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Advisory group makes recommendations for N.C. erosion and sediment control program

If recommendations recently agreed upon by an advisory group are followed, North Carolina's erosion and sedimentation control program will get an infusion of resources along with tighter standards, a more aggressive enforcement stance, and an innovative risk-based site assessment program to encourage developers to consider the environmental vulnerability of sites and to provide incentives for more careful treatment of vulnerable sites.

After runoff from construction sites and other disturbed sites in the Research Triangle area turned the troubled Neuse River red and grabbed newspaper headlines in June, Governor James B. Hunt, Jr. set in motion a series of events that led to recommendations for improving the program.

In June, Gov. Hunt instructed officials of the (former) Department of Environment, Health and Natural Resources (DEHNR, now DENR) to work with the N.C. Sedimentation Control Commission (SCC) and staff of Land Quality Section, Division of Land Resources to put together a plan of action to improve the effectiveness of erosion and sedimentation control efforts.

In August, the new Secretary of DENR, Wayne McDevitt, sent a letter to numerous federal, state, and local agencies; private regulated groups; and environmental groups asking for support of the plan.

To implement the plan of action, the SCC activated its Technical Advisory Committee (TAC), under the chairmanship of Commissioner Joseph A. Phillips. The TAC was charged with reviewing provisions of the Sedimentation Pollution Control Act, erosion and sediment control regulations and standards, and recommendations in the plan of action and with making final recommendations for program changes and funding to the SCC, Governor Hunt, and the next session of the General Assembly.

Representatives of numerous agencies, the regulated community, and environmental groups joined the TAC at its first meeting on September 10 and have continued to participate on the three subcommittees that were formed to examine specific aspects of the erosion and sedimentation control program.

The three subcommittees were:

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Director's Forum

Kenneth H. Reckhow, Director, Water Resources Research Institute

The Clean Water Responsibility Act: Stakeholders, nutrient limitations, and calibrated models

One of the interesting features of the newly enacted H. B. 515, the Clean Water Responsibility and Environmentally Sound Policy Act, concerns the role of stakeholders in the approval of water quality models. In brief, if the N.C. Environmental Management Commission decides to impose more stringent nutrient limitations on dischargers to nutrient sensitive waters, these limits must be substantiated by the application of a calibrated water quality model developed with participation of stakeholders.

This new role for stakeholders in model selection is consistent with the recent increased public involvement in environmental assessment and decision making, and it poses a challenge to scientists and engineers who develop and use predictive models.

To be specific, we must resist our tendency to try to make models large, complex, and cumbersome to interpret and apply, in our efforts to develop realistic models. Simulation models for the management of natural systems will never replicate the complexity in nature. In fact, the most effective predictive models for policy analysis and communication with stakeholders are often relatively simple in structure.

Consider the needs for policy analysis as reflected in the answers to a series of questions:

❑ What is the objective in the development of an effective environmental policy model?

The objective is not to replicate nature in the model; the objective is to provide understanding and assessment for decision makers and stakeholders.

❑ What are the questions for which decision makers seek answers?

These questions broadly concern the relation between a management option and an attribute of concern to the public.

For example, will the frequency (probability) of fishkills in the Neuse River Estuary be reduced to a tolerable level by forested buffers and additional nitrogen removal at wastewater treatment plants?

❑ Do we need complex simulation models to answer a question like that?

No. There is too much apparent randomness in nature to mathematically describe all of the mechanisms affecting fish survival in natural waters. Just as the physicist uses probabilistic expressions

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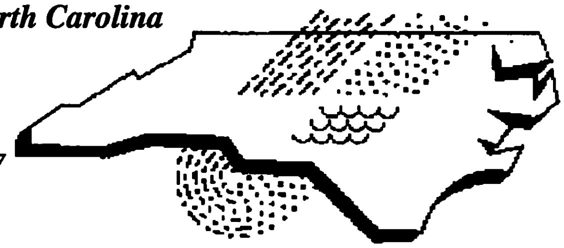

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to capture the aggregate response of molecular motion in statistical mechanics, so too can the water quality modeler summarize small-scale processes with probabilistic expressions that characterize the aggregate response of interest to the decision maker.

❑ What might a useful environmental policy model predict? In other words, how might the output be expressed so that it is useful to a decision maker?

There are a number of ways. For example, "if nitrogen loading to the Neuse River is reduced by 40 percent or more, the chance of a major fishkill in a given year is reduced from 60% to less than 25%."

Or, "if nitrogen loading to the Neuse River is reduced by 40 percent or more and June-August streamflow at Kinston does not drop too low (below 500cfs) for a one-week period, then there is less than a 15% chance of a major fishkill in a given year." Statements like these are supportive of risk-based decision making; they also help to convey the relative importance of human intervention (e.g., nitrogen controls) and natural variability (e.g., streamflow).

❑ What other issues are likely to be of concern to a decision maker?

In simple terms, most decision makers want a reliable, low cost solution. In other words, the decision maker is likely to be concerned about cost and about being wrong (prediction uncertainty).

So, what should be the basis for selection and approval of a predictive model?

Few will argue against the viewpoint that a model should be as simple as possible. However, it is also true that few will argue against the viewpoint that a model should be as accurate as possible, and it is likely that few will argue against the viewpoint that a model should correctly characterize processes. Unfortunately, these desirable features for models are often in conflict with each other.

What is the best model? That question has no single, general answer.

Erosion and sediment control recommendations *continued*

- Standards Subcommittee, chaired by Tom Horstman, Town of Cary erosion and sediment control program.
- Enforcement and Incentives Subcommittee, chaired by Berry Jenkins, Associated General Contractors of N.C.
- Staff and Local Program Subcommittee, chaired by Donnie Brewer, Sedimentation Control Commissioner.

The TAC reconvened on October 29 to receive and integrate the recommendations of the subcommittees. At press time the recommendations had been adopted by the TAC and were being readied for presentation to the N.C. Sedimentation Control Commission (SCC) for adoption on November 19.

Several new, innovative concepts are among the recommendations for program changes:

Self-Monitoring and recordkeeping: Under this program contractors would be required to designate a compliance officer who would be responsible for monitoring installation and maintenance of erosion and sediment control devices and keeping records of inspections. If compliance officers were "certified" under a state program to be developed, the contractor would be provided incentives such as lower fees, less reporting requirements, and less regulatory audit.

Site risk assessment. Under this program a protocol would be developed for assigning a risk factor to land disturbing activity on a specific site, based on assessment of site vulnerability, type of construction planned, and plans for erosion and sediment control. Fees and penalties would be linked to site vulnerability. The program is conceived primarily as a mechanism to encourage developers to consider the vulnerability of a site and the consequences of offsite sedimentation before making a significant investment in the site.

Rapid Response Team. Under this program a special team of engineers and technicians trained in erosion and sediment control would be established to respond to problems, such as a sudden building boom in a community or region that threatened to overwhelm local resources. The team would be cross trained and could also respond to problems and emergencies in the Dam Safety and Mining programs and could help with training.

These concepts will be more fully developed by working groups over the next several months.

For a copy of recommendations for the N.C. Erosion and Sediment Control Program adopted by the SCC, call the Land Quality Section, Division of Land Resources, N.C. Department of Environment and Natural Resources at (919) 733-4574.

Director's Forum *continued*

However, a relatively simple, calibrated model that addresses scientific uncertainties to provide an assessment of risk can be developed to communicate at the interface between scientists, stakeholders, and decision makers.

This model should be simple in concept so that stakeholders and decision makers can easily grasp the nature of the model.

It should be possible to run scenarios quickly so that the general implications of a range of options are rapidly understood.

The model should provide estimates of the probabilities of various outcomes; this gives the stakeholders and decision makers a realistic appraisal of the chances of achieving desirable goals.

