Soak Up the Rain

At Home

Everyone lives downstream

LAWRENCE COUNTY
CONSERVATION DISTRICT

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What is Stormwater?

Very simply, stormwater is all of the rain that does not soak into the ground. According to the Penn State Extension, Pennsylvania gets an average of 41 inches of rain per year. In a forested area, eighteen inches of rain will soak into the ground per hour but a lawn will only soak up two inches per hour. Everything that doesn't soak in runs off your property, into the storm drain and into streams and rivers.

That doesn't sound like it should be a problem but unfortunately it is. The water running off your property joins the water running off of everyone else's and picks up speed. Along the way, it can erode exposed soil or streambanks and pick up nutrients like nitrogen and phosphorus, as well as toxins like road salt, gasoline, motor oil, pesticides, and trash sending them into the waterways.

These nutrients, toxins, and sediment are collectively called Non-Point Source (NPS) pollution and they all have a negative effect on the aquatic life in the stream. Sediment churned up in the water makes it hard for fish to breathe and when it settles, it can smother the nesting areas of fish and macro invertebrates that the fish need to survive. In addition, sediment can also cause the temperature of the water to increase and fish need cold water. Warming water also contributes to harmful algae blooms that make water toxic to all life.

If you don't have a well, your drinking water comes from these waterways. Water authorities have to filter pollutants before we can drink it.

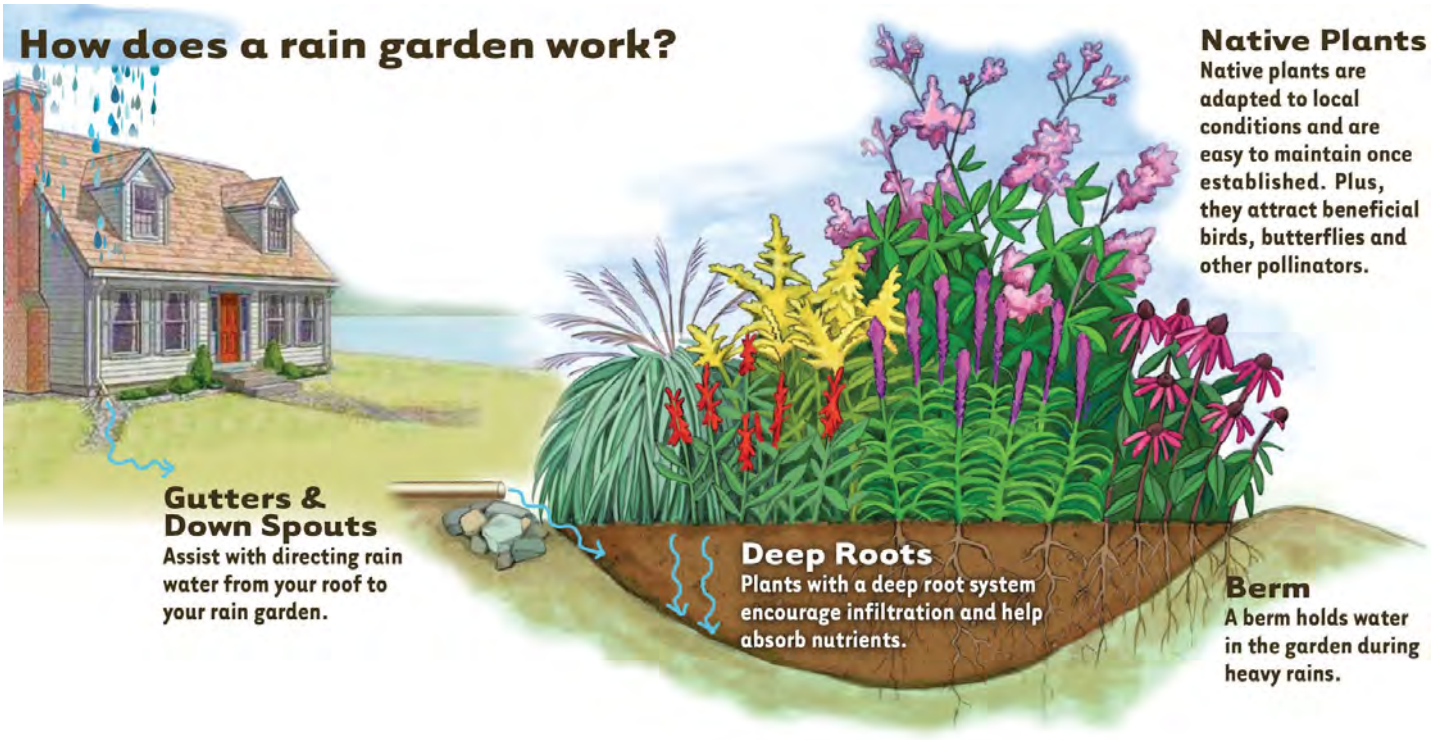
What can we do?

