



# *Stormwater Management*

Reducing Water Quantity and  
Improving Water Quality

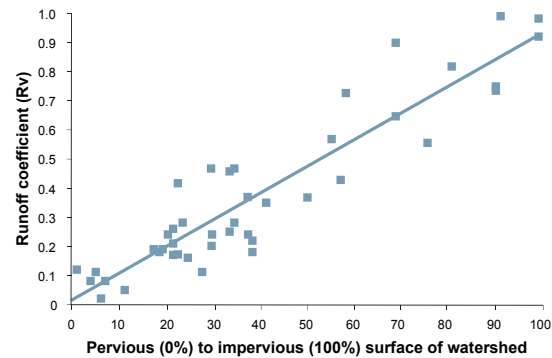
CHESAPEAKE AND ATLANTIC COASTAL BAYS TRUST FUND

# Managing Stormwater Runoff

When excess rain does not soak into the ground or is absorbed by trees and plants, it runs off quickly and directly into storm drains and ditches, picking up pollutants like oil, fertilizer, pesticides, pet waste, and sediment as it flows. The speed and volume of this stormwater can cause erosion and flooding that harm properties, while the pollution it carries

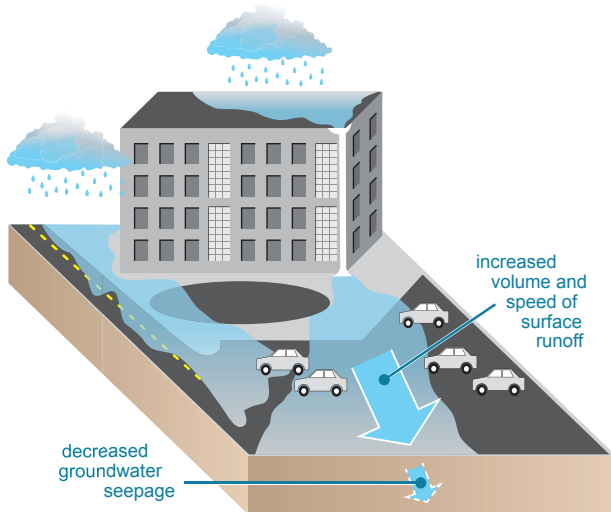
## Stormwater runoff can vary in volume and speed

As seen in the data plot to the right, there is a strong relationship between how impervious the land cover is and how much water soaks in, confirming the fact that hard surfaces will result in greater volumes and speed of runoff, concentrating pollutants and causing problems downstream.



Source: Schueler 1987.

### Impervious surfaces



Impervious 'hard' surfaces (roofs, roads, large areas of pavement, and asphalt parking lots) increase the volume and speed of stormwater runoff. This swift surge of water erodes streambeds, reduces groundwater infiltration, and delivers many pollutants and sediment to downstream waters.