We know that scientific assessment and prediction are far from certain. By acknowledging the sometimes-substantial uncertainty in model predictions, we enhance, rather than diminish, the value of predictive modeling by focusing on the ability of the model to estimate risk.

October action of the N.C. Environmental Management Commission

At its regular meeting in October, the N.C. Environmental Management Commission took the following action:

- Elected Charles H. Peterson as vice chair. Peterson, a marine ecologist with the UNC-Chapel Hill Institute of Marine Sciences in Morehead City, is now serving his 3rd term as vice chair of the EMC.
- Approved holding public hearings on amendments to air quality rules regarding volatile organic compound (VOC) reasonably available control technology rules, permit fees applicability rule, and monitoring, recordkeeping, and reporting rules. For information on air quality rulemaking call Tom Allen with the N.C. Division of Air Quality at (919) 733-1489 or visit the Air Quality web site at http://www.ehnr.state.nc.us/EHNR/AQ/.
- Approved permanent Risk-Based Corrective Action (RBCA, pronounced Rebecca) rules for assessment and cleanup of contamination from underground petroleum storage tanks and rule changes that establish conditions under which "reasonable and necessary" reimbursements will be made from the state's Commercial and Noncommercial Petroleum Underground Storage Tank Trust Funds. According to staff, the rulemaking is intended to assure that state trust fund reimbursements are continued for sites that pose the greatest risk and to reduce the demand on trust funds for those sites that are not a threat to public health or the environment.
- Approved holding public hearings on reclassifying Harris Lake in Wake County from Class C to Class WS-V, Hyco Lake in Person and Caswell counties from Class B to Class WS-V and B, and Mayo Reservoir in Person County from Class C to Class WS-V. WS-V is a classification for (among other things) water sources for industries that supply drinking water to employees. These lakes are cooling and process water sources for CP&L facilities and are also used for employee drinking water. WS-V carries no categorical restrictions on watershed development or wastewater discharges. For information on these reclassifications contact Liz Kovasckitz with the Division of Water Quality at (919) 733-5083, Ext 572.
- Approved holding public hearings on reclassifying Armstrong Creek in McDowell County from Class WS-II Trout to Class C Trout, High Quality Waters and on reclassifying Lookout Shoals Lake in Alexander, Catawba, and Iredell counties from Class C to Class WS-IV and WS-IV CA. Contact Liz Kovasckitz (919) 733-5083, Ext 572.
- Approved, after much discussion, continued implementation of the Tar-Pamlico Nutrient Reduction Plan for Nonpoint Sources of Pollution. The acclaimed Tar-Pamlico Nutrient Sensitive Waters Strategy was adopted by the EMC in two phases. Phase I, covering 1990-94, established a nutrient reduction goal for point sources to the Pamlico River estuary and established a point source/nonpoint source nutrient trading program considered to be a "cutting edge" approach to reducing nutrient pollution. Phase II, covering 1995-2004, established a nitrogen loading reduction goal of 30% for both point and nonpoint sources and called for development of a specific plan for reducing nonpoint nitrogen loading. The plan that resulted, the Tar-Pamlico River Nutrient Management Plan for Nonpoint Sources of Pollution, established an action plan and an accountability process for nine nonpoint source categories and set a five-year timeframe for achieving the 30% reduction target. The plan also required annual reports to the EMC on implementation efforts. The report presented to the EMC in October was the first annual report on implementation of the nonpoint source control strategy, and it was not entirely well received. Commissioners voiced concerns that claimed nutrient reductions from nonpoint sources were merely "paper exercises" and that better field monitoring is needed to document reductions; that atmospheric contributions of nitrogen have not been "tied down" and that the plan could therefore be neglecting the dominant source of nitrogen to the system; that animal operations are not being required to share in the responsibility for reductions from the agricultural sector; and that the rate of data collection on contributions from and potential controls of urban stormwater and atmospheric deposition has been slow. According to the report, lack of staff and financial resources is preventing timely data collection. While the commission approved continued implementation of the plan, they directed staff to explore integration of "Neuse-type" strategies and to bring the plan back no later than spring 1998 with an analysis of whether some strategies adopted for the Neuse could be useful in the Tar-Pamlico plan.

Water Quality Committee

The Water Quality Committee of the EMC is now approving water supply watershed protection ordinances. In October the committee approved ordinances for the Towns of Hoffman and Selma, the City of Creedmoor, and the counties of Haywood, Mecklenburg, and Wilson.

The Water Quality Committee also reviewed draft rules for the wetlands restoration program and options for a rulemaking schedule for the wetlands restoration program. The proposed rules establish a schedule for development of and the required components of basinwide wetlands restoration plans as well as criteria for acceptance of property proposed for donation as part of a basinwide wetlands restoration program. It is expected that draft rules for the wetlands restoration program will be presented to the EMC in December and scheduled for public hearing in February 1998.

For information on the wetlands restoration program, contact Ron Ferrell with the Division of Water Quality at (919) 733-5083 ext 358.

EMC tables request by Division of Water Quality for statement on nitrogen limits in Clean Water Responsibility Act

At a hastily scheduled business meeting on November 13, the N.C. Environmental Management Commission (EMC) tabled a request from the N.C. Division of Water Quality (DWQ) for an "interpretative statement" on provisions of recent legislation related to nitrogen limits in wastewater discharges to "nutrient sensitive waters." DWQ had asked the EMC to say whether a provision of the Clean Water Responsibility Act sets a default limitation or a cap for nitrogen in wastewater discharges.

By unanimous vote, the EMC delayed the issue so that hearing officers for the proposed Neuse River cleanup rules can consider the disputed provision of the Clean Water Responsibility Act as they finalize a set of rules for EMC approval in December.

The question regarding requirements of the Clean Water Responsibility Act, (H.B. 515 passed by the last session of the General Assembly) arose in October. At its October meeting, the EMC had been scheduled to approve a schedule for implementing nitrogen and phosphorous limits for wastewater treatment plant discharges into waters classified as nutrient sensitive in accordance with the Clean Water Responsibility Act. The schedule proposed by DWQ included a requirement that affected facilities in the lower Neuse River Basin meet an annual mass load limit for nitrogen of 3.5 mg/l by 2003. The nitrogen limit was based on expected rules in the Neuse River Nutrient Sensitive Waters Management Strategy.

Regulated interests (the Lower Neuse Basin Association, N.C. League of Municipalities, Manufacturers and Chemical Industry Council, N.C. Citizens for Business and Industry, and N.C. Home Builders Association) objected to the proposed nitrogen limit for dischargers in the lower Neuse. They asserted that the Clean Water Responsibility Act sets 5.5 mg/l as the limit on discharges into nutrient sensitive waters.

In an effort to resolve the disagreement over nitrogen limits in wastewater discharges, DWQ first filed a request for a "declaratory ruling"—a formal procedure under the State's Administrative Procedure Act by which agencies may take a legal stand on how they think a statute applies under a specific set of circumstances.

However, according to Frank Crawley, EMC counsel, the Attorney General's office advised DWQ to change its request to one for an "interpretative statement." Unlike a declaratory ruling, an interpretative statement is not subject to judicial review and does not involve questions of "standing." In addition, a request for an interpretative statement can be delayed with no legal consequences, while failure to answer a request for a declaratory ruling within 60 days is considered a denial of the request and the merits of the request. Although the legal nature of the request had been changed, the EMC heard arguments from attorneys for both sides much as they would have for a formal declaratory ruling.

