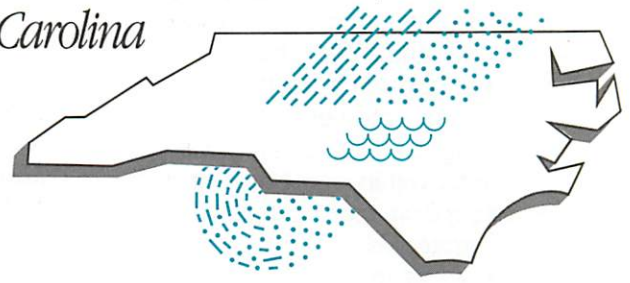


Water Resources Research Institute News

of The University of North Carolina



ISSN 0549-799X

Number 268, March/April 1991

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Strategy represents next step toward Clean Water Act water quality goal

DEM PREPARES TO IMPLEMENT BASINWIDE STREAM POLLUTION CONTROL STRATEGY

Using an approach that could be likened to giving the fabled blind men a look at the whole elephant, the Division of Environmental Management's Water Quality Section is preparing to implement a river-basin wide strategy for protecting surface water quality in North Carolina. According to J. Trevor Clements, an assistant chief with the Water Quality Section and one of the coordinators of the basinwide initiative, the strategy will integrate information from water quality and biological monitoring, wastewater discharge permitting, and nonpoint source pollution control efforts to give regulators a complete picture of

MAKING OUR MARK

Appearing for the first time in our newsletter banner is WRRRI's institute symbol. Representing the hydrologic cycle in North Carolina, it was conceived and executed by Rasor & Rasor of Cary, NC. Art director for the project was Julie Barker.

As existing stocks of printed materials are used up, our mark will begin appearing on all institute publications and other printed material.

water quality conditions in each of the state's 17 river basins.

Being able to integrate all this information will allow DEM to estimate each major river's ability to assimilate wastes (assimilative capacity), to estimate the total maximum daily load (TMDL) that the river can absorb without impairment of its intended best use, and to control stream pollution in support of water quality goals more effectively than ever before.

In the past, said Clements, most water quality management decisions have been made on an ad hoc basis. Efforts have addressed specific requirements or specific problems and have

therefore produced only a spotty picture of water quality conditions across the state. With the basinwide approach, staff management activities (monitoring, permitting, etc.) will be focused within one basin at a time to support more proactive control strategies.

Today, as in the past, permits to discharge treated wastewater (called NPDES or National Pollutant Discharge Elimination System permits) are issued individually or renewed individually every five-years. Each permit has limits on the concentration of pollutants that can be in the wastewater discharges. These limits are derived from minimum technology-based guidelines and/or more stringent water quality based requirements.

Currently there are 3,300 active NPDES permits in North Carolina, including 142 municipal wastewater treatment plants that receive influent from more than 400 significant industrial users. Until this time there has not been a consistent method for assessing the cumulative impact of all dischargers and, just as importantly, all nonpoint sources of pollution within a river basin. That is why some rivers in North Carolina show signs of stress (in EPA parlance, they are "water-quality limited") even though the majority of dischargers in the basin may be complying with their permits.

By integrating all information on activities that can affect stream water quality, the basinwide initiative will make it possible to modify permits to avoid exceeding a stream's assimilative capacity.

In Clements' words, "We can make our management decisions on upstream waters consistent with protecting uses downstream."

Although the basinwide initiative has been on the DEM

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Number 268

March / April 1991

Published bimonthly.



This newsletter is financed in part by the Department of the Interior, U.S. Geological Survey, as authorized by the Water Resources Research Act of 1984. Twenty-nine hundred copies of this newsletter were printed at a cost of \$1,501.88 or 52 cents per copy.

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WRR I Information Resources

Publications

- Technical completion reports on research sponsored by WRR I
- Proceedings of workshops and conferences conducted by WRR I
- Special topics reports
- Directory of Water Resources Research Expertise in North Carolina
- WRR I Program (current research and information activities)

There is a \$10 reproduction charge for the expertise directory. Single copies of other publications are free to federal water resource agencies, state water resources research institutes, and other water research institutions with which exchange agreements have been made. Publications are free to public agencies, institutions, industries, and private citizens of North Carolina as long as they are in print. Copies of out-of-print publications are available for a \$5 reproduction charge (\$10 if billed). Nonresidents of North Carolina will be charged a prepaid amount of \$8 per copy and \$10 if billed for all publications. For a list of publications available, call WRR I and ask for the Publications List.

Technical Library

WRR I maintains a library of selected technical publications from many federal and state agencies and other state water resources research institutes. This library is located at 1131 Jordan Hall on the campus of N.C. State University and is open to the public from 8 am to 5 pm, Monday through Friday, except for official university holidays. Documents may be borrowed for two weeks.

Databases

WRR I subscribes to the Selected Water Resources Abstracts (SWRA) database compiled by USGS and the USGS daily values (streamflow, temperature, conductivity, and water quality) for the Southeast and climate data for the central and eastern parts of the United States provided through EarthInfo, Inc. These databases are on compact disk, and the Institute has a CD reader for use with its IBM AT. WRR I also maintains a database of North Carolina college and university faculty with water resources research expertise. Individuals who wish to use the SWRA, USGS daily values, or research expertise database may do so in the WRR I offices by making an appointment. Limited searches of the research expertise database will be performed by staff and may be requested by phone.

drawing board for some time, impetus for implementation is coming from the Environmental Protection Agency. EPA is beginning to push states to step up implementation of the Clean Water Act. Section 303(d) of the Clean Water Act (CWA), mandates that where technology-based pollution controls have not accomplished the primary CWA water quality goal, states must take the next step toward the goal of restoring and maintaining the "chemical, physical, and biological integrity of the Nation's water's." The next step EPA calls the "water-quality based step," and it involves just what N.C. DEM has been preparing itself for—establishing assimilative capacity and TMDLs for each water-quality limited water body in the state.

