

JANUARY 2023
4TH QUARTER



EXECUTIVE DIRECTOR

Charlene DeSha

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WEBSITE

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TNSA Times

Tennessee Stormwater Association
Quarterly Newsletter

A Message From the TNSA President

PAGE 1

Greetings TNSA Family,

We have made it through a pandemic, exponential growth, and a new MS4 Phase 2 Permit (after 2 long years of debate), and we are still here! I don't know about you, but I feel like we are finally in a place where we can take a deep breath, and once again focus on getting back to the basics. The basics of operating and managing our MS4 programs. The basics of teaching and growing our stormwater and city staff. And, the basics of serving the public through improving water quality.

For those I have not yet spent a lot of time with, my name is Lance Wagner. I am a Professional Engineer and a Tennessee Qualified Hydrologic Professional. I spent almost 20 years in the consulting world before giving in to my calling to serve public by working for the City of Gallatin. The majority of my consulting work has been here in Tennessee, but I have worked on site development, landfill, and environmental remediation projects in over 15 states, with my roles in these projects revolving around stormwater management, environmental remediation and restoration, project management, and permitting.

About five years ago, I came to the City of Gallatin just as they developed a Stormwater Utility and just as private development started exploding across the city. When I got here to Gallatin, I found that I had lots of questions that my consulting background did not prepare me for. Quickly, I realized that one of my best resources was TNSA. Especially, the people involved with TNSA. The collaborative and helpful atmosphere and the understanding of the oddly specific problems we deal with while having to balance the regulations, funding, politics, pandemics, and exponential growth has been invaluable to me and my personal development in my position. This is why I am honored to give back and serve as TNSA President this year.

As president, I want to encourage you and empower you to get involved with this great organization. We need help with filling positions on committees, running events, and helping other MS4s get back to the basics. Please let me, or more importantly, Charlene know your questions, concerns, and where you would like to get involved, because you are what makes TNSA the valuable resource that it is!

TNSA President,
Lance Wagner
City of Gallatin



** TNSA FORUM QUESTION **

We have started a discussion in the Club Express Forum about stream mitigation costs for MS4's and am looking for some feedback from members to see how widespread the issue is and how we need to address it with TDEC.

The Question:

The designed process of the TN Stream Quantification Tool assigns credits and debits for stream restoration projects in order to standardize and more fairly assign mitigation when compared to the State's previous policy. What, if any, exposure and experience has your MS4 had with the TN SQT, especially as it relates to mandatory infrastructure repair (or other municipal projects) and potential mitigation costs?

In order to participate in the forum you must login to your Club Express account. <https://tnsa.clubexpress.com/>

Interested in other helpful stormwater discussions?
Start your own forum discussion on Club Express.

Upcoming Regional Meetings

Regional meetings are held each quarter. You do not have to be a TNSA member to attend a meeting. Region meetings are a great way to keep updated within your area and the state. Meet like-minded professionals, network, learn about statewide events and new ideas within the stormwater community.

North East: Tuesday, March 7 , 1pm-3pm. Kingsport Water Services Operation Center 1113 Konnarock Rd, Kingsport, TN 37664 Future Dates: June 15, September 14, December 13.

East: Friday, March 3. Networking 8:30am, Meeting 9:00am-11:30am. Morristown Landing 4355 Durham Landing, Morristown, TN 37814. Meeting and tour of new facility. Future Dates: June 2, September 8 , December 1

West: Tuesday, February 28, 1:00pm-3:00pm. International Harvester Park 4523 Canada Rd Lakeland, TN 38002 Future Dates: June 6, September 5, December 5

North West: Wednesday, March 1, 11am-1pm Dyersburg. Lunch will be provided. RSVP to tware@dyersburgtn.gov Future Dates: June 7 (Paris, TN), September 6, December 6

Middle: Thursday, March 2, 10am-12pm. Murfreesboro Public Library (upstairs, Linebaugh Room) 105 W. Vine St. Murfreesboro, TN 37129 Future Dates: June 8, September 7, December 7

South East: Wednesday, March 8 10:30 am. Enterprise South Nature Park 190 South Hollow Loop Chattanooga, TN 37416 Future Dates: June 14, September 13, December 12

For updated meeting information visit our website event calendar.

**** Meeting Dates/Locations are subject to change ****

Email Charlene DeSha if you would like to be added to a specific region email list.

Committee Updates

Public Outreach: Creates Education Resources

Chair: Tom Lawrence, Thomas Lawrence Engineering

The TNSA Public Education and Outreach Committee has continued to move forward, completing several important milestones. At the moment we are working on a Homeowners Association rack card or brochure. TNSA currently sells the Homeowner Guide to Clean Water & EPA "After the Storm" brochures and TENS the Turtle Children's Activity booklet/stickers. To purchase visit: <https://www.tnstormwater.org/ed>

Education: Manages and Creates Educational Training and Resources

Chair: Tim Gangaware, UT Water Resources Research Center

UPCOMING EVENTS

Mid-South Clean Water Expo \$50 to attend

April 13, 2023. Shelby Farms FedEx Center, 415 Great View Dr. Cordova, TN 38018

To register: <https://www.tnstormwater.org/mscwe>

West Trail Run

May 6, 2023. International Harvester Managerial Park, 4523 Canada Rd, Lakeland, TN 38002

To register: <https://www.tnstormwater.org/westtrailrun>

We are interested in continuing TNSA Talks this year. TNSA Talks are one hour and hosted on Zoom. PDH's are included. Please let Charlene know if you are interested in speaking. Schedule and times are flexible.