DWQ was joined in its request by the Neuse River Foundation, the N.C. Wildlife Federation, the N.C. Coastal Federation, the Pamlico-Tar River Foundation, and the N.C. Chapter of the Sierra Club. Attorneys for DWQ and the environmental groups argued that the General Assembly did not intend to prohibit the EMC from setting limits lower than 5.5 mg/l on nitrogen discharges, citing earlier legislation that mandates the EMC to adopt rules to accomplish a 30% reduction in nitrogen loading to the Neuse and arguing that a 30% reduction cannot be reached with a 5.5 mg/l limit on wastewater discharges.

Lawyers for the regulated groups responded that the issue was being misstated and said that regulated groups do not dispute the EMC's authority to set lower limits for wastewater discharges but contend that in order to set limits below 5.5 mg/l, the EMC must follow a process set out in the Clean Water Responsibility Act. That process is to develop—with stakeholder participation—a "calibrated nutrient response model" that substantiates the need for lower limits.

Ellis Hankins, Executive Director of the N.C. League of Municipalities, said that in working with legislators on the Clean Water Responsibility Act, the League did not ask for or want the bill to include a specific limit on nitrogen. "We were interested in a process," said Hankins, referring to the requirement for developing and applying a nutrient response model. He insisted that municipalities are not trying to dodge their responsibilities but are not willing to pick up the share of nitrogen reduction for large pork producers and other agricultural operations.

Following presentations, EMC Chairman David Moreau said that his calculations show that a 5.5 mg/l discharge limit on permitted (as opposed to actual) wastewater flows in the lower Neuse would lead to an increase in nitrogen loading to the Neuse.

"What the bill addresses is annual mass load, which is more than just concentration—it's concentration and flow, presumably permitted flow, but no one has addressed the question of flow.

"I don't believe that the Legislature intended to require the EMC to increase nitrogen loading to the Neuse, which is where this argument will take us," said Moreau.

Moreau also said that setting a 5.5 mg/l standard for permitted wastewater flows in the Neuse would create a "highly inequitable situation among municipalities" in the basin, with some being able to increase loading and others being forced to meet a lower limit or being denied discharge increases. (Some dischargers in the lower Neuse Basin have permission to discharge more wastewater than they are currently discharging. This excess permitted flow amounts to a reserve for growth.)

Moreau expressed his confidence that EMC Neuse River hearing officers will be able to develop final rules that accomplish a 30 percent reduction in nitrogen loading and do it in a "fair and equitable" way. He said if there is a conflict with provisions of the Clean Water Responsibility Act when the final rules are presented, the General Assembly can resolve the issue (presumably through its rules review process).

Application deadline set for new Drinking Water State Revolving Fund

The 1996 Safe Drinking Water Act Amendments created a Drinking Water State Revolving Fund. About $46 million will be available in 1998 to local government water systems through the Department of Environment and Natural Resources, Division of Environmental Health, Public Water Supply Section (PWSS).

EPA requires that priority funding, to the maximum extent possible, is given to projects that (1) address the most serious risk to public health; (2) are necessary to ensure compliance with the requirements of Title XIV of the State Drinking Water Act; and (3) assist systems most in need, on a per household basis, according to State "affordability criteria."

The PWSS is currently developing the priority criteria to support the federal priorities. The criteria and application forms should be available on December 12, 1997. The deadline for submitting applications is February 13, 1998.

In order to meet the application deadline, water systems with eligible projects (below) are advised to begin now preparation of the Preliminary Engineering Report as required by the existing SRF program in T15A NCAC 1J Rule .0700. Any additional criteria forthcoming in December can be incorporated at that time.

For more information, contact Sid Harrell with the Public Water Supply Section at (919) 715-3216.

Eligible project types include the following:

- develop, rehabilitate, or replace sources, excluding dams and reservoirs;
- install or upgrade treatment to primary or secondary drinking water standards;
- install or upgrade storage (including finished water reservoirs) to prevent entry of microbiological contamination;
- install or replace transmission or distribution pipe to prevent entry of microbiological contamination or to improve water pressure to safe levels;
- consolidate water supplies when other public water supplies are contaminated or are unable to meet capacity development requirements;
- purchase capacity in other system when deemed most cost effective to meet public health or compliance requirements; and
- restructuring/consolidation of systems when other public water supplies are unable to meet capacity requirements.

Ineligible projects include the following:

- in-stream dams, or rehabilitation of dams;
- reservoirs, except off-stream, presettling, or pretreatment reservoirs that are part of the treatment process;
- repair, maintenance, or operation expenses including monitoring/laboratory costs;
- projects needed mainly for fire protection;
- projects for systems that lack adequate technical, managerial and financial capability unless assistance will ensure compliance;
- projects for systems in significant noncompliance, unless funding will ensure compliance; and
- projects primarily intended to serve future growth.

French Broad River to be nominated for American Heritage Rivers initiative

In his 1997 State of the Union address, President Clinton announced the American Heritage Rivers initiative to help communities revitalize and protect rivers and promote river-related economic development. People in Western North Carolina and Eastern Tennessee are hoping that in his 1998 State of the Union address, the president will announce selection of the French Broad River for this new program. The French Broad arises in Transylvania County, NC, and flows through Henderson, Buncombe, and Madison counties into Coche County, Tennessee, then through four other Tennessee counties.

RiverLink, a nonprofit organization in Asheville, is spearheading nomination of the French Broad for the American Heritage Rivers program, and Land-of-Sky Regional Council is helping. According to Karen Cragnolin, Executive Director of RiverLink, both N.C. Governor James B. Hunt, Jr. and Tennessee Governor Don Sundquist have endorsed the nomination. The nomination—which includes plans for economic development and river corridor projects— went through public hearings in Asheville and Tennessee in October and will be submitted Dec 10.

Designation of the French Broad as an American Heritage River would involve no new regulations but would give French Broad supporters priority access to federal grants and technical assistance from a host of federal agencies as well as a dedicated federal employee – to be called a River Navigator – to guide them through the bureaucratic maze to grants and services.

According to Cragnolin, the French Broad nomination application includes plans for a greenway beginning at the headwaters in Transylvania County and following the entire river corridor into Tennessee. Within the greenway, historical, botanical, musical and craft markers would guide hikers to points of local interest. The nomination also includes proposals for economic development initiatives for Madison County, NC, and Coche County, TN, and establishment of passenger train service from Asheville through the French Broad River Gorge into Tennessee.

(In its most recent session, the N.C. General Assembly approved funding for the Transit 2001 Commission recommendations, which include establishment of passenger train service from Raleigh to Asheville. According to Patrick Simmons, Director of the N.C. DOT's Rail Division, this service should become available in two to three years. Simmons also said that Walt Disney and the Florida Fun Train have mentioned the possibility of a stop in the Asheville area.).

Neuse River Basin Regional Council asks for aquifer study and fish kill cleanup

In October, the Neuse River Basin Regional Council passed resolutions calling on Governor James B. Hunt, Jr. and state agencies to conduct a study of groundwater withdrawals and to initiate a program to clean up major fishkills. A third resolution calling for a study of new and innovative sewage treatment facilities for both human and animal waste was tabled.

In the resolution titled "Rate of Withdrawal of Aquifer Waters in N.C." the council asks that the governor direct a qualified body to study the rate at which potable waters of aquifers in North Carolina are being depleted, with special reference to the Castle Hayne, Pee Dee, Black Creek, and Upper Cape Fear aquifers. The resolution also asks that if findings indicate the need, regulatory measures be instituted to prevent salt water intrusion into aquifers.

In the second resolution titled "Action to Properly Dispose of Large Fish Kills," the council states that thousands of fish that once were caught for fertilizer die in coastal waterways each year and are left to decay, contributing tons of nitrogen pollution in the river. The resolution asks that the State "address its responsibility for the clean up of its navigable waterways, such as by contracting with fishermen to pick up fish kills for disposal in a safe and environmentally sound manner."

