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THE STATE UNIVERSITY
OF NEW JERSEY

City of Newark
Green Infrastructure Overview

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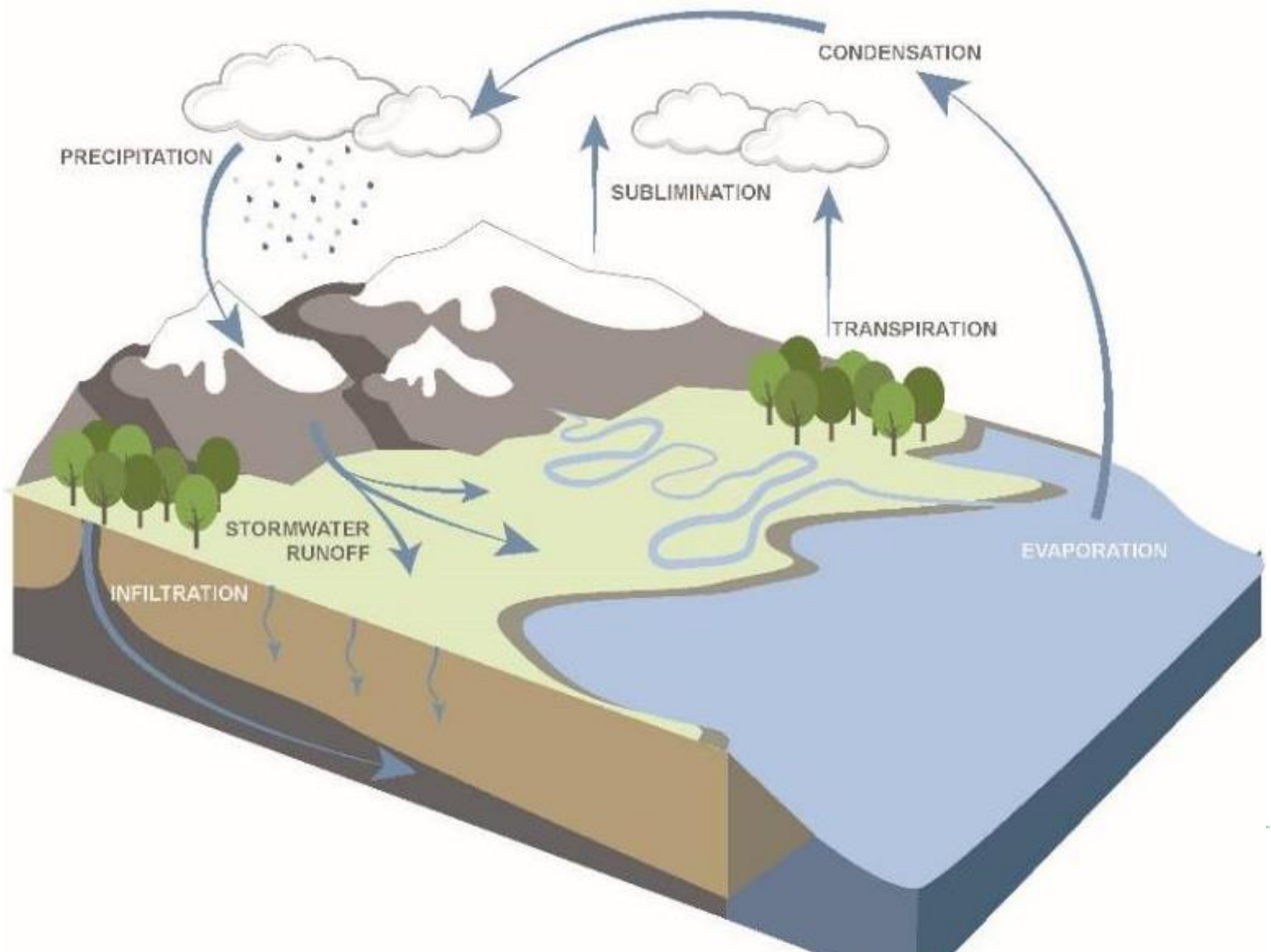
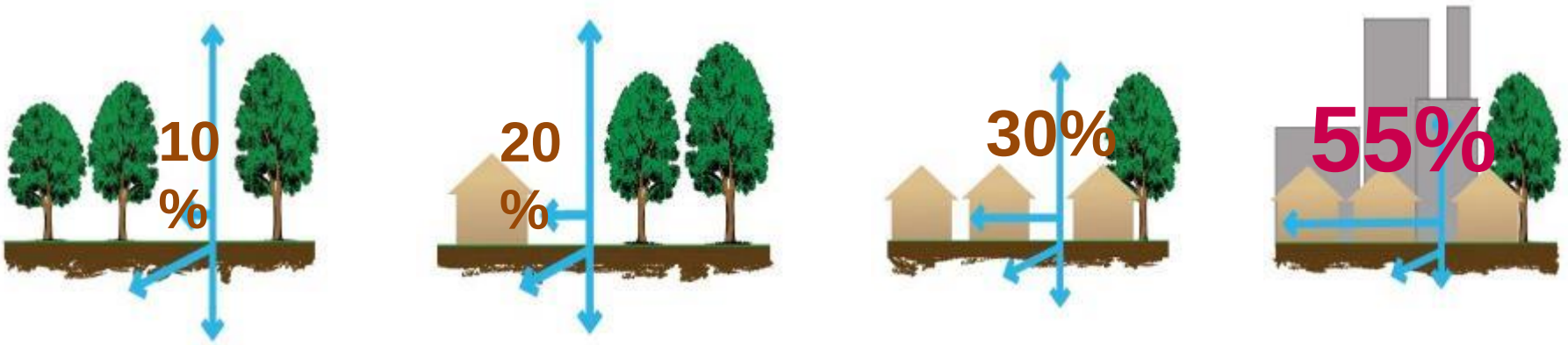
What is stormwater?

