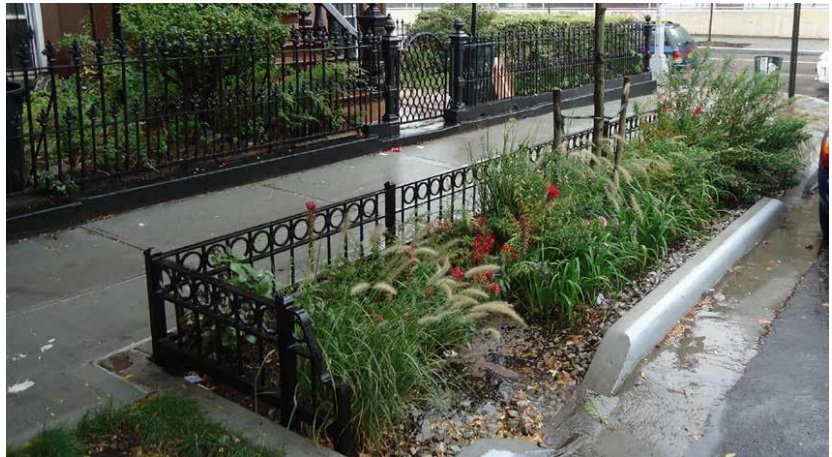


RAIN GARDENS AND GREEN ROOFS IN NEW YORK CITY PROMOTED BY THE GREEN INFRASTRUCTURE PLAN

To improve and integrate green infrastructures, such as rain gardens and green roofs, the New York City Department of Environmental Protection in 2010 released the NYC Green Infrastructure Plan which presents an alternative approach to improving water quality management, offering investments to optimize the existing system with a grant Program for Private Property Owners.



Today citizens can sign a contract and be reimbursed for managing a substantial redevelopment of their neighbourhood areas, directing it to engineered systems that typically feature soils, stones, and vegetation.

The [2014 Annual Report](#) shows the great impact reached by New York City Department of Environmental Protection through the Green Infrastructure Plan.

As cities and suburbs grow and replace forests and agricultural land, increased storm water runoff from impervious surfaces becoming a problem. Those problems are quite acute for example in NY where more than 70% of the urban soil is waterproof to the rains causing urban floods.

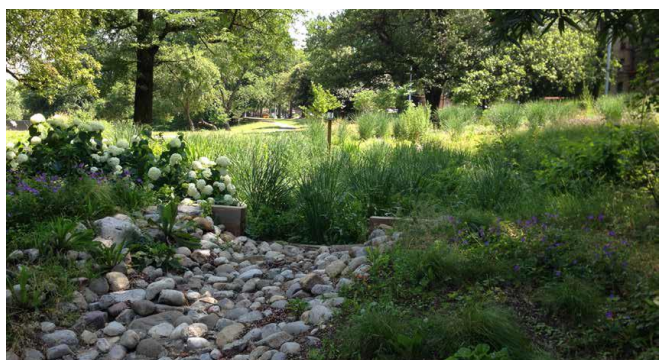


Green Infrastructure with an array of practices that use or mimic natural systems to manage urban storm water draining is spreading in particular around the Canal Gowanus area, Newtown Creek and the Giamaica Bay (NY). Main problem in this old industrial area of the city are mostly the sewer discharges into New York City's water bodies. When rainwater flows, combining with them, a flood from sidewalks can often occur that reverse on the streets.



In NY it is today possible to implement the green innovation called *Rain gardens* as a collaborative practice on City owned property such as streets, sidewalks, schools, and public housing.

A *rain garden* is a depression that collects storm water drains from a roof, driveway or yard and allows it to infiltrate into the ground. They are



typically planted with shrubs and perennials (natives are ideal), and can be colourful, landscaped areas in your yard. Rain gardens are designed to temporarily hold and soak in rain water runoff. Rain garden is dry most of the time and typically holds water only for the day following a rainfall event.

A rain garden can be any size, most often positioned perpendicular to the slope of the land in order to catch the maximum amount of rainfall. Rain gardens should be placed at least 10 feet away from building foundations and should not be located where water ponds for an extended period of time. The soil in the interior and lower area of the rain garden should be filled with sand and gravel to improve drainage. Usually there is a slope leading into it, allowing the water to flow towards the depression. They are easy to construct, mostly requiring digging in the area in order to add the soil amendments or to increase the depth of the rain garden.

Among the main advantages of the rain gardens:

- they suck up rainwater, which makes them an effective tool for keeping pollution out of waterways. Also streams and lakes are protected from pollutants carried by urban storm water – lawn fertilizers and pesticides, oil and other fluids that leak from cars, and numerous harmful substances that wash off roofs and paved areas.
- in addition to help alleviate problems with flooding and drainage, rain gardens also can increase the amount of water that filters into the ground, which recharges local and regional aquifers;
- they can reduce the need for expensive storm water treatment structures in the community.
- they are not only functional but pretty, enhancing the beauty of yards and communities and providing valuable habitat and food for wildlife like birds and butterflies when planted with native plants.

While an individual rain garden may seem like a small thing, collectively they produce substantial neighbourhood and community environmental benefits, especially if combined with other green technologies like [bioswales](#) or the green roofs, the vegetative layer grown on a rooftop.

These living roofs not only hold rain water, reduce temperatures of the roof surface by evapo-transpiration. They can also be ornamental or be used to grow vegetables and larger plant material for vegetables growing (urban farms) or didactical activities, only needing technical information about surface, weight bearing capacity, membranes protections, amount of inches of soil (mainly grasses and sedums) in relation to the local wind and temperature.



The Green Infrastructure Plan of the New York City is not only an example of instruments to improve communities towards environmental vulnerability, but also to make our urban landscapes more liveable and attractive.

To know more

[2014 Report](#)

[Green Infrastructures Plan](#)

[Green Infrastructure Toolkit](#)

[Rain gardens manual](#)

[Article in nyflora.org](#)

[Article in esf.edu](#)

[Brooklyn Botanic Garden](#)

