



Testing the Waters: How Collaborative Field Monitoring in North Carolina is Shaping the Future of Stormwater Technology.

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As towns and municipalities across the country become more developed, forests and meadows are being replaced by pavement and buildings. When it rains, stormwater runs off roofs and parking lots into the street, picking up everything from fertilizer, pesticides, bacteria and other pollutants. The untreated run-off then makes its way through storm drains and ditches to our rivers, lakes and oceans. There's no getting around it: polluted runoff is one of the greatest threats to clean water in the U.S. And without clean water, our world would be unrecognizable.

Fortunately, there are studies in the field that are helping to do something about it.

The North Carolina Department of Environmental Quality (NCDEQ) New Stormwater Technology (NEST) Program is an excellent example. By playing a vital role in validating the field performance of proprietary stormwater control measures, NEST is leading the way by putting together strong partnerships and ensuring water quality solutions are in fact effective. Oldcastle Infrastructure is actively engaged in this process through ongoing monitoring of its PerkFilter™ and BioPod™ systems in collaboration with Civil & Environmental Consultants (CEC), River to Tap (R2T), and North Carolina State University.

Multiple active field studies including PerkFilter evaluations in Knightdale, NC and Nashville, TN, as well as BioPod monitoring in Hillsborough, NC and Gainesville, GA are generating critical performance data related to total suspended solids (TSS) and nutrient removal under real-world conditions.

These partnerships strengthen regulatory credibility, streamline technology validation, and help close the gap between lab performance and field realities. The ultimate goal of programs like NEST is to shape the regulatory landscape while driving measurable improvements in stormwater quality throughout North Carolina and beyond.



Seeing the Light in Knightdale

Phillip Bunton is the Public Works Director for the Town of Knightdale, N.C.

“My job is to manage our municipality’s public infrastructure, including construction administration and water systems. Ultimately, I am responsible for developing long-term improvement plans to ensure the efficient and effective delivery of services to the community. This is especially crucial where clean water is concerned.”



Knightdale is one of those towns experiencing explosive growth and development. “A good example of that is our police department,” says Phillip. “They are moving from a 4,500 square foot facility to one about 31,000 square feet, which is a huge improvement.”

It’s also an ideal site for a stormwater field study. “Working with NEST, Oldcastle Infrastructure and North Carolina State University, we saw first-hand how the PerkFilter system cleans water by removing sediment and filtering contaminants,” says Phillip.

“The data has been very impressive. And as Knightdale continues to grow, everything will start to infill – small footprint solutions will be crucial. We also did not want to end up with a large, unsightly retention pond. We wanted a solution that would succeed – without being seen. As a town, we want to be forward-thinking and ahead of the curve on green stormwater infrastructure (GSI). And, ultimately, we will look forward to finding, implementing and monitoring more cutting-edge sustainable solutions like PerkFilter.”

A Great Leap in Technology

For Tyler Henderson, Environmental Lead GIS Specialist for River to Tap, Inc (R2T), stormwater field studies are more than an exercise in collecting data. They are our lifeline for the future.

“My entire career has been focused on water and ensuring that we keep our rivers, streams and groundwater clean and not contaminated,” Tyler says. “Water is the most important resource we have on Earth. Protecting it is probably the most important thing we can do at municipal, state and federal levels.”

Within a rapidly developing section of Gainesville, GA, Tyler oversees the set-up and monitoring of BioPod sampling for NEST certification.

“We have been working in the field here for about a year and are about 50% complete in the data collection process,” says Tyler, “and we are seeing some astounding removal rates from the BioPod, as high as 90%. It’s the first time we’ve actually worked with a product that directly takes stormwater runoff and filters it in a kind of chamber. It’s just a great leap in technology. These emerging advancements are giving me hope for clean water in our future.”



Smothered and Covered in Data

Some of the most interesting field studies out there are not in a field at all – but in a parking lot. In Nashville, a PerkFilter treats runoff from a parking lot for a small commercial site housing a diner. That’s where you’ll find Janette Wolf and Kevin Wolfe. Janette is the Project Manager and Kevin is the Quality Manager and Technical Advisor for Civil & Environmental Consultants (CEC). Since setting up their equipment to monitor the PerkFilter in March 2025, CEC have sampled some 13 storm events over that time.





