

Upland Stormwater BMPs – Key Points

- Upland BMPs are essential components of a watershed approach; complement in-stream efforts by influencing runoff volumes and pollutant loads delivered to the stream. They also help protect the smaller feeder streams that flow into the main stream channel.
- It can be difficult to separate out influences or impacts from uplands versus stream channel without sophisticated modelling.
- Chesapeake Bay expert panel protocols assign pollutant removal credits and methods for a wide range of both in-stream and upland practices.
- There are many types of BMPs, including small green infrastructure (GI) practices (bioretention, tree planting, conservation landscaping, permeable pavement, rainwater harvesting, etc.) and retrofits of existing stormwater ponds and basins. Some BMPs are required elements of a site plan for new development or redevelopment, and others are constructed as “voluntary” retrofits, largely to meet Chesapeake Bay TMDL pollutant load reductions.
- Research indicates that both small GI practices as well as larger storage practices (pond, basins) are needed to control range of storms: small to large.
- Research on the effectiveness of upland BMPs at the watershed scale is difficult to undertake, and work is ongoing. Picking up a signal in the stream channel about BMPs’ influence on storm flow rates, quantities, and water quality is inherently difficult and requires sophisticated modelling and monitoring approaches. Researchers are working through several studies with mixed results. Note that there are many studies about BMP effectiveness at the site scale or within small catchments, and these results are largely very positive.
- It is apparent that it may require numerous BMPs in a watershed in order to have a measurable effect or change the flow dynamics or pollutant loads carried by a stream. There are technical, financial, logistical, and practical challenges involved in scaling up to this extent.
- Costs for urban BMPs vary widely, and different cost reports account for the full range of the BMP life cycles (planning and design, permitting, construction, ongoing inspection and maintenance, and even repair or replacement over time) or just some of these factors. Also, costs are reported on a per impervious acre treated, per pound of phosphorus reduced, or other metrics, making comparison difficult. More recently, contractor bids have gone up, so previous cost figures may be under-estimates.
- Long-term operation and maintenance of BMPs is essential for ongoing performance as well as public acceptance. Maintenance needs to be considered at the design stage and also within municipal budgets and staff capabilities.