The Neuse River Basin Regional Council was the first of five basin councils established by gubernatorial executive order as part of the Albemarle-Pamlico Estuarine Study Comprehensive Conservation and Management Plan. The other basin regional councils just recently formed are the Roanoke, Chowan, Tar-Pamlico, and Pasquotank. The purpose of the regional councils is to provide public input and coordinate agency resources for development of basin resource management plans in the Albemarle-Pamlico region. (For information about any of these regional councils and their upcoming meetings, call Guy Stefanski with the N.C. Division of Water Quality at 919/733-5083, Ext 585.)

The Chairman of the Neuse River Basin Regional Council is Bill Ritchie, Mayor of River Bend in Craven County. Vice Chairman is Dr. John D. Costlow, Duke University Professor Emeritus.

Changes to N.C. well program will help protect private drinking water supplies

According to a recent report by the U.S. General Accounting Office,* in six states the agency studied (including North Carolina), coliform bacteria contamination was found to be common in private drinking water wells.

Bacterial contamination of wells, according to the GAO report, can usually be traced to improper siting and construction of wells, and the way to avoid such problems is to make sure well drillers are qualified and follow well construction rules. At the time the GAO prepared its report (June 1997), North Carolina was the only state studied that did not require licensing of well drillers. Now, that is about to change.

In the last session of the General Assembly, lawmakers passed H.B. 251 "Well Contractors Certification." The act requires that well drillers be certified, creates the Well Contractors Certification Commission to establish requirements for certification, and makes changes in the N.C. Well Construction Act to address problems that had been brought to the attention of the N.C. Environmental Management Commission and the General Assembly's Environmental Review Commission. The law was supported by the N.C. Groundwater Association, the well contractors trade organization.

According to Bob Cheek, Supervisor of Permits and Compliance with the N.C. Groundwater Section, the Well Contractors Certification Commission is to have rules—including requirements for education, experience and knowledge—in place for a certification program by Janu-

continued

Well contractors certification *continued*

ary 1, 1999. Those who wish to perform well contractor activity must submit an application and fee before January 1, 1999. Certification must be renewed annually and continuing education will be required. Certificates can be revoked for several reasons including (1) willful violation of well construction laws or rules and (2) violation of certification commission rules. Until the certification program is implemented, well drillers and well drilling firms will continue to be required to register with the Department of Environment and Natural Resources annually.

According to Cheek, development of the certification program rules will begin when members of the Well Contractors Certification Commission have been appointed as provided by the law by the Speaker of the House, the President of the Senate and the Governor.

Cheek also said that rule changes to further strengthen the state well construction program are under development and will be discussed with the Environmental Management Commission's Groundwater Committee within the next several months.

* *Drinking Water: Information on the Quality of Water Found at Community Water Systems and Private Wells* GAO/RCED-97-123 June 1997.

According to *Environment* magazine (Sept 1997) "On average, Americans drive each of their 200 million motor vehicles 11,000 miles per year. According to a recent nationwide personal Transportation Study conducted by the U.S. Department of Transportation, only 22 percent of those miles are taken up commuting to work and only 8 percent for vacation travel. Errands, recreation, and general chauffeur duties account for the remaining 70 percent."

Registration required for practice of landscape architecture

As of October 1, 1997, no person may use the designation "landscape architect" or practice landscape architecture in North Carolina unless that person is registered as a landscape architect.

This law was enacted in the last session of the N.C. General Assembly as House Bill 1110, An Act Amending the Statutes Related to Landscape Architects. Before this bill was passed, only people registered as landscape architects were allowed to use the title. Now, is it a class 2 misdemeanor for any person not registered as a landscape architect to practice landscape architecture, defined as:

> *The preparation of plans and specifications and supervising the execution of projects involving the arranging of land and the elements used thereon for public and private use and enjoyment, embracing drainage, soil conservation, grading and planting plans and erosion control, in accordance with the accepted professional standards of public health, safety and welfare.*

In addition, no firm, partnership or corporation shall engage in landscape architecture unless it is registered with the N.C. Board of Landscape Architecture and performs its work under the direct supervision of a registered individual.

HB 1110 specifies that the act is not intended to restrict the practice of engineers or land surveyors nor to authorize landscape architects to engage in engineering or land surveying. Neither is the act intended to restrict anyone from engaging in the occupation of grading lands or to restrict planting, maintaining, or marketing of plants or plant materials or drafting of plans or specifications related to the location of plants on a site.

Anyone with questions regarding the provisions of House Bill 1110 or requirements for registration as a landscape architect should contact Robert Upton, Board Administrator and Secretary of the N.C. Board of Landscape Architects, at (919) 850-9088.

Earth/ environmental science required for high school graduation

To graduate from high school in North Carolina, students must now pass an earth/environmental science course.

The N.C. State Board of Education voted unanimously for the requirement in August 1996, a public hearing was held in July 1997, and the requirement was scheduled to become effective November 1, 1997.

Formerly, one of the three units of science required for graduation could be an elective. Now, every student must pass courses in biological science, physical science, and earth/environmental science.

On October 28, U.S. Senator Tom Harkin (D-IA), ranking member on the Senate Agriculture committee, introduced S 1323, The Animal Agriculture Reform Act. The bill would set new national environmental standards for the management of animal waste by large livestock and poultry feeding operations. Under the proposed program, each operation must submit an individualized waste management plan for approval by USDA.

Vice President Gore asks for federal clean water action plan

On October 18 in observance of the 25th anniversary of the Clean Water Act , Vice President Al Gore released a directive to the U.S. EPA and U.S. Department of Agriculture asking for development of a clean water action plan.

The vice president's memo directs EPA and USDA to work in consultation with all other affected agencies to "develop a comprehensive Action Plan that . . . addresses three major goals: enhanced protection from public health threats posed by water pollution; more effective control of polluted runoff; and promotion of water quality protection on a watershed basis."

The directive says that the Action Plan is to be informed by the following principles:

- Agencies will develop cooperative approaches that promote coordination and reduce duplication among Federal, State, and local agencies and Tribal governments wherever possible.
- Agencies will ensure participation of community groups and the public to the maximum extent practicable. Such participation will include community and public access to information, to protect the public's right-to-know about water quality issues.
- Agencies will emphasize innovative approaches to pollution control, including, where appropriate, incentives, market-based mechanisms, and cooperative partnerships with landowners and other private parties.

EPA is to focus on

- reducing the need for fish consumption advisories;
- identifying major sources of nitrogen and phosphorous and actions to address the sources;
- expediting new standards for targeted problems of polluted runoff, including a new strategy for animal feeding operations and urban stormwater.

USDA is to promote awareness of the Conservation Reserve Enhancement Program and help states to develop agreements with farmers that will address critical water quality, soil erosion, and fish and wildlife habitat needs, including habitat needed for threatened and endangered species. NOAA and EPA are to have in place all 29 state Coastal Nonpoint Pollution Control Programs by June 30, 1998. The action plan is also to include a strategy for achieving a net gain of as many as 100,000 acres of wetlands by the year 2005; a strategy for ensuring that agricultural producers in 1000 critical rural watersheds have the technical and financial assistance they need to abate polluted runoff and comply with standards; and plans for better management of federal lands for water quality purposes.

The Action Plan is to have input from state and local agencies, Tribal governments, Members of Congress and the public and is to be submitted within 120 days following review by the Council on Environmental Quality and the Office of Management and Budget.

According to a recent report by the U.S. General Accounting Office (GAO/NSLAD-97-98), the National Aeronautics and Space Administration (NASA) has identified 613 sites at 22 of its field facilities in 10 states where hazardous waste contamination may need to be cleaned up. On EPA's National Priorities List of highly polluted sites are NASA's Dryden Flight Research Center in California, the Langley Research Center in Virginia, and the George C. Marshall Space Flight Center in Alabama. Cleanup could cost $1.4 billion.

