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EDITORIAL

Tailor Organizations To Meet New Needs *By John Wray*

We see on TV an ad saying, "I wouldn't change the Southern way of life for anything." Unfortunately, the Southern way of life has been changing and will continue to change. Change will occur more rapidly in the future than it has in the past.

In the South, we have rapid development, new conflicts between water users and water uses, new imposed constraints both justified and unjustified, and in many cases government chaos and confusion.

(continued on page 2)

One of the major emerging issues of the Southern States is the fact that the States are not organized to meet the changes, the challenges, and the conditions of the 21st century. The Southern States are not organized to manage natural resources and growth. One problem is State Government's failure to reorganize the total environment and economy as interrelated. A partial cause for some of the organizational problems stems from Federal funding and de facto direction by the Federal Government. There is a need for each State to look at its own organization in terms of its own situation and requirements, exclusive of Federal funding and Federal direction.

The type of program the State needs is one which considers the total environmental picture as it relates to the development and growth programs of the State. For example, we need to evaluate air quality as a constraint to development in concert with water and growth plans. There is a strong need for land use categorized in terms of water and air resources and a realistic growth program. Within this overall umbrella, we must have a total water management approach that looks at plans for action, not just reaction. Should we direct development and growth toward certain specified areas of our State? Should we consider issuing permits for withdrawals of water and any changes to the natural system? Instream flow and lake level management must be a part of the total water management approach. And certainly with the new emphasis on irrigation, we must look at its effects on the long range aspects of our overall agricultural program.

It is time for the States and the State Legislators to reevaluate Federal-State relationships in view of the re-awakening of the recognition by the courts of the sovereignty of the States. It is time for the States to consider organizations that are tailored for their needs. We should not duplicate the Federal model with its interagency conflicts and jurisdictional battles. What is needed is a new approach in which the State initiates an objective comprehensive organization tailored to meeting the State's needs, solving problems for the State, and working with sister States and Federal agencies.

EDITORIAL

Water Study Worth A Plunge

The News and Observer

May 14, 1979

The General Assembly can hit a lick for the wisest future use of the state's water resources by passing House Bill 1310, which implements an idea advanced last year by House Speaker Carl J. Stewart, Jr. This bill would create a legislative study commission on alternatives of water management in the state.

In his May, 1978, suggestion that a state water authority might be a useful agency in North Carolina, Stewart conceded that the pros and cons of the idea needed careful weighing. He proposed that a study commission explore the proposal. Basically, Stewart envisions the authority furnishing water to North Carolina cities and towns at wholesale cost. The water would flow from a main distribution line running through the center of the state.

An advantage of the water study proposed in H. 1310 is that it provides for more than just Stewart's authority idea. It specifies that the commission look at other alternatives for good water management and also at the need for laws or regulations on local and regional water supplies. The commission would be composed of 12 members, half appointed by the lieutenant governor and half by the speaker. At least six of the appointees would have to be "knowledgeable in water resource management."

The \$150,000 appropriation the bill provides to cover the study group's expenses between now and the March 1, 1981 report deadline should be a good investment. The Department of Natural Resources and Community Development warned in a 1977 report that "if the people of North Carolina do not wisely plan and manage their water resources, not only will their economic life be impaired, but irreparable damage to the environment could occur ... An improved water resource management system is needed to obtain the desired results."

The News and Observer last May raised some basic questions about the central authority idea while applauding Stewart's call for a fresh look at the state's water supply and distribution systems. The legislative study commission is a sound way of assembling a decision package on the state's future water needs.

"NUTRIENT SENSITIVE WATERS" CLASSIFICATION

The Division of Environmental Management has developed the concept of Nutrient Sensitive Waters (NSW) to use in adopting

regulations to limit nutrient discharges into streams, and tributaries to streams experiencing, or which are likely to experience, excessive growths of microscopic and/or macroscopic vegetation. The concept is in response to major water quality problems such as those experienced in the Chowan River but can be used to address specific nutrient enrichment problems in other areas.

The Environmental Management Commission at its May 10 meeting unanimously adopted a resolution which would authorize a revision of the North Carolina Water Quality Standards and apply the NSW concept.

Chowan River Basin

In related action the Commission also adopted a resolution in which the Commission Chairman is authorized to sign the emergency certification revising the existing classification assigned to the waters of the Chowan River Basin. Public hearings must be held prior to the implementation of this water quality designation.

The resolution sets into motion actions designed to reduce nutrient inputs to the rivers systems from point and non-point sources of pollution.

The Commission decision is expected to influence regulatory actions regarding nutrient input in the Chowan River Basin in both North Carolina and Virginia.

NATIONAL WATER ASSESSMENTS SITE WATER PROBLEMS

The second national water assessment titled "The Nation's Water Resource - 1975-2000" by the U.S. Water Resources Council emphasizes the critical problems still facing the

nation. Intensive use and competition for water to satisfy a wide variety of purposes pinpoint the need for further research and resource management. The problem areas are:

- Inadequate surface-water supply. Localized problems of inadequate surface-water supply have been identified in all 21 water resources regions. However, 17 subregions have or will have a serious problem of inadequate surface-water supply by the year 2000.
- Overdraft of ground water. The most dramatic instances of ground-water over draft are found in the High Plains area that extends from Texas to Nebraska. Central Arizona and parts

of California also depend heavily on ground water. In some of those areas ground-water levels are declining from 7 to 10 feet per year. Extensive ground-water overdraft is occurring in 8 of the 106 subregions. Moderate ground-water overdraft is occurring in an additional 30 subregions.

- Pollution of surface water. Occurrences of surface-water pollution were reported in most of the 21 water resources regions. Dispersed agricultural sources, municipal and industrial wastes, acid mine drainage, and accelerated urban runoff are the significant sources.
- Pollution of ground water. Ground-water pollution, whether existing or potential, natural or man-made, poses a significant health threat inasmuch as 40 percent of the population derives drinking water from ground-water sources. Areas of ground-water pollution have been recognized in practically all 21 regions.
- Quality of drinking water. Pollution of surface and ground sources of public water supplies has serious potential public-health consequences. For that reason, maintenance of both surface- and ground-water quality for drinking is of concern nationwide. At the community level, most surface water receives extensive monitoring and treatment, and ground water receives at least chlorination. In rural areas, however, where many people obtain drinking water from individual domestic wells, the water receives little or no treatment and the potential health hazard is significant.
- Flooding. In 1975, 107 people were killed by flood waters, and potential property damage was estimated to be \$3.4 billion. By the year 2000, potential flood damage is expected to increase \$4.3 billion annually unless there is expansion of flood-plain management efforts and the regulation of flood plains.
- Erosion and sedimentation. The "1975" average cropland soil loss from erosion was nearly 9 tons per acre; in some areas the soil loss exceeded 25 tons per acre. In addition, forest and pasture lands sustain soil losses of about 1 ton per acre per year.
- Dredging and disposal of dredged material (dredge and fill). The large volume of sediment deposited each year in navigable stream channels, reservoirs, and harbors requires regular removal and disposal. In order to maintain the national navigation network, continued dredging is necessary. Disposal of the dredged material can disrupt or destroy aquatic life in adjacent wetlands that have important environmental and economic values. Between 1955 and 1975, a total of 6 million acres of wetlands was lost for use by aquatic life, from filling as a result of development, disposition of dredge material, or other causes.
- Wet-soils drainage and wetlands. Wet soils comprise an estimated 400 million acres, of which about 104

million acres is used for cropland, and 43 million of those acres need improved drainage. An additional 70 million acres of wet soils in forest, pasture, or other types of wetland could be converted to cropland, but it is estimated that by the year 2000 only 11 million additional acres will have been converted to cropland. This conversion will be offset to some degree by croplands that revert to wetlands and by the creation of new wetlands. Competition between agricultural and wildlife interests is particularly acute in some wetland areas.