Committee Updates Continued...

INTERESTED IN BEING MORE INVOLVED? CONSIDER PARTICIPATING IN A COMMITTEE. POLICY, CONFERENCE, EDUCATION, COMMUNICATION, SCM AND PUBLIC OUTREACH CONTACT CHARLENE FOR MORE INFORMATION

SCM: Standardizes Device Evaluation and Develops SCM Toolkit.

Chair: Jacob Dorman, Contech

At the Annual TNSA Conference, SCM Committee Members Bing Cao and Jacob Dorman presented a status update on the Designing for Maintenance Guide that the Committee has been working to prepare throughout 2023. A final guidance document for use by TNSA members is forthcoming.

Communication: Goal is to work on communication within and outside of the organization

Chair: Aaron Rogge, CDM Smith

TNSA wants to see your stormwater successes! The Communication Committee is compiling footage from all corners of the state that demonstrates “How Beautiful Stormwater Can Be.” That could be anything – natural areas, innovative BMPs, staff at work – be creative! Your submissions will be compiled into an educational video and shared by TNSA this fall.

Video guidelines: The video must be taken landscape. Please keep the length between 3 and 10 seconds.

Videos from iPhones etc. are fine. Be creative! Be safe!

Send video submissions to Aaron Rogge at roggea@cdmsmith.com. Title your emails with “TNSA video” and the name of your location.

Policy: Works with TDEC to share and update members on state and EPA regulations and policies;

Chair: David Mason, CDM Smith

The policy committee is looking for new committee members. Please contact Charlene DeSha if you are interested in participating.

NMSA Seeks Your Support for the WEF MS4 Needs Assessment Survey

The Water Environment Federation (WEF) Stormwater Institute has launched its third iteration of the National Municipal Separate Storm Sewer System Needs Assessment Survey (<https://www.surveymonkey.com/r/WEFMS4Survey>) and is collecting responses.

The primary objectives and impacts of these surveys include:

- to better understand MS4 program challenges
- to identify the information and resource needs of MS4 permittees
- to approximate current funding levels and estimated funding needs in the MS4 sector.

The WEF Stormwater Institute survey should be filled out by MS4 program managers. To access the survey, please go to: <https://www.surveymonkey.com/r/WEFMS4Survey>. **The survey will close on February 17, 2023.**

If you are interested in reviewing the questions ahead of time so you can prepare, <https://wefstormwaterinstitute.org/wp-content/uploads/2022/09/2022-WEF-MS4-Survey-Questions.pdf>



2023 Governor's Environmental Stewardship Awards

Nominations are currently being accepted until March 17, 2023

Award recipients will be announced in the summer of 2023

<https://www.tn.gov/environment/program-areas/opsp-policy-and-sustainable-practices/governor-s-environmental-stewardship-awards.html>

Urban Stormwater Presents Pollution Challenge

Chemists look to adapt green infrastructure to manage emerging contamination. *by Alla Katsnelson, special to C&EN*

On the wildest, stormiest nights in the San Francisco Bay Area, scientists from the San Francisco Estuary Institute (SFEI) go out on the prowl. Nighttime is when storm intensity in the Bay Area is generally highest, and the team gets going only when a storm is predicted to dump more than 2 cm over 6 h at a particular site.

The researchers fan out to different sites where they know stormwater flow is especially strong. At each site, they take samples to assay the levels of five classes of chemicals: tire- and vehicle-derived chemicals such as 6PPD-quinone; bisphenols, a starting material in manufacturing plastics; organophosphate esters, a key component of flame retardants; per- and polyfluoroalkyl substances (PFAS); and ethoxylated surfactants from paints, coatings, and floor polish. Over several hours, they nab some samples in 50 mL tubes and others in 2 L glass jugs.

This year will be the fourth and final wet season that SFEI scientists conduct these night runs before synthesizing their findings. “We’re laying the groundwork for understanding what’s out there in stormwater,” chemist Rebecca Sutton says. SFEI launched the monitoring project after a chemical analysis of samples collected in 2016 revealed untreated stormwater runoff from populated areas as an overlooked source of chemicals that water-monitoring agencies have only recently begun to track (*Environ. Sci.: Processes Impacts* 2021, DOI: [10.1039/d0em00463d](https://doi.org/10.1039/d0em00463d)). “It really opened our eyes to stormwater as an underexplored pathway in terms of emerging contaminants,” Sutton says.

In the US, the passage of the Clean Water Act in 1972 mandated federal, state, and local agencies to prevent chemicals from polluting the nation’s streams, rivers, lakes, and coastline. Sewers and factories posed the biggest problem, but as that pollution got cleaned up, attention turned to stormwater runoff, which in many ways is more challenging to address.

Wastewater and industrial effluent generally come from specific locations. But runoff, which is primarily carried by stormwater, is what environmental engineers call nonpoint source pollution—in other words, it flows in from all over the place. “It’s pollution coming from a whole bunch of small sources that individually create maybe a larger-than-expected issue because none of those individual sources looks important by itself,” says Edward Kolodziej, a civil and environmental engineer at the University of Washington Seattle and Tacoma.

