

# SEDIMENTS

State of North Carolina  
Department of Environmental Quality

Division of Energy, Mineral, and Land Resources  
Brian Wrenn, Director

## ABOUT SEDIMENTS

SEDIMENTS is a newsletter published by the North Carolina Sedimentation Control Commission to provide information and assistance to the regulated community and to facilitate communication among personnel of state and local erosion and sedimentation control programs.

SEDIMENTS is available in electronic form at:

<https://deq.nc.gov/SEDIMENTS>

And via the WRRRI Sediments listserv. To subscribe follow the directions at:

<https://wrrri.ncsu.edu/contact-us/listservs/>

Send comments to the [Sediment Education Specialist](#).

## 2021 Local Erosion and Sedimentation Control Programs Workshop & Awards Program

*Presented by:*

NC Department of Environmental Quality - Land Quality Section

*In partnership with:*

Water Resources Research Institute  
of the University of North Carolina System

This year the annual Local Programs Workshop and Awards Program was held virtually on April 19-22, 2021. This annual workshop virtually brought together delegates from a majority of the 54 local programs throughout the state and averaged 140 people in attendance for each half-day webinar session. The four days of half-day webinars focused on regulatory updates, design reviews, inspection and enforcement topics, and erosion and sedimentation control best practices. The sessions also incorporated breakout rooms, roundtable discussions, and Q&A panels.

Support for the Workshop and Awards Program is provided by the North Carolina Sedimentation Control Commission, NC Department of Environmental Quality, Division of Energy, Mineral, and Land Resources, Land Quality Section, and the Water Resources Research Institute of the University of North Carolina System.

## Lincoln County and Town of Apex Win Awards for Excellence in Erosion and Sediment Control

Local erosion and sediment control programs have the ability to exercise greater control over erosion and sediment control in their respective jurisdictions and may often inspect sites more frequently than the state erosion and sediment control program. Furthermore, local erosion and sediment control program ordinances may be more restrictive than state law, giving additional control over erosion and sedimentation control during the development occurring within their respective jurisdictions. The North Carolina Sedimentation Control Commission recognizes the importance and the value of local erosion and sediment control programs in controlling pollution by sedimentation to the waters of North Carolina. In addition to training, the Annual Local Programs Workshop seeks to recognize outstanding local programs. Each year awards of excellence are presented to programs in two categories:

- Small program – program providing 0-3 man-years or full-time equivalents supporting erosion and sediment control
  - Large program – program providing 3+ man-years or full-time equivalents supporting erosion and sediment control
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## The North Carolina Sedimentation Control Commission

The Sedimentation Control Commission (SCC) was created to administer the Sedimentation Control Program pursuant to the NC Sedimentation Pollution Control Act of 1973 (SPCA). It is charged with adopting rules, setting standards, and providing guidance for the 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 they remain Director. The chairman of the SCC is named by the Governor.

### Chair:

Dr. Susan White

Water Resources Research Institute

### Commissioners:

Ms. Susan Foster

NC Home Builders Association

Ms. Marion Deerhake

NC Environmental Management Commission

Mr. Michael Taylor

Associated General Contractors

Mr. Michael D. Willis

NC Soil and Water Conservation Commission

Mr. Benjamin Brown

NC League of Municipalities & Association of County Commissioners

Dr. Rich McLaughlin

NCSU, Dept. of Soil Science

Mr. Mark Taylor

Professional Engineers of NC

Mr. Hartwell Carson

Non-governmental Conservation

Ms. Emily Sutton

Non-governmental Conservation

Ms. LeToya Ogallo

NC Public Utilities

Mr. Robert Jason Conner

NC Mining Commission

## NC Sedimentation Control Commission: February Actions

At its virtual meeting on February 23, 2021 the NC Sedimentation Control Commission (SCC) took the following actions:

### Delegated Local Programs

- Pitt County: Voted to continue delegation of the program under review for another three months.
- City of Burlington: Voted to continue delegation of the program under review for another three months.
- Town of Weddington: Voted to continue delegation of the program under review for another six months.
- City of High Point: Voted to continue delegation of the program under review for another six months.

### Commissions Technical Committee

The CTC Chair provided an update on the progress of soliciting members: eight representatives have been named to the committee to date.

## NC Sedimentation Control Commission: May Actions

At its virtual meeting on May 4, 2021 the NC Sedimentation Control Commission (SCC) took the following actions:

### Delegated Local Programs

- City of Jacksonville: Voted to continue delegation of the program under review for another six months.
- Iredell County: Voted to continue delegation of the program under review for another six months.