Degradation of bay, estuary, and coastal water. Much of the coastal-area water is being degraded by domestic and industrial waste, particularly in the densely populated New England, Mid-Atlantic and Great Lakes Regions. These coastal waters provided major recreational opportunities for more than 80 percent of the population.

The summary report is available for \$3.25 from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402. The stock number is 052-045-0051-7.

DR. JOE PHILLIPS
MOVES TO DNRCD
POST

Dr. Joe Phillips, Professional Extension Soils Specialist at North Carolina State University, has assumed responsibilities in the Department of Natural Resources and Community Development in what is expected to become the Soil and Water Conservation Division. Phillips will administer programs in the areas of Soil and Water Conservation District operations, Soil Survey, Watershed Planning, and 208 Agriculture related programs.

Phillips is also Chairman of the North Carolina Erosion and Sediment Control Commission.

DESTRUCTO-CHEMWAY,
INC. ASSESSED
\$5,000 PENALTY

On June 3, 1977 vandals opened valves on tanks containing hazardous chemicals at Destructo-Chemway, Inc. resulting in contamination of Kernsville's water supply. As a result of the incident the company was assessed a civil penalty.

The Environmental Management Commission in its May 10 meeting voted to sustain a hearing officer's recommendation that a civil penalty in the amount of \$5,000 be assessed against the Destructo-Chemway, Inc. for violations of water quality standards. The company representative argued that they had complied with all required regulations.

They also contended that the discharge was caused by a criminal element and the company did not cause the discharge.

During the recent Commission meeting, questions regarding responsibility were aired by members. Why had the industry been allowed to locate in the watershed of a water supply lake? Why had the company not been required by either state or local government to take safe guards to prevent possible contamination by installation of retention dams and dikes? Which agency at the state or local government had such responsibility? No satisfactory answers were received for any of the questions.

The chemical waste treatment facility is now being operated by the Carolawn Company.

LEGISLATION
INTRODUCED FOR
WATER MANAGEMENT
STUDY

Representative Rountree has introduced legislation titled Water Resources Management-2 (see related editorial) which is designed "to create the Legislative Study Commission on the Alternatives of Water Management." The proposed legislation would create a commission to study: (1) feasibility of creating state water authority to furnish water throughout state; (2) other alternatives for water management; and (3) need for legislation and regulations concerning local and regional water supplies. The commission to consist of 12 members, six appointed by Lt. Governor and six by Speaker (each must appoint a minimum of three persons knowledgeable in water resources management). It appropriates to the commission \$150,000 from General Fund and directs the commission to file with both houses interim report by March 1, 1980 and final report by March 1, 1981.

INSTITUTE SUPPORTS
NEW AGRICULTURAL
RUNOFF STUDY IN
HERTFORD COUNTY

Hertford County has two small watershed areas that have been selected for a study of the effects of certain agricultural practices on water quality.

The study, which will be carried out under the Water Resources Research Institute of The University of North Carolina, will investigate ways of reducing agricultural non-point sources of pollution. The staff conducting the study will consist of biological and agricultural engineers, Agricultural Extension Service representatives and members from the Division of Environmental Management, the Agricultural Research Service and the Soil Conservation Service.

Monitoring stations will be set up on streams where they leave the selected watershed. The nutrient levels and flow of these streams will be checked

throughout the study to see what effect certain management practices have on water quality.

Landowners within the study area will be asked to cooperate in applying the best management practices on their land to reduce water pollution. These practices will range from correct and timely fertilizer and pesticide applications to the installation of conservation practices that will reduce erosion and slow runoff.

The ASCS office will be cooperating by providing cost share assistance on practices that are eligible under the ACP program. Agricultural Extension Service employees will be working with the landowners to assist them in determining the best and most accurate methods of fertilizer and pesticide applications.

The Soil Conservation Service will assist in determining the conservation practices needed to reduce erosion and decreases of nutrients into the streams.

The study should give some indication of effects of the various agricultural management practices on water quality and should also give the agencies and landowners involved some idea of the problems to be encountered in applying these practices on a large scale in North Carolina.

ACID SPILL
CAUSES FISH
KILL

Approximately 2,000 gallons of sulfuric acid spilled into the Nantahala River near Bryson City on April 30

when a tanker wrecked. The acid resulted in a fish kill of more than 2,000 fish. According to Wildlife Resources biologists in Sylva, the majority of the dead fish were native rainbow trout.

The acid came from a Caustic Soda Transport Co. vehicle which wrecked off highway U.S. 19. The cargo of liquid acid spilled from the tanker, ran through a culvert under the highway and into the river.

LAND-OF-SKY
REGIONAL COUNCIL
ISSUES 208 PLAN

Results of a three-year study of area-wide water quality problems are basis for a 208 plan recently completed by the Land-of-Sky Regional Council

"208" staff and consultants. The plan contains data and other information concerning water quality, existing or potential sources of water pollution, structural and non-structural solutions to problems, suggested programs for implementing

the solutions, and the description of a coordinated system of agencies for managing the implementation of the plan, and refining the plan during the continuing planning process.

Copies of the plan for review are available from the Land-of-Sky Regional Council, P. O. Box 2175, Asheville, NC 28802.

TJCOG INDIVIDUAL
WASTEWATER PROJECT
ISSUES RECOMMEN-
DATIONS

Technical experts in on-site wastewater disposal have released interim criteria and recommendations for the use of alternative septic systems in Region J

(Chatham, Durham, Johnston, Lee, Orange, and Wake Counties). Triangle J Council of Governments has been conducting its Individual Wastewater Project under its 208 Areawide Water Quality Management Program. The recommendations were formulated by a Technical Advisory Committee (TAC) made up of local sanitarians, university experts, and representatives of the NC Division of Health Services and Environmental Management.

These TAC Recommendations will be used by individual County Boards of Health in establishing local policies regarding the use of alternative on-site systems.

Low Pressure Pipe System

Recent recommendations have included site and soil criteria for permitting Mound and Low-Pressure Pipe (LPP) systems. Additional positive papers have been adopted on the siting, maintenance, and management of conventional soil absorption systems.

The LPP system is defined as "a network of small diameter perforated pipes placed at shallow depth (6 to 18 inches) in narrow trenches. The soil absorption system may include up to 6 inches of imported fill material. Septic tank effluent is pumped through the LPP system in controlled doses to insure uniform distribution throughout the absorption field. Basic components of the LPP system include (a) septic tank, (b) pumping chamber, (c) submersible pump, (d) high water alarm, (e) supply manifold and (f) perforated distribution laterals."