Digest

Chemical accident risk communication. According to the U.S. General Accounting Office, national efforts to protect the public from chemical accidents by planning and prevention are not as effective as they could be because of a lack of involvement of community residents and some sectors of the industry. CHEMICAL ACCIDENT SAFETY: EPA's Responsibilities for Preparedness, Response, and Prevention (GAO/PEMD-96-3) released in June 1996 says that data suggest the total number of chemical accidents has been increasing. Over the period 1987 to 1995, fixed-facility accident reports rose steadily from 26,662 to 39,817, and chemical accidents for highway, railway, and other transportation modes rose steadily from about 5,000 to 14,000 accidents. The report says that while chemical accidents have maintained relatively low actual impact, the potential for harm is fairly high. It says that EPA, which has a central role in implementing the nation's chemical accident safety policy, is doing its job of providing response training and accident prevention information. However, the report says, Local Emergency Planning Committees often do not actively carry out their responsibilities to inform community residents about potential accident risks and that often local residents and industry officials remain unconvinced about the possibility of occurrence of a chemical accident. GAO recommends that EPA improve efforts to communicate to industry, state and local government and the public the need to use "lessons learned" from previous chemical accidents to facilitate prevention.

The value of nature. According to an international group of ecologists and economists, services of ecological systems and the natural capital stocks that produce them are not fully "captured" in commercial markets and are, therefore, often given too little weight in policy decision. In an article published in the May 15, 1997, issue of *Nature*, the group says, "This neglect may ultimately compromise the sustainability of humans in the biosphere." To correct this neglect, the group set out to quantify in terms comparable with economic services and manufactured capital, the value of 17 ecosystem services (gas regulation, climate regulation, disturbance regulation, water regulation, water supply, erosion control and sediment retention, soil formation, nutrient cycling, waste treatment, pollination, biological control, refugia, food production, raw materials, genetic resources, recreation, cultural). Using published studies and a few original calculations, they estimated the current economic value for the entire biosphere to be in the range of $16 - $54 trillion per year, with an average of $33 trillion per year and compared that to the global gross national product of about $18 trillion per year. Their calculations show the most valuable service to be nutrient cycling, focusing on nitrogen and phosphorous. Estuaries, open ocean, and coastal ocean, they say, are each responsible for about one-third of the global nutrient cycling, serving as sinks for nutrients in all the world's water flowing from rivers. If these systems were not present, they reason, we would have to replace their nutrient cycling service, and it would cost us about $17 trillion per year. The writers note that since the economies of the Earth would grind to a halt without the services of ecological life-support systems, the value of these systems can be considered infinite and that their exercise is meant primarily to make the value of ecosystems more apparent and to stimulate additional research and debate. The full article can be read on the web at http://www.nature.com.

Chloroform and colon cancer. A study reported recently in the *American Journal of Public Health* found new evidence of an association between chlorinated drinking water and colon cancer. For 28,237 Iowa women who reported their drinking water source, researchers used statewide water quality data to determine exposure to chlorination by-products. In comparison with women who used municipal groundwater sources, women with municipal surface water sources were at an increased risk of colon cancer and all cancers combined. A clear dose-response relation was observed between four categories of increasing chloroform levels in finished drinking water and the risk of colon cancer and all cancers combined. No consistent association with either water source or chloroform concentration was observed for other cancer sites. *Am J Public Health* Vol 87 No 7 July 1997. Abstract at http://www.apha.org/news/publications/journal/abs2july.html

Chesapeake Bay forested riparian buffer goal. Chesapeake Bay basin jurisdictions have agreed upon a goal of reforesting 2,010 miles of bay tributaries by 2010. Each jurisdiction is to develop a riparian buffer implementation plan by June 1998 to spell out how much each will restore and how it will meet its goal. The Riparian Forest Buffer Panel of the Chesapeake Bay Commission, created in 1994, has recommended that the 2010 goal be met by increasing private sector involvement through incentives like tax credits, tree planting credits, cost-sharing, grants and conservation easements and by supporting research, monitoring, technology transfer, and education. The U.S. Forest Service liaison to the Chesapeake Bay Program Office has estimated that increasing the riparian forest buffer may prevent half a million pounds of excess nitrogen from entering the bay each year. Other public agencies and private groups have restoration projects that dovetail with the reforestation goal. – *Nonpoint Source News-Notes* April/May 1997

Small System Compliance Technology List for Surface Water Treatment Rule. In 1989, EPA promulgated the Surface Water Treatment Rule, which requires public drinking water systems using surface water or groundwater under the direct influence of surface water to implement treatment technologies (filtering and/or disinfecting source water) to earn credits for accomplishing specific reductions of certain microbiological contaminants. The 1996 Safe Drinking Water Act Amendments required EPA to publish a list of technologies that three categories of small drinking water systems (25-500 persons, 501-3,300 persons, and 3,301-10,000 persons) can use to comply with requirements of the Surface Water Treatment Rule. In August 1997, EPA published the list, *Small System Compliance Technology List for the Surface Water Treatment Rule* (EPA 815-R-97-002). The document can be downloaded in PDF or WordPerfect format at http://www.epa.gov/ogwdw/swtrlist.html.

ASTM standards for septic systems. The American Society for Testing and Materials (ASTM) has published standards for installing septic systems that protect ground water supplies. The guides include: *Standard Practice for Surface Site-Characterization for On-Site Septic Systems; Standard Practice for Sub-Surface Site Characterization of Test Pits for On-Site Septic Systems*; and *Standard Practice for Preliminary Sizing and Delineation of Soil Absorption Fields.* To order copies of the voluntary standards, contact Carla Falco, ASTM (610) 832-9605 or download them in PDF format from the ASTM website: http://www.astm.org/.

Final EQIP rule. The 1996 Farm Bill (Federal Agriculture Improvement and Reform Act of 1996) revised the conservation programs administered by the USDA Natural Resources Conservation Service, establishing the Environmental Quality Incentives Program (EQIP) to provide assistance to farmers and ranchers who face serious threats to soil, water and related natural resources on their land. In Oct 1996, the Commodity Credit Corporation (CCC) of the U.S. Department of Agriculture issued a proposed rule for administration of EQIP, including use of funding authorized at $200 million a year. Finalization of the rule was delayed by disagreement over several issues, primarily definition of "large confined livestock operation." The 1996 Farm Bill had prohibited EQIP cost-share assistance for constructing waste treatment or storage facilities for such operations but did not define them. Representatives of animal producers had argued that EQIP eligibility should not be based on size of operation but on the potential for maximizing environmental benefits per dollar by reducing and preventing pollution. In May, USDA finalized the rule for EQIP, defining a "large confined livestock operation" as one with more than 1,000 animal units "Animal unit" means 1,000 pounds of liveweight of any given livestock species; 1,000 animal units equals 2,500 55-lb swine) The rule also provides that the NRCS state conservationist, using criteria recommended by the state's technical committee, can modify this standard to meet a state's conservation needs, with approval from the Chief of NRCS.

Call of nature. When the National Audubon Society had to build a comprehensive sewage system to accommodate the growing number of visitors to its Corkscrew Swamp Sanctuary in southwest Florida, it turned to Living Technologies of Burlington, Vermont, to create an organic solution to the problem. The company installed a Living Machine, a treatment facility that mimics in an accelerated fashion the natural purification system found in estuaries, marshes and ponds. Developed by biologist Dr. John Todd, the system filters sewage through a series of fiberglass tanks filled with bacteria, green plants, snails, shrimp, insects and fish then through two artificial marshes filled with crushed limestone and planted with wetland plant species. After the effluent is sterilized, it recycles back to rest rooms where it is used for flushing. Read about this technology on the Living Technologies website at http://www.livingmachines.com/default.htm. To learn about similar technology using constructed wetlands applied in the Research Triangle area of North Carolina by NCSU researcher Hal House, visit website http://www.waterrecycling.com/.