- Pitt County: Voted to continue delegation authority.
- City of Burlington: Voted to continue delegation authority.

### Commission' Technical Committee

The Chair provided an update on the first two meetings of the Commission's Technical Committee: they are working to process and rank the order in which to address the topics submitted to them. The Chair also announced that reoccurring meetings of the CTC are set for the third Thursday of each month, from 3:30—4:30 pm.

## 2021 SCC Meeting Dates

**Tuesday, Feb. 23, 2021**

**Tuesday, May 4, 2021**

**Tuesday, Aug. 17, 2021**

**Thursday, Nov. 4, 2021**

All meetings are at 10:00 am  
Ground Floor Hearing Room

Archdale Building

512 N. Salisbury Street Raleigh, NC

Schedule and location of meetings is subject to change. Public notice of any changes will be given pursuant to NCGS 143-318.12

## NC Sedimentation Control Commission and Committee Information

Meeting dates, times, location information and materials for scheduled meetings of the SCC and it's Committees can be found on the SCC's website:

<https://deq.nc.gov/about/divisions/energy-mineral-land-resources/sedimentation-control-commission>

## 2021 Local Programs E&SC Workshop & Awards Program

*(continued from page 1)*

This year, the Town of Apex received the Local Program Award for Excellence for a small program. The Town of Apex administers and enforces erosion and sediment control for the town and has 2.25 full-time equivalent positions that oversee an average of 95 open projects per month. Some noteworthy aspects of this program include the requirement to phase mass-grading of single-family development in excess of 20 acres, issuing helpful resource documents at pre-construction meetings that cover expectations, financial holds, and contact information. The program also issues notices to developers when violations are discovered. Recently, the program received good marks for addressing the construction site discharge minimum requirement under their MS4 permit.

The Town of Apex has a commendable education and outreach program with colorful tents and banners that convey the impacts of construction and how their mission is to protect water quality. This media reaches over 100k people every year. They also spend time giving presentations to the local schools. The Town of Apex also meets with other Triangle area programs to solve problems related to erosion and sediment control administration and enforcement, and to work jointly with other programs to set clear and consistent expectations for the regulated community within the broader area.

More information on the Town of Apex’s Erosion and Sediment Control Program can be found at:

<https://www.apexnc.org/269/Soil-Erosion-Sedimentation-Control>

This year, Lincoln County received the Local Program Award for Excel-

lence for a large program. The Lincoln Natural Resources Division oversees the enforcement of erosion control for Lincoln County and the City of Lincolnton. They have 3 full-time and two half-time staff that provide 4 full-time equivalents in support of the program that oversees an average of 100 projects per month. Some notable attributes of this program include an interdepartmental process that involves notification to anyone receiving a well or septic permit as to their land disturbance procedures prior to issuance of the permit; requiring additional measures for disturbances greater than 20 acres; ensuring other permits are in place when applicable; and providing an educational video to the public.

The Lincoln County Program follows a three strikes and you’re out concept when issuing notices and penalties. The developer is notified of necessary corrective actions. If these corrections have not been addressed during the compliance inspection, the FRP will receive a Notice of Violation and a hold will be placed on the county inspections until repairs have been made. If corrections have not been addressed by the third visit, this would result in another NOV with a civil penalty. Placing the hold on inspections during the second strike has reduced the penalties assessed and assured quicker compliance.

Not only do they set firm expectations, but Lincoln County also values the importance of positive reinforcement. In 2018, the program began incentivizing their developers/contractors/builders who exceed the requirements of their erosion and sediment control plan with an award. Each year, an award is granted to one large contractor and one small build-

er. This has helped build rapport with their land developers and builders.

More information on the Lincoln County’s Erosion and Sediment Control Program can be found at:

<https://www.lincolncounty.org/695/Natural-Resources-Division>

Congratulations to these two well-deserving programs in recognition of their excellence in erosion and sediment control.

The programs that were nominated for the awards this year include:

Small Program Nominees:

- Town of Apex
- Catawba County
- Chatham County
- Guilford County
- City of Monroe

Large Program Nominee:

- Lincoln County



**The Town of Apex’s E&SC Staff**  
From L to R: Anthony Scott, James Mis-ciagno, Jimmy McClure



**Lincoln County’s E&SC Staff**  
Front Row, L to R: Mike Dellinger, Patty Dellinger, Christie Walker, Danielle Rudisill. Back Row, L to R: Jamie Martin, Evan Crawley

## Tweaking Bioretention Systems to Improve Performance

By Dr. Rich McLaughlin, NCSU

Originally Published in IECA's *Environmental Connection's Magazine* 15 (1): 6-7

In many of our watersheds, runoff from impervious surfaces leads to both high hydraulic loads and excess nutrients in our surface waters. We've found numerous ways to dampen the high flow events, but removing the pollutants has proven more difficult. One option is to pass the runoff through an engineered bioretention system designed to create a number of removal mechanisms, but these have often had disappointing efficiencies and sometimes become sources themselves. Two recent studies have suggested modifications to standard designs which can make these systems work much better.