Mound System

A Mound System is similar to an LPP, except that it "relies on more than 6 inches of imported fill material for treatment of septic tank effluent." Both systems overcome some of the site limitations of shallow and/or slowly permeable soils. Recently adopted criteria for the LPP require a minimum separation of 24 inches between the natural soil surface and an underlying restrictive horizon such as bedrock or seasonally high water table.

At least 18 inches of the soil column (which may include up to 6 inches of imported fill) must be of suitable or provisionally suitable texture, structure, and permeability (as defined by existing State Regulations). A Mound can function satisfactorily on somewhat more restrictive sites than an LPP. It requires only a 12-inch separation from the natural soil surface to a restrictive horizon. This 12 inches must be of suitable or provisionally suitable texture, structure, and permeability.

The recently adopted criteria also include requirements for space, slope, and drainage of the LPP and Mound systems.

Although these systems may allow the development of some previously unuseable property, the Technical Advisory Committee "recognizes that some sites may not be acceptable for construction of either conventional or alternative ground absorption systems." The Technical Advisory Committee cautions that alternative systems should not be regarded as a panacea for all septic tank problems. In another position paper, the Project "finds that the successful operation of alternative on-site wastewater disposal systems requires more attention to details of siting, design, installation, and maintenance than the operation of conventional septic systems." It goes on to say "successful local implementation of alternative systems may require additional manpower and/or funding; and may require the eventual expansion of local services related to on-site wastewater disposal."

Other recommendations of the Project are directed at septage disposal. "Septage" is the high strength waste removed by septic tank pumpers. Many current disposal problems could be resolved through improved surveillance by local Health Departments and by the addition of septage handling facilities at wastewater treatment plants.

In order to facilitate the location and cleaning of septic tanks, the Project recommends the installation of permanent markers and/or ground-level access ports above all tanks installed after July 1, 1980. Another recommendation is the required use of two-compartment solid baffle septic tanks. State regulations currently require this only for tanks of 1600-gallon capacity or larger.

Further details on the TJCOG Individual Wastewater Project are available from: Triangle J Council of Governments, P. O. Box 12276, Research Triangle Park, NC 27709, (919) 549-0551.

TVA OFFERS LOANS TO AID IN ENERGY CONSERVATION

TVA now offers each of its customers a loan of up to \$2,000, interest free, to weatherize their homes. Loans are paid back as a part of the homeowners bills. Some 70,000 homes have taken advantage of the loans.

TVA provides the homeowner with information on what economical steps can be taken to conserve electricity.

USA IRRIGATION WATER STUDY

A national study on the use and management of irrigation water was initiated by the U.S. Department of Agriculture, U.S. Department of the Interior and the Environmental Protection Agency.

This follows two recent reports on irrigation by the General Accounting Office which point out the need for detailed knowledge about potential for water conservation through irrigation improvements and about the economic, environmental, and social effects of such improvements.

Irrigation is by far the biggest single use of water in the United States - averaging more than 380 million cubic meters a day.

The national study will identify water use and management problems in farm irrigation systems and in irrigation water delivery systems. It will also recommend Federal actions to improve coordination or irrigation assistance to farmers from the Department of Agriculture's Soil Conservation Service and Science and Education Administration, and Department of Interior's Bureau of Reclamation.

RECEPTION FOR NORTH CAROLINA CONGRESSIONAL DELEGATION

The North Carolina Congressional Delegation will be the guest of honor at a reception and dinner to be held in the Rayburn House Office Building restaurant, Washington, D.C. on the evening of June 5, which will be sponsored by the North Carolina Water Resources Congress. Mr. Sherwood H. Smith, Jr., President and Chief Administrative Officer, Carolina Power and Light Company and President of Raleigh Chamber of Commerce, will be the guest speaker.

The Water Resources staff of the North Carolina Congressional Delegation will be the guest at a luncheon to be held in the Rayburn House Office Building restaurant on June 6. Dr. Neil Grigg, the recently appointed Assistant Secretary, North Carolina Department of Natural Resources and Community Development, will present the N.C. Water Resources Development Program.

Members and guests of the North Carolina Water Resources Congress are encouraged to attend. Advanced registration is required. Further information may be obtained by calling 919/733-4064 or writing to the North Carolina Water Resources Congress, P. O. Box 12204, Raleigh, NC 27605.

**NEW INSTITUTE
PUBLICATIONS**

*Assessing Man's Impact
on Wetlands.* This publica-
tion represents a look by

Col. G. E. Galloway, Jr. for a methodology which might be used to assess the environmental impact of any construction on the wetland assets of the Nation.

The first section provides a short background on federal interest in wetlands and a discussion of how, when, and where man's impact on wetlands occurs. The next section focuses on impact assessment, first by defining the characteristics of a usable evaluation system and then by briefly surveying current evaluation techniques. The third section proposes the Wetland Evaluation System (WES), a concept of an evaluation system. The fourth section applies this model, for illustrative purposes, to abbreviated case studies of wetland evaluation in the Yazoo Basin of Mississippi and the Neuse River Estuary of North Carolina. The paper concludes with some comments on the utility of the WES and the concepts contained within the WES.

This publication was co-sponsored by The UNC Water Resources Research Institute and the Office of Sea Grant, NOAA, U.S. Department of Commerce.

Copies of this publication may be obtained free by North Carolina residents from either the Water Resources Research Institute or the UNC Sea Grant Office.

Benefits and Cost of Seasonal Effluent Permits in North Carolina. This publication presents the findings from a brief study of the benefits and costs of seasonal (summer/winter) effluent permits.

Results of the study show that in the winter the capacity of North Carolina streams to assimilate oxygen-demanding wastes increases due to higher dissolved oxygen saturation levels and increased streamflows. Waste treatment plants are designed to meet water quality

standards which are based on summer conditions when waste assimilative capacities are lowest due to high temperatures and reduced flows. The seasonal effluent permits proposed by the North Carolina Department of Natural Resources and Community Development would allow up to a doubling of the discharge of BOD wastes for the most severely restricted dischargers during the months November through March. These winter-summer permits could result in large benefits to the State of North Carolina (a rough estimate of the savings in waste treatment costs is \$2.9 million per year). The researchers found no quantifiable social costs (negative effects on the environment, health, or production, and practically no additional administrative costs).

This study was undertaken as part of a Cooperative Research and Training Program in Socio-Economic Impact Analyses between The N.C. Department of Natural Resources and Community Development, The U.S. Environmental Protection Agency, The Water Resources Research Institute of The UNC and the North Carolina Agricultural Experiment Station.

Copies of the Report No. 135 are available from the Institute free for North Carolina residents and for \$4.00 for out-of-state residents.

**WORKSHOPS AND
CONFERENCES**

Land Treatment of Municipal
Wastewater Effluents - The
U.S. Environmental Pro-
tection Agency's Environ-

mental Research Information Center is sponsoring a conference on Land Treatment of Municipal Wastewater Effluents on June 7-8 in Atlanta, GA.

The subjects areas featured in this seminar include land treatment systems; slow rate, high rate, and overland flow; health aspects; management and monitoring options; development of public relations programs; design examples for each treatment--mode and selected case histories.