Status of shellfish waters. NOAA's Office of Ocean Resources Conservation and Assessment (ORCA) has just published the *1995 National Shellfish Register of Classified Growing Waters*. The publication characterizes the status of more than 4,200 shellfish-growing waters in 21 coastal states, reflecting an assessment of nearly 25 million acres of estuarine and non-estuarine waters. Information collected through the states' Shellfish Sanitation Programs included: name of growing area, location, spatial extent, classification and relative abundance, and in cases where there is a harvest limited classification, the basis for the classification, the pollution sources contributing to the classification and their relative importance, a rating of the possibility of upgrading the classification, and any ongoing restoration efforts at the site. Nationally, 6.7 million acres of shellfish-growing waters are harvest limited. For 72 percent (4.9 million acres) of these waters, the limitation was attributed to water quality. The top five pollution sources reported as contributing to harvest limitations were urban runoff (40 percent), upstream sources (39 percent), wildlife (38 percent), individual wastewater treatment systems (32 percent, and wastewater treatment plants (24 percent). The report includes tables showing classification trends by state and tables for each state giving information on each "growing water," including acres prohibited or restricted and pollution sources. Classification trends by state 1985-95 show an increase in acres approved for harvest in North Carolina along with an increase in total acres classified over the period and a decrease between 1990 and 1995 in acres prohibited. The report also shows that in addition to pollution sources listed above, feedlot and agricultural runoff contribute significantly to shellfish harvest limitation in North Carolina. The report (399 pages--a very large file that takes more than 10 minutes to download) can be downloaded in PDF format from website http://www-orca.nos.noaa.gov/projects/95register.

LUST. The U.S. EPA anticipates that over the next year or so 100,000 additional leaks from petroleum underground storage tanks (USTs) will be discovered as owners and operators replace or upgrade tanks to meet new technical standards. EPA says that when these new leaks are added to the 65,000 confirmed releases that have not yet been cleaned up, the extent of UST leaks to be addressed by states *will exceed* the cleanups completed since the beginning of the UST program in 1984.

WRRI reports available

Researchers say objectives of forested filter zones should determine siting and management

In the southeast United States, agricultural nonpoint source pollution affects more than 50 percent of the surface waters and contributes more than 1.2 million metric tons of nitrogen to these waters annually. One means of reducing nutrient loading in surface waters from nonpoint source pollution is using vegetated filter zones. Much of the recent research on filter zones has examined output vs. input of different nitrogen species with the objectives of determining the effectiveness of vegetated filter zones in reducing nonpoint source pollution and developing design criteria for effective filter zones. Few studies have focused on the mechanisms of nitrogen removal from surface runoff. Understanding the relative importance of different nitrogen attenuation mechanisms and the ultimate fates of different nitrogen forms entering vegetated filter zones is important for evaluating the long-term effectiveness of these zones and developing management strategies to maximize their effectiveness.

In this project, researchers set out to evaluate the effectiveness of two experimental forested filter zones (FFZs) in the Piedmont region of North Carolina, determine the fate of nitrogen leaving an agricultural area in both surface and subsurface runoff, and determine the impact of short-term (1-2 years) increase in nitrogen loading on the soil denitrifier population. They examined surface and subsurface processes that accounted for nitrogen pollutant removal in FFZs on two small watersheds on the Oxford Tobacco Research Station in north-central North Carolina.

The researchers studied surface soil processes by constructing nitrogen budgets for the surface 30 cm of two FFZs and studied subsurface processes by measuring changes in groundwater chemistry along transects from the field edges to the forest edge and below the FFZ. They also introduced nitrate and a conservative tracer, bromide, into the soil profile at different depths and measured attenuation by intercepting the solute plume at different distances from the point of introduction. In addition, they performed a laboratory incubation experiment to determine the effect of 1 to 2 years' exposure of FFZ soils to nutrient laden runoff on the denitrifier microbial population at different depths in the soil profile.

The two filter zone ecosystems presented contrasting hydrologies and contrasting efficiencies at removing nitrogen pollutants. The soils in FFZ 1 were moderately well drained but had a perched water table throughout the winter and into the early spring. The soils in FFZ 2 were well drained, and, although a perched water table developed in the winter, it did not result in the saturation of the soil surface and seepage.

Nitrogen loading increased as water passed through FFZ 1 but generally decreased in FFZ 2. The FFZs were ineffective during the winter and spring when water-filled pore space exceeded 35% in FFZ 1 and 25% in FFZ 2 and infiltration was low. Infiltration was the key factor for retention of dissolved species, and sedimentation was the key for particulate bound nitrogen.

In subsurface runoff, the researchers measured a marked decrease in nitrate nitrogen along the piezometric gradient from 8 to 10 mg/l at the field edges to near 0 mg/l in the forest. Chlorine concentrations remained between 8 to 10 mg/l in areas of disappearance, suggesting that dilution was not a major factor in nitrate reductions.

Tracer studies on a third site indicated that nitrate attenuation in the grass field border was low compared to the forest. Nitrate loss in both areas was almost exclusively through denitrification. Plant uptake played no detectable part in nitrate-nitrogen concentration reductions.

A laboratory experiment indicated that short term exposure of forest soils to nutrient laden agricultural runoff enhanced their denitrification capacity. It was not clear whether this was a response to increased nitrate-nitrogen in the soil profile, wetter conditions caused by the runoff, or both. In soils with enhanced denitrification capacity, carbon availability became the limiting factor, whereas the denitrifier population was the limiting factor in non-exposed soils.

The researchers say that with respect to removal of nitrogen from surface runoff, not all FFZs are created equal. For dissolved pollutants, such as nitrate and dissolved organic nitrogen, infiltration capacity of the soil is the important factor governing the effectiveness of FFZs. For particulate or particulate-bound pollutants such as particulate organic nitrogen or adsorbed ammonium, sedimentation is the primary removal mechanism, and characteristics of the FFZ that promote sedimentation (such as surface rugosity and vegetation density) determine efficiency. They say their results underline the importance of these mechanisms and show how failure to take these factors into account can lead to poor filter zone performance.

They recommend that FFZs that are designed for the removal of nitrogen species from surface runoff should not be located on sites where infiltration capacity is inadequate for the contributing field area. On sites with adequate infiltration, removal of dissolved nitrogen species, particularly nitrate, from runoff is enhanced. Sites with inadequate infiltration may become net contributors to nitrate in runoff, due to increased contact of the runoff water with the soil

They also say that their results suggest that the benefits to nutrient uptake from harvesting of trees and other vegetation in FFZs (suggested to maintain an earlier successional stage to maximize nutrient uptake) may be offset by reductions in filtration on the site due to soil compaction during the harvesting operations. Vegetation management decisions, they say, must also be weighed against the impacts of such actions on other riparian forest functions such as sediment trapping, filtration of other agricultural pollutants (such as phosphorous) and wildlife habitat.

Therefore, they say, careful definition of objectives for forested filter zones is required to determine appropriate siting and management.

The report is the subject of a peer-reviewed rerport now available from WRRI:

continued

Report No. 310 *Nitrogen Biogeochemical Cycling in Piedmont Vegetated Filter Zones* by Louis Vincent Verchot and E. Carlyle Franklin (FRANKLIN@CFR.CFR.NCSU.EDU), Department of Forestry, and J. Wendell Gilliam (WENDELL_GILLIAM @NCSU.EDU), Department of Soil Science, North Carolina State University, August 1997.

Single copies of WRRI reports are available free to federal/state water resource agencies, state water resources research institutes, and other water research institutions with which exchange agreements have been made.

