



June 2013 Update
Executive Summary
Cost-Effective Stormwater Management
to Meet Local Water Quality Goals in the
James River Watershed

The Challenge:

Urban Stormwater is the Greatest Threat to the Future Health of the James River and the Most Expensive to Address

The James River, designated by Congress as America's Founding River, has played an integral role in the development of Virginia. That critical role continues, with the river serving as a primary source of drinking water for millions of Virginians, a home for commercial and industrial facilities that utilize the river and as an asset to our quality of life. Today, "urban stormwater"—rainwater that washes over dirty surfaces such as roads, buildings and lawns and becomes a major source of pollution in local waterways and our rivers—is a growing threat to the health of the James River and to our future prosperity. Stormwater delivers a toxic soup of pollutants, including pathogens, toxic compounds, nitrogen, phosphorus and sediment, that damage the river ecosystem and create human health hazards. If left unaddressed, urban stormwater stands to undermine the value of this shared resource and diminish the public's well being.

The obligation to address the upward trend of urban stormwater pollution lies in the hands of Virginia's local governments. Local governments are required to achieve stormwater pollution reductions as a part of the Chesapeake Bay Cleanup and their local water quality permits. Yet, the task of addressing stormwater pollution from existing development can seem daunting. Initial cost estimates for addressing stormwater pollution in Virginia are approximately \$10.5 billion—over half the total cost of cleaning the Chesapeake Bay.

Local governments are challenged with fulfilling Virginia's commitments to stormwater management, safeguarding its waterways for future generations and facing a difficult fiscal climate. While the challenge of addressing stormwater at the local level is certainly significant, localities have the ability to develop innovative, cost-effective plans for meeting their stormwater pollution requirements. The results of this study demonstrate how this can be achieved.

Study Methodology

In order to assist localities in meeting their stormwater management obligations, the James River Association partnered with the Center for Watershed Protection to identify the most cost-effective practices that localities can implement to achieve their stormwater pollution reductions. By gathering and reviewing available cost and pollutant removal data for 33 urban best management practices (BMPs), from management of fertilizer application to forest buffers, we were able to determine which practices provide the greatest pollution reductions for the lowest investment. BMPs that have been approved by the Chesapeake Bay Program were reviewed, as well as those that are currently under consideration by the Chesapeake Bay Program. The cost analysis calculated 20-year life cycle costs associated with BMP implementation, including design, construction, land values, financing and operation and maintenance. Pollution reductions were determined by using the Chesapeake Bay Program efficiencies. For practices not yet approved by the Bay Program, pollution reductions were based on existing research.



Results: Cost-Effective Approaches are Achievable

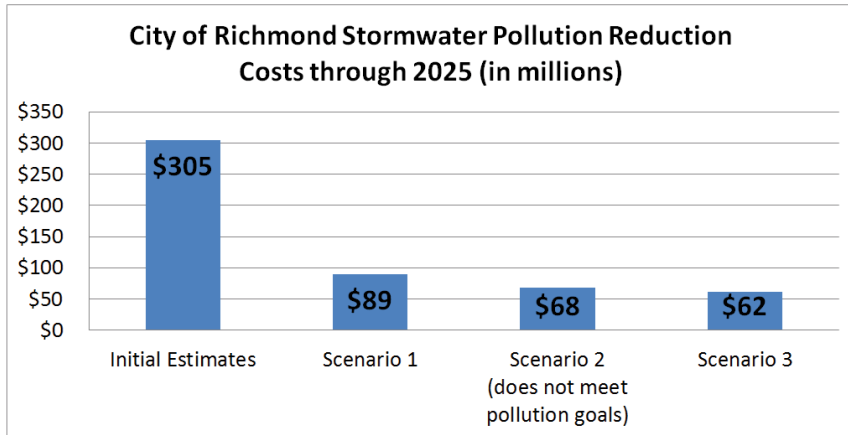
By compiling data on various BMPs and investigating future trends, this study demonstrates that localities have the ability to significantly lower the cost of meeting pollution reduction requirements. Not only do the results provide a variety of methods to address local needs, they also illustrate that localities have the ability to cost-effectively address their stormwater pollution reductions.

