

Raining Solutions: Navigating Stormwater Management for a Sustainable Future

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Spring has sprung at Wake Forest, and seemingly overnight, the tulips have been planted, the grass has greened, and the trees have thickened, all thanks to our abundance of rain. Little do most students understand is where all this rain is going.

An intricate system of pipes, reservoirs, sandpits, and more lay beneath our feet, working overtime to keep our campus dry and our local streams at bay.

To most, managing excess water seems like a simple procedure, but for people like Seth Looney, our campus Utilities System Manager, it is a complex subject that is always at the top of his mind.

“The two main things that you need to look at with stormwater are quantity and quality,” said Looney.

To offset the quantity, Wake has abundant drainage systems that guide water off impervious surfaces, such as parking lots, streets, rooftops, and sidewalks, into underground reservoirs, where it can be slowly released into Silas Creek.

To ensure water quality, a more complex issue, Wake uses two general strategies: bio cells and bay filters.

A bio cell is placed either above or below ground and uses organic material such as sand, gravel, and fabric to mimic nature, while a bay filter is an underground man-made filter that guides water through various levels of filtration. Both systems ensure that clean water is being released into our local waterways.



An above-ground bio cell placed near the golf center this year.



A bay filter placed underneath Davis Field.

Managing excess rainwater is a problem that Wake Forest will continue to face as the climate crisis gradually increases North Carolina's average precipitation and causes extreme weather events.

NC State University released its North Carolina Climate Science Report, which states that heavy rains from hurricanes and other weather systems will become more frequent and intense. Annual precipitation is also expected to increase. The study equated these changes to increasing atmospheric water vapor as the climate warms.

The campus arborist, Jim Mussetter, explained that adding nature to our campus is another tool for controlling this abundance of rainwater.

“A tree will intercept thousands of gallons of water in no time, and the root system will stabilize the soil and reduce erosion,” said Mussetter. “I think the only thing keeping the dance studio from falling into the creek is the root systems holding together.”

The increase in extreme weather and average precipitation is the reason why Wake has invested so much time and money into their water facilities.

“We have preventative maintenance tasks that we have to perform monthly, and we have to inspect them after every one-inch rainfall in 24 hours.” said Looney, “We have a whole program to do that because the city of Winston Salem comes out and inspects these things once a year.”

These meticulous measures assure the safety of our water systems because when stormwater is managed poorly, our environment pays the price.

“The concern is that anything on the surface of the Wake Forest campus can end up in the local waterway because water is a universal solvent,” said Stephen Smith, a professor in the environmental studies department. “If you think about things like coolant or fuel leaking from cars and parking lots, that can end up in the water supply.”

Krista Stump, a professor with a master's in environmental engineering, shared her fears of water pollutants.

“There are a lot of different pollutants, but when it comes to stormwater runoff, we're looking at things like pesticides and other chemicals that are used primarily on lawns or landscaping like fertilizers,” said Stump. “Fertilizers can cause dangerous algae blooms.”

In the past, Wake has had issues with pollution and sediment build-up that affected stormwater management systems.

“We've got guys on campus that are power washing, and they'll have bleach they're using. We get calls from people down on faculty drive all the time saying, ‘Hey, you guys got something funky going on here in the water.’ ” said Looney.

Trash build-up from students and faculty also poses an issue.

“The biggest thing is trash in parking lots that get washed down, and sometimes the trash can obstruct the whole system to back up. We've had that happen,” said Looney.

Smith emphasizes the importance of students being conscious of Wake's efforts to manage stormwater in an environmentally friendly way while noting the connectivity within water systems.

“Anything that rainwater picks up on gets dumped into Silas Creek, Silas Creek flows into Muddy Creek, Muddy Creek flows into the Yadkin River, and the Yadkin River is the drinking water source for pretty much all of Winston Salem,” said Smith.

Most students are not from Winston Salem and will likely move away after graduation, but understanding how one's actions can affect the broader community is an important lesson to be learned.

“You are an inhabitant of this area for the better part of at least four years. Understanding the connections between what's going on on campus and how that impacts areas outside of campus. I think it's useful, right?” said Smith.

“Awareness is always useful.”