"For the first time," said Clements, "DEM is in a position to carry out its water quality charge as originally envisioned by the authors of the Clean Water Act. Formerly, we didn't have the tools to look at entire basins, to bring all the needed information together. Now, however, we're very close to being able to develop basinwide planning that will result in a consistent strategy, an equitable distribution of assimilative capacity, and more effective water quality protection."

The basinwide strategy will be made possible by computer technology, including shared databases, mathematical modeling, and—most notably—the state's increasingly sophisticated Geographic Information System (GIS) capability (see following article). As funds become available, DEM will automate its discharge permit writing process and implement the framework it has developed to centralize its permitting and monitoring databases. These systems will generate some of the numbers that will be plugged into river

<p>PRIORITY LISTING AND SCHEDULE FOR DEVELOPMENT AND IMPLEMENTATION OF RIVER BASINWIDE WATER QUALITY MANAGEMENT PLANS</p> <p>1994 Neuse Yadkin-Pee Dee/Lumber</p> <p>1995 Tar-Pamlico Catawba French Broad New</p> <p>1996 Cape Fear</p> <p>1997 Roanoke White Oak Savannah Watauga Little Tennessee Hiwassee</p> <p>1998 Chowan-Pasquotank Broad</p>

basin models to determine assimilative capacity and TMDLs, and will provide some of the information for the section's GIS.

In order to estimate a TMDL for a stream, regulators must first estimate the background pollutant load. This data will come from the ambient monitoring system. They must then estimate the amount of pollution contributed by nonpoint sources, such as agriculture, highway construction, forestry, and urban runoff. GIS capabilities will assist in this task by providing many kinds of information, such as land use data.

Regulators then must estimate how much additional pollution the stream can absorb without use impairment and allocate a percentage of that assimilative capacity among point source dischargers in the basin. Here both the modeling and GIS capabilities come into play, the GIS providing spatial and relational information and the models generating a "budget" for point source discharges.

To satisfy planning requirements of 303(d), North Carolina must (1) identify streams that are water-quality limited, (2) rank these streams according to the severity of their problems, (3) establish TMDLs for each stream, and (4) get EPA approval of the plan. DEM has already taken tentative steps toward meeting these requirements. In September 1990, the division submitted to EPA a priority listing and time schedule for development and implementation of basinwide management plans. This list essentially tells EPA which river basins in North Carolina DEM considers to have the most pressing water quality problems and the date by which the division expects to start actually using TMDLs to allocate assimilative capacity among dischargers in each basin (see boxed list).

To distribute (or in some cases redistribute) assimilative capacity among point source dischargers within a single basin in an equitable manner, DEM must get all dischargers on the same permit renewal schedule. To accomplish this, the division began in January 1990 to issue short-term permits, that is permits that are in force for less than the standard five years. According to Clements, the division may have to issue some dischargers two permits within a period normally covered by one permit in order to get them in step with the

basinwide implementation schedule.

"Since EPA has ruled that we cannot exceed the maximum permit period of five years as mandated by federal regulations, we'll have to issue some facilities a shorter permit to adjust the expiration dates to the appropriate year," said Clements. "This strategy will, of course, double the permitting workload during this adjustment period and was a major reason for developing the automated permit writing system."

Clements said that the basinwide approach will give municipalities and other dischargers a fixed target around which to plan waste treatment capacity and technology.

"Those considering new or expanded wastewater treatment facilities will know where there is assimilative capacity and where there is no assimilative capacity. They'll know where higher treatment will be required. Wastewater treatment plants can adopt technology for the future, technology that they can build on rather than retrofit."

In addition, Clements said, the basinwide approach will make it evident where water quality problems are and where major sources of pollution are. And, it will enhance public participation in water quality planning efforts.

"In the past there has been a multitude of public notices and hearings on individual discharge permits, and that makes it difficult for the public to focus on anything and become involved," he said. "In the future, we will be able to present a basinwide plan, and a major hearing can be scheduled so the public can be given a view of the entire basin, how each discharger or other pollution source fits in and impacts others. We expect public input will be substantially increased."

Clements said that by the end of this spring, the division will have produced a written description of the basinwide initiative that will serve as a report to EPA (which intends to use it as a model for other states), a reference document for staff, and a document to introduce and explain the concept to the public.

N.C. CENTER FOR GEOGRAPHIC INFORMATION AND ANALYSIS (CGIA) PROVIDES POWERFUL TOOL FOR ENVIRONMENTAL MANAGEMENT

When the Division of Environmental Management needs information on what is where in the North Carolina and how land-use and other decisions may affect the environment, it turns to the state's Center for Geographic Information and Analysis (CGIA). Established in 1977, CGIA has implemented one of the first fully operational state geographic information systems (GIS) in the United States. This rapidly evolving state GIS is crucial to many of North Carolina's recent water quality protection initiatives.

What CGIA does sounds simple enough. The center collects data generated by various studies, surveys, and monitoring programs, converts it to a form that can be displayed on a map, then overlays data layers to highlight and define specific issues and problems visually. In reality, the work is extremely complex and time-consuming, but once done, digitized data layers can be utilized in many combinations to

support and facilitate a wide variety of programs.