The Natural Hydrologic Cycle

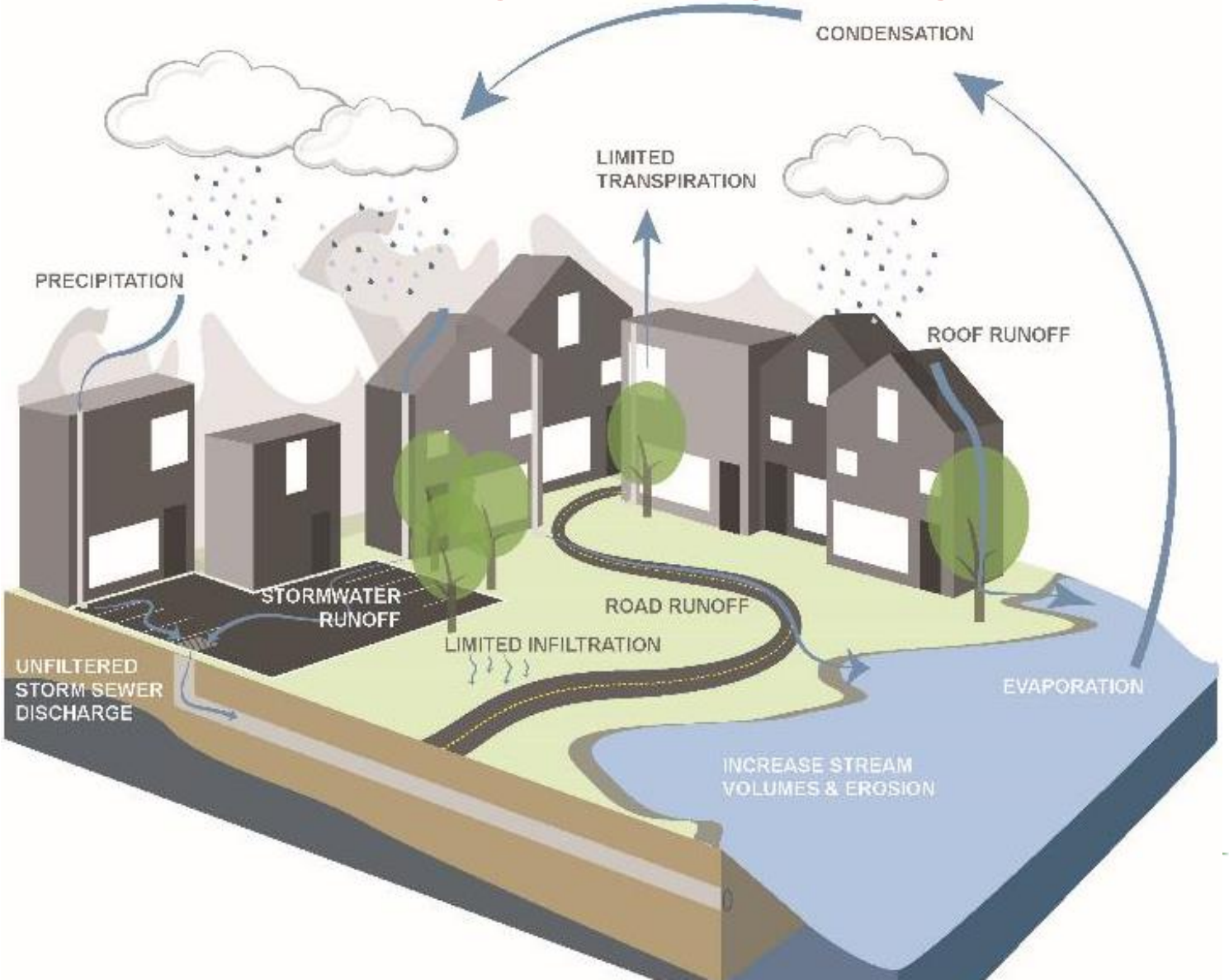


The Impact of Development on Stormwater Runoff



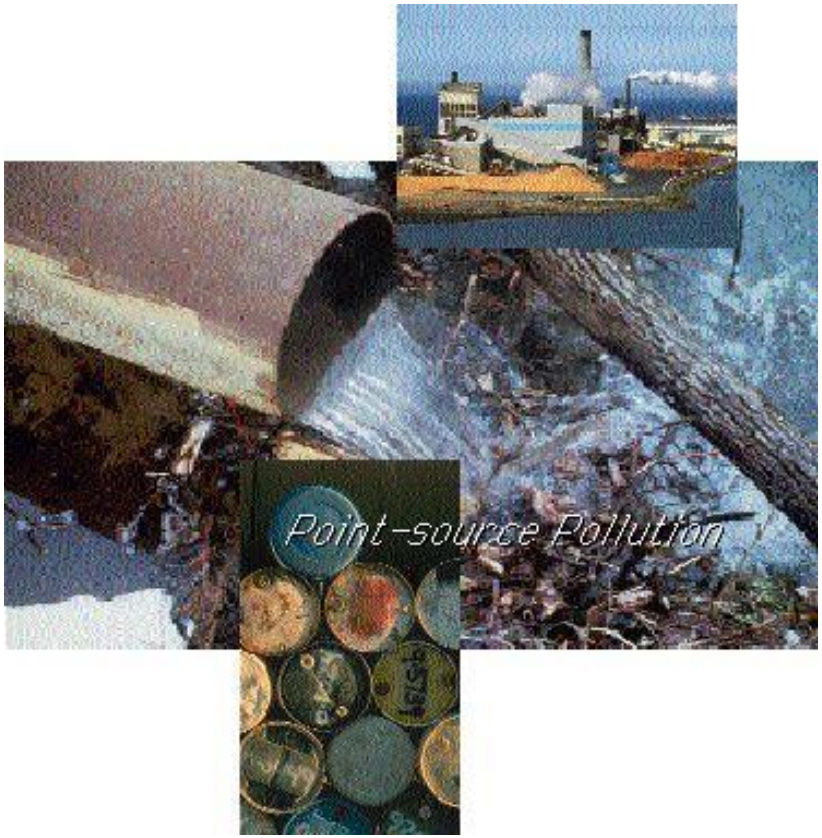
More development → *More impervious surfaces* → *More stormwater runoff*

The Urban Hydrologic Cycle



Water Pollution Sources

POINT SOURCE POLLUTION



NONPOINT SOURCE POLLUTION

Environmental Health Perspective, National Institute of Health

Point Source Pollution

- Comes from a specific source, like a pipe
- Factories, industry, municipal treatment plants
- Can be monitored and controlled by a permit system (NPDES)

Nonpoint Source Pollution

- Nonpoint Source (NPS) Pollution is pollution associated with stormwater or runoff
- NPS occurs when runoff collects pollutants on its way to a collection system or water body
- NPS pollution cannot be traced to a direct discharge point such as a wastewater treatment facility

Impacts of Nonpoint Source Pollution

- Fish and wildlife
- Recreational water activities
- Commercial fishing
- Tourism
- Drinking water quality

What is infrastructure?

