

# Sustainable Stormwater Management Key to Clean Water



During large rain events, communities need to manage great amounts of rainwater. Traditionally, stormwater management systems were aimed to drain the landscape as quickly as possible. Run off flows from roofs, lawns and driveways into storm drains and then to the nearest body of water.

This system relies on gray infrastructure—human-engineered water and wastewater treatment plants, pipelines and reservoirs—to prevent flooding. With this system much rainwater is wasted as it flows into waterways, carrying pollutants and topsoil along with it. The primary concern was to limit nuisance and potentially damaging flooding. The environmental impacts of such practices were not considered.

Today's green infrastructure is designed to capture, infiltrate, cleanse and detain rainfall close to where it falls in the landscape. The Iowa Stormwater Education Partnership is based on this—implementing appropriate methods in a water treatment train that makes water cleaner and safer before it leaves the site.

The sustainable approach to natural landscape preservation, conservation of water resources and stormwater management allows more stormwater to infiltrate the ground and re-charge groundwater supplies.

## KEEP WATER WHERE IT FALLS

On residential properties, conservation practices to keep water where it falls and soil from washing away begin with soil quality restoration, native landscaping, green roofs, rainwater harvesting and rain gardens.

Commercial and municipal properties and residential developments use additional green infrastructure, such as permeable pavers, bioswales, infiltration trenches and basins, filter boxes (with rechargeable filters), infiltration and retention (hold water permanently) basins and constructed wetlands.



Infiltration trench construction



Mature hedge: indigo bush, hazelnut, meadowsweet, elderberry, and high bush cranberry.

The photos are used by permission from Judy Joyce, Impact7G, an environmental company in Iowa that helps clients make informed decisions for sustainable solutions. They show an infiltration trench in a stormwater wetland, during construction and five years later.

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The bioswale used in commercial and municipal properties is a vegetated channel that conveys water. It has an engineered soil subgrade and a subsurface drain. An infiltration trench stores water before it infiltrates through an amended or engineered soil.

These larger projects, often city or county

stormwater runoff quality and stormwater reduction become important new goals.

Many resources guide the watershed planning process. These include local Soil and Water Conservation Districts and the Natural Resources Conservation Service. State universities' flood centers, local water basin



Planting native shrubs on the surface of the infiltration trench

based, begin with a definition of a local watershed. This is the land area that drains or sheds to a low point in the landscape such as a body of water, a river, lake, or wetland. The water passes through many jurisdictional boundaries, creating a diversity of land-use and ownership, a challenge when forming policy on land use plans. These projects fall under the category of flood plain management and hazard (flooding) mitigation. As the area of impervious surfaces (in paved and developed areas) increases in a watershed, more rainfall is converted to runoff.

### CONCERNS ABOUT WATER RUNOFF

Awareness of the damaging effects stormwater runoff has on water quality and aquatic life in streams is a relatively recent development. Previously, stormwater management has been a flood control rather than a quality control program. Local governments now intending to improve the quality of their runoff-impacted streams are incorporating best management practices into their stormwater programs. With new stormwater regulations,

coordinators, engineers, landscape architects and native vegetation specialists all need to work together. Community groups, landowners and businesses can also have a great interest and take action to improve the health of the landscape.

### MITIGATION PLAN

In Iowa, the [Coralville Resilient Action Plan](#) addresses real flood impacts by providing a model that can be used for preparing communities on the implementation of a hazard mitigation plan.

Another good resource for sustainable watershed management is the Environmental Protection Agency webpage on [water topics](#), which includes links to green stormwater management and sustainable water infrastructure.

As a community member, homeowners can assess proposed green infrastructure projects to maximize public health benefits and serve all populations. Not the least is improved aesthetics and opportunities to be outdoors that will contribute to the overall health and well being of everyone.

Stormwater management brings many benefits to municipalities. The size of city and county stormwater projects can overwhelm residents when attempting to learn about and understand the process. Becoming familiar with a wide range of best management practices for sustainable stormwater management that include the capturing, infiltration, cleansing and detaining of rainfall close to where it lands on the landscape is a great place to start. Understanding green infrastructure shows us how these types of projects use sustainability planning on a large scale and also that these important ideas can be scaled down and applied to our home garden as well. 🌿

### RESOURCES;

U.S. Environment Protection Agency (EPA)

<https://www.epa.gov/water-research/healthy-benefits-green-infrastructure-communities-fact-sheet>

Federal Emergency Management Agency

(FEMA) <https://www.fema.gov/emergency-managers/risk-management/hazard-mitigation-planning/create-hazard-plan>

Iowa Stormwater Education Partnership (ISEP) <https://iowastormwater.org/green-infrastructure/>

Iowa Department of Natural Resources

Stormwater Manual (ISSWMM) <https://www.iowadnr.gov/Environmental-Protection/Water-Quality/NPDES-Storm-Water/Storm-Water-Manual>

California Stormwater Quality Association (CASQA) <https://www.casqa.org>

Arizona, City of Flagstaff Stormwater Management Design Manual <https://www.flagstaff.az.gov/DocumentCenter/View/58133/SWMgmtDesignManual-3-09?bidId=>

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