For instance, CGIA produced maps that will be used in implementing the state's watershed protection program. The maps layer political (county and municipal) boundaries and water supply watershed boundaries to show which political entities have responsibility for developing local watershed protection programs. The maps can also show NPDES permitted discharges within watersheds and provide some land-use information to help DEM establish classifications for water supply watersheds.

The accompanying map provided by CGIA illustrates how data layers can be selected to highlight issues. This map shows water bodies that have received some special water classifications, including the Public Water Supply Watershed designation, the Coastal Outstanding Resource Water designation and the Nutrient Sensitive Watershed designation. If it were not already obvious, this map would make it clear that some of the state's most important (in terms of population served) water supply watersheds are threatened by nutrient overload.

Having been designated the information management center and GIS for the EPA/NC Albemarle-Pamlico Estuarine Study, CGIA has developed its most in-depth capabilities in areas that support the A/PES. It is developing a database that includes more than 60 layers of cartographic and attribute data collected for the coastal and estuarine region being studied under A/PES, including political boundaries, river basin and sub-basin boundaries, population distribution, transportation, soils data, land-use/land-cover, fisheries nursery areas,

monitoring site locations and on and on.

In addition to making maps that visually reveal proximities and potential interactions, CGIA's GIS capabilities also support mathematical analyses of spatial relations and interactions, including water quality modeling, site suitability studies, routing and distribution projects, and trends analysis.

All these capabilities give N.C. DEM a powerful tool for seeing the big picture and for taking a more holistic approach to protecting the state's environment.

These capabilities are also available to local governments and to the private sector, as CGIA is a receipts-funded agency. It is located administratively in the Department of Environment, Health, and Natural Resources.

Addition information about CGIA is available from Tom Tribble, CGIA, P.O. Box 27687, Raleigh, NC (919/733-2090).

HEARING SCHEDULED ON VIRGINIA BEACH PIPELINE APPEAL

While the N. C. Attorney General's office awaits an appeals court decision in one suit to prevent the Lake Gaston-Virginia Beach pipeline, it is filing briefs for an appeals court hearing in another suit brought to stop construction from going forward.

According to Alan Hirsch of the Attorney General's office, action on the state's appeal of U.S. District Court Judge W. Earl Britt's decision upholding the Corps of Engineers' permit for pipeline construction may not come until May. The hearing was held in the Fourth Circuit Court of Appeals in Richmond, VA, in February.

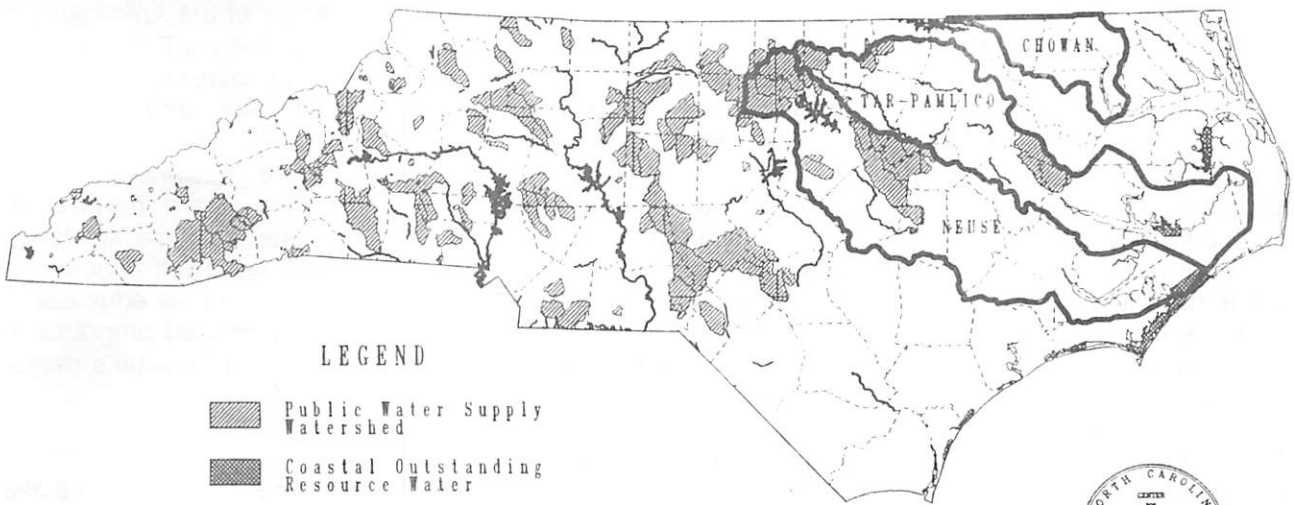
Meanwhile, final briefs were filed in March for a hearing on Virginia Beach's appeal of Britt's injunction forbidding Virginia Beach to begin construction on the pipeline. North Carolina won

the injunction in December 1990 with a suit claiming that ongoing construction might influence the Federal Energy Regulatory Commission (FERC) in its decision whether to modify the operating permit of Virginia Power Company, which operates Lake Gaston as a hydropower project. FERC must approve a license amendment before water can be withdrawn from the lake and must do an evaluation to determine if an environmental impact statement is needed before issuing a license amendment.

The hearing on Virginia Beach's appeal against the injunction will be held April 11. If Virginia Beach wins the appeal, construction might begin. However, according to Hirsch, the FERC review could take up to two years to complete, during which time uncertainty about water withdrawals will remain.

Virginia Power has begun the process of requesting a license modification, filing a request with FERC February 20.