Lopez-Ponnada et al. conducted a unique study of a raingarden experiment two years after it was installed in south Florida, USA.<sup>1</sup> Two cells were established adjacent to a building and received mainly roof runoff for two years prior to data collection. One cell used a standard infiltration design with 30 cm of sand, a 5 cm pea gravel layer, and 30 cm of limestone gravel and a drainage pipe. The modified cell had a 30 cm layer of wood chips and pea gravel (1:2) below the sand layer, plus an internal water storage zone of 30 cm (upturned drainage pipe). Synthetic runoff containing different forms of N and ground oak leaves (C source) were introduced at different rates and the effluent sampled for removal rates. After 14 tests, five plants were established in the cells and

the next season the same simulated events were conducted. Weighted average total N removal was about 50% for the standard system, but the modified system reduced it significantly another 25%. The modified system also removed more ammonia-N and nitrite+nitrate N than the standard system. Dissolved organic carbon, however, was not changed by either system. Both systems had higher removal rates at the lower loading rates tested, and the authors suggested that a storage system for high flow events might enhance the effectiveness of these devices. Plants may have improved system performance, but the data did not clearly establish this effect.



Aerial view of the soil blend study showing the three bioretention cells, with the standard practice in the foreground with the dead plants. Photo credit: James Funai.

When bioretention systems are also intended to provide aesthetic value through landscape plantings, it is important that the plants can survive dry periods between storms. Unfortunately, the tradeoff between high infiltration rates and plant-available soil moisture can result in high plant stress during dry periods. The effect of alternative media in these systems on plant survival was the subject of a study in Ohio, USA.<sup>2</sup> Three large bioretention cells were established adjacent to a parking lot which provided runoff for

the study. The conventional cell used a topsoil-sand blend (84% sand, 4% clay) mixed with compost (12% by volume) at a 55 cm depth on top of a 45 cm gravel drainage layer. A second cell used a proprietary mix of expanded shale, pine fines, and compost, and the third had the site soil mixed with expanded shale at a 2:3 ratio, both cells with an expanded shale gravel drainage layer. For all three, the drain pipe was upturned to create a 75 cm storage zone. Nine species of ornamental plants were established in the same pattern on all cells. Parking lot runoff was evenly split between the three cells. Soil moisture and plant survival were monitored for 2.5 seasons. The

conventional cell plant survival rate was less than 50% due to high moisture stress levels which were present for more than 50% of the growing seasons. The expanded shale (shale heated to high temperatures) mixes held more plant-available moisture, with the soil:expanded shale mix having 22% mortality and the expanded shale/pine fines/compost mixture only losing 3% of the plants. The authors observed that all three bioretention cells performed well hydraulically, draining within 24 h of storm events, and would be considered successful installations.

<sup>1</sup> Lopez-Ponnada, E. V., T. J. Lynn, S. J. Ergas, J. R. Mihelcic. 2020. Long-term field performance of a conventional and modified bioretention system for removing dissolved nitrogen species in stormwater runoff. *Water Research* 170 (2020) 115336. <https://doi.org/10.1016/j.watres.2019.115336>

<sup>2</sup> Funai, J. T., and P. Kupec. 2019. Evaluation of three soil blends to improve ornamental plant performance and maintain engineering metrics in bioremediating rain gardens. *Water Air Soil Pollut* 230: 3 <https://doi.org/10.1007/s11270-018-4049-x>

## Hurricane Weather Advisory for Construction Sites

### Act Now to Reinforce your BMPs to Prepare for Multiple Impacts

By Julie Coco, PE, CPESC, DEQ-DEMLR, State Sediment Program Engineer

As we enter hurricane season, there exists the possibility that sites in development will be adversely impacted, regardless of the measures that are in place to control stormwater and sediment runoff. However, proper planning can minimize damage and the work effort to restore the site to pre-storm conditions.

Below are some suggestions for pre-storm preparation, and conditions under which land-disturbing activities may be necessary.