Single copies of publications are available to North Carolina residents at a cost of $4 per copy prepaid ($6 per copy if billed) and to nonresidents at a cost of $8 per copy prepaid ($10 per copy if billed).

Send requests to WRRI, Box 7912, NCSU, Raleigh, NC 27695-7912 or call (919) 515-2815, or Email water_resources@ncsu.edu.

Water Resources Research 1997-98 Seminar Series

Monday, November 17, 1997, Room 1132, Jordan Hall, NCSU Campus. "Atmospheric Emissions, Transport, Transformation and Deposition of Nitrogen compounds in the Neuse River Watershed." *Professor Viney Aneja, Department of Marine, Earth and Atmospheric Sciences, North Carolina State University.*

Monday, December 1, 1997, Ground Floor Hearing Room, Archdale Building, downtown Raleigh. "Optimization of Treatment to Mitigate Impacts of Algae Control on Finished Water Quality." *Assistant Professor Detlef Knappe, Department of Civil Engineering, North Carolina State University.*

Tuesday, January 20, 1998, Room 1132, Jordan Hall, NCSU Campus. "History of Water Quality in North Carolina Estuarine Waters as Documented in the Stratigraphic Record." *Assistant Professor Sherri Cooper, Nicholas School of the Environment, Duke University.*

Tuesday, February 24, 1998, Ground Floor Hearing Room, Archdale Building, downtown Raleigh. "Biologically Mediated Nitrogen Dynamics in Eutrophying Estuaries." *Professor Hans Paerl, Institute of Marine Sciences, University of North Carolina at Chapel Hill.*

Tuesday, March 30, 1998, Room 1132, Jordan Hall, NCSU Campus. "Development of Methods of Estimating the Cost of Watershed Management Policies." *Professor David Moreau, Department of City and Regional Planning, University of North Carolina at Chapel Hill.*

Monday, April 20, 1998, Ground Floor Hearing Room, Archdale Building, downtown Raleigh. "Effectiveness of Four 'Best Management Practices' for Reducing Nonpoint Source Pollution from Piedmont Tobacco Fields." *Professor Carlyle Franklin, Department of Forestry, North Carolina State University.*

Tuesday, May 19, 1998, Room 1132, Jordan Hall, NCSU Campus. "Development of the Technical Basis and a Management Strategy for Reopening a Closed Shellfishing Area." *Associate Professor William Kirby-Smith, Nicholas School of the Environment, Duke University.*

Additional courses being taught spring semester at N.C. universities

North Carolina State University
Department of Forestry

FOR 520 Watershed Hydrology (a new course, currently listed as FOR 592K and FOR 592L in TRACS)
FOR 521 Wetland Assessment, Regulation, Delineation (a new course currently listed as FOR 592U in TRACS)

For course information contact Dr. James D. Gregory at (919) 515-7567. Non-degree students may sign up through the NCSU Division of Lifelong Education (919) 515-2261 (non-credit) or (919) 515-2265 (credit).

University of North Carolina at Chapel Hill
Department of Environmental Sciences and Engineering

ENVR 95 Analysis & Solution of Environmental Problems
ENVR 101 Environmental Health
ENVR 102 Principles & Applications of Environmental Engineering
ENVR 127 Oceanography
ENVR Chemical Oceanography
ENVR 134 Ecological Microbiology
ENVR 200 Problems in ENVR: Chemical Kinetics of Aquatic & Atmospheric Chemistry
ENVR 200 Problems in ENVR: Humics Chemistry Section
ENVR 200 Problems in ENVR: Instrumental Methods of the Chemical Analysis of Environmental Samples
ENVR 225 Analysis of Trace Organics
ENVR 324 Chemistry of Humic Substances
ENVR 193 Biochemical Toxicology
ENVR 200 Problems in ENVR: Quantitative Risk Assessment for the Environmental Health Sciences
ENVR 200 Problems in ENVR: Microbial Risk Assessment
ENVR 159 Analytic Thought and Environmental Risk
ENVR 219 Water Policy in Lesser Developed Countries
ENVR 217 Systems Analysis in Environmental Planning
ENVR 272 Design of Water Systems
ENVR 274 Physical/Chemical Treatment Processes
ENVR 275 Biological Treatment Processes
ENVR 277L Treatment Process Laboratory
ENVR 278 Geostatistics for Spatial/Temporal Environmental Phenomena

For course information, contact Student Services, Dept Environmental Sciences and Engineering at (919) 966-3844. Nondegree students should contact UNC-CH's Evening College for registration (919) 962-1134.

Personnel changes

Harlan Britt retired Nov 1 from his position as deupty director of the N.C. Division of Water Quality.

Craig Deal, formerly Sedimentation Control Specialist with the N.C. Division of Land Resources' Erosion and Sediment Control Program is now Director of the Highway Environmental Evaluation Unit within the N.C. Department of Environment and Natural Resources.

Strategies for Urban Wet Weather Management

A teleconference concerning Storm Water Phase II Regulations and Sanitary Sewer Overflows

December 10,1997
9:00 am to 4:00 pm

Downlink sites at:

The Friday Center
Chapel Hill
&
Catawba Valley Community College
Hickory

APWA/WEF member: $50
Nonmember: $75

To *register call* Pam Cloer
at the Institute for Transportation Research and Education
(919) 515-7990 or email:
pcloer@unity.ncsu.edu

Sponsored by American Public Works Association, N.C. Chapter and Water Environment Federation

Conferences and workshops

The National Water Research Institute and others are sponsoring **Source Water Protection 98**, a conference for people responsible for assessing source waters, delineating protection areas, monitoring strategies, and managing data to meet the requirements of the Safe Drinking Water Act Amendments of 1996. The conference will be held April 28-30, 1998, at the Doubletree Hotel Campbell Centre in Dallas, Texas. For a brochure and registration form write National Water Research Institute, P.O. Box 20865, Fountain Valley, CA 92728-0865.

The University of Texas at Austin will present **Advanced Water Pollution Control: Physical and Chemical Waste Treatment Sludge Handling and Disposal** January 26-30, 1998, at the campus in Austin, TX. For course information contact

North Carolina Precipitation/Water Resources

Rainfall (+/- average)	September	October
Asheville	4.89" (+1.02")	3.90" (+0.31")
Charlotte	3.39" (-0.11")	3.94" (+0.58")
Greensboro	3.88" (+0.36")	est 2.38" (-1.12")
Raleigh	3.07" (-0.12")	3.26" (+0.40")
Wilmington	8.94" (+3.90")	1.33" (-1.36")

Streamflow

Index Station (County, Basin)	**Sept mean flow (CFS)** (% of long-term median)	**Oct mean flow (CFS)** (% of long-term median)
Valley River at Tomotla (Cherokee, Hiwassee)	99 (115%)	119 (146%)
Oconaluftee River at Birdtown (Swain, Tenn)	266 (112%)	293 (122%)
French Broad River at Asheville (Buncombe, FB)	1,220 (112%)	1,370 (96%)
South Fork New near Jefferson (Ashe, New)	236 (94%)	206 (58%)
Elk Creek at Elkville (Wilkes, Yadkin/Pee-Dee)	--- ----------	35 (57%)
Fisher River near Copeland (Surry, Yadkin/Pee-Dee)	82 (81%)	75 (62%)
South Yadkin River near Mocksville (Rowan, Yadkin/PD)	---- ---------	155 (86%)
Rocky River near Norwood (Stanly, Yadkin/Pee-Dee)	315 (109%)	802 (369%)
Deep River near Moncure (Lee, Cape Fear)	350 (94%)	248 (102%)
Black River near Tomahawk (Sampson, Cape Fear)	169 (48%)	247 (108%)
Trent River near Trenton (Jones, Neuse)	11 (26%)	15 (38%)
Lumber River near Boardman (Robeson, Lumber)	380 (56%)	493 (99%)
Little Fishing Creek near White Oak (Halifax, Pamlico)	30 (82%)	41 (123%)
Potecasi Creek near Union (Hertford, Chowan)	14 (91%)	10 (66%)

Groundwater

Index well (Province)	**Sept. depth below surface (ft)** (departure from average for month)	**Oct depth below surface (ft)** (departure from average for month)
Blantyre (Blue Ridge)	31.55 (+0.15)	32.66 (+0.72)
Mocksville (Piedmont)	15.90 (+1.82)	17.23 (+0.55)
Simpson (Coastal Plain)	7.41 (-1.80)	8.53 (-3.10)

Source: U.S. Geological Survey's *Water Resources Conditions in North Carolina*

Dr. Joseph Malina at (512) 471-4614. For registration information contact Continuing Engineering Studies at (512) 471-3506.