There are a number of ways homeowners can help reduce NPS pollution and the volume of water leaving their properties. These measures are called Best Management Practices (BMPs) for residential stormwater management.

- Plant more trees - one larger canopy tree can absorb around a thousand gallons of water each year.
- Convert part of your property or lawn to meadow. Ornamental grasses, perennials, and shrubs soak up much more water than lawns and reduce your need to mow.
- Install a rain garden or dry well to capture runoff from your walkways, patios, driveways, and roofs.
- Install a dry creek to channel water and reduce runoff.
- Install rain barrels or cisterns to capture runoff from your roof.

Rain Gardens

A rain garden is a small depressed planted garden area that serves as temporary water retention after a storm. Rain gardens slow and reduce water leaving the property and discharging into rivers and streams. They recharge the water table by allowing the rain to soak in rather than run off and filter out NPS pollution like nutrients, oil, gasoline, and pesticides. They also help reduce erosion and sediment load in streams.



Building a Rain Garden

Before building your rain garden, choose a location that you can direct a downspout to or that will collect water runoff from a driveway or patio. Locate your rain garden at least ten feet from your house foundation but not more than 30 feet from the downspout.

Start with a percolation test by digging a one foot deep hole and filling it with water. The water should drain within 24 hours. If not, your soil may need to be amended with 50-60% sand, 20-30% low clay topsoil, and 20-30% compost.

To calculate how big to make your rain garden you'll need to calculate the amount of water draining into it. If you're draining a downspout into your rain garden you'll start by calculating the roof area draining into the downspout. (Usually Length in feet x Width of house / 2) Divide this number by 6 to get the square footage of your rain garden.

If you're draining a driveway or patio, calculate the square footage draining into the garden and divide by six. This will give you the square footage of your rain garden.

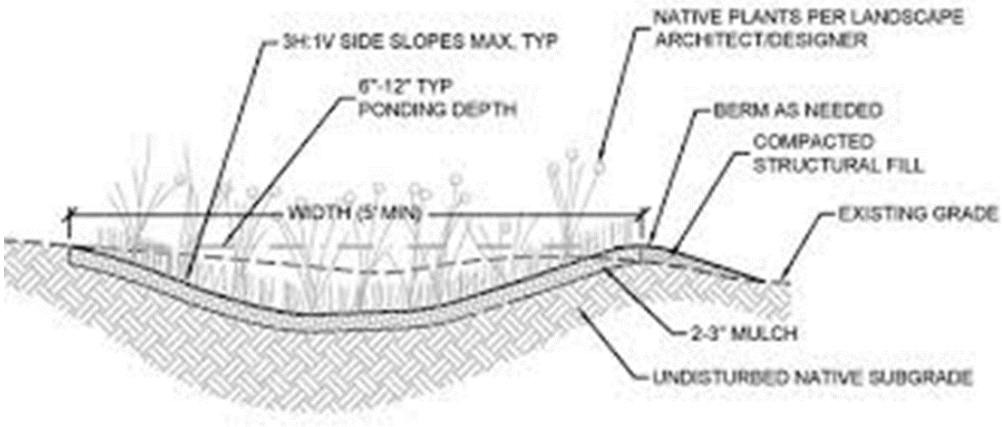
Online resources for help in calculating your rain garden size:

http://raingardenalliance.org/right/calculator

http://water.rutgers.edu/Rain_Gardens/RGWebsite/Certification%20Program/RGS_RGST_RGDesign.pdf

Once you've decided on the size of your garden, measure and outline the shape of your garden and remove the turf. Dig the garden with slightly sloped sides (3 Horizontal to 1Vertical) and add a 6" berm around the downslope side or all around the garden if your area is flatter using the excavated soil. Ponding water depth in the garden should be 6-12". If the water drained slowly in your percolation test, amend the soil to a depth of 2.5 – 3 feet.

Plant native perennials and shrubs that can tolerate standing water and periods of moderate drought (a list is included at the back of this publication) and add 1-3" of mulch or gravel at the bottom of the garden bed. You can add a rock drainage channel from the downspout or driveway to slow water heading to the garden.
Add an overflow path on the downslope area or a drainage pipe to a downslope outlet for times of very heavy rain.



Building a Dry Creek

Building a dry creek is similar to building a rain garden but it will cover a longer area. Follow the rain garden instructions for choosing a location but do several percolation tests along the proposed path. If percolation is slow you may have to amend the soil under the creek. A dry creek should follow a path with a natural downward slope. The creek can stand on its own as a way to soak up the rain or may be used to channel water into a rain garden.