For further information please write: Land Treatment of Municipal Wastewater Effluent Seminar, P. O. Box 827, Rockville, MD 20851.

Coastal Mapping Workshop - A workshop on Mapping for Coastal Decision-Making will be held on June 13-15 at Blockade Runner Motor Hotel in Wrightsville Beach, NC. It will be conducted by the Coastal Plains Marine Center for the Topographic Division, U.S. Geological Survey; National Ocean Survey, National Oceanic and Atmospheric Administration; and the Office of Coastal Zone Management, National Oceanic and Atmospheric Administration.

The purpose of this workshop is to assist individuals responsible for acquiring, developing, and using cartographic data for coastal mapping programs in the States from New Jersey through Florida. Sources of Federal map products, programs, and services will

be identified; active State mapping programs will be reviewed; and future Federal coastal mapping programs, including those for which cooperative funding is available.

For further information contact the: Coastal Plains Marine Center, 1518 Harbour Drive, Wilmington, NC 28401.

National Symposium on Urban Stormwater Management in Coastal Areas - A symposium on urban stormwater management in coastal areas will be held on June 19-20, 1980 at the Virginia Polytechnic Institute and State University, Blacksburg, Virginia. The symposium is sponsored by the Hydraulics Division, American Society of Civil Engineers.

The symposium is to deal with problems associated with the design and operation of any type of drainage system or management scheme including hydraulic, hydrologic, water quality, sociological, legal and economic problems.

For further information contact: Dr. Chin Y. Kuo, Department of Civil Engineering, Virginia Polytechnic Institute and State University, Blacksburg, VA 24061.

Water Quality Management - A seminar on water quality management will be presented by Environmental and Water Resources Engineering Program and the Center for Environmental Quality Management in Nashville, Tennessee on June 11-15, 1979.

This course will present an overview of the existing and anticipated policies on water quality management and its implications on point and non-point source control. Specific information will be presented on accurate development of water quality management tools including: modeling, toxic substance analysis, survey design, data processing, and model calibration and verification.

For further information contact: Ms. Janet Vance, Vanderbilt University, Box 6222, Sta.B, Nashville, TN 37235. Telephone: (615) 322-2720.

Frequency Analysis and Rainfall Data Analysis - A workshop on Frequency Analysis, June 5-6; and Rainfall Data Analysis, June 7-8; will be held on the University of Illinois campus and is co-sponsored by the Department of Civil Engineering, University of Illinois; Division of Water Resources, State of Illinois; American Society of Civil Engineers, Central Illinois Section; and Water Resources Center, University of Illinois.

The main purpose of these two 2-day workshops is to acquaint the participants with the analysis techniques and the computer/calculator programs

on (1) frequency analysis and (2) rainfall data handling. Each workshop will cover the basic theory, with a discussion on application, followed by a session in which design problems are solved.

For further information contact the co-directors: Dr. Ben C. Yen (217-333-4934) or Dr. George W. Tauxe (217-333-6746), Department of Civil Engineering, University of Illinois, Urbana, Illinois 61801. The enrollment telephone number is (217) 333-0687.

Water Quality Instructors' Workshop - A workshop for water quality instructors will be held on July 30-August 3, 1979 at the University of Cincinnati. The co-sponsors for this workshop are: National Training and Operational Technology Center and University of Cincinnati.

During the four-day training workshop several areas of topical information will be stressed. It would be expected that as a result of the workshop: (1) participants will be familiar with Agency-sponsored programs or courses in water pollution control; (2) the need for water pollution control training programs across the country will be made more apparent; (3) necessary impetus to strengthen these programs will be provided; (4) informal lines of communication will be encouraged among educational training institutions and between these institutions and EPA; and (5) the principles of program design and management will become better understood.

Those interested in attending the workshop should contact: Dr. Thaddeus W. Fowler, Teachers College, University of Cincinnati, Cincinnati, Ohio 45221, for further information.

Flood Plain Short Courses--HEC 1 and 2 - The short course HEC-1, Flood Plain Hydrology will be held at the Pennsylvania State University on June 4-8, 1979. It presents basic principles and practical applications of hydrology that relate to flood plain studies. A major emphasis is placed on the computer program HEC-1.

The short course HEC-2, Flood Plain Hydraulics will be held July 16 to 20, 1979 at Penn State. It presents basic principles and practical applications of river hydraulics that relate to flood plain studies. The computer program HEC-2, is used for calculating water surface profiles.

A short course HEC-2, Advanced will be held July 9 to 12, 1979 at Penn State. This course is limited to participants who have either attended a basic course dealing with HEC-2 or who have experience with the program.

For further information on all three courses contact: Patricia A. Bodman, 401 Keller Conference Center, The Pennsylvania State University, University Park, PA 16802.

Small Scale Hydroelectric Power in the Southeast: New Impetus for an Old Energy Source - The United States Department of Energy in conjunction with The National Conference of State Legislatures is sponsoring a conference on Small Scale Hydroelectric Power on June 14 and 15 in Atlanta, GA.

Energy supply is one of the most important issues facing state legislators today. To meet that challenge, state legislators must address the development of alternative energy sources. The Small Scale Hydroelectric Policy Project of NCSL is designed to assist state legislatures in looking at the benefits of one alternative, small scale hydropower.

The format of the conference will feature resource panelists and workshops covering the topics of: federal and state barriers/incentives; the economics of small scale hydropower; and the small scale hydropower impact on natural resources. Through workshops and discussions, the aim of the conference is to produce recommendations for change which legislators can apply to their own state.

For further information contact: Harriet Owen, (303) 623-6600.

Workshop on Individual Wastewater Systems - As the WRRRI Newsletter goes to press, final arrangements are being made for an Individual Wastewater Project workshop scheduled for mid to late June.

Triangle J Council of Governments has been conducting the Individual Wastewater Project as the priority planning activity of the 208 Areawide Water Quality Management Plan. Recommendations from the Project include site criteria for conventional and alternative systems and regulatory/management options.

The Workshop is designed to attract homebuilders, realtors, contractors, septic tank manufacturers and installers, planning and environmental interests and landscape/siting consultants. Concerned citizens are encouraged to attend in order to apply the recommendations to their particular needs.

Announcements will be mailed and additional information is available from: Sue Snaman, Public Participation Coordinator, Triangle J Council of Governments, P. O. Box 12276, Research Triangle Park, NC 27709, telephone 919/549-0551.

POSITIONS
AVAILABLE

Environmental Engineer:
The University of Alabama in Huntsville has an opening for one year faculty appointment for an environmental engineer. Send complete resume to: Dean, School of Science and Engineering; The University of Alabama in Huntsville; P. O. Box 1247; Huntsville, Alabama 35807.

Research Assistant or Research Associate Position Available July 1, 1979 in the Department of Biological and Agricultural Engineering. The duties are the application of a computer simulation model for the design and evaluation of drainage and water table control systems for soils in the Coastal Plains and Tidewater Regions. M.S. preferred in Agricultural Engineering, Civil Engineering or Soil Physics and training in drainage and hydrology and experience in computer programming, modeling and data processing. A B.S. degree in Agricultural Engineering with appropriate qualifications will be considered. Applicants should contact Dr. R. Wayne Skaggs, Department of Biological and Agricultural Engineering, 150 Weaver Labs, N.C. State University, Raleigh, NC 27650.

