**Watershed**

The land area that rain and over land flow drains into a single waterbody. Ridges of higher ground generally form the watershed boundary.

**Stormwater runoff**

Water that originates from rain events that does not soak into the ground and becomes surface runoff, which either flows directly into surface waterways or is channeled into storm sewers, which eventually discharge to surface waters. Stormwater can accumulate debris, chemicals, sediment... or other pollutants that adversely affect streams or lakes water quality.

**Urban Polluted Runoff**

Stormwater that has accumulate debris, chemicals, sediment... or other pollutants that adversely affect streams or lakes water quality.

**Non-point Source Pollution**

Pollution accumulated from a large land area and not from one specific location. This is a form of diffused pollution caused by sediment, nutrients, organic and toxic substances originating from land-use activities, which are carried to lakes and streams by surface runoff.

**Best Management Practice (BMP)**

An effective, practical, structural or nonstructural method which prevents or reduces the movement of sediment, nutrients, pesticides and other pollutants from the land to surface or ground water, or which otherwise protect water quality from potential adverse effects.

**Stormwater best management practices**

The method through any structural or nonstructural practice or technology intended to control or reduce stormwater runoff and associated pollutants, or to increase the infiltration of storm water.

 **Impervious Surfaces**

Surfaces such as paved streets, parking lots, compacted soils and building rooftops that prevent rain or snow from soaking into the ground.

**Hydrology**

Hydrology is the science of the properties, movement, and characteristics of water found on the earth's surface, in the soil and rocks beneath the surface, and in the atmosphere.

**Infiltration**

The penetration of water through the soil, typically a downward movement of water through a soil in response to gravity and capillary suction.

**Water Cycle**

The circulation of the earth's water, in which water evaporates from the sea into the atmosphere, where it condenses and falls as rain or snow, returning to the sea by rivers or returning to the atmosphere by evapo-transpiration.

**Ground water**

Ground water is the supply of fresh water found beneath the Earth’s surface, usually in aquifers within the pore spaces and cracks between the particles of soil, sand, gravel and bedrock.

**Surface water**

Surface water resources include any water flows over the land, such as rivers, lakes, reservoirs, ponds, streams, estuaries.

**Stormwater infrastructure**

A system designed to move urban stormwater away from the built environment.

**Grey infrastructure**

A network of inlets, piping, and facilities that manage runoff from areas such as paved surfaces and roofs.

**Green infrastructure (GI)**

A term used to describe an array of products, technologies, and practices that use natural systems - or engineered systems that mimic natural processes - to enhance overall environmental quality and provide utility services. Green Infrastructure use soils and vegetation to infiltrate, evapo-transpire, and/or recycle stormwater runoff. Green Infrastructure practices include green roofs, porous pavement, rain gardens, and vegetated swales. In addition to effectively retaining and infiltrating rainfall, these technologies can simultaneously help filter air pollutants, reduce energy demands, mitigate urban heat islands, and sequester carbon while also providing communities with aesthetic and natural resource benefits.

**Philadelphia Water Department (PWD)**

The Philadelphia Water Department and Water Revenue Bureau serve the Greater Philadelphia region by providing integrated water, wastewater, and stormwater services. The utility's primary mission is to plan for, operate, and maintain both the infrastructure and the organization necessary to purvey high quality drinking water, to provide an adequate and reliable water supply for all household, commercial, and community needs, and to sustain and enhance the region's watersheds and quality of life by managing wastewater and stormwater effectively.

**Ecology**

The study of interrelationships between living things and their environment, including the pattern of interactions; a view that includes all plant and animal species and their unique contributions to a particular habitat.

**Biodiversity**

The variety and variability among living organisms and the ecological complexes in which they occur.

**Stormwater infrastructure**

A system designed to move urban stormwater away from the built environment, Stormwater infrastructure is the network of piping, systems and facilities that manage runoff from areas such as paved surfaces and roofs.

**Culverts**

Pipes that allows water to flow under a road. A component of the stormwater sewer under the roads draining to a nearby waterway or sewage treatment plant.

**Storm drains**

An outdoor drain in a street, parking lot or lawn conveying stormwater runoff to a storm sewer or to a combined sewer beneath the street. A storm drain collects stormwater runoff through a heavy iron grate, through a "mouth" cut in the curb, or a combination; in any case, the stormwater falls beneath the street into a rectangular, brick catch basin (to catch grit and trash) with a trap (to prevent noxious gases from escaping from the sewer), drained by a pipe leading to the sewer.

