization rate* of 15 to 20 percent of sludge organic nitrogen... for the first growing season following application, and three percent of the residual sludge organic nitrogen for three subsequent growing seasons." Volatilization of ammonia from surface-applied sludge runs as high as 50 percent. Soil injection or prompt plowdown of surface-applied sludge is encouraged to prevent nutrient loss and control odors.

A controversial feature of the guidelines is the suggestion to collect surface runoff from sludge-treated land followed by "controlled release." EPA recommends monitoring of soils, surface runoff and/or groundwater as well as site fencing where high nitrogen or heavy metal loading rates are used.

Heavy metal uptake can be minimized in most crops by controlling pH to 6.5 or greater by liming, if necessary. *Cadmium loadings* should be less than 2 kg/ha (1.8 lb/acre), and the *cadmium-to-zinc ratio* should be less than 0.015, according to the EPA guides.

Regarding *crop selection*, "sludge-treated land should not be used for growing human food crops to be eaten raw if the edible portion of the plant is in direct contact with the sludge or soils receiving sludges until one year after final sludge application or longer if there are positive indications of viable *Ascaris* ova." Also, dairy cattle should not be allowed to graze sludge-applied pastures.

Finally, the guidelines stress that evaluation of each site for land application of sewage sludge be conducted in consultation with Extension Service, Experiment Station, SCS-USDA, and ARS-USDA specialists and scientists. Cities are urged to pretreat sludge by anaerobic digestion, composting, aerobic digestion, or heat processing to kill pathogens prior to land disposal.

EPA expects the volume of sewage sludge to continually increase as secondary treatment and chemical precipitation technologies are adopted. Federal sludge disposal criteria for state regulatory programs are now being developed under the Resource Conservation and Recovery Act of 1976. Those "criteria" may eventually become mandatory.

NEED FOR MONITORING INDUSTRIAL WASTE LANDFILL AND LAGOON SITES

The disposal of industrial wastes in landfills and lagoons necessitates extensive groundwater monitoring. A recent EPA report entitled *The Prevalence of Subsurface Migration of Hazardous Chemical Substances at Selected Industrial Waste Land Disposal Sites* discusses the potential groundwater contamination associated with the land disposal of hazardous wastes. The report is based upon an EPA survey of 50 land disposal sites (landfills and lagoons) all located in the East which had received large volumes of hazardous industrial wastes. The hazardous wastes examined included heavy metals, cyanide, arsenic, selenium, and selected organic substances detected by gas chromatography.

The EPA report concludes that at 86% of the sites investigated, migration of one or more of the contaminants from the site into the groundwater had occurred. Most commonly, metals, selenium and cyanide were detected in groundwater above the background levels. According to one State official who reviewed the report, many of the sites investigated were old sites established prior to the current regulations governing land disposal and the contamination of groundwater from these old sites is "to be expected." Copies of the report *The Prevalence of Subsurface Migration of Hazardous Chemical Substance at Selected Industrial Waste Land Disposal Sites* are available for $13.00 from NTIS, U.S. Department of Commerce, Springfield, VA 22161.

WATER RESOURCES CONDITIONS IN NORTH CAROLINA

As a result of frequent, moderate rains, streamflow during December was above normal in most of the state. Monthly-mean flows at USGS index-gaging stations ranged from normal flow conditions in the Neuse River near Clayton to 1-1/2 times normal in the French Broad River at Asheville. Flows at the end of December were generally slightly below normal in the Coastal Plain region and near normal elsewhere. No significant flooding occurred during the month.

For the third consecutive month, groundwater levels rose slightly. Except for several heavily pumped areas, levels were near normal in the eastern Piedmont and above normal elsewhere.

As an update on the effects of severe flooding in western North Carolina in early November, the Federal Disaster Assistance Administration reported that flood damages now stand at $42 million and might exceed $55 million as more reports become final.

...U.S. Geological Survey

POSITIONS AVAILABLE

- The States of North Carolina and South Carolina are seeking applications for the position of **YADKIN-PEE DEE LEVEL B STUDY MANAGER.** Candidates for this position should have a strong management background and experience in water resources planning. The study manager will be responsible for organizing, coordinating, and scheduling the activities of federal and state water resource agencies and a small personal staff in developing a Plan of Study and the preparation and approval of the Yadkin-Pee Dee Level B Study. The position will be available by February 1, 1978, and should be filled by March 1, 1978. This river basin study has been funded by the U.S. Congress and will be carried out under a joint effort by the States of North Carolina and South Carolina and the U.S. Water Resources Council.

Qualified applicants should send a complete resume together with names and addresses of three references to: Ms. Maria Spaulding, N.C. Department of Natural Resources and Community Development, P. O. Box 27687, Raleigh, NC 27611. For further information call John Wray at 919/733-5501 or Chris Brooks at 803/758-2514.

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DIRECTOR, INSTITUTE FOR MAN AND ENVIRONMENT, University of Massachusetts Amherst - The Institute for Man and Environment conducts an on-going University program of research, education, and public service directed to problems in man-made and natural environments. The Institute's research is interdisciplinary, and is conducted by its Centers, each of which focuses on a problem of major importance.