WATER RESOURCES
CONDITIONS IN
NORTH CAROLINA

Streamflow was extremely variable during April. As compared to long-term averages for the month, flows ranged from near normal conditions in Coastal Plain streams to almost twice normal flows in our mountain region. Runoff from heavy rains in the mountains on the 3rd and 4th caused some minor flooding.

Ground-water levels rose in the Mountain and Coastal Plain regions and declined slightly in the Piedmont. Levels remained above long-term averages throughout most of the State.

WATER RESOURCES LEGISLATION IN NORTH CAROLINA

Bills Introduced

Senate

S 641 Environmental permit limitations

"To amend G.S. 143-215.1 (a) so as to modify the method of establishing permit limitations." Amends cited subsection, which provides that when issuing permits when both effluent standards or limitations and water quality standards are applicable to any point sources and to waters to which they discharge, the more stringent standards set by Environmental Comm'n to control, to add proviso that when issuing permit Environmental Management Comm'n not to include in permit limitations on discharges from point sources more stringent than those required by effluent limitations generally applicable to such point sources unless it finds by substantial evidence disclosed to applicant, that benefits to be derived from more stringent limitations outweigh costs to applicant.

S 666 Waste treatment system discharges

"To give the Environmental Management Commission authority to allow additional discharges to municipal waste treatment systems." Adds GS 143-215.67(b) authorizing cited Comm'n to allow local unit to accept wastes in excess of waste-disposal system capacity when Comm'n finds (a) unit has secured financing for improvement of system which will adequately treat additional waste, and (b) additional waste will not significantly degrade receiving waters. Comm'n may include protective conditions on its GS 143-215.1 permits and take other necessary actions to meet violations of water quality standards, effluent limitations, or terms of order or permit.

S 762 Water resources management study-2

H 1310

"To create the Legislative Study Commission on the Alternatives of Water Management." Creates cited commission to study: (1) feasibility of creating state water authority to furnish water throughout state; (2) other alternatives for water management; and (3) need for legislation and regulations concerning local and regional water supplies. Commission to consist of 12 members, six appointed by Lt. Governor and six by Speaker (each must appoint a minimum of three persons knowledgeable in water resource management). Appropriates to commission \$150,000 from General Fund. Directs comm'n to file with both houses interim report by March 1, 1980 and final report by March 1, 1981.

S 769 Controlling toxic substances

H 56

"To control the disposal of toxic substances." Adds new Art. 21C entitled "North Carolina Toxic Substance Control Act" to GS Ch. 143. Act covers all toxic substances except pesticides and radioactive material. Calls for administration of schedule of controlled toxic substances by Dep't of Natural Resources and Community Development (NRCD), and Environmental Management Comm'n empowered to add or delete substances from list. Lists factors Comm'n to consider in making additions or deletions, such as toxicity, potential for accumulation in tissue, potential for adverse health effects, etc. Comm'n required to make specific finding that release of substance into environment will cause unreasonable risk of injury to health or environment before adding substance to list. Gives Comm'n discretion to exempt mixtures containing toxic substance of less than specified maximum concentration level from schedule. Requires inclusion of substances regulated to federal Toxic Substances Control Act in N.C. schedule unless Comm'n files formal objection. Prohibits discharge, release or incineration of any substances listed in schedule into water, air or land of state unless pursuant to permit from Comm'n for Health Services Environmental Management Comm'n or U.S. Environmental Protection Agency. Wilful or intentional violation felony punishable by fine of not more than \$100,000 per day of violation or ten years imprisonment, or both. Requires any person with control over toxic substances released in violation of Art. to collect substance and restore area if feasible. Authorizes NRCD to use staff and equipment or contract with persons to collect and investigate violations and perform any necessary restoration. Authorizes Sec'y of Transportation to purchase portable equipment and protective clothing to carry out cleanups in conjunction with NRCD, and allows for reimbursement by NRCD of cleanup expenses incurred by Dep't. Requires persons owning or having control over toxic substances to immediately notify NRCD of violations, and such persons

are directly liable to state for cleanup expenses. Allows instigation of suit for injunctive relief against persons Sec'y of NRCDD believes to be violating or threatening to violate Art. Establishes civil penalty of not more than \$35,000 per day to be assessed by Comm'n against any person who discharges toxic substance in violation of Art. or fails to report a violation. Requires notification of penalty by registered or certified mail with requirement that reasons for assessment be specified. Authorizes Comm'n to institute civil suit against persons failing to pay penalty.

S 792 Water quality standards consider costs

"To amend G.S. 143-214.1(d)(4) pertaining to water quality standards and classifications." Amends cited statute to require (now, encourages) Comm'n to consider economic costs and benefits in revising or adopting water quality standards.

House

H 1084 County water, sewer district bonds

"To amend the Local Government Bond Act to provide that a county water and sewer district is authorized to issue its bonds thereunder and to amend Article 6 of Chapter 162A of the General Statutes of North Carolina to delete the requirement of a petition in connection with the creation of a county water and sewer district thereunder and to provide that the inhabitants of any such district may establish, revise and collect rates, fees or other charges and penalties for the use of or the services furnished or to be furnished by any system of such district." Amends GS 159-48(e), GS 162A-86, and GS 162A-88 as title indicates. Also amends GS 162A-86 to require notice of hearing on proposed county water and sewer district to include description of territory to be included within district.

H 1102 Soil and water conservation boards

"Relating to membership on soil and water conservation district boards." Amends GS 139-6 to provide that if position of district supervisor is not filled due to failure to elect, then office considered vacant upon expiration of incumbent's term and filled under GS 139-7 (appointed by Soil and Water Conservation Comm'n). Amends GS 139-7 to require that the two persons recommended for appointment to Comm'n by elective supervisors from districts composed of less than four counties must be from district. Provides that if names not submitted to Comm'n by elected supervisors as required, office considered vacant on date term expires. Requires that person appointed district supervisor by Comm'n in district composed of four or more counties must be from district.

H 1149 Sanitary district sewer service

"To make statewide a law allowing sanitary districts in certain counties to provide sewer service outside the district boundaries." Amends GS 130-128(9)(b) to give sanitary district board power to contract with any person or firm within or without corporate limits of district to supply water and sewer service (now, only allows contracting for water service). Repeals Sec. 1, Ch. 882, SL 1973 (making above amendment apply only to counties with population over 70,000 based on 1970 US census).

H 1185 Dam safety law extension

"To extend the Dam Safety Law of 1967." Deletes cited law (part 3, Art. 21, GS Ch. 143) from GS 143-34.11 providing for repeal July 1, 1979, and adds new GS 143-215.37A providing for repeal July 1, 1985.

H 1195 Environmental Management Comm'n changes

"Relating to the authority of the Environmental Management Commission." Adds to GS 143-211 statement of intent that powers and duties of Environmental Management Commission ("Comm'n") and Dep't of Natural Resources and Community Development ("Dep't") be construed so as to allow them to qualify to administer federally mandated programs of environmental management and to accept federal funds for such programs. Amends GS 143-215.3(a)(7) to allow Comm'n rather than Dep't to bring civil suit for damages for fish and wildlife kills. Amends GS 143-215.3 to authorize Dep't to accept and administer federal funds for water and air pollution programs and to contract concerning use of such funds. Amends GS 143B-283 to require that majority of governor's appointees to Comm'n not derive significant portion of income from persons subject to Comm'n permits or enforcement orders.

