



SEDIMENTS

STATE OF NORTH CAROLINA, DEPARTMENT
OF ENVIRONMENT AND NATURAL RESOURCES
William G. Ross, Jr. Secretary

Land Quality Section
Division of Land Resources
James D. Simons, Director and State Geologist

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October - December 2003

NC to host Southeast IECA Conference

North Carolina is hosting the next conference of the Southeast Chapter of the International Erosion Control Association (IECA).

Charlotte is the place to be on March 17-19, 2004, for the *Sediment and Erosion Control Solutions for the Southeast* conference. This conference is sponsored by the Southeast Chapter of the IECA, in conjunction with North Carolina State University, N.C. Water Resources Research Institute (WRRI), N.C. Sedimentation Control Commission, and N.C. Land Quality Section.

The objectives of this conference are to:

- Provide the latest information on topics of interest to professionals in erosion and sediment control, including slope technology, stormwater management, stream restoration, vegetative establishment, and wetlands.
- Provide training opportunities in areas important to the industry.
- Exchange ideas and network among professionals.

The latest information on new products, designs, and rules and regulations will be presented by researchers, practitioners, and government officials from all over the Southeast. You should attend this conference if you are an erosion and sediment control specialist, engineer, research scientist, project manager, government official, stream restoration specialist, construction or property manager, landscape architect, or a developer.

Four pre-conference workshops are also scheduled which will provide additional training opportunities for attendees:

- SedCAD Training
- Erosion and Sediment Control Design
- Certified Professional in Storm Water Quality (CPSWQ)
- Natural Channel Design & Stream Restoration Overview

Information and registration at:
<http://www.soil.ncsu.edu/swetc/ieca/main.htm>



Frances and Julie assisting attendees signing up for Professional Development Hours at the October 29th-30th Erosion and Sedimentation Control Conference in New Bern.

Erosion and Sedimentation Control Basic Planning and Design Workshops a success

At the Hickory (October 15-16) and New Bern (October 29-30) meetings, the speaker presentations focused on ways to meet the four mandatory standards for land-disturbing activity of the Sedimentation Pollution Control Act (SPCA) of 1973: maintain buffer zones, provide stabilized slopes, provide groundcover, and file an erosion and sedimentation control plan. The conference participants were frequently asked by Janet Paith or Dr. Greg Jennings to state the four SPCA requirements.

The conference evaluations received showed that both meetings, in Hickory and New Bern, were a success! Thank you for your evaluations. Your comments help us improve our conferences so you get the most out of them.

Remember there is an Advanced Erosion and Sedimentation Control Seminar coming up in February, in Wilmington and the IECA conference is coming up in Charlotte in March. There are some pictures of the New Bern meeting posted at: <http://www2.ncsu.edu/ncsu/CIL/WRRI/erosionseminars.html>

Do you remember the four SPCA requirements?

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September action of the North Carolina Sedimentation Control Commission

At its regular meeting on November 5, 2003, the N.C. Sedimentation Control Commission (SCC) took the following action:

■ Approved continuing the delegation of authority to implement the Sedimentation Pollution Control Act (SPCA) to the N.C. Department of Transportation. The unanimous vote to continue the delegation occurred after a lengthy discussion of the annual review of the DOT delegation. The staff review found a number of highway construction sites to be out of compliance (Sugar Hill Road in McDowell County, US 23 Business in Haywood County, US 64 widening project in Washington County, and the US 64 Knightdale Bypass in Wake County). In the case of the U.S. 64 Knightdale Bypass, Land Quality Section Chief Mell Nevils had taken the unprecedented action of issuing a Notice of Violation (NOV) during the annual review inspection. Problems on the Knightdale Bypass had been reported by the *Raleigh News & Observer*, and DOT had ordered work stopped on the project until problems with erosion and sedimentation control were corrected. DOT officials present apologized for allowing the problems to occur and pledged to give closer attention to design-build projects such as the Knightdale Bypass to prevent such

problems in the future. DOT also agreed to implement a list of staff recommendations to improve the DOT delegation.

■ Approved revisions to the application form and application requirements for local governments applying for grants from the Local Program Assistance Fund. The primary change was to decrease the contract period from 18 months to 12 months. (See grant announcement below.)