Call for Abstracts
The North American Lake Management Society, Florida Lake Management Society and U.S. EPA Region IV have issued a call for abstracts for the Seventh Annual Southeastern Lakes Management Conference, **Integrating Water Resources and Growth into the 21st Century**, April 15-17. 1998 at the Radisson Plaza Hotel in Orlando, FL. Abstract deadline is December 12, 1997. For abstract submittal and program information, contact Dr. Harvey H. Harper, P.E., Environmental Research & Design Inc. Phone: (407) 855-9465, Fax: (407) 826-0419, email: hharper@erd.org.

Correction

John E. Schefter, Chief of the Office of External Research of the U.S. Geological Survey, has noted an error in WRRI's 1997-98 Annual Program. Mr. Schefter notes that funding for USGS regional grants is appropriated under section 104(f) of the Water Resources Research Act, not 104(g) as we stated. He explains that prior to 1996, the funds appropriated under section 104(f) were divided equally among state water resources research institutes. In fiscal years 1996 and 1997, Congress stated that these funds were no longer to be equally apportioned among the institutes and that the institutes were to compete for a portion of the funds. The USGS working with the institutes devised the regional competition to allocate the funds among the institutes. While section 104(g) does authorize a regional competitive matching grant program, that section has never received an appropriation. If funding were being received under this section, federal matching grants would be made on a one-to-one basis, rather than the more stringent matching requirements now in place (two nonfederal dollars for each federal dollar). We thank Mr. Schefter for this clarification.

The **National Environmental Justice Advisory Council** (NEJAC) will hold a meeting in Durham, NC, December 8 through 10, 1997, at the Regal University Hotel. In conjunction, NEJAC and EPA will sponsor an **Environmental Justice Enforcement Roundtable** December 11 - 13, 1997, at North Carolina Central University. Public comment periods for the NEJAC meeting are scheduled from 7:00 pm to 9:00 pm on Monday, Dec 8 and Wednesday, Dec 10. Public comment periods will be held during the roundtable; however, dates and time for these public comments have not been established. You can register for all these events by contacting the NEJAC Registration Hotline at (888) 335-4299 or through the NEJAC website at http://www.ttemi.com/nejac.

Publications

The Center for Marine Science Research at the University of North Carolina at Wilmington has published **Environmental Assessment of the Lower Cape Fear River System, 1996-1997** (CMSR Report No. 97-01). The report provides results of a broad-scale water sampling program conducted under auspices of the Cape Fear River Program at 34 stations throughout the estuary and the lower Cape Fear, Black, and Northeast Cape Fear Rivers. Contact the Center at 910-256-3721 or check out the Cape Fear River Program website at http://smec.uncwil.edu/glaxo/cfrp/.

WRRI has 12 copies of Ralph Heath's USGS Water Supply Paper 2220, **Basic Ground-Water Hydrology** (1983) that we would like to provide free to libraries or organizations that will make them available for educational purposes. Call (919) 515-2815 or email: water_resources@ncsu.edu.

The N.C. Cooperative Extension Service has recently published **Organic Lawn Care: A Guide to Organic Lawn Maintenance and Pest Management, 1997**, which provides information about organic lawn care, focusing on methods and species appropriate for North Carolina. $4 from Agricultural Communications, Box 7603, N.C. State University, Raleigh, NC 27695-77603. or (919) 515-3173.

TVA's Clean Water Initiative and Environmental Research Center have developed a publication, **Banks and Buffers: A Guide to Selecting Native Plants for Streambanks and Shorelines**, to support watershed protection and restoration activities. An accompanying CD ROM includes a plant database and computer software compatible with Windows 3.1 and 95. The cost is $25.00 plus $5.00 shipping. To order copies call (423) 751-7338 or email cadavid@tva.gov or write TVA Water Management, 101 Market Street, TVA CST 17B, Chattanooga, TN 37402-2801.

Web sites

The **Resistant Pest Management Newsletter** is edited at the Pesticide Research Center at Michigan State University. Its web site is hosted by Mississippi State University and can be found at **http://www.msstate.edu/Entomology/EntHome.html**. The most recent issue (Vol. 8, No. 2) contains two articles on evidence that weeds are becoming resistant to glyphosate (Roundup), the second most commonly used herbicide in nonagricultural situations in the United States, and a call for development of resistant management plans for glyphosate.

The **Haw River Assembly newsletter** is online at **http://www.ntrnet.net/~galin/hranews197.html**. The current issue includes an article about a visit to the organization's board meeting by HRA co-founder, Chuck Brady, an astronaut who flew aboard the Columbia.

The U.S. EPA is making **information about public drinking water systems** available on the Internet at **http://www.epa.gov/enviro/html/sdwis/sdwis_ov.html**. Customers of public drinking water systems can get information on the sources of drinking water and compliance data on their systems.

continued

Several federal agencies are developing a **document of stream corridor restoration technology** to serve as a common technical reference. Check out their plans and progress at **http://www.usda.gov/stream_restoration**.

EPA's **Watershed Academy** provides training and information on implementing the watershed approach to local, state, tribal and federal officials and private practitioners of watershed management. For those who cannot attend live courses, a distance learning program called Academy 2000 is being made available on the Internet. The first training module, "Monitoring Consortiums" is now up on the website: **http://www.epa.gov/OWOW/watershed/wacademy.htm**.

The U.S. **EPA's Office of Pesticides** has put a wide range of information, tools and databases—including the Pesticide Product Information System, The Dietary Risk Evaluation System, and Pesticide Assessment Tool for Rating Investigations of Transport (PATRIOT)—online at its website: **http://www.epa.gov/pesticides**.

EPA has put the **Index of Watershed Indicators** online at **http://www.epa.gov/surf/iwi/**. This is the agency's first comprehensive assessment of water quality in the 2,111 watersheds in the continental United States.

Those following **"El Niño"** may be interested in a web site compiled by Dr. David Duffy and Dr. Peter J. Bryant and hosted by the University of California at Irvine: **http://darwin.bio.uci.edu/~sustain/ENSO.html**. This electronic listing is intended to provide near real-time reports primarily on marine and terrestrial events that may be linked to the development of the 1997 El Niño/Southern Oscillation which appears to be unfolding as one of the most severe ENSO events in history.

The **State Climate Office of North Carolina** is online at **http://www.nc-climate.ncsu.edu**.

North Carolina Water Resources Association

NCWRA

North Carolina Section of the American Water Resources Association

Luncheon and Forum Schedule

Feb 9, 1998	Safe Drinking Water Act in N.C. Information
Apr 13, 1998	Stream Restoration
Sept 14, 1998	Water Quantity Issues in N.C.
Nov 9, 1998	Nutrient Management

All luncheon/forums take place at 11:30 am at the Jane S. McKimmon Center on the N.C. State University campus. For additional information call Robert Holman at WRRI (919/515-2815).

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