#### Suggested Actions Prior to the Storm Include:

- Cease any new grading or land disturbances that will not be paved or otherwise structurally stabilized. The freshly exposed bare soil will not have time to stabilize prior to the storm.
- Secure any construction materials that may become airborne during the storm.
- Haul away waste materials.
- Seal and secure or otherwise protect containers holding equipment fluids, liquid building material waste, flocculants, herbicides, pesticides, rodenticides, or other hazardous or toxic wastes from leaks or spills. Hazardous materials should be removed from the site if they cannot be contained in an enclosed building and stored away from windows.
- Dewater sediment basins in a manner permitted by your E&SC Plan Authority.
- Ensure emergency spillways on basins and traps are fully functional. Secure any loose filter fabric, rock, or liners.
- Clean out culverts, outfalls, inlets, ditches, or other conveyances as needed to prevent clogging. Ensure outfalls are stabilized per your approved plan.
- Catch basins or curb inlets with inserts used to filter sediment from the storm drain system can be temporarily removed to prevent street flooding.
- Complete, as time permits, any restoration efforts underway in streams, buffers, wetlands, etc.
- Secure or temporarily remove document boxes and their contents.

#### After the Storm:

- Do not touch any downed powerlines or equipment in contact with powerlines.
- Avoid driving or working in flooded areas or non-workable soils. Be on the lookout for washed-out or undermined roads. Avoid bodily contact with floodwaters.
- Check and record rain gauges. If the gauge has been damaged, document the reasoning for it and why you are unable to obtain an accurate reading from this source. Precipitation estimates for your region may be found online.
- Report any spills, sediment releases into jurisdictional waters, unanticipated by-passes to stormwater devices, upsets, or non-compliance issues that may endanger health or the environment to the appropriate DEQ Regional Office within 24 hours of discovery.
- Repair or replace damaged waste or fluid containers.
- Clean and reinstall any catch basin or curb inlet inserts removed prior to the storm.
- Clean up off-site sedimentation immediately (excluding that released into riparian buffers or jurisdictional waters needing a restoration plan).
- Reinstall the document box, if removed prior to the storm.
- Remove debris from culverts, outfalls, inlets, ditches, or other conveyances on the project, and evaluate for stability. Make necessary repairs.
- Repair any damaged erosion and sediment control measures to restore their full functionality in accordance with the plan.

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### DEMLR Staff Changes: The Highlights

Matt Gantt has retired from the Division of Energy, Mineral, and Land Resources (DEMLR) after 28 years of service. Matt served in the Winston-Salem Regional Office for over 26 years and served as the Regional Operations Section Chief for the last two years in the Central Office. Matt's last day with DEMLR was April 6, 2021.

Brad Cole has been named DEMLR's new Regional Operations Section Chief. Brad joins DEMLR from the City of Raleigh's Stormwater Unit where he managed Raleigh's stormwater control measures and city-owned dams. Prior to that, Brad was the Regional Operations Chief with DEMLR. Brad has over 19 years of experience with the Department of Environmental Quality and over 10 years with DEMLR. Brad's first day was June 21, 2021.

Another recent hire is DEMLR's new Public Information Officer, Josh Kastinsky. Josh comes to DEMLR from UNC's Coastal Resilience Center. Josh's first day was May 26, 2021.

Congratulations to Matt on his retirement from DEMLR and on his new position with the City of Winston-Salem's Streets Department; and congratulations and welcome to Brad and Josh!

Sincerely,  
The DEMLR Team



## DEQ's Current Operating Procedures

During the past year+ of efforts to minimize the spread of COVID-19, the Department of Environmental Quality has adjusted operations to protect the health and safety of the staff and public. During this time many employees were working remotely or on staggered shifts. As North Carolina's COVID-19 restrictions have eased, the Office of State Human Resources has set a September 1 date for return to regular onsite operations at all state agencies. To meet that goal in a safe and orderly manner, DEQ will begin a phased return to our office spaces starting on July 1. During this phased return, **all DEQ office locations will continue limiting public access to appointments only.** Please check with the appropriate staff before visiting our offices, as we may be able to handle your requests by phone or email. Individuals who are not vaccinated against COVID-19 are required to wear face coverings while indoors and within six feet of others at all DEQ facilities. Inspections are being conducted as normal with appropriate safety measures in place.

## COVID-19 Vaccinations

Want to get vaccinated against COVID 19?