North Carolina Special Water Classifications



LEGEND

-  Public Water Supply Watershed
-  Coastal Outstanding Resource Water
-  Run of River
-  Nutrient Sensitive Watershed Boundary
-  County Boundary

Scale 1:3,100,000
One Inch Equals Fifty Miles



March 1991

STORMWATER RULES PROMPT QUICK ACTION BY DEM, LOCAL GOVERNMENTS

At the February meeting of the Environmental Management Commission, Division of Environmental Management (DEM) personnel added a last-minute agenda item asking for approval to hold public hearings on rule modifications that would reconcile N.C. regulations with federal regulations to allow North Carolina to issue General Permits for wastewater discharges. The request was made so that DEM can eventually write a single general permit that will cover an entire category of discharge (such as from a landfill) and allow individual dischargers to request coverage under the general permit rather than file individual permits. The request was prompted by recently issued federal regulations requiring NPDES permits to discharge stormwater. Under the regulations, hundreds, if not thousands, of individual permits could be required in North Carolina.

Meanwhile, according to a publication of the N.C. Association of County Commissioners (NCACC), N.C. local governments were caught off guard by provisions of the stormwater rules requiring local governments that own landfills, large wastewater treatment plants, and transportation facilities to apply for permits to discharge stormwater from these facilities. NCACC and the N.C. League of Municipalities retained a consultant to fast-track applications (Part I due Mar 18) for group permits for landfills, wastewater treatment plants, and transportation facilities operated by N.C. local governments.

SKAGGS ELECTED TO NATIONAL ACADEMY OF ENGINEERING

R. Wayne Skaggs, William Neal Reynolds Professor of Biological and Agricultural Engineering at North Carolina State University, has been elected a member of the National Academy of Engineering. Election to the academy signifies recognition of distinguished contributions to the fields of engineering, engineering science, and technology.

An authority in the hydrology of poorly drained soils, Skaggs has completed eight projects under WRRRI sponsorship and is currently engaged in a ninth project, this one receiving matching funds from the U.S. Geological Survey.

Skaggs joined the NCSU faculty in 1970 and shortly thereafter joined Dr. George J. Kriz on a WRRRI-sponsored project aimed at determining the feasibility of using subsurface drains for water management in the lower Coastal Plain of North Carolina. Today, Skaggs is an internationally recognized expert in subsurface drainage and irrigation and is widely known as the creator of a computer model, DRAINMOD, developed as a tool for optimizing the design of subsurface drainage and irrigation systems.

Over the last 20 years, Skaggs has applied his expertise to investigation of many questions about the water quality effects of land use conversion in North Carolina's Coastal Plain. Much of his work has focused on the effects of clearing, draining, and agricultural cultivation of large tracts of land in the estuarine areas of North Carolina. He introduced the concept of controlling drainage from agricultural fields to reduce the

effects of drainage on nearby estuarine waters. He has also investigated the effects on water quality of peat mining in the Coastal Plain and the effectiveness of infiltration ponds for treating stormwater runoff on the North Carolina Outer Banks.

Skaggs recalled that the first WRRRI project awarded to him as principal investigator, was in a vastly different area from his present specialization. It was an investigation of the feasibility of using hot water from steam electric generating plants to heat soil for growing crops. He concluded the scheme was not very feasible. But his work in hydrology on water table control did point to a feasible technology.

In addition, Skaggs said, the fact that interest and money for such research was available, through WRRRI and others, helped focus his career.

A frequently honored researcher, Skaggs is a member of the Drainage Hall of Fame at The Ohio State University and is a fellow of the American Society of Agricultural Engineers (ASAE). He has received the NCSU Alumni Research Award, the ASAE Young Researcher Award, and the Outstanding Young Scientist Award from the NCSU Chapter of Sigma Xi. He has also made significant contributions to water resources education, having directed programs for 19 PhD and 15 master's degree candidates.

A new brochure titled *Bottled Waters: Helpful Facts and Information* is available from the EPA Safe Drinking Water Hotline (800) 426-4791 or (202) 382-5533.

CONFERENCE



May 9 - 10, 1991
Mission Valley Inn
Raleigh, NC

APPROACH TO
MEETING
TOXICITY
LIMITS

INTRODUCTION

Already considered a national leader in pollution prevention, North Carolina is now pioneering the application of pollution prevention/waste reduction principles to solving problems of toxicity in industrial wastewater effluent. As requirements for biological monitoring and toxicity limits are incorporated into NPDES permits and as municipal wastewater treatment plants turn more and more to industrial pretreaters to help solve problems of toxicity in effluents, strategies for reducing toxicity in industrial discharges become increasingly important. By incorporating waste-reduction principles into processes and practices, industries may be able to eliminate or reduce toxicity problems as they conserve raw materials and save money. This Waste Reduction Approach to Meeting Toxicity Limits Conference is being sponsored by the N.C. Pollution Prevention Program and WRRI to help industries design pollution prevention strategies for meeting toxicity limits.

AGENDA

Thursday, May 9 - 5:30 pm to 9:30 pm

Registration and Social Hour

Dinner and Address, "Legal Aspects of Toxicity Compliance"

Conference Overview

Overview of Toxicity Testing and Control

Friday, May 10 - 8:00 am to 2:00 pm

Opening Remarks - William W. Cobey, Jr.
Secretary of Environment, Health, and Natural Resources

Introduction to Waste Reduction and Pollution Prevention Principles

Conducting a Waste Reduction Opportunity Assessment

Applying Waste Reduction Principles to Reduce Effluent Toxicity

Concurrent Sessions:

I. Applying Waste Reduction Principles to Reduce Effluent Toxicity in the Textile Industry

II. Applying Waste Reduction Principles to Reduce Effluent Toxicity in the Metal Finishing Industries

The Municipal Treatment Works Perspective on Toxicity Reduction

Lunch (provided)

CONFERENCE FEE AND REGISTRATION

The conference fee of \$60 includes materials, coffee breaks, dinner and lunch. To register by mail please return the registration form to the UNC Water Resources Research Institute. Payment should accompany registration. Checks should be made payable to the Water Resources Research Institute. If you must cancel your registration, a refund can be made if you notify us at least 10 days prior to the conference. We will gladly accept last-minute substitutions.