Initially, environmental scientists studying the chemical pollution spawned by urban runoff focused their concern mostly on nutrients, such as nitrogen and phosphorus, and metals. But studies over the past 5 years or so have begun picking up a wide variety of organic chemicals. The sheer diversity of compounds that this flow carries is dizzying, and researchers are only beginning to appreciate the scope of the problem, says Allen P. Davis, a civil and environmental engineer at the University of Maryland, College Park. Davis has been studying the issue in the Chesapeake Bay region for close to 3 decades. “At this point, if you can name a chemical, it can probably be found in stormwater,” he says. “As we continue to identify more and more different pollutants that we want to remove from our waters, we are going to have to look at novel ideas for making that happen.”

In the natural environment, water from heavy rain gets absorbed by soil, trickling down to replenish groundwater. But most pavement and other features of the built environment are impervious to liquid. Consequently, says Jessica Ray, an environmental engineer at the University of Washington, “we get high volumes of runoff that are going over these engineered surfaces. They go into storm drains, and eventually the storm drains convey the stormwater to a nearby body of water.” Climate change compounds the problem, adding more intense rainfall and weather events, she says.

Efforts to stem pollution from urban runoff have largely focused on creating what civil and environmental engineers call green infrastructure—things like rain gardens, stormwater ponds, and other vegetation-based systems that capture stormwater and act as a filter for pollutants. Another option is permeable pavements that allow stormwater to drain into the ground so it doesn’t hit waterways in concentrated form.

For many pollutants in urban runoff, rain gardens work great, says Andy Erickson, a civil engineer at the University of Minnesota Twin Cities. The organic matter in such gardens removes metals and provides a substrate for microbial communities, which can break down polycyclic aromatic hydrocarbons that accumulate from gasoline and oil. A layer of sand also extracts particulate matter.

Other pollutants need a bit more than a simple garden can provide. Minnesota set out to tackle phosphorus pollution, which comes from yard waste like hedge trimmings and grass cuttings as well as from many soaps and detergents. As a graduate student, Erickson found that iron shavings mixed into the sand at a mass fraction of 5% can pull about 90% of the phosphorus out of stormwater. Since Erickson first published the work in 2007, about 150 full-scale, iron-enhanced sand filters treating runoff have been incorporated into rain gardens across the state, and other regions are adopting them too.

But these systems are not designed to handle many of the newer substances appearing in stormwater, such as pharmaceuticals, flame retardants, PFAS, and microplastics. “The problem with these newer, long-chain complex chemicals is that in the environment they can do some pretty strange things, like transform into other chemicals, volatilize, or stick to particles,” Erickson says. “Having materials that remove those chemicals is going to be a huge thing for stormwater.” One solution researchers are experimenting with is adding biochar, typically made by pyrolyzing agricultural waste products such as wood and corn husks, to rain gardens and other green infrastructure. Biochar’s charcoal-like, high-carbon composition creates a material that is loaded with tiny pores, giving it a high surface area with which to draw pollutants out of water. The trick is to figure out which type works for what chemicals, how to configure it in green infrastructure and how to switch it out when it is “used up,” Ray says. Her lab at the University of Washington is studying a biochar made from coffee grounds to determine the types of contaminants it can remove and how long it functions under a continuous flow of stormwater. The researchers are also testing the properties of an iron oxide-coated sand that degrades compounds on contact.

Another approach is to augment the ecosystems that emerge in green infrastructure. Gregory H. LeFevre, a civil and environmental engineer at the University of Iowa, is studying microbial communities in these structures. He says that boosting specific bacteria to promote biofilm formation or adding particular plants and fungi may help degrade especially recalcitrant chemicals. His lab is also examining what exactly happens to contaminants as they mix in systems enhanced in such ways. Chemical mixtures could be “creating a whole plethora of different metabolites, some of which nobody has ever seen before,” he says, and understanding how they interact and evolve is an emerging area of environmental science.

And then there’s the ongoing problem of identifying which chemicals to target. Often, chemicals’ effects on wildlife are subtle—causing changes in fertility or immune response, for example—and it’s not obvious which ones are most damaging. “As a society we are making several hundred thousand of individual chemicals, so the potential portfolio of chemical pollutants is very, very large,” Kolodziej says. “How do we prioritize the most important ones in this huge chemical soup?” It doesn’t help, he notes, that companies classify their chemical recipes as trade secrets. “To protect the environment, we need to know what’s there,” he says.

Urban Stormwater article (continued)

Occasionally, clear culprits emerge. In 2020, Kolodziej and his colleagues identified 6PPD-quinone, a chemical derived from tire plastic, as the primary cause of mass die-offs of coho salmon in the Pacific Northwest. The chemical, a component of roadway runoff, had been ending up in waterways for decades, yet it still took 5–6 years of concerted effort and some intense chemistry to identify it. This effort involved narrowing down from some 2,000 compounds in tire plastic leachate. It's still unclear how the chemical is transported through the environment. Some is leaching from bits of rubber, and those bits could be filtered out by roadside rain gardens or captured by buffer strips or retention basins that highway crews clean periodically. Some is also dissolved in water and will likely require a different solution.

Because runoff from roadways and other sources is so chemically complex and largely uncharacterized, Kolodziej and others advocate testing the water not just for specific known chemicals. Some researchers are exploring using a suite of biological assays, such as ones that measure changes to estrogen receptors, to monitor aquatic environments where runoff is discharged. Thomas Young, an environmental engineer at the University of California, Davis, calls this approach "an insurance policy" that can "detect problems in an environment where you don't know, a priori, what chemicals might or might not be there." He notes, though, that so far the field hasn't settled on which assays to use.

