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Why should we manage stormwater?

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First in a series

This year's drought makes us more aware of the value of water we receive during rainstorms. This year so far we have received about a third less precipitation than normal. Many of Rappahannock County's 755 miles of streams were dry in late summer, or nearly so. Every day we see the effects of the drought on our gardens, forests, farm animals, fields, springs, creeks, ponds, wildlife, and even some deep wells. This is an opportune time to consider how we can better manage, protect and conserve future rainwater.

Muddy runoff from driveways and road enters Thornton River in Sperryville. (Photo by Bev Hunter)

How we manage our land - including how we design and maintain buildings, roads, driveways, parking lots, fields, forests, lawns, and landscape vegetation - directly affects both the quality and quantity of water available in the ground, in streams, and in ponds.

In this article we look at reasons why we should improve the ways in which we manage stormwater. In the second article of this series, we will identify how we can better manage and conserve rainwater on our own property. The third article will discuss the draft Stormwater Management Ordinance being considered for adoption by Rappahannock County.

Rainwater soaks into the ground - for free

Ideally, rainwater soaks down into the ground. Raindrops that fall on well-vegetated land can gently soak down into the soil to help recharge the groundwater that we depend upon for drinking water. Some of the water will move slowly just under the surface of the ground to be cleansed of pollutants before it recharges our streams and ponds. When it rains so hard the raindrops cannot sink in immediately, tall grasses, shrubs and trees slow down the movement of the water so it has more time to soak in to the ground before it reaches the stream. This process requires no effort on our part - it's a free service from nature.

Runoff water can be wasted water

The problem comes when raindrops fall on impervious surfaces such as roads, driveways, parking lots, and rooftops, or on bare soil where vegetative cover has been removed or disturbed. In such places, raindrops join together and then race downhill, causing "runoff" and other problems along the way. By not capturing the raindrops, the soil and rock fissures deep underneath the ground don't get a chance to store that water for later use by plants, animals, and people. We are penalized several times over for poorly managed stormwater runoff.

Runoff causes damage and flooding

Besides losing the benefit of water storage due to runoff, we also pay a direct price for poorly managed stormwater. Soil is lost from erosion. We pay to repair damaged roads and driveways. Increased flooding is damaging and dangerous. The fast-moving volume of water damages vegetation and destabilizes the banks of the stream, causing further erosion and sedimentation.

Stormwater runoff pollutes the stream

The stormwater runoff that rushes over land instead of being absorbed into the soil gathers pollutants along its way downhill to the streams. That polluted water goes directly to the streams and damages fish and other aquatic life downstream. The pollutant you can easily see in a stream after a rainstorm is sediment - tiny particles of soil and dirt that make the stream look muddy. Runoff water collects sediment most easily when the ground and vegetation has been disturbed. Sediment clogs the gills of fish and other aquatic animals and kills them.

Nutrients are a type of pollutant you don't see at the time of the rainstorm but is equally damaging to water quality. These nutrients - primarily nitrogen and phosphorus - come from a wide variety of sources including the atmosphere, chemical fertilizers, animal wastes, mowed grass, damaged septic systems and soil. If a stream is not protected by an adequate buffer area vegetated with tall grasses, shrubs, and trees, then the runoff deposits these nutrients directly to the stream's surface water. Excess nutrients in surface waters cause an imbalance of plant life, which in turn starves the water of oxygen, creating dead zones where aquatic animals cannot breathe.

Our runoff impacts the Rappahannock River, the Chesapeake Bay, and other communities

All 755 miles of streams here in Rappahannock County (headwaters of the Rappahannock River Basin) eventually drain to the Rappahannock River and thence to the Chesapeake Bay. The Rappahannock River and the Chesapeake Bay are degraded. Excess amounts of nitrogen, phosphorus and sediment flow into the bay and its tributaries from land, the air, wastewater treatment plants and industrial facilities. These nutrients and sediments foul our waters and harm the water supplies of communities downstream from us, and also finfish, shellfish, aquatic plants and other organisms that make up the Bay's fragile ecosystems. We also suffer economically from impaired waters. The living resources of the rivers, the Bay and their economic potential are compromised by poor water quality.

Commercial and recreational fisheries will benefit from cleaner water as will the broader economy.

The Chesapeake Bay Program identified an over abundance of nutrients as the most damaging water quality problem facing the Bay and its tributaries. High levels of nutrients over-fertilize the Bay waters, causing excess levels of algae. These algae can have a direct impact on submerged aquatic vegetation by blocking light from reaching these plants. More importantly, these algae have an indirect effect on levels of dissolved oxygen in the water. As algae die off and drop to the bottom, the resulting process of biological decay robs the surrounding bottom waters of oxygen needed by oysters, fish, crabs and other aquatic animals.

Next: Save water, save money, save streams, save the Bay.

The next article in this series will suggest ten things you can do on your own property to better conserve stormwater for later use while at the same time protecting against expensive damage from stormwater runoff, protecting streams from pollution from stormwater, and helping clean up the Chesapeake Bay.