“Seeing PerkFilter perform in the field has been extremely gratifying,” says Janette. “We are seeing a wide range of urban pollutants and the removal efficiencies have been great. The upshot is that we have been highly successful in terms of meeting the NEST treatment goals.”

“Field monitoring is a real-world scenario,” says Kevin. “Lab testing is effective for collecting data in a controlled environment – but if you want to see how a product performs outdoors in a watershed environment – you have to be there.”

“We’re monitoring PerkFilter in the field where it’s intended to perform and it has been a fascinating experience,” said Janette. The system itself is an underground chamber system, so it’s difficult to see what’s going on. That’s why we are big fans of Go Pro cameras. We extended them with sticks so we can explore inside the devices. And if any problems ever come up regarding maintenance, we know Oldcastle will be quick to fix any issues.”

Maintenance is Mega-Important

Developing new technologies to make stormwater management more effective and efficient is right in the wheelhouse of Dr. Vini Taguchi, a University Extension Associate at North Carolina State University. Working with Dr. Bill Hunt III and a cadre of graduate students, Vini is working in the field with BioPods in Gainesville and PerkFilters in Knightdale and Nashville.

“Each field study brings its own unique set of circumstances,” says Vini. “We’ve had some surprising inflow samples in Nashville and some active construction in Gainesville, but the systems are all operating well, and the water quality improvements are significant. What’s especially relevant is that the products in the field are filtration-based. We are living in a time with an uncertain climatic future, and with increasingly violent and unpredictable storms on the horizon, filtration-based systems give us the resilience and capacity to handle larger and more intense storms.”

“Another great advancement in the PerkFilter system is that the cartridges can be swapped out. The most common point of failure for any stormwater technology is lack of maintenance. I see incredible value in subscription-based models, where the company selling the system also swaps the cartridges out periodically. This way, a municipality does not have one more task to stay on top of. Oldcastle Infrastructure is already doing this – which is what makes them an ideal collaborator when it comes to maintenance and sustainability.”



We're All in This Together

The big takeaway from these various field studies is that we're all in this together in the stormwater community. Whether you're a regulator, engineer, city manager, or manufacturer, we all want to see effective BMPs out there cleaning water. The clearer and more streamlined we can make the path for good technologies to be proven and approved, the better for water quality and for our communities. NCDEQ and NEST are shining examples of shaping the future of stormwater technology.

And while having numerous independent studies in the field is making significant progress, we can do more. The momentum toward harmonizing standards – like through the National Stormwater Testing and Evaluation for Products and Practices (STEPP) certified devices – is a sign our industry is maturing. It's not going to happen overnight, but it's happening.

In the meantime, Oldcastle Infrastructure will continue to prioritize total stormwater management solutions, partnerships and maintenance. Because one thing we can forecast with 100% certainty: it's going to rain.



Oldcastle Infrastructure, a CRH Company, is a market leader in providing total stormwater solutions specially designed to meet the ever-changing regulations that protect our environment.

BioPod™ and PerkFilter™: Outstanding in their Field

Innovative technologies like the PerkFilter and BioPod are critical for improving stormwater field monitoring by enabling more accurate, efficient, and localized data collection than traditional methods. These advanced systems, which are often classified as green infrastructure or Low-Impact Development (LID), remove pollutants at the source and also offer an integrated platform for monitoring water quality and flow.

BioPod™

BioPod systems use an advanced design and engineered soil media for high-performance filtration, sorption and biological uptake to remove Total Suspended Solids (TSS), dissolved metals, nutrients, gross solids, trash and debris as well as hydrocarbons from stormwater runoff. BioPod is proven to deliver 84% removal of total suspended solids (TSS) and 64% removal of total phosphorus.*



PerkFilter™

PerkFilter is an advanced stormwater treatment system that uses engineered proprietary filtration media to remove a wide range of pollutants from surface water runoff. A high-performance treatment system in a compact footprint, PerkFilter is proven to deliver 80% removal of total suspended solids (TSS) and 60% removal of total phosphorus.*