Applications and resumes should be forwarded by February 15, 1978, to Screening Committee for Director, Institute for Man and Environment, Room 211A Graduate Research Center, University of Massachusetts, Amherst, MA 01003.

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The Department of Environmental Sciences and Engineering of the University of North Carolina at Chapel Hill has an opening in Water Resources Engineering for a faculty member at the **ASSISTANT PROFESSOR** level. Applicants should have a Ph.D. in applied fluid mechanics and be interested in research and graduate teaching in flow phenomena pertinent to water supply, water and wastewater treatment, wastewater discharge, or natural aquatic systems.

Interested persons should forward vitae, references, and pertinent publications to Dr. Philip C. Singer, Department of Environmental Sciences and Engineering, School of Public Health 201H, University of North Carolina at Chapel Hill, Chapel Hill, NC 27514.

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ASSISTANT PROFESSOR OF ENGINEERING SYSTEMS - Environment-Resource Interaction, Dartmouth College - Assistant Professor of Engineering specializing in analysis and design of systems for environmental protection, resource utilization, and policy development. Write to S. Russell Stearns, Thayer School of Engineering, Hanover, NH 03755. Deadline for applications is 20 February, 1978.

WATER RESOURCES LEGISLATION IN THE CONGRESS

BILLS INTRODUCED

House

H.R. 10178 To provide that the Secretary of the Interior and Attorney General shall not withhold water deliveries from any beneficiary of a federal reclamation project.

H.R. 10186 To increase the amount of privately owned land eligible to receive irrigation water under federal reclamation laws.

H.R. 10243 No contracts may be entered into by Bureau of Reclamation for water supply for purposes of irrigation without prior public notice and opportunity for hearing.

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

"Modern County Government," 1977, by H. S. Duncombe, avail. from National Association of Counties, Wash., DC 20240, Price - $7.44.

"Drinking Water and Health," 1977, by National Academy of Sciences, avail. from NTIS, Port Royal Rd., Springfield, VA 22151.

"Costs of Errors in Defining a Community's Flood Plain," by D. L. Daniel, *et al*, WRRI, MS State U., MS St., MS 39762.

"Estimate of National Hydroelectric Power Potential at Existing Dams," 7/77, by R. J. McDonald, IWR, US Army Corps of Engineers, Kingman Bldg., Ft. Belvoir, VA 22060.

"Introduction to Hydrology,"(2nd ed.), 1977, by W. Viessman, *et al*, avail. from IEP - A Dun-Donnelley Publisher, 666 Fifth Ave., NY, NY 10019, Price - $21.00.

"Review of Land Resource Legislation of the State of North Carolina," 8/77, by B. L. Kays, *et al*, Dept. of Soil Science, NCSU, Raleigh, NC 27607.

"Handbook on Public Notification," 6/77, by EPA, Office of Water Supply, Wash. DC 20460.

"Multiobjective Water Resource Planning," 1977, (Water Resources Monograph #4), by David C. Major, avail. from American Geophysical Union, 1909 K Street, N.W., Wash., DC 20006.

Water Quality Management

"Desalting Plants Inventory Report No. 6," 10/77, by N. A. El-Ramly, *et al*, avail. from OWRT, USDI, Wash., DC 20240.

"Detoxification by Bark Filtration of Shock Loads to Secondary Treatment Systems," 10/77, by G. R. Lightsey, WRRI, MS St. U., MS State, MS 39762.

"Freshwater Wetlands and Sewage Effluent Disposal: Proceedings of a National Symposium Held at the University of Michigan," (PB-259 305), 5/76, by U. of MI, avail. from NTIS, Springfield, VA 22161.

"Pollution Abatement in the Fruit and Vegetable Industry," (EPA-625/3-77-0007), 7/77, by EPA, 345 Courtland St., N.E., Atlanta, GA 30308.

- Vol. #2 - "Pollution Abatement in the Fruit and Vegetable Industry - In-Plant Control of Process Wastewater"
- Vol. #3 - "Pollution Abatement in the Fruit and Vegetable Industry - Wastewater Treatment"

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<u>Water Quantity Management</u>

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<u>YOU</u> ARE INVITED TO A

WATER RESOURCES MANAGEMENT LUNCHEON

Our next Water Resources Management Luncheon will be February 8 at the N.C. State Faculty Club. David A. Adams, Assistant Secretary of the North Carolina Department of Natural Resources and Community Development will address us on

"Evolution of Permit Programs for
Water-Related Land Management"

Dr. Dave Adams has impressive experience with state government, the federal government, the private sector, and academia. As Assistant Secretary for Natural Resources, he is responsible for the Division of Environmental Management, among other programs. He has worked on permit programs for fifteen years.

You will enjoy interacting with other water professionals and hearing Dave Adams speak. Luncheon cost: $4.00. Please make reservations by calling Eva McClung by noon Monday, February 6, 737-2815.

SEARCH FOR ENVIRONMENTAL MANAGEMENT DIRECTOR

North Carolina is in the process of recruiting a replacement for Everette Knight, who retired December 31, 1977. The Director of the Division of Environmental Management carries out the State's responsibilities in water resources planning, water and air quality, and groundwater management. Applications or nominations should be directed to:

David A. Adams
Assistant Secretary
NRCD
P.O. Box 27687
Raleigh, NC 27611