Regardless of how many pollutants researchers can identify and ways they find to remove them, what's clear is that treatment and remediation alone won't solve the problem, SFEI's Sutton says. The level of infrastructure required to treat stormwater everywhere in the US would require "an incredible investment," she says. "That would be unrealistic."

Indeed, even maintaining existing infrastructure will take more than is currently being done, the University of Maryland's Davis says. With proper maintenance, rain gardens and similar constructions were designed to last for about 20–30 years, and some of the earliest installations are reaching the end of their natural life span. How exactly to refresh, rebuild, or update them is a question the field has yet to tackle. "Nobody has really thought that far ahead," Davis says. And what, chemically speaking, happens to many of the compounds being captured is unknown. "That's also an area where we need to continue to do research to make this a sustainable process."

But just as important, Sutton says, are longer-term efforts such as working with manufacturers to reduce the variety of chemicals they use and develop less toxic replacements for some, she says. Efforts might also involve reformulating products in such a way that they shed fewer contaminants or finding ways of capturing them before they enter the environment. "It would be much smarter," she says, "to address this pollution at the source."

Alla Katsnelson is a freelance writer based in Northampton, Massachusetts, who covers the life sciences.



San Francisco Estuary Institute researchers Matthew Benjamin (left) and Diana Lin collect stormwater runoff draining from Berkeley, California, to the San Francisco Bay to look for chemical contaminants.

2023 STORMWATER AND ENVIRONMENTAL CONFERENCES

Tennessee American Society of Landscape Architects Conference April 20-21, 2023, Memphis
 Municipal WET Conference (EPA/IECA) May 1-3, 2023, Chattanooga
 TN Environmental Show of the South May 10-12, 2023, Chattanooga
 Tennessee Municipal League Conference July 22-25, 2023, Nashville
 KY/TN Water Professionals Conference July 30-August 3, Memphis
 TN Association of Floodplain Managers August 14-16, 2023, Franklin
 StormCon August 28-30, 2023, Dallas, TX
 TN Engineers Conference September 17-19, 2023, Franklin
 SESWA October 4-6, 2023, Hilton Head, SC
 TNSA Annual Conference October 24-26, 2023, Montgomery Bell State Park
 Sustainability Solutions Symposium (Formerly TN Environmental Conference) October 23-25, 2023, Kingsport
 TCAPWA/SWANA Annual Conference November 13-15, Nashville



The Tennessee Stormwater Association is Tennessee's premier membership organization for stormwater professionals.

TNSA's mission is to assist members with their local efforts to comply with State and Federal clean water laws; including stormwater regulations through EPA and TDEC (Tennessee Department of Environment and Conservation).

TNSA's goal is to protect and improve the quality of the waters of Tennessee through the exchange of information and knowledge regarding design, construction, maintenance, administration and operation of stormwater facilities.

Upcoming 2023 ARP Grant Workshops

Engineering Document Submittals Workshop and TDEC ARP Non-Competitive Grant Workshop Series

TDEC is excited to see you in-person across the state for our 2023 ARP Non-Competitive Grant Workshop series, starting in Jackson next Thursday! The workshop will focus on key information for grant awardees, including information regarding contracting, deliverables, procurement, and monitoring and compliance. We encourage anyone involved in the application process or with affiliated projects to attend. Please register for the workshop you plan to attend; you will receive further details regarding your specific location. Registration forms will close two days prior to the workshop date. The dates and locations for the workshops are:

- [Jackson, TN: Thursday, 2/23 1:00-5:00pm CST](#)
- [Bartlett, TN: Friday, 2/24 8:30am-12:30pm CST](#)
- [Chattanooga, TN: Wednesday, 3/1 9:00am-1:00pm EST](#)
- [Columbia, TN: Thursday, 3/2 1:00-5:00pm CST](#)
- [Murfreesboro, TN: Friday, 3/3 9:00am-1:00pm CST](#)
- [Knoxville, TN: Tuesday, 3/7 1:00-5:00pm EST](#)
- [Cookeville, TN: Wednesday, 3/8 8:30am-12:30pm CST](#)
- [Kingsport, TN: Friday, 3/10 9:00am-1:00pm EST](#)
- [Virtual Workshop: Thursday, 3/16 1:00-5:00pm CST](#)



The information for both the Engineering workshop and the ARP Non-Competitive Grant workshops can be found on the [ARP Engagement Opportunities webpage](#). Please reach out to tdec.arp@tn.gov if you have any questions. We look forward to engaging with you soon!



**CUMBERLAND
RIVER COMPACT**
OUR WATER. OUR FUTURE.

STREAMBANK REPAIR COURSE AND CERTIFICATION

February 28 and March 1, 2023

Murfreesboro, TN

9am-3pm \$50 with scholarship available.

Altered streamside vegetation and areas where we see plants mowed up to the bank edge are some of the top five causes of water quality impairments in the region. Many of these small streams are on private property

where larger restoration work is difficult.

To help private landowners, landscapers, and other industry leaders address these problems, we will be providing a workshop on practical, cost-effective solutions using natural materials and native plants that create a healthy streamside.

The workshop is in partnership with North Carolina State University leaders Bill Lord and Mitch Woodward.