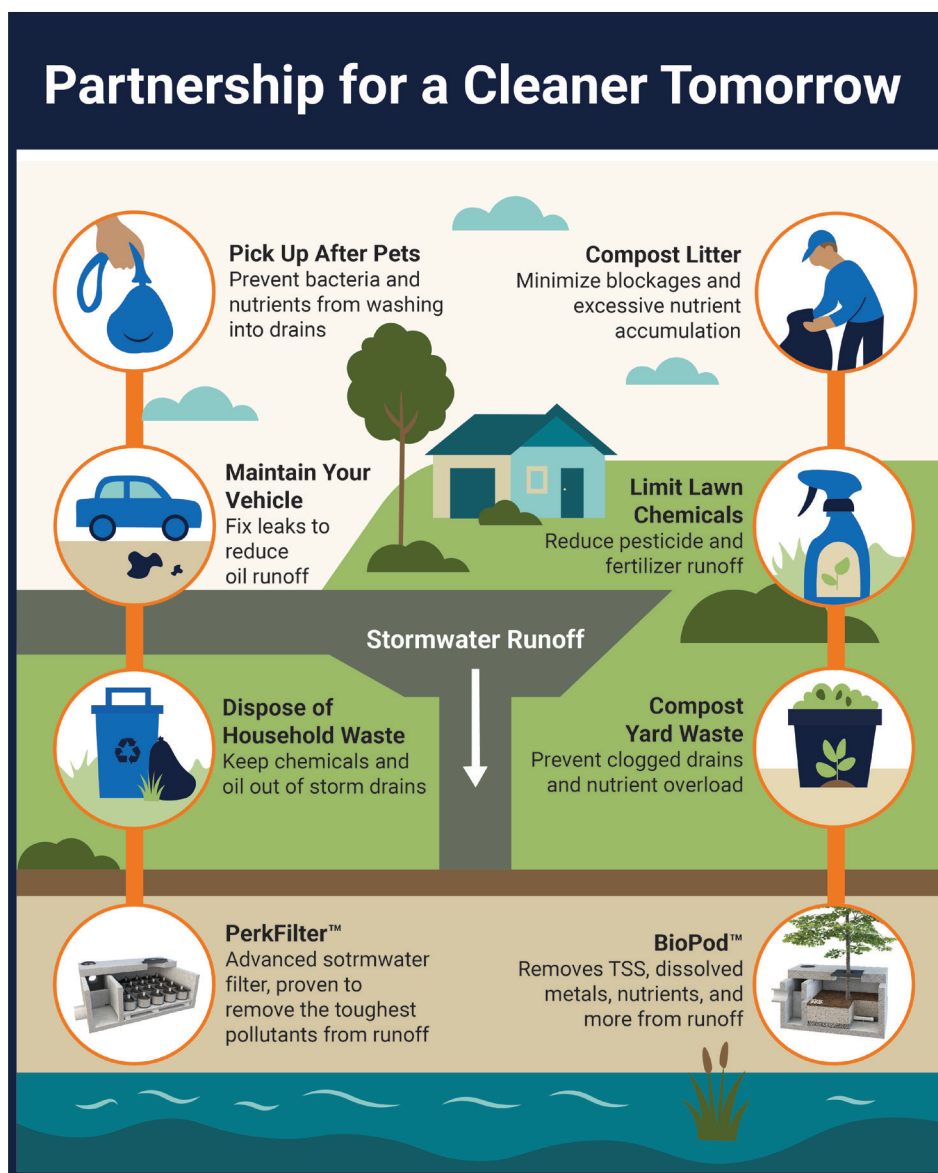
*per Washington State Department of Ecology TAPE Program

Together, Small Actions Lead to Big Change

Clean water protection begins long before a drop reaches the drain – and it's a shared effort between innovative infrastructure and everyday choices.

Stormwater solutions like BioPod™ biofiltration systems and PerkFilter™ cartridge filtration units are engineered to capture and treat pollutants before they ever reach rivers, lakes, and groundwater. These systems work quietly beneath our streets and parking lots, filtering out oil, sediment, nutrients, and debris to keep waterways clean.

These systems work best in our communities when partnered with people. The actions you take in your own neighborhood play a vital role in reducing what enters those systems in the first place. Together, community habits and engineered solutions form a powerful partnership for protecting clean water. Every small action helps – from maintaining your car and properly disposing of waste to reducing fertilizer use and cleaning up after pets. When we all take responsibility for what happens above ground, our water treatment systems can work more efficiently below ground.





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