

RESIDENTIAL STORMWATER MANAGEMENT

What is residential stormwater management and why is it important?



The quantity and quality of stormwater runoff from residential areas collectively poses a great threat to our waters.

Large impervious surfaces such as roofs, driveways and parking areas prevent rain from being distributed evenly across the ground. Instead the water is concentrated into channels and other drainages where it can easily increase in force and velocity if the drainage path is too steep and is also impervious. As rainwater passes over impervious surfaces, it picks up sediment and other particles, nutrients, pathogens and chemical pollutants that cause pollution. Anything that enters a storm sewer system or that flows from your residence directly to a nearby stream or lake is left untreated. Although it seems like a small thing when considering one individual house or lot, polluted stormwater runoff from all of our residential areas collectively poses a great threat to our waters. There are many things that we as individual landowners can do to protect the environment and improve water quality by managing stormwater runoff in our neighborhoods. Even if you don't live at the water's edge, reducing stormwater volumes and helping infiltrate stormwater into the ground benefits the whole watershed.

How can one reduce stormwater runoff from residential property?

Here are some ways to reduce the quantity of stormwater runoff and in many cases improve stormwater quality as well. A more detailed guide has been developed by the North Carolina Division of Water Quality entitled *Improving Water Quality in your Own Backyard*. See the resources section below to obtain a copy.

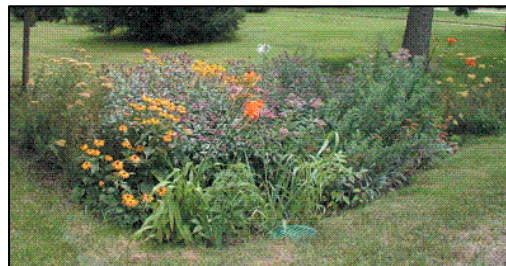


⇒ Capture water from a downspout in a rain barrel or cistern. Rain barrels are a cost effective way to reduce stormwater runoff near its source and to catch the "first flush" of stormwater from your roof. Rain barrels also provide a source of irrigation water for use in gardening or lawn maintenance. A rain barrel is typically a 50 to 80-gallon plastic vessel that is attached to a roof downspout. Homemade rain barrels can be easily constructed at a cost of approximately \$60 per barrel or purchased as a unit at a cost of approximately \$125 per barrel.

⇒ Direct other downspouts away from pavement and toward grassy, mulched or planted areas. You can attach a perforated plastic "French drain" pipe and bury it in order cross a stretch of lawn with the drainage. If you don't have gutters, dig a 3-6 inch deep infiltration trench under the drip line and fill it with gravel to decrease erosion as well as standing water.

⇒ Create a residential rain garden. A rain garden is a shallow depression in the ground that captures runoff from your driveway or roof and allows it to soak into the ground. NC State University has step-by-step instructions on creating a rain garden on the following web site: <http://www.bae.ncsu.edu/topic/raingarden/Building.htm>.

Rain gardens are typically designed to drain completely within 2 to 5 days. Where existing drainage is located in close proximity to a rain garden, the drainage should be linked to the rain garden. Overflow from a rain barrel can be directed to rain gardens. Rain gardens can be constructed for approximately \$10 per square foot and would be especially appropriate wherever residents are experiencing problems with poor stormwater drainage.



- ⇒ Use a broom instead of a hose to remove plant debris and soil from your driveway.
- ⇒ Reduce the size of impervious paved driveways, walkways, parking areas and patios. As repairs are needed to parking areas and walking paths, consider using permeable paving such as interlocking pavers or gravel.



- ⇒ Instead of piping stormwater to a roadside ditch, install swales to carry stormwater runoff while moderating the concentration and flow of water leaving your property. Many swales are simply wide, shallow, vegetated depressions that are gently sloped and directed toward areas that can easily stand an influx of water; they are really nothing more than a grass-lined ditch. Others are more complex, like the one pictured left that is under construction. This pipe will bring a concentrated flow of stormwater from a parking area into a backyard rain garden. When the rain garden overflows, stormwater will sheet flow across a gravel apron (not shown) and into the woods. Solutions can be found for many stormwater problems, even when space is limited.

- ⇒ Design new construction to allow water to soak in to the ground. Decks should be built with gaps between the boards, and bricks, concrete lattice pavers or stones should be used for paved areas. If you're building a new building, consider constructing a green roof. Green roofs consist of a thin layer of soil that is planted with drought resistant plants. This type of roof can be used on existing flat roofs as well as sloped roofs.



The following websites offer additional information on residential stormwater management practices:

North Carolina State University
Biological and Agricultural Engineering, Stormwater Engineering Group
<http://www.bae.ncsu.edu/stormwater/>

North Carolina Division of Water Quality
Stormwater Fact Sheet
http://h2o.enr.state.nc.us/su/PDF_Files/Land_of_Sky_factsheets/FactSheet_6.pdf

North Carolina Division of Water Quality
Improving Water Quality in Your Own Backyard
<http://www.hrwc.net/publications.htm>

Home*A*Syst North Carolina
Environmental Stewardship for Homeowners Fact Sheets
<http://www.soil.ncsu.edu/assist/homeindx.html>
<http://www.soil.ncsu.edu/assist/homeassist/stormwater/>

University of Central Florida Stormwater Management Academy.
http://www.stormwater.ucf.edu/public_education.asp

U.S. Environmental Protection Agency
National Pollutant Discharge Elimination System (NPDES), Stormwater Program
<http://www.epa.gov/npdes/stormwater>

North Carolina State University
Step-by-Step Guide to Creating a Residential Rain Garden
<http://www.bae.ncsu.edu/topic/raingarden/Building.htm>