■ Adopted a resolution proposed by Commissioner Joe Rudek to clarify the SCC's role in approving changes to local government ordinances that govern local erosion and sedimentation control programs. The resolution states "future votes by the Commission on the appropriateness of local sediment and erosion control ordinances adopted by a local government with a delegated local program shall be based upon a determination that the ordinance at least meets or exceeds the minimum requirement of this Act [SPCA] as portrayed by the model ordinance."

■ Adopted dates for the Commission's meetings in 2004: February 18, May 5, August 4, and November 3.



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Send comments to Janet Paith, NCDENR-Land Quality, 1612 Mail Service Center, Raleigh, NC 27699-1612. Email: Janet.Paith@ncmail.net. Send change of address to WRRI, Box 7912, North Carolina State University, Raleigh, NC 27695-7912 (919/515-2815; water_resources@ncsu.edu). Fifty-nine hundred copies of this newsletter were printed at a cost of \$1,433.80 or 24 cents per copy.

Personnel of the Land Quality Section of the N.C. Department of Environment and Natural Resources provide information and assistance for implementation of the N.C. Erosion and Sedimentation Control Program. For assistance, please contact the Regional Engineer or the Raleigh headquarters listed below:

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585 Waughtown St.
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Raleigh, NC 27699-1612 (919) 733-4574

Local Program Assistance Grants Available

It is anticipated that the N.C. General Assembly will again appropriate funds to aid local governments in starting or enhancing local erosion and sedimentation control programs.

Funds will be available July 1, 2004, or when the State budget is passed, whichever is later. Priority will be given to local governments starting new programs. Funds will be available in the form of 12-month contracts.

Contract application guidelines and an application form are available on the N.C. Land Resources web site at <http://www.dlr.enr.state.nc.us/forms/>. Application deadline is January 12, 2004, by close of business. Questions should be directed to Sonya Avant, Assistant State Sediment Specialist, at (919) 733-4574.

The North Carolina
Sedimentation Control Commission

The Sedimentation Control Commission (SCC) was created to administer the Sedimentation Control Program pursuant to the N.C. Sedimentation Pollution Control Act of 1973 (SPCA). It is charged with adopting rules, setting standards, and providing guidance for implementation of the Act. The composition of the Commission is set by statute to encompass a broad range of perspectives and expertise in areas related to construction, industry, government, and natural resource conservation and quality. All members are appointed by the Governor and serve three-year terms, except for the Director of the Water Resources Research Institute of The University of North Carolina, who serves as long as he remains Director. The chairman of the SCC is named by the Governor.

Chairman:
Kenneth H. Reckhow
Durham

Director of Water Resources Research Institute

Commissioners:

W. T. "Buzz" Bryson
Cary
Rep. N.C. Public Utilities

Hugh J. Franklin
Marion
Rep. N.C. Mining Com.

Phillip Ray Gibson
Cullowhee
Non-governmental conservation representative

J. Wendell Gilliam
Raleigh
Rep. NCSU Dept. of Soil Science

Gregory D. Jennings
Raleigh
Rep. N.C. Environmental Management Com.

Grover McPherson
Winston-Salem
Rep. N.C. Soil and Water Conservation Com.

Joseph Rudek
Hillsborough
Non-governmental conservation representative

Kyle Sonnenberg
Southern Pines
Rep. Association of County Commissioners/
N.C. League of Municipalities

Ralph Stout
Greensboro
Rep. Carolinas Associated General Contractors

Mark A. Taylor
Greensboro
Rep. Professional Engineers of N.C.

F. Roger Watson
Asheville
Rep. N.C. Home Builders Association

A delegation of eight Russian ecologists visited the NC Department of Environment and Natural Resources to learn about the overseeing of regulations regarding air, water, and land quality. The visit was sponsored locally by Friendship Force and by the Open World Program—the only exchange program housed in the Legislative branch of the United States government. The program brings emerging Russian leaders to the United States for a 10-day training program. Alison Davidson and Mike Goodson of the Asheville Regional Office represented the Land Quality Section.



Personnel Changes

Alan Cook is the new Environmental Technician in the Fayetteville Regional Office.

Doug Jones is the new Assistant Regional Engineer in the Mooresville Regional Office.

Wayne Watkins is the new Environmental Technician in the Asheville Regional Office.

Stormwater: Emerging Issues for Local Communities

April 19-21, 2004, The Grove Park Inn, Asheville, North Carolina. Sponsored by: North Carolina State University, WRRRI, NC Department of Environment and Natural Resources, and US EPA. Information at: <http://www.soil.ncsu.edu/swetc/stormwaterconf/main.htm>.