Registration deadline is May 2, 1991.

FOR ADDITIONAL INFORMATION

For details about the conference program, please contact Robert E. Holman, UNC Water Resources Research Institute (919/737-2815). For additional registration details, please contact Eva Tew or Linda Lambert at WRRI (919/737-2815)

WASTE REDUCTION APPROACH TO MEETING TOXICITY LIMITS REGISTRATION FORM

Name _____

Company or Affiliation _____

Address _____

City _____ State _____ Zip _____

Telephone _____

I will attend concurrent session: (circle one)

I

II

Enclosed is my check for \$60 made payable to Water Resources Research Institute.

Mail to:

Water Resources Research Institute
Box 7912
North Carolina State University
Raleigh, NC 27695-7912

DIGEST

SLUDGE BY ANY OTHER

NAME. Peter S. Machno, head of the Seattle (Washington) sludge management program, suggested at a conference sponsored by the Water Pollution Control Federation (WPCF) in December 1990 that wastewater sludge needs a new name to make it more acceptable to the public for use as a soil enhancer. Machno suggested "regulated organic nutrients," and said WPCF should form a task force to consider the matter. He also suggested an effort to see that the expected 1991 reauthorization of the Clean Water Act include a term other than "sludge" for wastewater solids. Sludge disposal is a major problem for many municipalities. *Environment Reporter* quotes a consultant as predicting that sludge composting to produce a soil amendment product will double in five years as a result of EPA sludge regulations expected to be promulgated in early 1992 and public opposition to siting landfills and incinerators which provide sludge disposal alternatives. Final sludge management regulations are expected to be less stringent than the proposed regs, which could have virtually eliminated composting as a disposal option. *Environment Reporter* Dec 7, 1990

SLUDGE LESS POLLUTED THAN PREDICTED.

EPA's recently released National Sludge Survey revealed that of the 350 organic compounds on EPA's priority pollutant list, only 40 were detected in sludge from more than 180 publicly owned treatment works surveyed. Lead concentrations were 60 percent less than had been predicted. Survey results will be taken into

account when EPA writes final regulations for sludge disposal. *World Water and Environmental Engineer* Nov 1990

SLUDGE COMPOSTING FACILITY IN CATAWBA COUNTY.

Customers of a new regional wastewater sludge composting facility that went on line in Catawba County in Jan 1991 have no problem with the term "sludge," if demand for the facility's compost is any indication. The facility is jointly owned and managed by a regional consortium of the municipalities of Hickory, Newton, and Conover and Catawba County. Sludge generated by the members' wastewater treatment plants as well as septage from septic tanks is combined with sawdust and composted to produce a product that resembles potting soil. Facility officials say demand for the product is strong, with private firms contracting to buy the compost to use for reclaiming mined areas, as a golf-course treatment, in a nursery and on a farm project. The product may also be offered to individuals through home and garden centers. It is expected that the regional facility will be able to compost and sell sludge from consortium members for 20 years. *Southern City*, publication of the N.C. League of Municipalities, Feb 1991

ADDITIONAL DRINKING WATER STANDARDS.

In January EPA issued final drinking water standards for 33 inorganic, volatile organic, and pesticide contaminants. The Safe Drinking Water Act requires EPA to set binding standards for additional contaminants every three years. According to EPA's drinking water chief, the new rules are so stringent that they could effectively ban the use of certain contaminants, such as the

pesticide alachlor. Some 3,300 drinking water systems are expected to have to treat water to meet standards for at least one of the contaminants. EPA estimates that compliance with the standards and proposed monitoring requirements will cost \$88 million annually nationwide. *Environment Reporter* Jan 11, 1991.

FROG DECLINE AND ACID RAIN.

Although frog population decline in some countries can be attributed to human consumption of frog legs, amphibian populations throughout the world are declining, and the cause has yet to be identified. However, according to James Blankemeyer, a zoologist at Oklahoma State University, a chief suspect is the environmental effects of acid rain. Blankemeyer believes that the entry channel for salt into frog skin is being affected by toxicants in and acidity of acid rain, and that the amphibians are being prevented from recovering salt that they continually lose to their pond environment. Blankemeyer's current research on the interaction of waters with acidic pH's and environmental toxicants is supported by the Oklahoma University Center for Water Research. *ripples*, publication of the Oklahoma UCWR, Jan-Feb 1991.

PESTICIDES IN RAIN.