H 1196 Pollution discharge amendments

"To amend Article 21 of Chapter 143 in order to preserve delegation of the state from the United States Environmental Protection Agency of the national pollutant discharge elimination system governing discharges of wastewater to the waters of the state." Amends GS 143-213 to define "waste treatment management practice" and permits such practices to be imposed supplemental to effluent limitations only for pollutant designated as toxic or hazardous under Federal Water Pollution Control Act. Amends GS 143-215 to include management practices in standards and limitations to be adopted by Environmental Management Comm'n ("Comm'n"), with practices to be published in official regulations. Amends GS 143-215.1(a) to require permit from Comm'n to dispose of sludge resulting from operation of a treatment works or to permit pollutant from entering state waters managed for maintenance or production of harvestable freshwater, estuarine, or marine plants or animals. Adds GS 143-215.3(a) to authorize Comm'n to certify and approve requests by public treatment works to administer pretreatment programs for control of pollutants interfering with treatment processes, and to require programs to comply with Federal Water Pollution Control Act and Resource Conservation and Recovery Act. Amends GS 143-215.6 to increase from \$5,000 to \$10,000 the maximum civil penalty to be imposed by Comm'n for violations of classification, standard or limitation, and to increase by same amount the maximum daily penalty to be assessed for continuous violations. Amends GS 143-215.6(c) to allow injunctive relief where terms of a permit are violated. Effective July 1, 1979.

H 1228 Carolina Beach erosion funds

"To appropriate funds to the Department of Natural Resources and Community Development for beach protection at Carolina Beach in New Hanover County." Appropriates \$1,718,500 for each year of 1979-81 biennium from General Fund to pay up to 80% of nonfederal cost of federal project. Effective July 1, 1979.

H 1277 Water, sewer auth'y sales tax refund

"To amend G.S. 105-164.14(c) to provide the same entitlement of water and sewer authorities to refunds of sales and use taxes as is now extended to counties, incorporated cities and towns, sanitary districts, and metropolitan sewerage districts." Amends GS 105-164.14(c) to add water and sewer authorities created under Ch 162A to those entitled to sales and use tax refund on direct purchases of tangible personal property.

H 1316 (Joint Res) Coastal land regulation study

"Directing the Secretary of Natural Resources and Community Development to study the impact of regulation on coastal lands." As title indicates; requires named Sec'y to report to 1980 General Assembly session.

H 1359 Coastal area study comm'n

"To create a Study Commission on the Coastal Area of North Carolina." Creates cited Comm'n composed of nine members to be appointed as follows: (1) three persons jointly by chairmen of boards of county comm'rs of eight coastal counties specified in bill, (2) two by Governor, (3) two each by Speaker and Lt. Governor. Directs Comm'n to study and report to 1981 General Assembly on issues of erosion of coastline, building of structures along or near beaches, and gov't programs dealing with coastal area. Requires Comm'n to recommend policy on beach erosion and feasibility of further beach development. Appropriates \$30,000 for fiscal 1979-80 and \$20,000 for fiscal 1980-81 to implement act. Effective July 1, 1979.

Amendments and Committee Substitutes

Senate

S 212 Environmental comm'n powers (digested in March News, p. 11)
Committee substitute adopted in Senate 4/17/79 is identical to H 1196 digested in June News, p. 12.

S 289 Drinking water act (digested in April News, p. 9)
Committee substitute adopted in Senate 5/7/79: (1) deletes requirement that state drinking water regulations be no less stringent than most recent federal regulations; (2) adds requirement that Comm'n for Health Services notify Utilities Comm'n of its findings with regard to plans for construction or alteration of public water systems; (3) adds criteria for determination that

granting of variance or exemption will not result in unreasonable risk to health; (4) specifies that defiling of water supply or damaging of part of public water system must be willful in order to constitute violation; (5) increases maximum civil penalty for violation of act from \$1,000 to \$5,000 per day; (6) deletes authority of Sec'y of Human Resources to establish fees for laboratory analyses and sets statutory fee schedule; (7) deletes "threaten to violate" provisions of GS Ch. 130 from actions for which Sec'y may bring action for injunction and requires that action be brought in county where violation occurred (originally, Sec'y may bring action in Wake County); and (8) makes technical changes.

Amendment adopted in Senate 5/9/79 provides that General Assembly is not obligated to make additional appropriations to implement act.

- S 574 No ground cover for erosion (digested in May *News*, p. 9)
Committee substitute adopted in Senate 4/17/79 rewrites GS 113A-57(3) to require that whenever land-disturbing activity undertaken on tract of more than one acre and more than one contiguous acre uncovered, person conducting activity must install sufficient erosion control devices to retain sediment generated by activity within tract boundaries during construction and provide permanent ground cover sufficient to restrain erosion after completion of construction within time period adopted by Sedimentation Control Comm'n (now, section requires ground cover on land within 30 days after active construction ends).
- S 769 Controlling toxic substances-1 (digested in June *News*, p. 10)
H 56 Committee substitute adopted in House 4/27/79: (1) retains criminal anti-dumping provisions covering radioactive materials (GS 104E-5), five heavy metals (mercury, plutonium, selenium, thallium and uranium), and two halogenated hydrocarbons (pcb's and kepone); (2) eliminates provisions allowing Environmental Comm'n to add other substances to anti-dumping list; (3) eliminates civil penalty for dumping; (4) adds provision amending Oil Spill and Hazardous Substances Control Act to make it applicable to intentional disposal to land (not merely to water and lands near water); (5) makes Department of Crime Control and Public Safety responsible for initial response of state agencies to incidents involving toxic or hazardous substances; (6) creates Interdepartment Task Force to coordinate further incident response and to conduct ongoing study of toxic and hazardous substances, and authorizes Governor to create local or regional task forces; (7) creates Toxic and Hazardous Substances Study Comm'n to study need for additional legislation (4 appointed by Governor, 3 Senators and one city official appointed by Lt. Governor, 3 Representatives and one county official appointed by Speaker; (8) appropriates \$100,000 to Study Commission.

House

- H 175 Oil pollution law amended (digested in March *News*, p. 12; original bill identical to S 700)
Committee substitute adopted in House 4/12/79: (1) eliminates risk-shifting provisions and provision that would have deleted proviso exempting oiling of roads from oil spill controls; (2) rewrites definition of "hazardous substances" tying it to list promulgated by EPA under Clean Water Act; (3) adopts amendment to prevent overlap with Solid Waste Management Act of hazardous substance provisions in original bill; (4) authorizes Environmental Management Comm'n to designate local government agencies to take part in cleanup and be reimbursed for expenses; (5) retains jurisdiction of Pesticide law over pesticides, except where pesticides are misused and enter the waters of the state; (6) requires coordination between Environmental Management Commission and Pesticides Board in responding to pesticide spills.
- Amendment adopted in Senate 5/3/79 deletes amendment to GS 130-166.16(16)c adding hazardous substances controlled under Art. 21A of Ch. 143 to exclusions from definition of solid waste.
- H 1185 Dam safety law extension (digested in June *News*, p. 11)
Amendment adopted in House 5/7/79 deletes section making cited law subject to July 1, 1985 sunset date.
- H 1195 Environmental Management Commission changes (digested in June *News*, p. 11)
Amendment adopted in House 4/26/79 adds new GS 143B-283(d) to add two House and two Senate members (appointed by Speaker and Lt. Governor respectively) to comm'n membership; requires initial appointments to be made by July 15, 1979 and members to serve until Jan 31, 1981; thereafter, legislative members serve two year terms.

