VEGETATED FILTER STRIPS
FACT SHEET

Vegetated Filter Strips are vegetated areas of land designed to treat incoming stormwater runoff from nearby impervious surfaces, such as concrete or asphalt. Also called grass filter strips, or filter strips, they often use native vegetation or grasses planted on a slope to slow stormwater runoff, minimizing erosion and allowing for soil infiltration and pollutant removal. They are typically constructed near roads, parking lots, or along streams as buffers, to encourage groundwater recharge.

Filter strips are most effective for managing runoff generated from smaller storm events with lower flow rates. Drainage areas are sloped to encourage small diffuse flow and limit standing water. To maximize pollutant removal and runoff reduction capabilities, runoff from impervious surfaces must enter the filter strip at a controlled rate that spreads evenly across the strip, known as overland sheet flow. This flow rate allows for runoff to be infiltrated at a slower rate, allowing sediment to settle out and increasing the soil's ability to remove pollutants. Filter strips built on more permeable soil, such as sand, provide improved stormwater management benefits. Filter strips can serve as pretreatment systems that reduce runoff and initial pollutant loads for more robust systems, such as bioretention cells.

POLLUTANT REMOVAL[1]

60%	of suspended solids
20%	of phosphorus
20%	of nitrogen
40%	of metals

Vegetated filter strips rely on routine maintenance for effective stormwater management, and maintenance work often revolves around issues related to the establishment of vegetation, large rain events, or clogging. Grass and vegetation planted on the filter strip takes time to properly establish, meaning maintenance is highest during the first year of establishment. Large debris, sediment build-up, and ant hills can disrupt overland sheet flow and hinder performance. Inspection during a storm event can provide opportunities to observe disrupted flow patterns. After a large rain event occurs, inspection of filter strips is recommended. Large rain events can overwhelm the filter strip, leading to losses in vegetation, lower pollutant removal, erosion, and localized flooding.

Cost:

Estimates from the US EPA state that annual maintenance costs for filter strips total to about $320/acre of filter strip, however more robust local datasets are needed.[2]

Features to Inspect

1 Inlets and Outlets

The inlets and outlets of a vegetated filter strip direct the movement of water and are necessary for runoff infiltration and pollutant removal. Filter strips are often located adjacent to linear impervious surfaces such as concrete channels that lead to riprap, level spreaders, or the extended side of a road where runoff drains. Common outlets include a stormwater inlet grate, a waterbody, or another stormwater control measure. Inlets and outlets should be inspected regularly and cleared of any debris that may cause clogging or hinder the creation of overland flow. It is essential that inlets be cleared to allow for overland flow creation, as lack of overland flow will cause reduced performance. Report any cracks or damage to inlets or outlet structures.

2 Establishing Vegetation

Sod and vegetation planted on the filter strip can take up to a year to establish, meaning the system will perform less than expected. Early maintenance must take place at a higher rate to ensure the system develops properly.

3 Treatment Area

Once vegetation has been established, grass should be routinely cut at a height of 3-12 inches or 6-15 inches along a roadway. Large debris and ant hills should be cleared from the area to prevent flow breakdown and clogging. If sediment build-up, erosion, or concentrated flow is noted, it could be a sign of improper design or recent flooding. Seed areas of erosion or lack of plant growth. Applications of pesticides and fertilizers on the filter strip are not recommended, as they can contribute to downstream pollution.

Sources:

1 Georgia Stormwater Management Manual. Atlanta, 2016. 2016 Edition. https://cdn.atlantaregional.org/wp-content/uploads/gsmm-2016-edition-final-v2.pdf

2 Clary, J. and Piza, H. (2017). "Cost of Maintaining Green Infrastructure." ASCE. Reston, VA.

3 Coastal Stormwater Supplement. 2009. 2009 Edition. https://epd.georgia.gov/watershed-protection-branch/storm-water/georgia-epd-coastal-stormwater-supplement-stormwater

Marine Extension and Georgia Sea Grant
UNIVERSITY OF GEORGIA
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For more a more detailed inspection checklist reference:

gacoast.uga.edu/stormwater-management