In a study begun in 1987, the Iowa Department of Natural Resources has found traces of the herbicide atrazine and other pesticides in rainfall over the state's corn growing area. During the planting season, rainfall in Iowa may contain more than 10 parts per billion of atrazine. Other chemicals detected in Iowa rainfall are simazine, alachlor, metolachlor, cyanazine, metibuzin, and pendimethalin. *U.S. Water News* Feb 1991

BOTTLED RAINWATER. Rain water collected in the Margaret River Basin near Perth, Australia, will soon be marketed in the United States, according to *U.S. Water News*. Precipitation in the Margaret River Basin comes from Antarctic weather systems which are said to be unspoiled by atmospheric pollution. The rainwater will be double filtered and pasteurized and packaged in glass for U.S. markets. *U.S. Water News* Feb 1991

MISSISSIPPI-LOUISIANA WATER BATTLE. Continuing a battle dating back to 1980, the state of Mississippi has filed suit against the state of Louisiana and the U.S. Army Corps of Engineers to get back water the Corps diverted from its branch of the Pearl River. The Pearl River divides south of Bogalusa, LA, into east and west forks. Because of bayou alterations the Corps made to maintain navigation channels, almost all of the flow of the Pearl has been diverted into Louisiana's west fork. Mississippi's attorney general said the diversion has deprived his state's citizens of the benefit of navigation, commerce, and recreation. Last August, residents of Pearl River County, MS, (above the river fork) built a dam of dead trees, scrap metal, and sandbags to stop water from flowing into Louisiana but later dismantled it on orders of the Corps. *U.S. Water News* Feb 1991

SERVICE AVAILABLE FEES O.K. The N.C. Court of Appeals in June 1990 upheld a lower court decision that a municipality may charge for water or sewer service it makes available even if the service is not used. The decision came in the case of *Ricks V. Town of Selma*. The suit was brought by owners of a mobile home park which was annexed by the Town of Selma

in 1978. Beginning in 1983, the owners used the town's water supply but did not connect to the sewer system. Under its ordinance requiring a minimum sewer charge for water users, the town charged the owners for sewer service. The owners challenged the ordinance, and when it was upheld by the trial court, appealed the decision. They argued that a municipality's power to set rates should be limited to charges for actual use. The appeals court disagreed and upheld the Selma ordinance. *Journal AWWA* Jan 1991

N.C. WATER AND SEWER SURVEY. A significant number of towns and cities responding to a recent water and sewer survey conducted by the N.C. League of Municipalities charge non-consumption fees similar to the service available fee that was the subject of the court suit described above. Nearly 43 percent of the 240 respondents charge non-consumption fees for water, and 47.2 percent use non-consumption fees for sewer service. The League's survey, conducted in August 1990, also found that 42 percent of the responding cities and towns planned to increase water use rates for the 1990-1991 fiscal year and that another 11 percent planned to raise rates during the year. The survey also showed that 54.3 percent of the respondents expect to operate their water treatment systems at capacity by 1995-96 and that 48 percent plan to upgrade, expand or replace their oldest water treatment plant within the next five years. In addition, 54.7 percent of respondents (95 municipalities) expect their oldest wastewater treatment plant to be at capacity by 1995-96, and 50 percent expect to upgrade, expand or replace their oldest plant within five years. *Southern City* Jan 1991

GRADUATE FELLOWSHIPS in the WATER SCIENCES at NORTH CAROLINA STATE UNIVERSITY

Two PhD fellowships in agricultural water science with stipends of \$15,000 per year for three years are available at N.C. State University through the USDA National Needs PhD Graduate Fellowship Program.

THE NCSU PROGRAM. The water research program in the NCSU departments of Biological & Agricultural Engineering and Soil Science focuses on drainage, irrigation and irrigation scheduling, subirrigation and water conservation, water management for water quality, pollution of both surface and groundwater from agricultural and other sources, use of vegetated filters to improve water quality, and chemical and physical reactions affecting solute movement through soils.

Testing and development of models is common to many of the studies. The program is supported by excellent computer and laboratory facilities and several well-instrumented field sites.

QUALIFICATIONS: Applicants must be U.S. citizens and should have completed requirements for the M.S. in agricultural engineering, soil science, agronomy, civil engineering or related soil and water disciplines.

INFORMATION: For additional information contact Dr. R. W. Skaggs, Bio & Ag Engineering, NCSU, Box 7625, Raleigh, NC 27695-7625 (919/737-3121) or Dr. J. W. Gilliam, Soil Science, NCSU, Box 7619, Raleigh, NC 27695-7619 (919/737-2040).

VARIETY OF WATER-RELATED COURSES OFFERED BY N.C. UNIVERSITIES IN FALL

Individuals interested in educational opportunities related to water resources management will find a variety of courses available this fall at North Carolina universities.

University of North Carolina at Charlotte

Department of Civil Engineering

CEGR 5144	Engineering Hydrology
CEGR 5090-P90	Industrial Pollution Control
CEGR 5090-S90	Environmental Chemistry

For additional information on these courses contact Dr. Jy S. Wu at (704) 547-4178.

N.C. Agricultural and Technical State University

Department of Civil Engineering

CIEG 310	Environmental Engineering
CIEG 311	Environmental Engineering Lab
CIEG 460	Water Resources Engineering
CIEG 612	Environmental Engineering Design
CIEG 660	Water Resources Systems Analysis

For additional information contact Dr. Shoou-Yuh Chang (919) 334-7737.

Department of Plant Science and Technology

AGEN 410	Hydrology
AGEN 701	Soil and Water Conservation-Engineering

For additional information contact Dr. Godfrey A. Gayle (919) 334-7787.

University of North Carolina at Chapel Hill

Department of Environmental Sciences and Engineering

ENVR 51	Environmental Protection
ENVR 95	Analysis & Solution of Environmental Problems
ENVR 121	Aquatic & Atmospheric Chemistry Processes & Mechanisms
ENVR 131	Biological & Ecological Processes & Mechanisms
ENVR 135	Biology in Environmental Science Lab
ENVR 137	Ecology of Wetlands Lab
ENVR 324	Chemistry of Humic Substances
ENVR 325	Trace Elements: Geochemistry & Environmental Issues
ENVR 326	Advanced Techniques in Mass Spectrometry
ENVR 327	Projects in Mass Spectrometry
ENVR 153	Environmental Management and Policy
ENVR 283 (PLAN 233)	Natural Resource Law and Policy
ENVR 284 (PLAN 234)	Water Resource Planning
ENVR 122	Chemical Equilibria in Natural Waters
ENVR 122L	Aquatic Chemistry Laboratory

ENVR 176	Ground Water Engineering
ENVR 275	Biological Treatment Processes
ENVR 278	Stochastic Hydrology

Students enrolled at NCSU and Duke may register inter-institutionally. Others should apply to UNC-CH's Evening College through the Graduate School, CB #4010, Bynum Hall, UNC-CH 27599-4010.