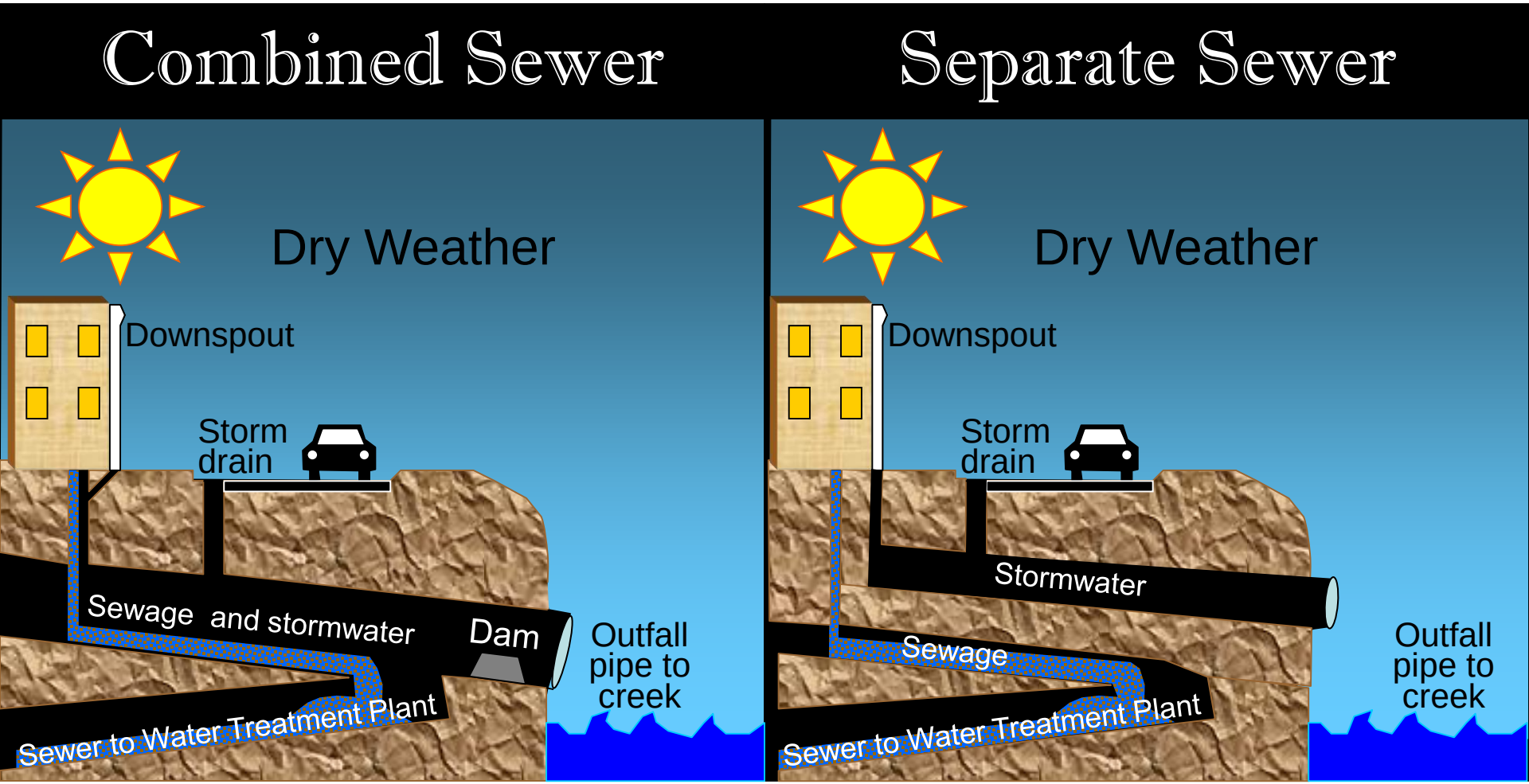
- Infrastructure includes the basic structures and organizations needed to operate our cities:
  - roads
  - water supply
  - sewers
  - electrical grids
  - telecommunications