The two-day workshop will include a classroom day with information on the techniques, regulation considerations, and best practices. The second day will focus on the hands-on implementation of the practices at a local waterway.

Certified attendees will be recognized by the Compact in a public list of Certified Stream Bank Repair Professionals.

This training is geared towards landscape designers, commercial landscapers, municipal personnel, utility workers, HOA officers, homeowners, landowners, park managers, and other industry professionals.

The talk will also be live-streamed. Upon registration, you can select the virtual option and a link will be sent to you.

[Click here to register](#)

Mid-South Clean Water Expo Thursday, April 13, 2023 8 am - 5 pm

Shelby Farms Park Fed Ex Center
415 Great View Drive
Memphis, TN 38018
5 PDHs Included as well at lunch

This day-long workshop will begin with speaker sessions about industry regulations and trends at the Fed Ex Center. After lunch demonstrations of SCM's led by experts eager to answer questions and share their knowledge will be located throughout Shelby Farms Park.

Click here for more information:
<https://www.tnstormwater.org/eccd>

Tennessee Stormwater Association



Mid-South Clean Water Expo

Tennessee's Premiere Organization for Stormwater Professionals

Thursday, April 13, 2023
Shelby Farms Park, Memphis
Registration \$75
5 PDHs and Lunch Included

Attend the 2023 TNSA Mid-South Clean Water Expo on April 13, 2023 to gain exposure to innovative research being performed on commonly employed construction site erosion and sediment control practices with hands-on field demonstrations. The field instructional session will be held at Shelby Farms Park and will provide attendees with an opportunity to learn proper design and installation techniques on various erosion and sediment controls to achieve improved performance & compliance.



LEARN MORE AND REGISTER AT www.tnstormwater.org/mscwe
Contact Charlene Desha at Charlene@tnstormwater.org or 865-386-6917 for sponsorship and exhibitor opportunities



May 6, 2023

International Harvester Managerial Park
4523 Canada Rd, Lakeland, TN 38002

3 Mile Trail Run, Family Fun Run & Water Quality Festival
Registration is 7:00AM Trail Run Starts at 8:00AM Fun Run at 9AM
Water Quality Festival 7am-1pm

Join us for the Water Quality Festival after the race in the park which includes music, food trucks and beverages.

For more information, to sponsor or register to run visit our website:
<https://www.tnstormwater.org/westtrailrun>



FIRST ANNUAL WEST TN TRAIL RUN FOR CLEAN WATER

May 6, 2023

Trail Run, Fun Run & Water Quality Festival

Call for WQ Booths and Sponsorships.

Click here for more information:

<https://www.tnstormwater.org/westtrailrun>

Contact Charlene DeSha with any questions



Tennessee Stormwater Association
P.O. Box 6550, Maryville, TN 37802
865-386-6917
Charlene@tnstormwater.org

TDEC UPDATES

Construction Stormwater

2023 - TDEC's Tennessee Erosion Prevention and Sediment Control (EPSC) Training (Level 1)
(Facilitated by the University of Tennessee Knoxville)

Level 1 training schedule:

March 15, 2023 - Nashville - Southern Company, 2451 Atrium Way, Nashville, TN

April 12, 2023- Memphis- Holiday Inn Suites-Wolfchase Galleria, 2751 New Brunswick Road, 38133

April 14, 2023-Knoxville-Rothchild's Catering Center, 8807 Kingston Pike, Knoxville, TN

Check back later for additional classes.

Level 1 Recertification Training Schedule:

Level 1 Recertification - Online Video Course

2023 - TDEC's Design Principles for Erosion Prevention and Sediment Control for Construction Sites (Level 2)
(Facilitated by the University of Tennessee Knoxville)

Level 2 Training Schedule:

March 30 & 31, 2023 -Knoxville- Rothchild's Catering Center, 8807 Kingston Pike, Knoxville, TN

Check back later for new classes.

Level 2 Recertification Training Schedule:

Check back later for new classes

Check back later for new classes.



Municipal Stormwater

The Department's goal will be to present to the Tennessee Board of Water Quality, Oil & Gas Board the modified rule 0400-40-10-.04 (2)(c) as proposed to remove the sentence "Uncontaminated roof runoff may be excluded from the WQTV." during their next Board meeting that is scheduled for April 18-19, 2023.

If the Board approves the rule as proposed, and once the rule becomes effective, the Department will modify the General Permit for Small Municipal Separate Storm Sewer Systems to remove the option to exclude uncontaminated roof runoff from the WQTV and rescind guidance related to such permit provision. Upon permit modification the Petition for Declaratory Order and the permit appeal will be dismissed.

Urban Waters Report Card (UWRC)

The Tennessee Water Resources Research Center is developing an Urban Waters Report Card (UWRC) in coordination with a working group of MS4s. The goal for use of the UWRC is to provide MS4s a means to track improvements in streams from their stormwater management and stream rehabilitation efforts. The UWRC Working Group will meet this February to review draft materials to meet the established goals.

Proposed TMDLs

JANUARY 31, 2023

Tennessee's proposed Total Maximum Daily Load (TMDL) for *E. coli* in the Hiwassee River Watershed, located in southeastern Tennessee, is now available for public review and comment.