To find a location to get your vaccination, visit

[www.YourSpotYourShot.nc.gov](http://www.YourSpotYourShot.nc.gov)

## Hurricane Weather Advisory for Construction Sites

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### Emergencies:

Repairs made to protect human life, and which involve land-disturbing activities are considered emergency repairs. Such repairs may be made without prior approval. In accordance with 15A NCAC 04B.0130, you shall notify the DEQ Director of the Division of Energy, Mineral and Land Resources, or his/her designee, of such repairs as soon as reasonably possible, but in no event later than five (5) working days after the emergency ends. Additionally, you shall take all measures necessary to protect all public and private property from damage caused by your repair as soon as possible, but no later than fifteen (15) working days after the emergency ends. Under emergency conditions, approval without a permit may be given on a case-by-case basis to discharge pumped stormwater to surface waters in an effort to minimize flooding. The definition of "Emergency Conditions" is water on streets at a depth of 14 inches that restricts emergency vehicles from responding to the needs of the public. Contact the DEQ office in your region for assistance.

## Erosion, Sediment, and Turbidity Control Virtual Classroom + In-Person Field Day

*Presented by:*

NCSU's Department of Crop and Soil Sciences

NCSU's June 24th ES&TC Field Workshop is the first in-person erosion and sediment control workshop in North Carolina since the International Erosion Control Association's Annual Conference was in Raleigh on February 23-26, 2020; right before all in-person events were cancelled due to COVID-19 restrictions. The field workshop involved ~ 4 hours of self-study via asynchronous video recordings followed by a half day (morning or afternoon) of participatory field demonstrations. The field portion included demos on the use of flocculants, various surface outlets (skimmers), rainfall simulation and erosion control options, passive treatment using wattles and other check dams, unmanned aerial vehicles, alternative silt fence anchoring and outlets, and more.



Pictured are some of the field demonstrations led by Dr. Rich McLaughlin. Photo credit: Jeffrey Chandler, DEQ-DEMLR-Mooresville Regional Office

## Project WET: A Water Education Curriculum for Formal & Non-Formal Educators

By Rebecca Coppa, DEQ-DEMLR, Sediment Education Specialist

Project WET, or Water Education Today, is a water education foundation with the mission of “advancing water education to understand global challenges and inspire local solutions.” Project WET has been researching, writing and publishing award winning water education materials since 1984. Their feature publication, the Project WET K-12 Curriculum and Activity Guide 2.0, is a collection of 64 activities based on 7 water literacy principles. These activities are aligned to standards, gives K-12 formal and non-formal educators tools to incorporate water education into every school subject, and can be used in the classroom or outdoors; what’s not to love?

While many of Project WET’s education materials are available on their website, [www.projectwet.org](http://www.projectwet.org), the Project WET K-12 Curriculum and Activity Guide is only available by attending a training session with one of the Project WET State Coordinators/Facilitators. In North Carolina, Project WET is housed within DEQ’s Division of Water Resources’ Education Program. Upcoming Project WET NC Workshops can be found on DWR’s website:

<https://deq.nc.gov/about/divisions/water-resources/water-resources-training/public-involvement/project-wet>

Project WET NC Workshops are fun, collaborative, demonstrate Project WET activities, and showcases various resources available through NCDEQ. So, if you want to learn more about how to incorporate water education into your curriculum or program sign up for a workshop today!

### Who Do I Call?

If you have questions or concerns related to erosion and sedimentation control or off-site sedimentation from construction in NC contact the appropriate local program, regional office, central office or the toll-free hotline.

Local program information:

<https://deq.nc.gov/about/divisions/energy-mineral-land-resources/erosion-sediment-control/local-government-programs>

Toll-Free Hotline:  
1-866-STOPMUD



Personnel of the Land Quality Section of the NC Department of Environmental Quality provide information and assistance for the implementation of the NC Erosion and Sedimentation Control Program. For assistance, please contact the appropriate Regional Office or the Raleigh headquarters listed below:

#### Asheville Regional Office

Phone: (828) 296-4500

Regional Engineer:

Stanley Aiken

#### Fayetteville Regional Office

Phone: (910) 433-3300

Regional Engineer:

Tim LaBounty

#### Mooresville Regional Office

Phone: (704) 663-1699

Regional Engineer:

Zahid Khan

#### Raleigh Regional Office

Phone: (919) 791-4200

Regional Engineer:

Bill Denton

#### Washington Regional Office

Phone: (252) 946-6481

Regional Engineer:

Samir Dumpor

#### Wilmington Regional Office

Phone: (910) 796-7215

Regional Engineer:

Dan Sams

#### Winston-Salem Regional Office

Phone: (336) 776-9800

Regional Engineer:

Tamera Eplin

#### Raleigh Central Office

Archdale Building

Phone: (919) 707-9220