



STORMWATER PONDS

FACT SHEET

Stormwater ponds, or retention ponds, are large pools of water constructed to retain and control stormwater runoff rates. Built either by excavation of a natural depression in land or by embankments, stormwater ponds are some of the most cost-effective and widely implemented stormwater management practices. When a storm occurs, the runoff produced from a subwatershed is routed to the pond to be temporarily stored. While in the pond, pollutants in the runoff are treated over time by gravitational settling and microbial decomposition. Stored runoff is slowly released at a safe and controlled rate to minimize erosion on the receiving waterbody.

Many versions of stormwater ponds exist that serve different purposes or meet unique site constraints. All ponds are designed to mitigate storm events through storage and control outflow but vary in size, number of ponds in use, and type of spillways used to control runoff. The inclusion of filter strips and native vegetation as pond buffers can increase runoff reduction and pollutant removal capabilities, increasing the lifespan and effectiveness of a stormwater pond.

Like all infrastructure, routine maintenance is needed on stormwater ponds to ensure long-term performance. Common issues that arise in stormwater ponds include sediment build-up of the pond, clogging of the inlets and outlets, nuisance species populations, aquatic vegetation control, and fish kills. Ponds should always be inspected after a major rain event. It is essential that maintenance occurs at a higher frequency during the early stages of stormwater pond construction and operation as vegetation and grasses will be less established, leading to losses in initial performance. Post construction, stormwater ponds require seasonal and intermittent maintenance. Vegetation should also be trimmed during the winter. Fertilizers and pesticides are not recommended around the pond to prevent water pollution.

POLLUTANT REMOVAL¹

80%	of suspended solids
50%	of phosphorus
30%	of nitrogen
50%	of metals



Maintenance cost estimations for stormwater ponds, particularly wet ponds, averaged around \$9,440/ac of pond surface, and maintenance was typically conducted monthly.⁴

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>

4 Hunt, William F., et al. *Maintenance Costs of Stormwater Control Measures (SCMs) in North Carolina*. NC WRRF, 29 Oct. 2021. [repository.lib.ncsu.edu, https://www.lib.ncsu.edu/resolver/1840.20/39523](https://www.lib.ncsu.edu/resolver/1840.20/39523).



For more a more detailed
inspection checklist reference:

gacoast.uga.edu/stormwater-management



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Features to Inspect

Inlets and Outlets

1 Routinely check the inlet and outlet structure for large debris, plant roots, signs of nuisance animals and vegetation, or structural damage. Remove large debris or vegetation as this limits stormwater pond flows. Plant roots, ant colonies or burrows may inhibit performance. Structural damage like cracks or substantial erosion near an inlet or outlet foundation should be reported to a professional engineer for further inspection and assessment of potential structural collapse.

Pond

2 Regularly inspect the pond for both chemical and biological threats. Typical chemicals include oils that sit on the water surface. Inspect the pond for eutrophic conditions, such as rapid algal blooms or fish kills. If these are present, it means that excess nutrients are entering the pond. Addressing the source of these inputs is recommended in a timely fashion. Remove trash and other large objects from the pond if present. If invasive vegetation is present, remove it from the area.

Sediment build-up

3 Inspect the pond, pond floor, and forebay for sediment accumulation. Typically, sediment markers are placed in the forebay to highlight sediment levels. If substantial amounts of sediment are present, sediment removal and disposal may be required. Sediment removal is essential for pond performance as increased sediment presence lowers the water storage capacity of the pond.

Pond buffer and bank

4 Periodic mowing of the pond buffer is recommended along the maintenance right-of-way and bank. Remove trash and other large objects from the pond buffer and bank if present. Inspect the areas for signs of animals and trees. Burrows from animals or trees growing along a bank can cause soil to loosen, causing ponds to collapse. Trees can also fall during a large storm, causing a similar issue.

Nuisance animals

5 Standing water and vegetation such as cattails in a stormwater pond can create excellent breeding habitats for mosquitos, leading to infestations. Removing trash from the site can aid in lowering mosquito breeding. Other methods of mosquito control include introducing or reinforcing populations of fish, dragonflies, bats, and birds that predate on mosquitos. Insecticide use should be limited. Many birds, such as geese, can also cause problems for maintenance. They can load water with waste that leads to pollution, prevent maintenance by attacking workers, and cause damage to plants or the banks. To control issues related to geese, shrubs or native vegetation should be planted on banks and aquatic shelves to reduce the number of geese landings. This vegetation requires seasonal maintenance.