Stormwater experiment results good, but lacking

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CHESTERTOWN, Md. — After nearly two years of monitoring, a stormwater control project developed by a Queen Anne's County farmer has shown to significantly reduce sediment and nutrients in runoff but the researchers also see room for improvement.

A report issued in the summer by Rosemary Myers and Allen P. Davis of the University of Maryland's Department of Civil and Environmental Engineering, on the system of stormwater containment basins installed by Sam Owings on his Hambleton Creek Farm, showed reductions of 65 percent reduction for suspended solids, 59 percent for total phosphorus and 64 percent for total nitrogen.

Owings installed the system in 2011 as a way to keep and treat stormwater on his farm and reduce or stop discharges into the nearby Hambleton Creek in the Chester River watershed.

The system is a series of four man-made basins about 35 feet wide by 140 feet long that have been seeded with a fescue and annual ryegrass mix.

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During a large storm event, the system's job is to keep the water from leaving the farm and allowing it to return to the soil.

That way, Owings said, the nutrients from the water stay in the ground where it has the potential to be used by the next crop. Owings' non-profit group, High Impact Environmental, secured a Maryland Industrial Partnerships grant to get water sampling data and analysis, which brought in Myers and Davis.

From July 2013 to April 2015, the researchers successfully sampled and tested water coming into and leaving the system from 27 storm events.

"During this time, the basin system provided statistically significant reductions of sediments, total phosphorus and total nitrogen masses," the report said. "The total runoff volume reduction exhibited by the system was 56 percent which is significant, especially given that this basin system is slightly undersized" for what would be recommended for its drainage area.

The report recommended at least doubling the size of the basins to prevent water flowing out of the system, bringing it closer in line with standards in the Maryland Department of Environment's Stormwater Design Manual.

"Resizing the basins to make them larger, or adding more basins in succession, is chief among the recommendations for improving the design," according to the report. "The larger the basins, the more likely that the system will be able to fully capture an event, and therefore the system will be expected to discharge less volume."

Of the 27 storm events that were sampled and tested, 13 filled the basins enough to record and outflow of runoff. Owings said costs largely dictated the size of the system when he installed it.

"Even the size that it is, it was very effective and removed a lot of nutrients," he said.

Along with enlarging the system, the report recommended measuring for dissolved oxygen, oxidation potential, electrical conductivity and pH and an economic evaluation as further research options.

Using the report's data, Owings is now working with Centreville, Md.-based Earth Data Inc. to standardize the project and develop a design guidance manual and apply for certification as a best management practice which could then become a candidate for state and federal cost-share funding to help farmers and landowners install basin systems on their property.

"All in all, I think it's fairly accurate," Owings said of the report. "I'm happy with it and I think it's very close to what it's doing out there."