If you're draining a downspout into your dry creek you'll start by calculating the roof area draining into the downspout. (Usually Length in feet x Width of house / 2) Divide this number by 6 to get the minimum square footage of your dry creek.

Once you've decided on the size and location of your creek bed, measure and outline the shape of the creek. Use a natural, meandering "S" shape to mimic a stream and remove the turf. Dig the creek 12 - 18 inches deep with slightly sloped sides and about 3 feet wide creating a concave channel. Place landscape fabric in the channel and on the sloped sides to prevent weeds. Next , place a number of large boulders along the length of the creek. The largest boulders should be placed toward the outside edges of the creek with the largest boulders upslope and slightly smaller ones downslope. Once the large ones are in place, place medium sized boulders around the large ones and at various places along the creek bed. This is where you get to be creative. Place the rocks in a way that looks and feels natural to you. A random placement creates a more natural look than uniform spacing. Once the large and medium stones are in place, fill the channel with river rock and gravel to cover the landscape fabric to a depth of at least 3 inches.

Plant perennials that would naturally be found along a stream (Siberian Iris, Yellow Flag Iris, Cardinal Flower, grasses etc.) periodically along the length to soften the look of the rock.

Rain Barrels

Erie County Conservation District's rain barrel decorating contest winner.

Rain barrels are containers that collect and store rain water from roofs and downspouts for future use. Water collected reduces runoff and water pollution, helps recharge groundwater, lowers your water bill, and conserves water.

Choose a good location for your rain barrel ideally near your garden, 6"- 28" from a downspout with adequate space for overflow. Locate it on a level and slightly elevated surface so there is room to access the spigot. You can use blocks, sand, brick, or a wooden platform to level it. Direct the overflow away from your foundation to a lawn or garden area for infiltration.

Rain water is naturally soft and devoid of minerals, chlorine, fluoride, and other chemicals so it is great for watering your lawn and gardens. It can also be used for car washing, window cleaning, and outdoor cleanup (Tools, boots, shoes etc.).

DO NOT use collected water for drinking, cooking or bathing.

Use your stored water as quickly as possible to avoid mosquitos. Use mosquito dunks if the water has been sitting in the barrel for more than a few days. (They are available at Lowes, Tractor supply, etc.) and keep the barrel tightly closed to prevent access by children or pets.

Inspect your rain barrel regularly and clean gutters to prevent debris and clogging. A clogged spigot can be cleaned with a pipe cleaner or metal wire.
At the end of the season, empty your barrel, disconnect from the downspout, and install winter disconnect fittings.

And last but not least, don't forget to have fun with it. Rain barrels can be painted and decorated to add a bit of whimsy.

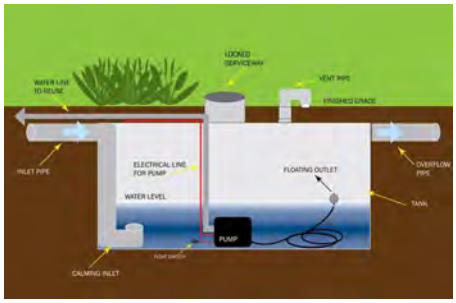
Dry Well

A dry well is a small, excavated pit filled with stone or gravel that temporarily stores stormwater runoff until it soaks into the surrounding soil. A dry well serves the same function as a rain garden but is underground. You can purchase a prefabricated dry well or build one with stone and gravel.

Always locate at least ten feet from the foundation of your house and at least three feet from your property line. Avoid locating a dry well near a septic or well head or near a septic leach field.

Instructions for sizing and installing a dry well can be found online and prefabricated wells can be purchased from hardware and retail stores and online.

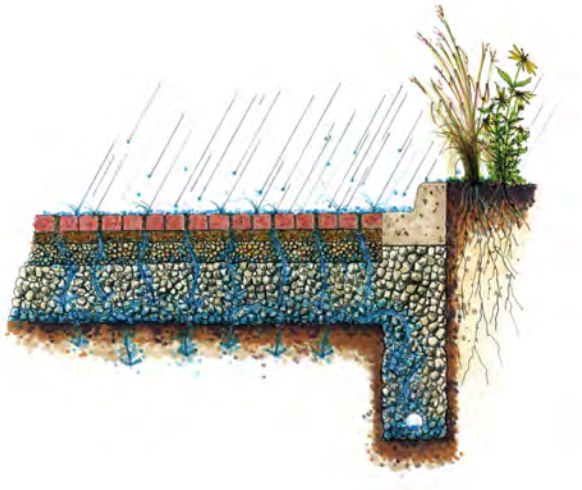
Cistern



A cistern serves a similar function to a rain barrel but is larger and often used on farms or large estates to capture and store water. A cistern can be an above ground or below ground tank.