**Bio-retention**

A depression area of land, planted and designed to retain and detain storm water before it enters the storm drains and into the stormwater system.

**Rain garden**

A planted depression that allows runoff draining impervious urban areas like roofs, driveways, walkways, and compacted lawns during rain events of 1 inch or less, the opportunity to be absorbed into the soils. The stormwater will soak into the ground (as opposed to flowing into storm drains and surface waters which... causes erosion, water pollution, flooding, and diminished groundwater).

**Bio-Swale**

Bio-retention areas designed as drainage swale with gently sloped sides filled with vegetation to allow infiltration and filtration.

**Constructed wetland**

Man-made wetlands built to remove various types of pollutants, recreating the structure and function of natural wetlands, retaining water that is than possessed by a rich microbial community to filter pollutants.

**Dry basin**

A detention basin intended store than release stormwater to a nearby waterbody and stay dry between storm events.

**System Elements**

**First Flush**

The quantity of initial runoff from a storm or snowmelt event that commonly contains elevated pollutant concentrations. Often the first flush contains most of the pollutants in drainage waters produced by the storm event.

**Stormwater Detention Facility**

Any structure, device, or combination thereof with a controlled discharge rate less than its inflow rate.

**Native Vegetation**

This term refers to plant types historically located in this geographic area as part of the tall grass prairie, riparian woodland, and oak-hickory forest plant communities. These plant species have not undergone change or improvement by humans, and are still found growing in uncultivated or relatively undisturbed areas within this region. Due to their historic presence, these plant species are extremely well adapted to the climate and natural disturbances (e.g., fire, grazing, and/or flooding) of the region. Furthermore, these plant species have co-evolved with a suite of insects, microbes, and other wildlife. As a result, the grasses, wildflowers, sedges, forbs, shrubs, and trees of these plant communities are drought tolerant, disease and insect resistant, and hardy. Preserved vegetation includes protection of the plant material, as described herein, from destruction and damage, including soil compaction and inundation of sediment. Establishment of native vegetation includes the establishment and maintenance of native plant types and plant associations historically present. Establishment of native plant materials is required if soil treatment is utilized as a BMP

**Level Spreader**

A structural practice of redistributing concentrated flows to sheet flow over a wide area to minimize erosive velocities, and to increase infiltration and treatment potential.

**Infiltration**

Percolation of water into the ground

**Infiltration Practices**

A system allowing percolation of water into the subsurface of the soil. This may recharge shallow or deep groundwater.

**Infiltration basins**

Earthen structures that capture a certain stormwater runoff volume, hold this volume, and infiltrate it into the ground over a period of days.

**Infiltration trenches**

Small, excavated trenches filled with coarse granular material; they collect first flush runoff for temporary storage and infiltration.

**Swale**

A depressed area used for stormwater conveyance and/or short term storage.

**Native Vegetation Swale**

Native grasses and shrubs planted in a swale to reduce velocity of runoff and promote infiltration.

**Turf Grass Swale**

A swale designed to convey stormwater planted with turf grass. Turf grass swales are meant to be used as a substitute for closed drainage systems.

**Wetland Swale**

 An open vegetated channel without underdrains or soil matrix designed to filter runoff and remain wet between rain events.

**Berm/bank/weir**

A man-made hill or wall hold water inside the planting bed or forbay.

**Planting beds**

A plot of ground in which plants are growing

**Mulch**

A covering of clipped bark, clipped wood, shredded leaves or compost spread on the ground around plants to prevent excessive evaporation or erosion which enrich the soil, inhibit weed growth.

**Invasive plants (or species)**

A plant that adversely affect the [habitats](http://en.wikipedia.org/wiki/Habitat) these plants invade environmentally, and/or ecologically. These plants may disrupt by dominating particular [habitats](http://en.wikipedia.org/wiki/Habitat), or [wildland-urban. They also lack the](http://en.wikipedia.org/wiki/Wildland-urban_interface) natural controls (such as [predators](http://en.wikipedia.org/wiki/Predation) or [herbivores](http://en.wikipedia.org/wiki/Herbivore)).

**Seed bank**

The store of seeds within soil, these seeds may stay dormant for a period of time.

**Soil saturation**

The point at which all easily drained voids (pores) between soil particles are temporarily or permanently filled with water. There is no air left in the soil the soil is said to be saturated. Significant saturation during the growing season is considered to be usually one week or more.