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

- "Environmental Statement - Carolina Beach Inlet Navigation Project, New Hanover County, North Carolina (DRAFT)," 4/79, by US Army Corps of Engineers, P. O. Box 1890, Wilmington, NC 28402. (06G)
- "National Handbook of Recommended Methods for Water-Data Acquisition," 6/78, by USDI, Geological Survey, Reston, VA 22092. (10A)
- "Idaho Falls Hydroelectric Project," by International Engineering Co., Inc., San Francisco, CA, for US Dept. of Energy, avail. from NTIS, USDC, Springfield, VA 22161 (W&E)
Selection of Unit Size, 10/78, Price - \$4.50
Design Criteria, 12/78, Price - \$5.25
- "Microbiological Methods for Monitoring the Environment," (EPA-600/8-78-017), 10/78, by Robert Bordner, *et al*, avail. from NTIS, Springfield, VA 22161. (EPA)
- "Proceedings - Soil Moisture...Site Productivity Symposium," 6/78, ed. by W. E. Balmer, contact Southeastern Forest Experiment Station, USDA, Asheville, NC 28801. (04A)
- "Synthesis and Calibration of a River Basin Water Management Model," (#89), 10/78, by J. M. Shafer, *et al*, WRRRI, CSU, Ft. Collins, CO 80523. (04A)
- "Models for System Water Planning With Special Reference to Water Reuse," (#90), 6/78, by D. W. Hendricks, *et al*, WRRRI, CSU, Ft. Collins, CO 80526. (06A)

Water Quality Management

- "Floral and Faunal Changes in Lowland Hardwood Forests in Missouri Resulting from Channelization, Drainage, and Impoundment," (FWS/OBS-78/91), 1/79, by L. H. Fredrickson, avail. from U.S. Fish and Wildlife Service, Office of Biological Services, Eastern Energy and Land Use Team, Water Resources Analysis Harpers Ferry Center, Harpers Ferry, WV 25425. (02L)
- "Solids Control in Effluents From Aerated Lagoon Systems," (#73), 7/78, by L. G. Rich, WRRRI, Clemson U., Clemson, SC 29631. (05D)
- "Heavy Metal Contamination of Surface Waters and Fish Flesh in South Carolina," (#74), 3/79, by A. R. Abernathy, WRRRI, Clemson U., Clemson, SC 29631. (05A)
- "Physiological Effects of 2,4-D and 2,4,5T (Herbicides) on Selected Aquatic Organisms," (#75), 3/79, by C. F. Sigmon, WRRRI, Clemson U., Clemson, SC 29631. (05C)
- "Potential for Using Saline Waste Water From Electrical Power Plants for Irrigation," 3/79, by R. J. Hanks, *et al*, Utah Agricultural Experiment Station, Utah State U., Logan, Utah 84322. (W&E)
- "Chemistry of Phosphorus, Cadmium, Copper, Nickel, Lead, and Zinc in Indiana Lake and Reservoir Sediments," (#122), 1/79, by E. D. Orme, *et al*, WRRRI, Purdue U., West Lafayette, IN 47904. (05A)
- "Detection of Enteroviruses and Bacterial Pathogens Surviving Standard Sewage Treatment," (#53), 1/79, by F. M. Hetrick, WRRRI, U. of MD, College Park, MD 20752. (05G)
- "Effects of Stream Channelization on Aquatic Macroinvertebrates, Buena Vista Marsh, Portage County, Wisconsin," (FWS/OBS-78/92), 6/78, by R. N. Schmal, *et al*, avail. from USGPO, Washington, DC 20402. (02L)
- "Stream Channel Modification in Hawaii," 10/78, avail. from U.S. Fish and Wildlife Service, Office of Biological Services, Eastern Energy and Land Use Team, Water Resources Analysis, Harpers Ferry Center, Harpers Ferry, WV 25425 (02L):
Part C: Tolerance of Native Stream Species to Observed Levels of Environmental Variability, (FWS/OBS-78/18), by C. B. Hathaway, Jr.
Part D: Summary Report (FWS/OBS-78/19), by J. D. Parrish, *et al*.

"208 Areawide Water Quality Management Plan," 12/78, by Land-of-Sky Regional Council, P. O. Box 2175, Asheville, NC 28802, Price - \$25.

Water Quantity Management

"Flood Hazard Analyses, Anarat River, Surry County, North Carolina," 4/79, by USDA, SCS, P. O. Box 27307, Raleigh, NC 27611. (06B)

"Influence of Pumped Storage Flows on Thermal Stratification in Reservoirs," (#10), 1/79, by V. Singh, *et al*, Dept. of Mechanical Engineering & Mechanics, WV U., Morgantown, WV 26506. (06G)

"Proceedings - Fifteenth Annual North Carolina Irrigation Conference," 11/78, ed. by R. E. Sneed, NC Irrigation Society, NCSU, Box 5906, Raleigh, NC 27650. (03F)

Miscellaneous

"Methods Development for Assessing Air Pollution Control Benefits," (Vol. V, Ex. Summary), (EPA-600/5-79-001e), 2/79, by D. S. Brookshire, *et al*, avail. from NTIS, Springfield, VA 22161. (06C)

"Water as a Parameter for Development of Energy Resources in the Upper Great Plains," 12/78, ND Agri. Exp. Sta., ND State U., Fargo, ND 58102 (W&E):

Effects on Land and Water Resources of Alternative Patterns of Coal-Based Energy Development, by D. F. Scott, *et al*,

Socioeconomic Effects of Alternative Patterns of Coal-Based Energy Development, by N. E. Toman, *et al*.

"Feasibility Report on Improvement of Navigation," 4/79, by US Army Corps of Engineers, P. O. Box 1890, Wilmington, NC 28402. (06G)

SPECIAL

WATER MANAGEMENT AND BALANCED GROWTH IN NORTH CAROLINA

*by Quentin W. Lindsey
Science and Public Policy Advisor
Office of the Governor*

Editor's Note: Presentation made at the North Carolina Water Management Conference on April 3.

Importance of Prevailing Concepts

Balanced growth, as a concept, is intended to provide a vision, a perspective, of the future for the purpose of guiding action in the present.

History is replete with examples of how prevailing notions guide action. There was a time, you recall, when many people thought that the world is flat, and that if you sail off into the sunset too far you will fall off the edge. Hence, do not venture too far from the sight of land.

The history of the evolution of the fundamental notions of physics demonstrates even more dramatically the manner in which basic concepts guide our thought and action. Aristotle, in his inquisitive way, observed the movements of planets and the sun in relation to the earth, and sought to discover the "unmoved mover" that was pushing them along.