Grey Infrastructure – Combined Sewer Systems (CSOs)

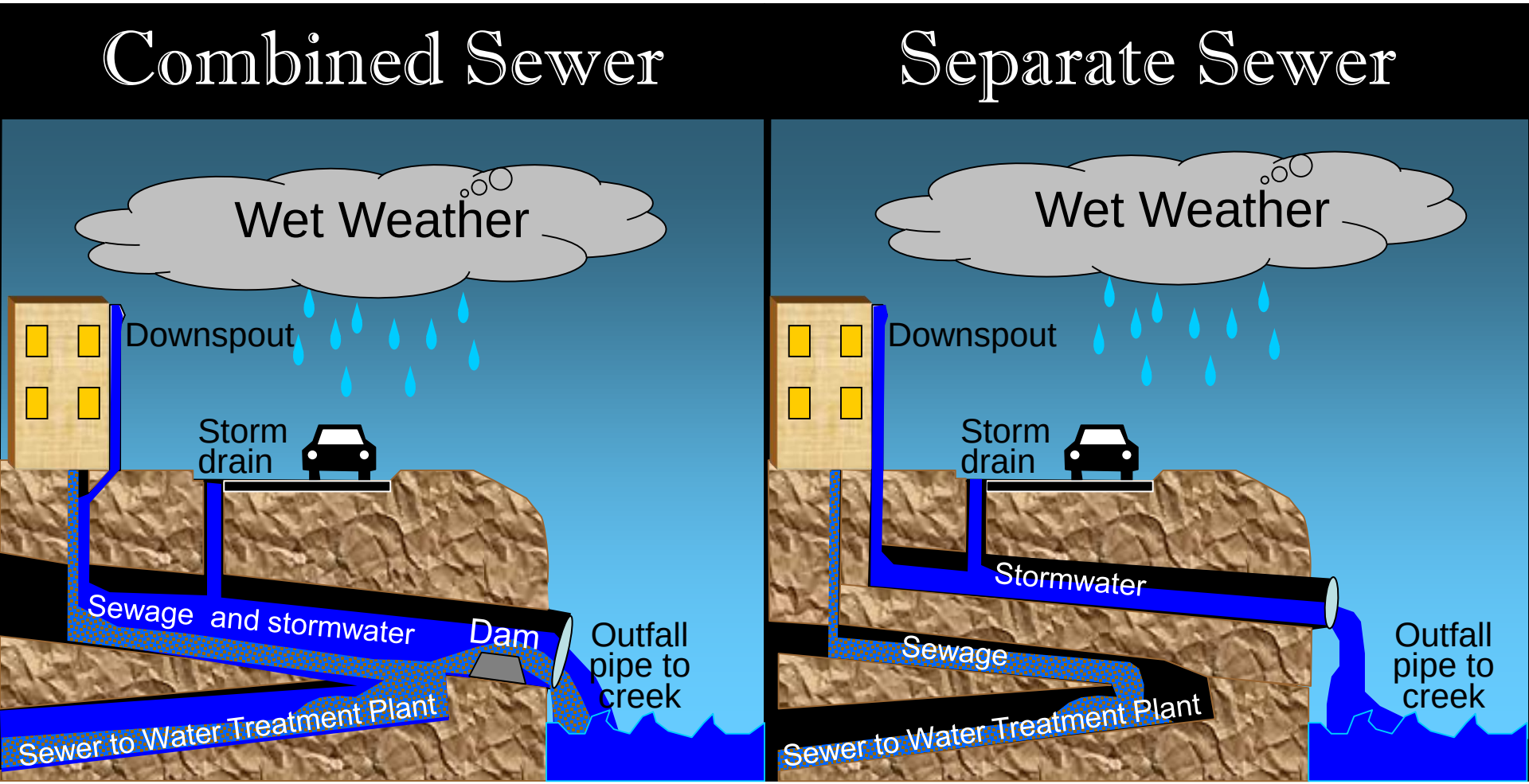
Water is held in the pipes and flows to treatment plant.