- [Public Notice Document](#)
- [Draft TMDL Document](#)

Comments on the proposed TMDL report may be submitted through March 7, 2023, directly via our WEB FORM, or in writing to:

Tennessee Department of Environment and Conservation: Division of Water Resources
Watershed Planning Unit-Attn: Vicki Steed
William R. Snodgrass Tennessee Tower-11th Floor
312 Rosa L. Parks Avenue, 11th Floor
Nashville, TN 37243

Blog Post: Subdivisions and Stormwater – Plan Review

Author: James “Chip” Moore, P.E. - CTI Engineers, Inc. - jmoore@ctiengr.com

Having worked for municipalities for 20 years, there is one thing that always happens, it rains. A continuing problem, however, is getting people to think about rain when it's not raining. Unless it's raining, stormwater issues are rarely perceived as important as drinking water, sewer, roads, and electricity. When its effects are overlooked, troubling issues arise. A little bit of storm water can cause a lot of damage. The following are a few observations and lessons I have learned in my tenure.

As a plan reviewer, do not implicitly trust the FEMA Flood Hazard maps, especially in karst areas. By no means am I saying the maps are not accurate, but they aren't perfect. Geology changes and when it does, it can be a doozy. I have seen subdivisions built very close to a dry creek bed. This site was unmapped by any FEMA flood hazard maps. When surveyed, there were large dry drainage ways on the site. There was, however, no one asking the question, “Well, water obviously flows through here, how much is it?” Because the plans were submitted and approved through the county, the city never had the chance to review the plans. Thus, a problem was inherited when the city annexed the subdivision before it was completed. As part of the annexation, the city should have required a plan review and might have been able to catch this situation and have the plans updated as a condition. That didn't happen at that time either. After a significant rainfall, two homes had their entire back yards flood. It is always best to look at the contours. If you see a ditch, there will be water in it, eventually. And if it's a big ditch, it's liable to have a lot of water on certain occasions. Find out how much water and maybe run your own HEC analysis if possible.

Road paving is another area that is critical when looking at redevelopment. If water pools in roads, it causes issues with pavement longevity and if occurring in winter, ice. Many people think about cars when it comes to roads and ice, but people still use sidewalks. Ponding at sidewalk landings and road crossings is critical to review. Roads in middle and east Tennessee should not be built to less than a 1% slope and that's with curb and gutter. Not just curb, but curb with gutter. The curb with gutter makes it far easier to be accurate in placing pavement since the curb with gutter was constructed on a string line. This line allows for a more constant and consistent elevation to place the pavement. It is rare that asphalt can be placed at a 1% slope. I have only witnessed crews with extensive experience in locations that have little change in elevation, such as towns along the Gulf of Mexico or west Tennessee, do it more often than not. For drainage, ditches and roads without curb and gutter slopes should not be less than 2% if you expect to have consistent and quality construction. Otherwise, it is very common to have ponding. Remember, the guy grading that ditch is probably using a skid steer and we all know how accurate grading can be with those.

My final comment on plan review is to examine every watershed. Too many times plans are submitted with not enough information on the water flowing onto the site from adjacent properties. Some jurisdictions require drainage area mapping on the project site, but it would be just as important to review all the watersheds that come to the property. As a reviewer, I would locate where the project outfall was and then look at the downstream watershed. I would then take that map to the maintenance division, in my case, the Public Works Road Department. I would then ask if they were aware of problems in that area that may not have been reported. This small effort paid off huge benefits to protect downstream areas from being overwhelmed. While the design is supposed to match preexisting conditions, it is crucial to determine if the existing system may already be stressed. This research allows the reviewer to possibly have the development make downstream improvements or to require stricter controls on the development to help with downstream issues. In addition, I would recommend looking at the next two downstream structures from the project and the properties adjacent to them. Do this to see what happens if a downstream structure gets blocked? I have seen 4'x8' sheets of siding get into a stream and block one barrel of a two barrel 4'x10' box culvert. The result was water overtopping the road and damaging HVAC units and ductwork. What would have happened if the elevations on the homes were a little lower? Catastrophic flooding. I have seen designers submit plans where drainage goes to sink holes. What happens when that fails? A really big pond. Another example of a review determined that six buildable lots would have been six feet underwater before the pond would have drained off the east side of the development to another subdivision.

Plan review is more than a checklist. As an engineer, we are required to protect life and property and hopefully not engineer new problems. I have appreciated reviewer comments and enjoyed the dialog from other points of view. Sometimes we'd both learn something.

Tennessee Smart Yards and MS4 Education Programs, a Mutually-Beneficial Partnership

by Andrea Ludwig, Associate Professor, University of Tennessee and Julie Berbiglia, Education Specialist, Nashville Metro Water Services

Success in Public Education and Public Involvement programs is becoming increasingly dependent on measurable metrics. The partnership between Metro Water Services Nashville-Davidson County and UT Extension to deliver Tennessee Smart Yards has provided Metro with needed measurable metrics as well as an umbrella program that connects residents with information across many departments. The Tennessee Smart Yards program involved participants directly with their municipal stormwater program. It allows participants to see how they are helping meet requirements for their community, how they are part of something bigger than just their individual yard, how they are part of the solution to climate-change enhanced flooding, biodiversity loss, and other ailments in our urban ecosystems.