Sediment and Erosion Control Course Latest Information with Hands-on Demonstrations May 7, 2004 Sediment & Erosion Control Research & Education Facility Raleigh, North Carolina

The stewards and watchdogs of environmental quality in North Carolina have recently focused their attention on sediment and erosion control at construction sites, often in the form of complaints and lawsuits. If you are a property owner, developer, designer or landscape architect, contractor, site foreman, or in environmental code enforcement, you need to know about technologies that will make your effort more effective, timely and less costly. This one-day workshop will provide you with the latest in technology. The field demonstrations will bring you together with experts in the field as well as vendors of products and services, so that you will see the latest techniques in a realistic setting.

What you will learn:

- How to improve sediment control without breaking the bank.
- Evaluations of many of the new devices and systems for sediment control.
- Overview of permeable pavement and stream restoration systems.
- Opportunities to interact with colleagues, regulators, and researchers.
- The experience of viewing live, "real-life" sediment and turbidity control in the field.

To find agenda and registration information go to the web site:

<http://www.soil.ncsu.edu/swetc/sediment2/main2.htm>
or contact **Kathryn Murray** at 919-515-7154 or soils_training@ncsu.edu.

PAM demonstrations move to the field

For several years, Dr. Rich McLaughlin of NC State University has been conducting experiments at an outdoor laboratory to find the best ways to use polyacrylamide (PAM) to reduce turbidity in construction site runoff. Under controlled conditions, McLaughlin has discovered some important factors that facilitate the use of PAM to encourage flocculation of suspended soil particles. Based on his laboratory work, he developed a “system” incorporating PAM and enhanced best management practices (BMPs) that he hoped could be used under field conditions to significantly reduce turbidity of water leaving sediment basins and traps. Now, McLaughlin is testing his system in the field.

One of the sites where McLaughlin is testing his PAM-BMP system is Balsam Mountain Preserve in mountainous Jackson County. His work is being supported by Balsam Mountain Preserve, NC State University, and a Clean Water Act Section 319 grant awarded through the N.C. Department of Environment and Natural Resources. Balsam Mountain Preserve is a 4,400-acre residential development that markets itself as a “human settlement within a park.” The development has committed to restoring many miles of streams impacted by past logging operations and to preventing any additional sediment impacts from golf course and home construction. In addition to heavy use of mulch (produced on site by shredding of trees removed during clearing) as groundcover and use of special construction practices designed to reduce erosion from unpaved roads on steep slopes, Balsam Mountain Preserve has provided McLaughlin a number of test sites and a grading contractor trained as a Clear Water Contractor to help test his PAM-BMP system.

One test site has been cleared for construction of a horse barn (upslope terrace) and summer horse pasture (downslope). Sediment control BMPs were put into place concurrent with clearing, and 8-10 inches of mulch—and on one particularly steep slope, bonded fiber matrix—were applied to slopes immediately after grading was complete. The pasture area was hydroseeded.

At the upslope site, McLaughlin has installed the first element of the PAM-BMP system, an enhanced sediment trap. The enhancement consists of a skimmer, which dewater the trap from the pool surface thereby removing much of the heavier sediment particles. No PAM is used with the sediment trap. McLaughlin says that to use PAM efficiently, sediment must first be removed from runoff so that PAM can act on suspended solids.

Water from the sediment trap runs through a rip-rap channel to a sediment basin below the future horse pasture. A PAM “floc log” was secured in the basin inlet to provide the first injection of PAM into runoff. However, McLaughlin says a good bit of turbulence is needed to dissolve PAM from a floc log, and placement in a channel or ditch does not provide the required turbulence. Moreover, floc logs must be kept wet to work, and in channels and ditches, they dry out.

The sediment basin has been constructed with forebays and with jute baffles. Forebays provide an easily accessible place for

heavier sediment to accumulate. Jute baffles reduce velocity and turbulence in the basin to maximize the amount of sediment that can settle out in the basin. While the effect of the PAM floc log in the inlet channel was negligible, McLaughlin says that baffles significantly increase the effectiveness of sediment basins.

The sediment basin outlet used a flashboard riser instead of the traditional riser barrel. Boards which fit into slots in the riser can be added or subtracted to raise and lower the water level. This creates a permanent pool most of the time, which improves sediment capture, but allows the basin to be drained for maintenance. A PAM floc log was installed at the bottom of this riser to allow water flowing over the boards to fall on it.