### Pervious surfaces



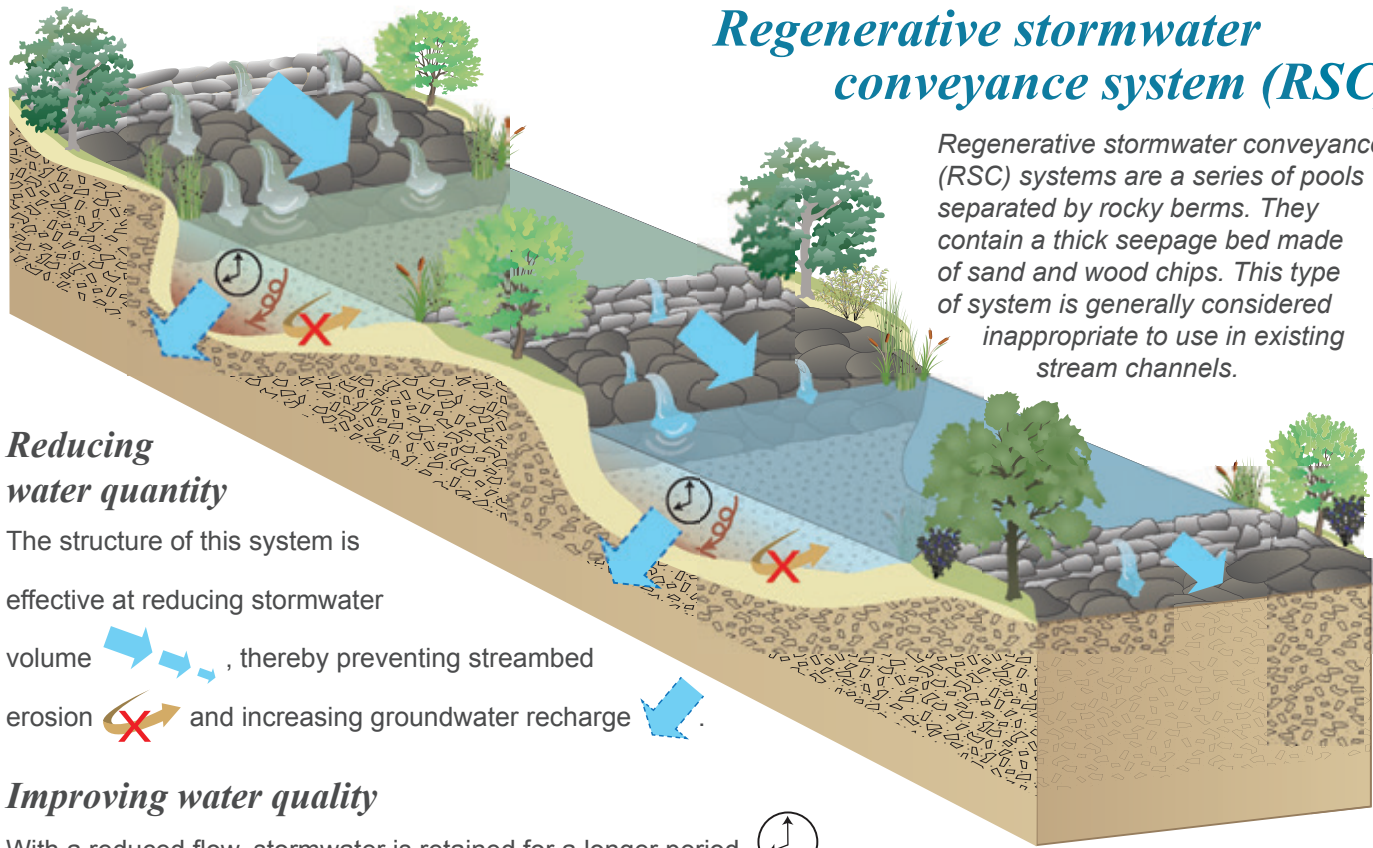
Pervious 'soft' surfaces (green roofs, rain gardens, grass paver parking lots, and infiltration trenches) decrease the volume and speed of stormwater runoff. The slowed water seeps into the ground, recharges the water table, and filters out many pollutants and sediment before they arrive in downstream waters.



can threaten the health of downstream rivers and bays. Stormwater management strategies to prevent damage and pollution have been designed to treat stormwater and route it safely back into our natural environment. Although there are many such strategies (see back page), a Regenerative Stormwater Conveyance system is one that is featured here.

## Regenerative stormwater conveyance system (RSC)

Regenerative stormwater conveyance (RSC) systems are a series of pools separated by rocky berms. They contain a thick seepage bed made of sand and wood chips. This type of system is generally considered inappropriate to use in existing stream channels.



### Reducing water quantity

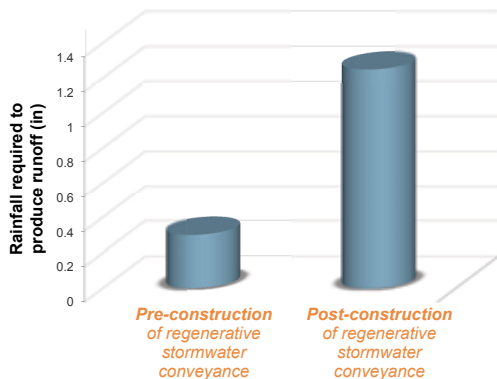
The structure of this system is effective at reducing stormwater volume, thereby preventing streambed erosion and increasing groundwater recharge.

### Improving water quality

With a reduced flow, stormwater is retained for a longer period, enabling pollutants, nutrients, and sediment to settle and be biologically transformed.

## Case study: RSC system monitoring results\*

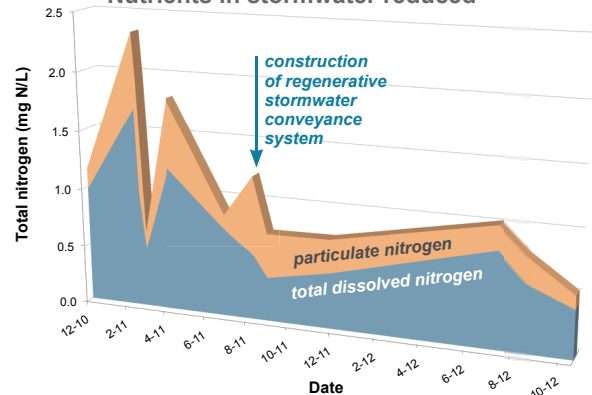
More rainfall required to produce runoff



After the construction of an RSC system, monitoring revealed that much more rainfall was now needed to produce a downstream flow, indicating a reduced stormwater volume due to the RSC.

\* This RSC system is located in Anne Arundel County, Maryland, and was constructed in an old drainage ditch that shunted storm water directly to a stream channel.