**Soil compaction**

The physical compaction or consolidation of a soil by an applied force that destroys structure, reduces porosity, reduces total pore space of a soil. Limits air and water infiltration and increases resistance to root penetration and limits crop yield. Low soil oxygen levels caused by soil compaction are the primary factor limiting plant growth in landscape soils. Soil conditions, primarily soil compaction, contribute to 80% of the plant disorders in the landscape setting

**Sedimentation**

Process of deposition of waterborne or windborne sediment or other material, solids settle out of water by gravity during ponding, covering bottom of the planting bed.

**Debris**

Pieces of organic matter, such as tree branches, leaf litter, trash, dead plants.

**Decomposition**

The breakdown of dead organic material by microorganisms into simpler compounds.

**Ecology**

Branch of science concerned with the interrelationships of organisms and their environments especially as manifested by natural cycles and rhythms, community development and structure, geographic distributions and population alteration.

**Ecosystem**

A community of living organisms (plants, animals, microorganisms, etc.) all of which interact among themselves and the environment where they live (on land, in the soil or in the water, etc.). They are often defined by the plants and animals living within the community (a marsh, a wetland or a coral reef, for example). Ecosystems do not always have distinct boundaries; they can be as small as a mud puddle or as large as a continent or even the earth itself.

**Indigenous/native**

Originating or occurring naturally in a specific area.

**Non-native plant**

A plant species that is present in a region outside its original, historic range due to intentional or unintentional introduction; not necessarily invasive. Also referred to as non-indigenous or [exotic](http://plants.ifas.ufl.edu/parks/glossary.html#exotic). The introduction of the plant to a new area is often the result of human activity.

**Naturalized exotic**

An [exotic](http://plants.ifas.ufl.edu/parks/glossary.html#exotic) plant that sustains itself outside of cultivation. (Note: this does not mean that it has "become" native).

**Filter fabric**

Landscape fabric, made of various materials, designed act a barrier between two materials (i.e soil and rocks).

**Landscape Management of Vegetated Systems**

***Planted vs. Volunteer:***

**Planted**

Put ([seeds](http://www.wordwebonline.com/en/SEED), [seedlings](http://www.wordwebonline.com/en/SEEDLING), or plants) into the [ground](http://www.wordwebonline.com/en/GROUND)

Placed or set in the ground for growth like trees or seeds…etc

**Volunteer**

A plant that grows on its own, rather than being deliberately planted by a farmer or gardener. Volunteers often grow from seeds that float in on the wind, are dropped by birds, or are inadvertently mixed into compost. Unlike weeds, which are unwanted plants, a volunteer may be encouraged once it appears, being watered, fertilized, or otherwise cared for.

A plant that grows in an area it wasn’t planted. These can either be desirable or undesirable plants. If you like the way it looks, it’s a desirable plant; if you don’t, of course it becomes undesirable. Another word for a volunteer plant is “weed.” The definition of a weed is any plant that grows where it’s not wanted. A beautiful sunflower is a weed/volunteer when it appears in a bean field. There are several ways these plants can get to your flower bed or garden. They may come from roots or seeds you planted the previous year, animals may deposit them in their feces, birds can drop the seeds, or the wind may blow them in. If you like the plant… leave it; if not…remove it!

***Non-native/exotic invasive plants:***

**Non- Native**

a plant species that does not occurs naturally in a geographic region or area (not indigenous plant); it has been introduced by humans (intentionally or unintentionally).

plant species introduced into an area where they do not occur naturally, non-native species

a plant species that is present in a region outside its original, historic range due to intentional or unintentional introduction; not necessarily invasive. Also referred to as non-indigenous or exotic. The introduction of the plant to a new area is often the result of human activity.

**Invasives**

a non-native plant species that is able to spread on its own, causing environmental or economic harm.

plants grow aggressively or spread rapidly, displace other plants, and primarily originated in another area. When one species takes over a large area it can also alter hydrological patterns, fire regimes and soil chemistry, moisture-holding capacity, wildlife habitat, and erodibility. All told, invasive plants cause billions of dollars of damage each year and tens of millions of dollars are spent annually trying to control them. One of the more notorious examples is kudzu, a quick-growing vine that was introduced in the Southeastern US as a quick-growing groundcover for disturbed areas like highway embankments. A native of Asia, it has now spread from East Texas to New England where it has smothered 7 million acres of forest

introduced by humans—either accidentally or intentionally—into areas where they were not originally found. Because those areas often lack the right predators and diseases to keep populations in check, invasive plants quickly reproduce and spread to cover large areas and even entire regions! In the process, they displace their native neighbors. Invasive plants negatively impact natural ecosystems, the local biodiversity, and the economy..

an exotic plant species that is expanding on its own in native plant communities, endangering the existence of native species. Example: water hyacinth

***Naturalized non-native plants/weeds:***

**Naturalized**

Is a term used to describe a non-native plant that is capable of surviving and reproducing without human intervention for an indefinite period. Naturalized plants do not spread away from where they were introduced are not generally a significant problem either in a garden or in a natural habitat. However, naturalized species that do spread and survive in new areas are called invasive plants

to adapt to a non-native environment; when a species of foreign origin, established itself and reproduces (outside cultivation) as though it is native.