In the long intervening centuries between Aristotle and the period of Copernicus, Galileo and Newton, the best minds of the day made observations and developed mathematical representations of our planetary system, but always with the vision of the earth at the center of the system. This vision was "correct" in that, as they observed, planets and the sun do rotate around the earth, assuming the earth is the center of all things. But the mathematical representation was very complicated and empirical observation and measurement were complex and subject to great error. A prime example of the error problem was "time." The exact length of each day of the year could not be determined accurately and neither could the length of a year. Consequently, every few years calendars had to be corrected. Otherwise, a winter holiday such as Christmas, for example, would drift into the spring and even the summer.

Copernicus changed this perspective by construing the sun as the center of the system, with planets, including the earth, rotating around it. The beauty of his conception is that it greatly simplified the mathematical representation and made empirical observation and measurement much more precise. When combined with improved telescopes, this conception or vision made it possible to devise a calendar that could be relied upon.

These notions regarding physical phenomena were further developed by Galileo and then Newton, culminating in Newton's concepts of absolute space and absolute time, and of gravity and laws of motion. They governed much thought for nearly 300 years until Einstein found it necessary to recast them extensively and speak of space-time, of relativity, of subatomic particles, of mass, energy and the speed of light, and of the outer reaches of space. Without the visions of physical phenomena that Newton and Einstein perfected, a good deal of what we do in the world today would not be possible.

Emerging Concepts of Water Management

Concern with water quality has dominated water management in North Carolina for many years. Safe drinking water was an early concern and continues to be important. The Environmental Protection Agency (EPA) influence has stressed water quality in our rivers, streams and coastal area. More recently, however, as water shortages have occurred in various places, and as conflicting claims upon the uses of water have become more prevalent, public concern with managing quantity as well as quality has come to the fore.

An interesting and often underestimated notion in the realm of water management, however, is the concept of place. We manage the quality and quantity of water in relation to places--places from which water comes and places to where water goes. Place is a generic term, just as are quality and quantity. Place may refer to a river basin, a coastal area or the location of an underground aquifer. It may be a city, a community, the location of an industrial plant, or the residence of an individual consumer.

Place is a key concept of balanced growth, as well as of water management. Growth occurs in places, and growth depends, in part, upon water in various quantities and of differing quality.

Balanced growth relates to changes in economic activity, in environmental conditions, in cultural affairs, in the use of physical resources, in the welfare of people, and in other phenomena. It is concerned with what is happening, where, when and for what purpose. The presupposition is that actions of state and local governments, private enterprise and so on affect what happens any place in North Carolina. It assumes that we should recognize this fact and develop a vision of what the people of the state want to have happen and act accordingly.

Components of Balanced Growth

Based upon "North Carolina Tomorrow" surveys, both scientific and of a general-response type, components of balanced growth that appear most important to the people of the state are as follows:

1. More and better jobs.
2. Strengthening local government.
3. Meeting human development needs.
4. Expanding educational opportunities.
5. Preserving environmental quality.
6. Increasing the productive capacity of agriculture, forestry, and seafood industries.
7. Enhancing cultural opportunities.
8. Providing adequate transportation links.
9. Assuring sufficient energy.

Water is not an explicit component of any of these major thrusts of balanced growth. But, as with land and air, the importance of water is implicitly assumed throughout all components of balanced growth.

Strategy of Balanced Growth

Balanced growth may be construed as a way of teaming together at the federal, state and local levels to achieve the common goals outlined above. Balanced growth recognizes that a sense of proportion must prevail, that preservation of the quality and beauty of our environment is important, that we cannot have uncontrolled, malignant growth and also preserve the desirable characteristics of North Carolina.

The strategy of balanced growth entails decisions by local governments, local people and local communities regarding where industrial and urban growth is to occur; where and how agricultural and forestry pursuits are to continue. The strategy also requires that state and federal programs such as education, health, environmental management, and water management are synchronized so that we are not working at cross purposes. The intent is to provide guiding principles so that we are not perfecting our transportation system in relation to one pattern of growth, our social service system according to another, our industrial development in terms of still another, and so on.

Water Management In Relation to Balanced Growth

Several key steps can be taken in managing water resources in relation to balanced growth. The most important is for those who are concerned with water resources to become involved with the balanced growth process. This means attending state and local meetings concerning balanced growth, reading the publications, and getting acquainted with members of the state Goals and Policy Board and their various committees. Know what is going on in relation to balanced growth and make sure that balanced growth policies and plans are properly formulated in relation to our water resources.

The balancing of growth must take account of the prevailing pattern of our water resources. We have river basins, ground water supplies, coastal waters and lakes. The "Water Resources Framework" study is a very valuable contribution in this regard. But be sure that those who are making decisions regarding the location of growth centers, the location of industry and other matters take proper account of quality, quantity and place or location of water. And be sure that proper conceptions of water resource management guide decisions governing water use in relation to growth.

It is the intent of balanced growth policy not to provide for growth for growth's sake, to stimulate malignant growth. Rather it is to guide the growth of North Carolina consistent with a vision of the beauty, the harmony and the integrity of a healthy society for all citizens, maintaining a proper ecological balance with their environment. Water resources and their proper management constitute an integral, indispensable component of that vision. And those of you here today participating in this meeting have a very important part to play in formulating that vision and in causing it to become a reality.

ITEMS OF INTEREST:

"Nutrient Sensitive Water" Concept, page 3

Workshops and Conferences:

- | | |
|----------------|--|
| June 4-8 | - Flood Plain Hydrology-HEC 1, page 8 |
| June 5-6 | - Frequency Analysis, page 8 |
| June 7-8 | - Land Treatment of Municipal Wastewater Effluent, page 7 |
| June 7-8 | - Rainfall Data Analysis, page 8 |
| June 11-15 | - Water Quality Management, page 8 |
| June 13-15 | - Coastal Mapping Workshop, page 7 |
| June 14-15 | - Small Scale Hydroelectric Power in the Southeast, page 9 |
| June 19-20 | - National Symposium on Urban Stormwater Management in Coastal Areas, page 8 |
| Mid June | - Workshop on Individual Wastewater Systems |
| July 16-20 | - Flood Plain Hydraulics-HEC-2, page 8 |
| July 30-Aug. 3 | - Water Quality Instructors' Workshop, page 8 |
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YOU ARE INVITED TO THE

NORTH CAROLINA CHAPTER OF THE SOIL
CONSERVATION SOCIETY OF AMERICA MEETING

CLEAN WATER FOR TOMORROW is the theme of the annual meeting of the North Carolina Chapter of the Soil Conservation Society of America. The meeting will be at the Holiday Inn, Atlantic Beach, June 15 and 16.

The emphasis of the program will be on the 208 plan in North Carolina and its possible impact on agriculture. Program details and additional information may be obtained by contacting Dr. Maurice Cook, 2224 Williams Hall, NCSU, Telephone 737-2643.

THE UNIVERSITY OF CHICAGO
DEPARTMENT OF CHEMISTRY
5301 SOUTH CAMPUS DRIVE
CHICAGO, ILLINOIS 60637
TEL: 773-936-3700
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