Duke University

Department of Civil and Environmental Engineering

CE 243	Physicochemical Unit Operations in Water Treatment
CE 245	Pollutant Transport Systems
CE 124	Environmental Engineering
EGR 115	Engineering Systems Optimization

Students at universities participating in the inter-institutional program should see representatives of that program for registration information on CE and EGR courses. Non-degree students and others should contact the continuing education staff in the Duke admissions office (919) 684-6259.

Department of Forestry and Environmental Sciences

FES 234	Watershed Hydrology
FES 236	Water Quality Management
FES 335	Water Quality Modeling

For registration information on FES courses, call Ms Berti Belvin at (919) 684-2135.

East Carolina University

Department of Geology

GEOL 1550	Oceanography
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For course information contact the department at (919) 757-6360. For registration, contact the University College at (919) 757-6488.

North Carolina State University

Department of Forestry

FOR 401	Forest Hydrology and Watershed Management
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Department of Biological and Agricultural Engineering

BAE (SSC) 323	Water Management
BAE 471	Soil and Water Engineering
BAE (CE) 578	Agricultural Waste Management
BAE (SSC) 671	Theory of Drainage-Saturated Flow

Department of Civil Engineering

CE 382	Hydraulics
CE 383	Hydrology and Urban Water Systems
CE 497	Introduction to Environmental Engineering
CE 480	Water Resources Engineering Project
CE 571	Theory of Water and Wastewater Treatment
CE 589	Aquatic Chemistry

CE 584	Groundwater Hydraulics
CE 585	Urban Stormwater Management
CE 589	Water Quality Modeling

Department of Marine, Earth, and Atmospheric Sciences

MEA 481	Principles of Geomorphology
MEA 481L	Principles of Geomorphology Lab
MEA 493F-002	Special Topics: Practical Hydrogeology

NCSU students may sign up for courses listed above through the TRACS system. Degree students at other universities participating in the inter-institutional program may sign up through inter-institutional registration. Non-degree students may sign up through the NCSU Division for Lifelong Education (919) 737-2261 (non-credit) or 737-2265 (credit).

REGISTRATION STILL OPEN FOR SOME WPCC WATER TREATMENT CLASSES

Although many of Western Piedmont Community College's water and wastewater treatment classes began in early March, registrations are still being taken for the following courses:

WWT 111 Water Treatment: Advanced Topics

This course, leading to Grade A certification, will be taught April 16-July 23

Correspondence

WWT 1203 Basic Groundwater Treatment

This course, leading to Grade C-Well certification, begins May 1 and runs through July 17

Basic Atomic Absorption Spectrometry

May 16, 17, 23 and 24

Advanced Atomic Absorption Spectrometry

June 6, 7, 13 and 14

For additional information call the Water and Waste Technology program at WPCC at (704) 438-6197 or 6177.

1991 Coastal Symposium: Economic Development and Environmental Protection in Coastal Carolina

May 16 and 17, 1991 at the Holiday Inn
at Wrightsville Beach, NC

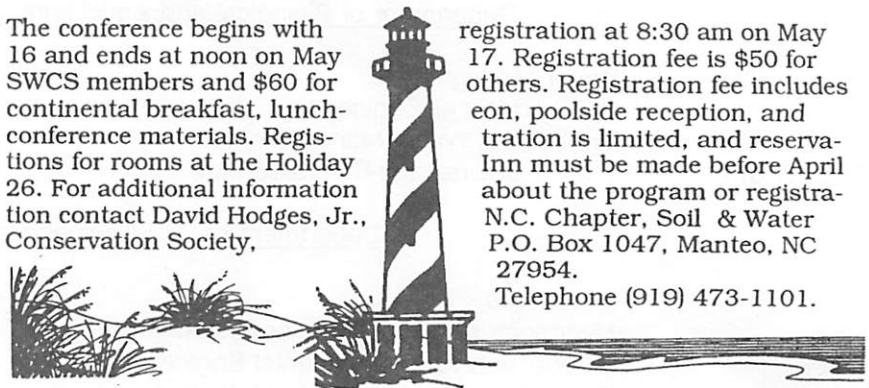
Presented by the North Carolina Chapter
of the Soil and Water Conservation Society

Conference topics include:

- Panel discussion on "Urbanization - Is More Always Better?"
- Edythe McKinney, Asst. Sec. DEHNR providing an "Overview of Coastal Wetland Policies"
- Dr. Orrin Pilkey, Jr. speaking on "Our Beaches Are Building - But Which Way?"
- Panel discussion on "Agriculture, Silviculture, Industry, Wetlands - Is There Room for All?"
- Dr. Stanley Riggs speaking on "What IS the Quality of Our Coastal Waters?"
- Panel discussion on "Water Quality - Let's Make One Thing Perfectly 'Clear'"
- Panel discussion on "Marine Fisheries - Let's All Go Fishing!"