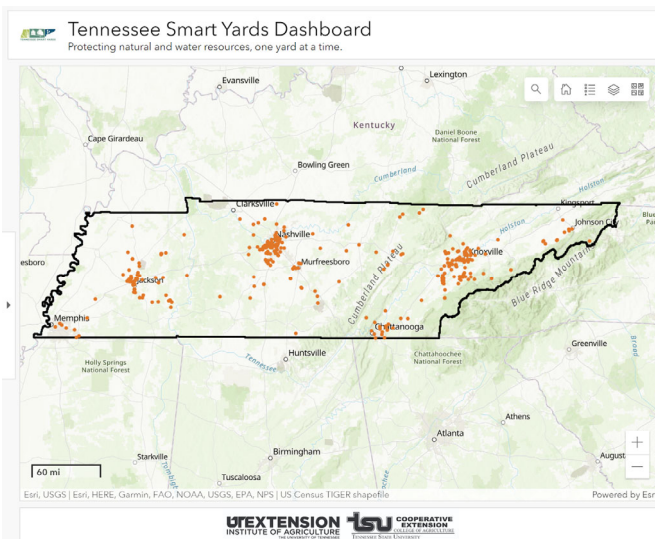
Tennessee Smart Yards is an education and yard certification program that was started by the Tennessee Water Resources Research Center in 2008 and is now fully delivered by UT Extension and municipal partners like Metro. In the program, participants learn about ecologically-sound landscaping principles, then voluntarily adopt a tailored set of stewardship practices in their landscape that meet their unique needs and environmental conditions. Participants report back their actions as they certify their Tennessee Smart Yards, protecting water and natural resources one yard at a time.

The program is also helping communities start the conversation about moving away from conventional, resource-consuming landscapes and towards environmentally friendly landscapes that support ecosystem services and protect natural capital. Through heightened awareness about how everything is connected, participants see their landscapes in a new way with new or refreshed goals centered on ecological function, stewardship, and being part of the larger ecological community. Many of the practices promoted also dove-tail into other municipal programs (like recycling) as well as other allied certification programs. Participants are able to double dip with programs such as the National Wildlife Federation's Wildlife Habitat Certification, Monarch designations, Homegrown National Park, and others. Provides framework for existing efforts, formalizing recognition, complementing, common missioned groups. Statewide program but local groups, local connections, local benefits.

Because of this partnership, UT Extension is able to provide Metro with tangible results such as certified yards per zip code, per watershed, and in priority areas. With the online certification form, the number of participants adopting specific practices is recorded and can be summarized for any specified time period. Some of the most notable reported metrics include the number of participants who built a rain garden, disconnected their downspouts, kept potential pollutants out of the flow path of runoff, used permeable surfaces in place of impermeable, and maintained a riparian buffer. Through the Tennessee Smart Yards program, Metro has been able to create new connections and strengthen existing partnerships with groups like watershed associations, garden clubs, and community groups. The program has a clear focus on protecting water resources, but the holistic approach that encompasses topics in native plants and low-input landscapes generates interests from a wide variety of allied groups.

Tennessee Smart Yard Communities started in 2021 as a means to connect with ecologically-minded community organizations to amplify the Smart Yards messaging and reach. Participating Communities are community organizations that strive to create healthier, more ecologically-sound landscapes. A Tennessee Smart Yard Community can take many forms – a neighborhood organization, garden club, homeowners association, or school community. To be recognized as a Smart Yards Community, a community champion or championing committee creates a Community Action Plan that commits the community to two or more activities in the areas of education, stewardship, and connection. Participation looks different across communities and is flexible to allow for unique circumstances of each group. Assistance is provided to communities through a monthly resource email that contains a newsletter, social media posts, and calendar of related events. Once an entire community gets on board with this concept of stewardship, the potential environmental impacts can increase exponentially. Since July 2021, seven groups in two counties have joined as Participating Communities.

Since the release of the online platform in October 2020, there have been over 370 yards certified statewide across 49 Tennessee counties. The ambitious goal for 2023 is to add an additional 300. If you would like to discuss how Tennessee Smart Yards may be implemented through your stormwater program so you can access measurable metrics for your reporting, check out the website at <https://tnyards.tennessee.edu> and email Andrea Ludwig at aludwig@utk.edu. For questions about how it is working in Davidson County, email Julie Berbiglia at julie.berbiglia@nashville.gov.



Tennessee Smart Yards (continued)

Total Yard Certifications in Davidson County, July 1, 2021 - June 30, 2022		45
Actions		# Yards with Practice
Determine your family's landscape objectives and level of maintenance desired.		44
Assess yard site conditions and incorporate into sketch.		41
Sketch your yard including long-term goals.		39
Group plants according to site conditions and maintenance needs.		36
Remove or avoid using invasive/exotic plants and incorporate native plants.		36
Preserve existing vegetation, especially trees, during land disturbance activities.		35
Assess and address soil compaction.		27
Maintain a 2-3 inch layer of mulch in plant beds and over tree and shrub roots, leaving at least 2 inches of space at the base of trunks.		38
Use organic pine straw, pine bark leaves, or hardwood mulch.		41
Protect all soil surfaces with vegetation to minimize erosion by rainfall and runoff.		41
Use rain gauge to help monitor plant water needs; apply about one inch of water per week, taking into account rainfall.		19
Use rain barrels to catch rooftop runoff.		25
Adjust sprinkler heads to avoid hitting paved surfaces and calibrate the output as directed by plant needs.		26
Mow grass high, creating deeper root systems and reducing water needs.		40
Leave grass clippings on lawn.		44
Use composted grass clippings, leaves, pruned plant parts, kitchen scraps to improve soils.		42
Locate plants to increase home energy efficiency.		25
Use landscape waste on site.		40
Incorporate salvaged materials into landscaping.		36
Maintain soil pH in the recommended range.		17
Fertilize as recommended by soil test and not in wet weather; use low maintenance plans when available.		22
Check for pests regularly to detect and determine problems that require intervention.		38
Use mechanical approaches to pest control such as pruning and hand removal.		40
Protect beneficial insects that control pests and support pollination.		39
Spot treat only affected areas, avoiding routine applications of pesticides.		39
Use environmentally-friendly pesticides such as horticultural oils and insecticidal soaps.		33
Incorporate plants that support habitat needs of desired wildlife.		39
Provide a water source.		38
Install bat houses, bird houses, bird feeders, etc.		36
Maintain a mix of native trees, shrubs, grasses and wildflowers along water's edge, creating a vegetated width that is as wide as practical.		13
Create "no mow, no fertilizer, no pesticide" zones along waterways.		9
Disconnect downspouts, directing them onto a lawn or garden rather than into drainage channels or onto impervious surfaces.		23
Build a rain garden to catch and filter stormwater runoff.		15
Use permeable surfaces for hardscapes such as driveways, walkways or patios.		19
Practice good housekeeping (e.g. sweep impervious surface, "scoop the poop," wash car on lawn instead of driveway).		37