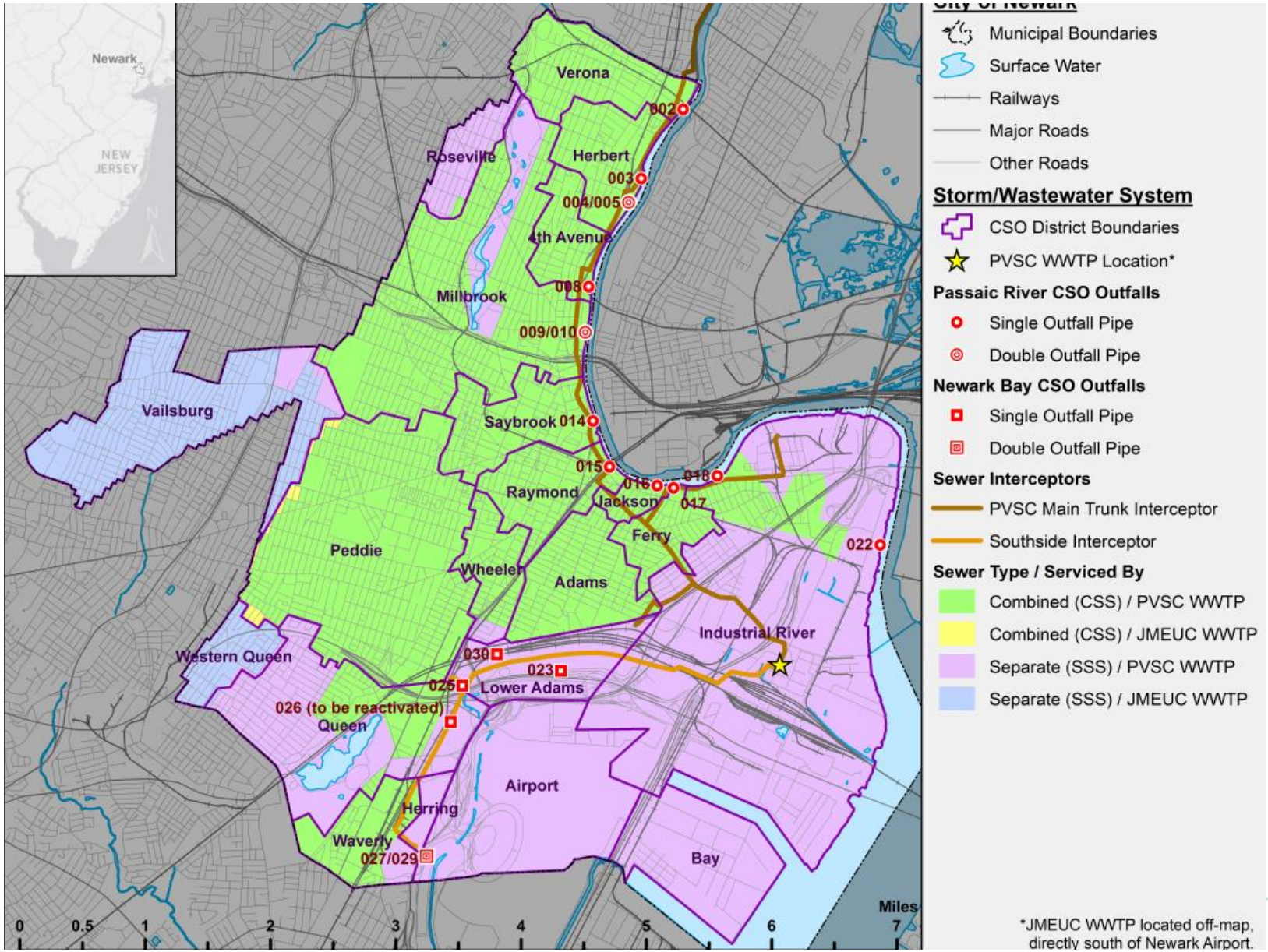
The combination of stormwater and sewage exceeds capacity and overflows into local waterways