The conference begins with 16 and ends at noon on May SWCS members and \$60 for continental breakfast, lunch-conference materials. Registrations for rooms at the Holiday 26. For additional information contact David Hodges, Jr., Conservation Society,

registration at 8:30 am on May 17. Registration fee is \$50 for others. Registration fee includes eon, poolside reception, and tration is limited, and reservation must be made before April about the program or registration. N.C. Chapter, Soil & Water P.O. Box 1047, Manteo, NC 27954. Telephone (919) 473-1101.



UPCOMING SHORT COURSES, CONFERENCES, AND WORKSHOPS

The Irrigation and Drainage Division of the American Society of Civil Engineers is holding the NATIONAL CONFERENCE IN IRRIGATION AND DRAINAGE ENGINEERING AND GROUND WATER IN THE PACIFIC RIM and LYSIMETRY SYMPOSIUMS July 22-26, 1991, at the Ramada Renaissance Ala Moana Hotel in Honolulu, Hawaii. For further information contact William F. Ritter, Agricultural Engineering Department, University of Delaware, Newark, DE 19717. Telephone: (302) 451-2468; FAX: (302) 292-3651.

The University of Arizona Water Resources Research Center, the USDA-Agricultural Research Service Water Conservation Laboratory, and the Salt River Project will present the FIFTH SYMPOSIUM ON ARTIFICIAL RECHARGE OF GROUNDWATER May 29-31, 1991, at the Westward Look Resort in Tucson, Arizona. For information contact Susanna Eden, AGR Symposium Coordinator, WRRC, University of Arizona, 350 North Campbell Ave., Tucson, AZ 85721. Telephone: (602) 621-7607.

The Conference Board and Arthur D. Little will present CORPORATE ENVIRONMENTAL EXCELLENCE: MEETING THE CHALLENGES, MANAGING THE OPPORTUNITIES May 7-8, 1991, at the Waldorf-Astoria in New York City. For information contact The Conference Board, Inc., P.O. Box 4026 Church Street Station, New York, NY 10261-4026. Telephone: (212) 339-0290. FAX: (212) 980-7014.

NATIONAL DECEMBER CLIMATE AND PRECIPITATION DATA AND LOCAL JANUARY & FEBRUARY WATER RESOURCES DATA

Preliminary data for December 1990 indicate that temperature averaged across the contiguous United States was much below the long-term mean. December 1990 ranked as the eighteenth coldest December on record (the record begins in 1895).

About a third of the contiguous United States was warmer than normal and two-thirds was cooler than normal. Large temperature extremes occurred at both ends of the scale, with about 13 percent of the country much warmer than normal but 41 percent much colder than normal. This resulted in an unusually cold nationwide temperature index.

In general, temperatures were warmer than normal east of the Mississippi River and colder than normal to the west. The West and Northwest had the coldest December on record and the Southwest had the fifth coldest, while the Northeast ranked fifth warmest and the Southeast ranked ninth warmest.

Areally averaged precipitation for the nation was slightly above the long-term mean. Heavy rains during the last week of December combined with melting snow in northern areas caused floods in an area stretching from Alabama to Pennsylvania. However, in most of California and part of Florida, there was continuing drought despite some relief from month-end rains.

In North Carolina, January rainfall was 3.25 inches (0.23 inches below normal) at Asheville, 6.02 inches (2.22

above normal) at Charlotte, 4.53 inches (1.02 above) at Greensboro, and 4.12 inches (0.57 above) at Raleigh. Streamflow for January increased at all but two reporting stations. It remained in the normal range in the Coastal Plain and Blue Ridge provinces and was in the excessive range in the Piedmont province. Groundwater levels increased across the state and remained in the above average range in the Blue Ridge and Piedmont. The level in the Coastal Plain index well remained slightly below average. The level in the Piedmont province index well set a new maximum for January.

February rainfall was 1.66 inches (1.94 below normal) at Asheville, 1.32 inches (2.49 below normal) at Charlotte, 1.15 inches (2.22 below normal) at Greensboro, and 0.69 inches (2.74 below normal) at Raleigh. Streamflow decreased across the state and was in the normal range except for several reporting stations in the eastern Piedmont and central Coastal Plain. The groundwater level increased and remained in the above-average range in the Blue Ridge index well. In the Coastal Plain index well, the level decreased and reached a record low for February. The level in the Piedmont well decreased but remained in the above average range.

U.S. Geological Survey

At the February meeting of the N.C. Environmental Management Commission, Dr. George Everette, director of the Division of Environmental Management, told commissioners that, due to division budget cuts, he will make efforts to cancel Commission meetings when agendas are light and no deadlines are at stake.

NEW PUBLICATIONS RECEIVED BY THE INSTITUTE

Water Supply

National Water Supply Improvement Association 1990 Biennial Conference Proceedings. 1990. Volume 1: Sessions 1-4. No availability information.

National Water Supply Improvement Association 1990 Biennial Conference Proceedings. 1990. Volume 2: Session 5-9 and Poster Presentations. No availability information.

Water Quality

Effects of Tillage and Nitrogen Fertilization on Nitrogen Losses from Soils Used for Corn Production. 1990. Bulletin 167 of the Virginia Water Resources Research Center, VPI, 617 North Main St., Blacksburg, VA 24060-3397. (703/231-5624). \$8.

Analytical Methods

A Helium High Efficiency Microwave Induced Plasma for the Atomic Spectrometric Determination of Metals and Nonmetals. 1991. Bulletin 168 of the Virginia Water Resources Research Center, VPI, 617 North Main St., Blacksburg, VA 24060-3397. (703/231-5624). \$10.

WATER RESOURCES RESEARCH INSTITUTE OF THE UNIVERSITY OF NORTH CAROLINA

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