ANNOUNCING THE NEW BLUE RIDGE SNORKLING TRAIL

The Blue Ridge Snorkel Trail is an innovative education project that will link together a set of publicly accessible river sites where people can safely snorkel to experience the underwater world of streams and rivers of western North Carolina. The creators are two biologists with the North Carolina Wildlife Resources Commission. They were inspired by Casper Cox's *Snorkeling the Hidden Rivers of Southern Appalachia*, which presents a set of snorkeling sites in Tennessee, Georgia, and Kentucky, describes a set of species that can be seen, and provides tips on how to snorkel. The idea of the Blue Ridge Snorkel Trail was spawned, developing a set of 10 pilot sites across WNC, where educational signs will be placed that provide safety information and a description of notable species at the site. Additional information on the BRST and the fishes that can be found at each site will be provided on the North Carolina Fishes website. Signs will be installed this spring, and they hope to have kick-off events with guided snorkeling. Funding has been provided by site hosts themselves (towns and watershed groups), Tennessee Valley Authority, and the North Carolina Chapter of the American Fisheries Society. They are hoping to expand this program so that there is a site in each county in WNC and beyond state borders to neighboring states.

Website: <https://ncfishes.com/>

2023 TNSA ANNUAL CONFERENCE

“Back to Basics”

OCTOBER 24-26, 2023

MONTGOMERY BELL STATE PARK

Call for Abstracts Open – Due June 1, 2023

Conference Fees:

TNSA Member Early Bird: \$300 (Regular \$350)

Non-Member Early Bird: \$350 (Regular \$400)

Early Bird Ends September 30, 2023

<https://www.tnstormwater.org/tnsa-conference>

Save the Date: October 22-24, 2024



We have booked Montgomery Bell State Park for the next 2 years.
October 24-26, 2023, Workshop October 23, 2023
Rooms are ready to reserve with Group Code 2543
If you are interested in a cabin call ASAP. The state will no longer hold cabins with a group code.
Call or book rooms online with group code 1-888-867-2757
October 22-24, 2024, Workshop October 21, 2024



Join the TN GIS Community at the Tennessee Geographic Information Council (TNGIC) 2023 Conference!

Where: [The Guesthouse at Graceland](#) - Memphis, TN

When: April 11th - GIS training (ESRI and QGIS)
April 12th - Ashley Hitt of Connected Nation, User Presentations, and the TNGIC Social
April 13th - Steve Aichele of USGS, User Presentations

What: GIS Training, GIS Data, Lidar, Imagery, Data Workflows, Hydrography Data, State and Federal Data Programs, Cartography, Programming, GIS Software, Learning, Networking and more!

REGISTER AT [TNGIC.org](https://www.tngic.org)

Free DIY Streambank Repair Workshop with including Invasive Species ID and Removal.

STREAMBANK REPAIR WORKSHOP

Join experts Dr. Andrea Ludwig, Associate professor of Ecological Engineering, and Mary Beth Sutton, Executive Director of WaterWays, for a FREE DIY streambank repair workshop with invasive species ID and removal. Join us to find nature-based solutions to streambank erosion. Please bring loppers, GLOVES, and hand tools if you have any! Please join us on either February 24th or 25th for a day of stream bank repairs.

TWO OPPORTUNITIES: FEBRUARY 24TH & 25TH

9:30AM - 12:30PM BOTH DAYS

WALDENS RIDGE PARK



WaterWays, UTK AG Extension and other local partners will provide practical, cost-effective solutions using natural materials and native plants to create healthy, stable stream banks and conduct small scale repairs. Attendees will participate in hands-on installation of live staked native plants, fascine bundles, and coir logs while learning about stream restoration and protection practices.

This workshop is FREE and open to the public. Sign up for either February 24th and or 25th from 9:30 - 12:30 at Walden's Ridge Park (1001 Reads Lake Road) at <https://www.eventbrite.com/myevent?eid=547734216787>

Attendees are encouraged to bring loppers, gloves, and hand tools if you have any. Let us teach you about how to improve the natural environment of our local streams!

For more information, check out mywaterways.org or email info@mywaterways.org