Most Cost-Effective Urban Stormwater BMPs	
Pollutant	BMPs
Total Nitrogen	These BMPs cost < \$18/lb: 1. Pet waste program 2. Illicit discharges- sewer repair 3. Illicit discharges- correction of cross-connections
Total Phosphorus	These BMPs cost < \$72/lb: 1. Pet waste program 2. Illicit discharges- sewer repair 3. Illicit discharges- correction of cross-connections
Total Suspended Solids	These BMPs cost < \$3/lb: 1. Illicit discharges- sewer repair 2. Urban Stream Restoration (recommended interim efficiencies) 3. Urban growth reduction

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Case Study: City of Richmond

The data compiled through this study provided a starting point for determining the most cost-effective range of options for the City of Richmond to use in meeting their required stormwater pollution reductions. Three scenarios were developed, which resulted in significantly different costs. The costs for these scenarios were then compared to initial estimates presented to Virginia's Senate Finance Committee in November 2011. The first scenario simply applied the most cost-effective BMPs approved by the Chesapeake Bay Program prior to 2012 across the City. This scenario revealed a 70% cost savings from initial estimates. The second scenario applied City property constraints along with Chesapeake Bay Program approved practices and found that the pollution reductions required could not be achieved without significant implementation occurring on private lands. The third scenario applied all practices, those approved and currently unapproved, and found that the pollution reductions could be met on City property at a cost savings of 80% from initial estimates.



Key Findings

- 1** Costs can be reduced by up to 80% from previous estimates by adapting the suite of practices applied to local conditions and needs. If the findings of this study were applied across Virginia, it could significantly decrease the total stormwater costs of the Chesapeake Bay Cleanup from \$10.5 billion.
- 2** Continuing research by the Chesapeake Bay Program into BMP efficiencies as well as new practices has the ability to significantly influence the cost-effectiveness.
- 3** Additional community benefits of BMPs need to be considered as a part of local planning. For example, Forest Buffers and Tree Planting can provide significant community benefits in the form of public education, neighborhood beautification, as well as wildlife and stream habitat.



Recommendations

- The Chesapeake Bay Program needs to approve additional cost-effective stormwater BMPs and prioritize research to quantify their benefits.
- Localities should pursue incentives for private stormwater investments, such as public private partnerships or stormwater utility credits.
- Localities should conduct local stormwater project inventories to identify feasible locations for the most cost-effective practices in their jurisdiction.
- Localities should consider stormwater management in all local capital improvement planning in order to achieve cost savings and pollution reductions through already planned public improvements.
- The state and localities should establish sustainable funding mechanisms for stormwater.
- The Chesapeake Bay Program should quantify additional community benefits achieved from BMPs to help localities understand their true value.

“Costs can be reduced between 70 and 80% from initial estimates by adapting the suite of practices applied to local conditions and needs.”

What Citizens Can Do to Protect the James River

- Reduce your runoff by installing practices, such as rain barrels and rain gardens on your property
- Let your elected officials know you support funding for stormwater management
- Reduce your use of fertilizers, pesticides and herbicides
- Pick up after your pets
- Join the James River Association and become a River Hero Home

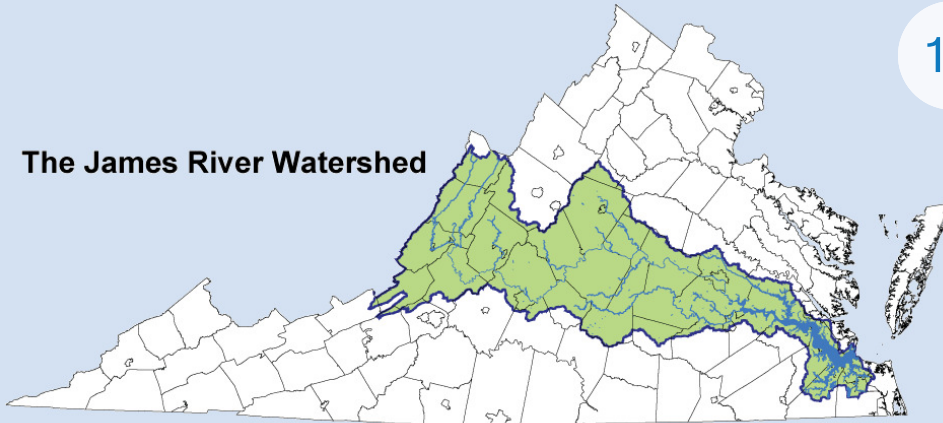
340 miles long

25% of the state

39 counties

19 cities and towns

The James River Watershed



About the James River Association

The mission of the James River Association is to be guardian of the James River. We provide a voice for the river and take action to promote conservation and responsible stewardship of its natural resources. We achieve these goals through our core programs: Watershed Restoration; Education, Outreach; River Advocacy; and our Riverkeeper program.

About the Center for Watershed Protection

The Center for Watershed Protection, Inc. is a 501(c)(3) non-profit organization dedicated to fostering responsible land and water management through applied research, direct assistance to communities, award-winning training, and access to a network of experienced professionals. The Center is your first source for best practices in stormwater and watershed management. The Center was founded in 1992 and is headquartered in Ellicott City, Maryland. As national experts in stormwater and watersheds, our strength lies in translating science into practice and policy, providing leadership across disciplines and professions. To learn more about the Center's commitment to protect and restore our streams, rivers, lakes, wetlands and bays, go to www.cwp.org.

Project Team:

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The Full Report and additional resources are available at www.jrava.org.
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