Combined versus Separate Sewers



Combined versus Separate Sewers





Grey Infrastructure – Combined Sewer Systems (CSOs)

Green Infrastructure

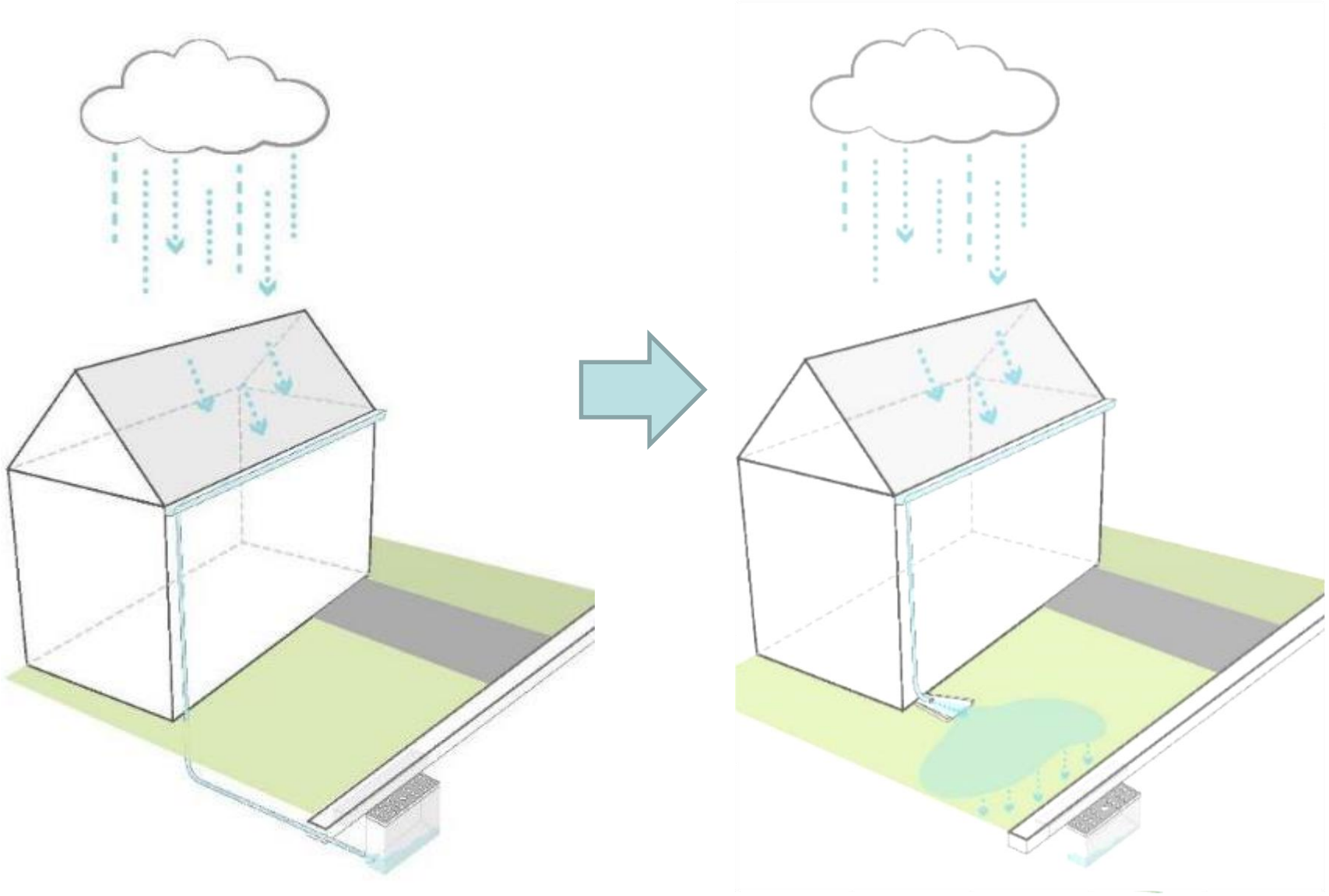
…is an approach to stormwater management that is cost-effective, sustainable, and environmentally friendly.