**Weed**

any plant that grows where it’s not wanted. A beautiful sunflower is a weed/volunteer when it appears in a bean field.

any plant that crowds out a cultivated and desired plant

**Outside the System**

**Best management practice (BMP)**

Methods or techniques found to be the most effective and practical means in achieving an objective (such as preventing or minimizing pollution) while making the optimum use of the firm's resources.

Best Management Practices are physical, structural or managerial practices that decreases the potential for facilities to pollute drinking water. They can be used singly or in combination as appropriate in a particular situation....

are effective, practical, structural or nonstructural methods which prevent or reduce the movement of sediment, nutrients, pesticides and other pollutants from the land to surface or ground water, or which otherwise protect water quality from potential adverse effects of silvicultural activities. These practices are developed to achieve a balance between water quality protection and the production of wood crops within natural and economic limitations.

**Edging**

in landscape and garden design, a material to divide different surfaces

Using an [edger](http://en.wikipedia.org/wiki/Edger) gardening tool

Something that forms or serves as an edge or border

anything placed along an edge to finish it, esp as an ornament, fringe, or border on clothing or along a path in a garden

**Fertilization**

very important component of plant health care in the landscape. Fertilization is necessary to supplement naturally occurring essential mineral elements in the soil in order to maintain an optimum supply for plant growth

the act or process of applying fertilizer to soil or plants

Applying A chemical or natural substance added to soil to increase its fertility

**Herbicide**

chemicals that kill plants or inhibit their normal growth. Their means of doing this are varied and theoretically as numerous as the processes essential to plant life. Herbicides are most often and most effectively used together with good cultural practices in a turf/ weed management program. The choice of the best specific combination varies with agronomic, ecological and economic factors.

a substance or preparation for killing plants, especially weeds

**Tour of Stormwater Management Practices**

**Riparian buffer**

a vegetated area (a "buffer strip") near a stream, usually forested, which helps shade and partially protect a stream from the impact of adjacent land uses. It plays a key role in increasing water quality in associated streams, rivers, and lakes, thus providing environmental benefits. With the decline of many aquatic ecosystems due to agricultural production, riparian buffers have become a very common conservation practice aimed at increasing water quality and reducing pollution.

Lands adjacent to streams where vegetation is strongly influenced by the presence of water. They are often thin lines-of-green containing native grasses, flowers, shrubs and trees that line the stream banks. They are also called vegetated buffer zones. A healthy riparian area is evidence of wise land use management

**Constructed wetland**

is an artificial wetland created as a new or restored habitat for native and migratory wildlife, for anthropogenic discharge such as wastewater, storm water runoff, or sewage treatment, for land reclamation after mining, refineries, or other ecological disturbances such as required mitigation for natural areas lost to a development. Natural wetlands act as a [biofilter](https://en.wikipedia.org/wiki/Biofilter), removing sediments and pollutants such as heavy metals from the water, and constructed wetlands can be designed to emulate these features.

**Greenroofs**

also known as an eco roof, living roof, vegetated roof, oikosteges, or greenroof, is one that is either partially or completely covered in vegetation on top of the human-made roofing structure.

a conventional roof that is covered with a layer of vegetation. Also known as “living roofs,” green roofs serve several purposes for a building, such as absorbing rainwater, providing insulation, creating a habitat for wildlife, and helping to lower urban air temperatures and combat the [heat island effect](http://www.ecomii.com/ecopedia/heat-island-effect%22%20%5Ct%20%22_blank).

**Naturalized storm basin**

stormwater control facilities that are planted with native vegetation rather than maintained as mown lawn. Both as detention basins, where the water drains out completely between storms, and as retention, or wet, basins, these facilities address stormwater quality. The stems and leaves of the native plants, and the detritus, or dead twigs and leaves, help filter stormwater. The plants may also take up certain pollutants, such as excess fertilizer, removing them before the stormwater is discharged.

basins utilizing native vegetation instead of riprap and turfgrass, to filter nutrients from surface water runoff, provide slope and soil stabilization, reduce erosion, and improve site aesthetics.