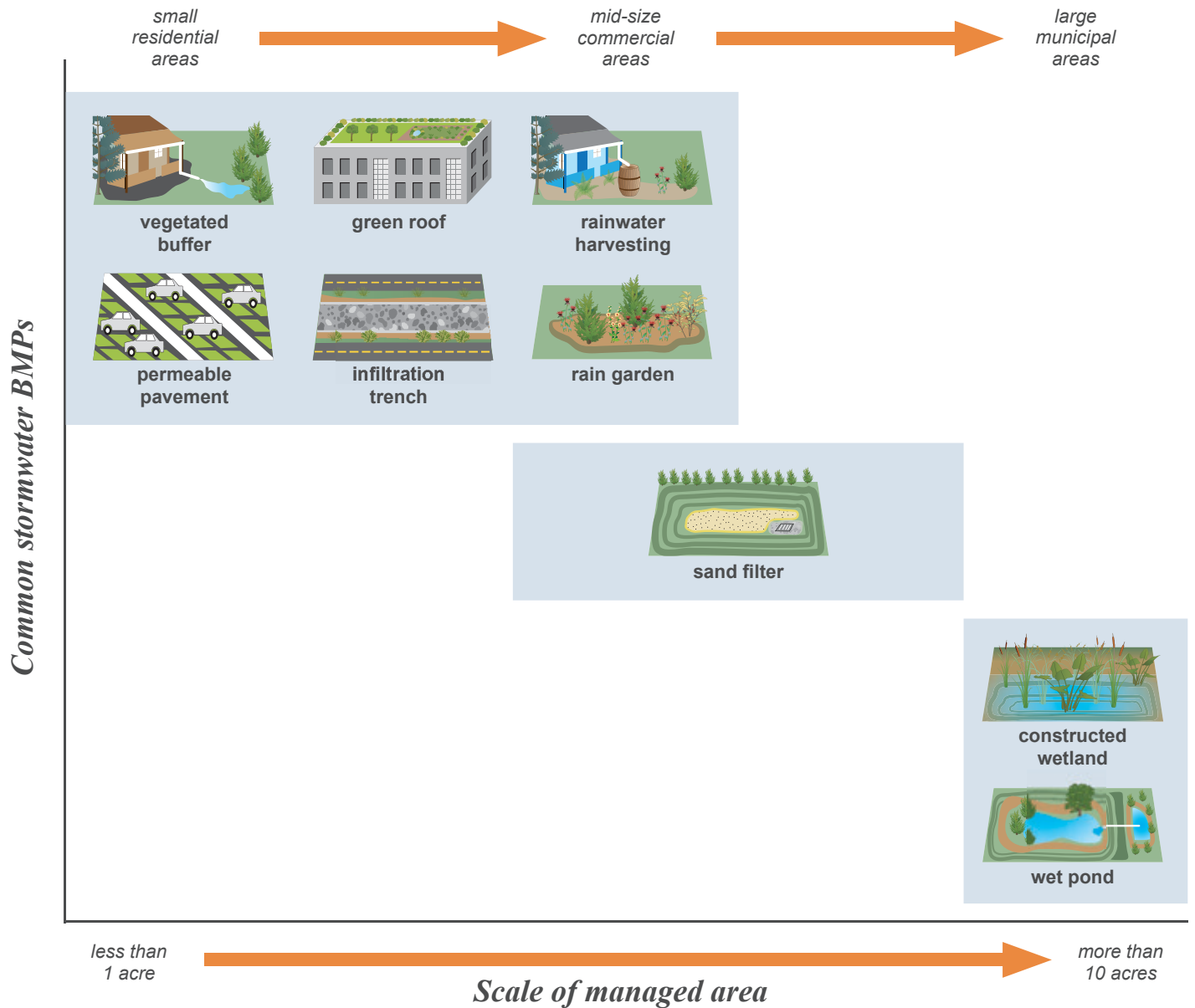
Nutrients in stormwater reduced



After the construction of an RSC system, monitoring of flow-weighted mean concentrations revealed that stormwater now contained less nutrients, indicating an improved water quality due to the RSC.

# Selecting the right BMP for the job

Maryland's stormwater management program encourages existing and new developments to adopt strategies that minimize the impacts of stormwater runoff from the impervious surfaces. Best management practices (BMPs) are strategies that can be used to manage this runoff. Examples of some of the more common BMPs designed for small residential areas, mid-size commercial areas, and large municipal areas are shown in the table below.



Adapted from CBSTP.

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## Chesapeake and Atlantic Coastal Bays Trust Fund

The Chesapeake and Atlantic Coastal Bays Trust Fund was created in 2007 in an effort to reduce nutrient and sediment pollution to these bays. The Trust Fund has focused its financial resources on the implementation of effective non-point source pollution control projects in high-priority watersheds.

## Trust Fund Evaluation Workgroup Members

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## References

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