

Storm Water Management and the Chesapeake Bay

What is Urban Storm Water?

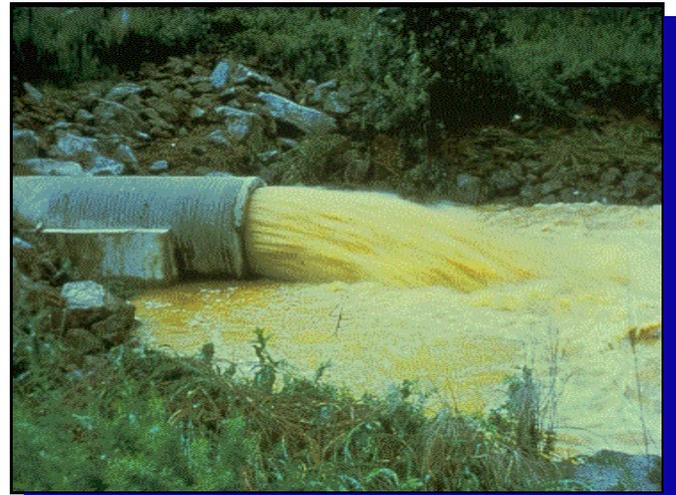
Did you ever think about what happens to a raindrop that falls onto the Chesapeake Bay watershed? It may land on a tree or other vegetation and evaporate in the hot sun. It may land on a farm field and soak into the ground, or it may land on a rooftop, driveway or roadway and travel down the street to a storm drain. Any rainwater in an urban or suburban area that does not evaporate or infiltrate into the ground, but pools up and travels down hill is considered urban storm water runoff.

Development activities such as clearing vegetation, mass grading, removing and compacting soils, and extensive uses of impervious surfaces (such as buildings, parking lots, and roadways) can increase the amount of storm water runoff in the watershed. In urbanized areas, increased storm water runoff can cause increased flooding, stream bank erosion, degradation of in-stream habitat and a reduction in groundwater.

Development not only leads to landscape changes but also to contamination of storm water runoff by pollutants on the watershed. Storm water runoff becomes contaminated as it flows across the land picking up pollutants such as nutrients, sediment and chemical contaminants from roadways, yards, farms, golf courses, parking lots and other lands. This polluted storm water runoff travels down through storm drains into local waterways and may ultimately end up in the Bay.

Why is Urban Storm Water Runoff Important?

Cities contribute to the Bay about twice the nitrogen and phosphorus load per acre as agriculture. Urban storm water runoff is responsible for about 15% of phosphorus, 14% of nitrogen, and 9% of sediment loads to the Bay. Urban runoff loads of chemical contaminants (such as metals) rival or exceed loads from industries, federal facilities and wastewater treatment plants. Urban storm water runoff is responsible for impairments in over 1,570 miles of streams in the Bay watershed and has caused flooding, streambank erosion, and habitat and living resource degradation in areas with as little as 2% impervious surfaces.



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How is Storm Water Managed?

Until recently, the focus of storm water management has been on controlling runoff quantity to prevent flooding, rather than focusing on controlling pollution in runoff, or stormwater quality. The vast majority of land developed prior to the early 1980's in the Chesapeake Bay watershed lacks storm water quality controls.

Technologies to better control and treat storm water runoff are still evolving. Existing regulatory requirements and management practices must be enhanced with new innovative technologies to effectively prevent storm water runoff pollutant loads and impacts, especially in older urbanized areas where storm water treatment has not been implemented.

Given projections regarding urban and suburban growth and the increase in impervious surfaces in the watershed, managing urban storm water runoff is one of the most important priorities the Bay Program will undertake to improve water quality and sustain progress in restoring vital habitats and living resources throughout the Bay.

How Does the Bay Program Address Storm Water Management?

The Chesapeake Bay Program has developed a Directive that sets actions for managing storm water on federal, state and district-owned lands and facilities, which comprise more than 13 percent of the watershed. Bay Program partners have committed to setting an example for local governments and private land owners by demonstrating how to develop, fund and implement innovative storm water management approaches and technologies on government-owned lands and facilities. They will show how to prevent storm water problems in the face of increased growth and development and how to remediate storm water problems on lands that have already been developed.

The New Storm Water Directive will:

- reduce by at least 30% toxic chemicals from government-owned lands and facilities in the three ultra-urban *Regions of Concern* (Anacostia River, Baltimore Harbor, and the Elizabeth River).

- prevent any increases of nitrogen, phosphorus, sediment and chemical contaminant loads to the Bay from new development or re-development on government-owned lands and facilities.
- decrease storm water volume and velocity, which will reduce flooding and stream bank erosion and habitat degradation.
- demonstrate new and innovative approaches for managing storm water runoff (such as tree boxes, rain gardens, and green roofs) which can be applied by local governments and private property owners throughout the watershed.
- ensure that management practices are regularly inspected and maintained.
- monitor costs and effectiveness of new and innovative technologies and approaches for managing storm water runoff.

Examples of Innovative Storm Water Management Technology

A tree box is ideal for an ultra-urban setting with a lot of impervious surfaces, where land is at a premium. A pedestrian on the side walk would not recognize this beautiful urban landscaping as a storm water management system. The tree box is placed next to a street, and the storm water runs into the inlet and is treated by the soil and tree complex and then leaves the system via a storm sewer pipe underground. The storm water will be much cleaner, and there will be much less of it compared to a normal curb and gutter system. This tree box reduces the amount of runoff and greatly improves the water quality. This is ideal in an ultra-urban setting where land is at a premium.



Innovative storm water management techniques, such as this treebox being prepared for installation at the Washington Navy Yard, filter runoff before it empties into local waterways and eventually the Chesapeake Bay.