An above ground cistern is often gravity fed like a rain barrel while a subterranean tank requires a pump to access stored water.

Pervious Pavement



Most concrete and asphalt paving is impervious meaning that it does not allow water to pass through. There are a number of paving options now that allow water to pass through and they are collectively referred to as pervious paving.

The example on the top left is a stone paver set in sand that allows the water to soak through the joints and into the water table. This helps reduce the NPS pollution going into our waterways. Above right is a pervious form of asphalt that similarly allows water to pass through into the ground below.

Grass pavers like those seen below are another form of impervious paving. These can be used for parking areas, pathways, and roads without heavy truck traffic.

Consider using one of these solutions at home when installing patios, walkways, and driveways.

Rain Garden Plants

Trees and Shrubs

Arrowwood *(Viburnum dentatum*)
Common Elderberry (*Sambucus canadensis*)
Hackberry (Celtis occidentalis)
Meadowsweet (*Spiraea alba*)
Ninebark (*Physocarpus opulifolius)*
Rosebay (*Rhododendron meximum*)
Silky Dogwood (*Cornus amomum*)
Spicebush (*Lindera benzoin*)
Sweetbay Magnolia (*Magnolia virginiana*)
Tupelo (*Nyssa sylvatica*)
Wild Hydrangea (*Hydrangea arborescens*)

Shady location

Basil Balm *(Monarda clinopodia)*
Blue-eyed Grass *(Sisyrinchium angustifolium)*
Creamy Violet *(Viola striata)*
Golden Ragwort *(Senecio aureus)*
Hairy Woodrush *(Luzula acuminata)*
Maple-leaved Waterleaf *(Hydrophyllum canadense)*
Marginal Wood Fern *(Dryopteris marginalis)*
Marsh Marigold *(Caltha palustris)*
Meadow Phlox *(Phlox maculata)*
Meadowsweet *(Spiraea alba)*
Monkey Flower *(Mimulus ringens)*
Northern Blue Flag *(Iris versicolor)*
Sensitive Fern *(Onoclea sensibilis)*
Spiderwort *(Tradescantia virginiana)*
Spreading Jacob's Ladder *(Polemonium reptans)*
Summer Phlox *(Phlox paniculata)*
Tall Meadow Rue *(Thalictrum pubescens)*
Thin-leaved Sunflower *(Helianthus decapetalus)*
Virginia Bluebells *(Mertensia virginica)*
White Turtlehead *(Chelone glabra)*
Wild Geranium *(Geranium maculatum)*
Woodland Sunflower *(Helianthus divaricatus)*

Sunny location

Beechwood Blend *(Lobelia cardinalis x siphilitica)*
Bee-balm *(Monarda didyma)*
Big Bluestem *(Andropogon gerardii)*
Blazing Star *(Liatris spicata)*
Blue Vervain *(Verbena hastata)*
Boneset *(Eupatorium perfoliatum)*
Bottle Gentian *(Gentiana clausa)*
Bottlebrush Grass *(Elymus hystrix)*
Cardinal Flower *(Lobelia cardinalis)*
Common Sneezeweed *(Helenium autumnale)*
Culver's Root *(Veronicastrum virginicum)*
Flat-topped Aster *(Aster umbellatus)*
Great Blue Lobelia *(Lobelia siphilitica)*
Green-headed Coneflower *(Rudbeckia laciniata)*
Joe-Pye Weed *(Eupatorium fistulosum)*
Marsh Marigold *(Caltha palustris)*
New England Aster *(Aster novae-angliae)*
New York Ironweed *(Vernonia noveboracensis)*
Oxeye *(Heliopsis helianthoides)*
Pink or Swamp Milkweed *(Asclepias incarnata)*
Purple Bergamot *(Monarda media)*
Purple-stemmed Aster *(Aster puniceus)*
Rough-stemmed Goldenrod *(Solidago rugosa)*
Short's Aster *(Aster shortii)*
Swamp Rose *Mallow (Hibiscus moscheutos)*
Switchgrass *(Panicum virgatum)*
Tall Sunflower *(Helianthus giganteus)*
Tall Tickseed *(Coreopsis tripteris)*
Three-lobed Coneflower *(Rudbeckia triloba)*
White Beardtongue *(Penstemon digitalis)*
Wild Rye *(Elymus virginicus)*

Dry Creek at the South Side Community Garden , New Castle, PA

LAWRENCE COUNTY CONSERVATION DISTRICT

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