“This is the ideal place for a floc log,” says McLaughlin. “The log can stay wet and water falling on the log is effective in dissolving the PAM.”

The third component of McLaughlin’s system is a rip-rap lined settling pool at the basin outlet. In addition to the log in the riser barrel, a floc log is placed beneath the outlet pipe to provide additional flocculation. Sampling equipment installed at this settling pool has documented turbidity in discharge water as low as 50 NTUs or less.

McLaughlin emphasizes that there is no silver bullet for reducing turbidity in construction site runoff to 50 NTUs. Controlling turbidity requires a carefully thought out systems approach—including effective groundcover applied immediately after grading.

“In June we had a four to six inch rain here,” says McLaughlin. “On these steep slopes that had been heavily mulched, there was no erosion.”

He also emphasizes that “floc logs alone do nothing. You can’t just throw one in a ditch and expect it to work.”

McLaughlin lists the most important lessons learned through his PAM-BMP research:

- You must match the type of PAM to your soil or suspended sediment and water chemistry.
- You must get the sediment out first, then treat turbidity.
- You must create high flow on floc logs or PAM powder spread on ditch liners followed by turbulence to get PAM to react with the suspended sediment.
- Basins and traps can be made more effective at a low cost and a low labor requirement.
- Jute/coir baffles in basins dampen vertical and forward velocity better than traditional silt fence. Tree protection fence is a good choice for the first in a series of baffles because it is tougher and stands up better under high velocities.
- You can improve effectiveness and save money by using a skimmer instead of a stone outlet on sediment traps.
- Basin and trap inlets need good erosion protection.



A skimmer improves the effectiveness of this sediment trap in removing sediment from runoff. Sediment must be removed from runoff before treating with PAM to reduce turbidity. Dr. Rich McLaughlin points out erosion at an inlet on the far side of the trap. "Inlets should be protected," says McLaughlin, "otherwise, the trap fills up with sediment eroded from its own banks. That's silly!"



Jute baffles in this large riser-barrel basin have slowed water velocity and encouraged sediment to drop out in forebays just below the inlet. One side of the first baffle has collapsed. McLaughlin recommends using tree protection fence as the first baffle because it can better withstand the force of water rushing into the basin.



A PAM floc log is secured just below the basin outlet pipe where flow will dissolve more PAM and encourage flocculation in this settling pool, which is at the end of the PAM-BMP train. Sampling here has shown turbidity as low as 50 NTU.



The traditional riser barrel has been replaced with a flashboard riser that allows the researchers to retain water in the riser and pool. A PAM floc log is suspended in the barrel. McLaughlin says this is the ideal place to use a floc log.

Express Erosion and Sedimentation Control Plan Review Available in the Wilmington Region

As part of a pilot project called for by the North Carolina General Assembly, the Division of Land Resources has established a procedure for express review of erosion and sedimentation control plans in the Wilmington Region ONLY.

For an additional fee, a Land Resources staff person in the Wilmington Regional Office dedicated to the express plan review project will complete a plan review within three days after receiving a COMPLETE plan. There is a \$300 per acre fee (\$250/acre express fee + \$50/acre normal fee) up to eight (8) acres. For nine (9) acres and above, the fee is a flat \$2,000 (express fee) + \$50 per acre (normal fee). For additional information contact Wilmington Regional Engineer Dan Sams at (910) 395-3900 or dan.sams@ncmail.net.

A toll-free hotline
has been
established
statewide for
concerned
citizens to report
possible
violations of the
North Carolina
Sedimentation
Pollution
Control Act.
To report
problems call
1-866-STOPMUD
(786-7683)

Advanced Erosion and Sedimentation Control for Construction Sites Seminar

February 24-25, 2004
Hilton Wilmington Riverside
Wilmington, NC

Purpose: This seminar is presented to update design professionals who develop erosion and sedimentation control plans—including engineers, landscape architects, and surveyors—on regulations related to erosion and sedimentation control and present new design concepts and approaches. We anticipate offering twelve (12) PDHs to professional engineers and land surveyors, and ten (10) continuing education units to landscape architects for completion of both days.

Fee: \$125.00. Covers materials, breaks, and lunches.

Deadline: Registrations will be taken on a first-come, first-served basis, but no registrations will be taken after Monday, February 9, 2004.

Details and any changes to the schedule will be posted at the following web address:

<http://www2.ncsu.edu/ncsu/CIL/WRRI/erosionseminars.html>

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