Green Infrastructure projects:

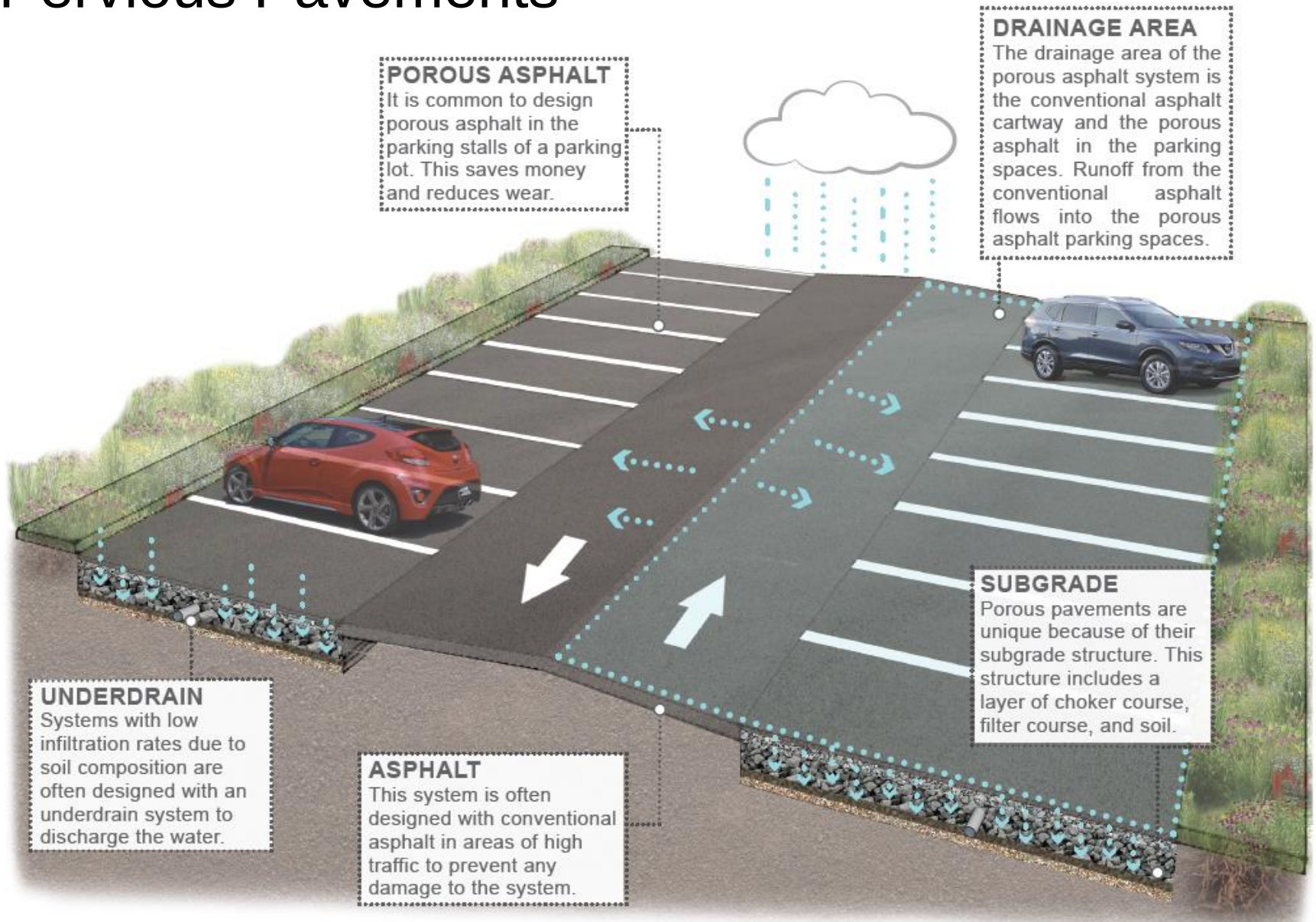
- capture
- filter
- absorb
- reuse

stormwater to help restore the natural water cycle.

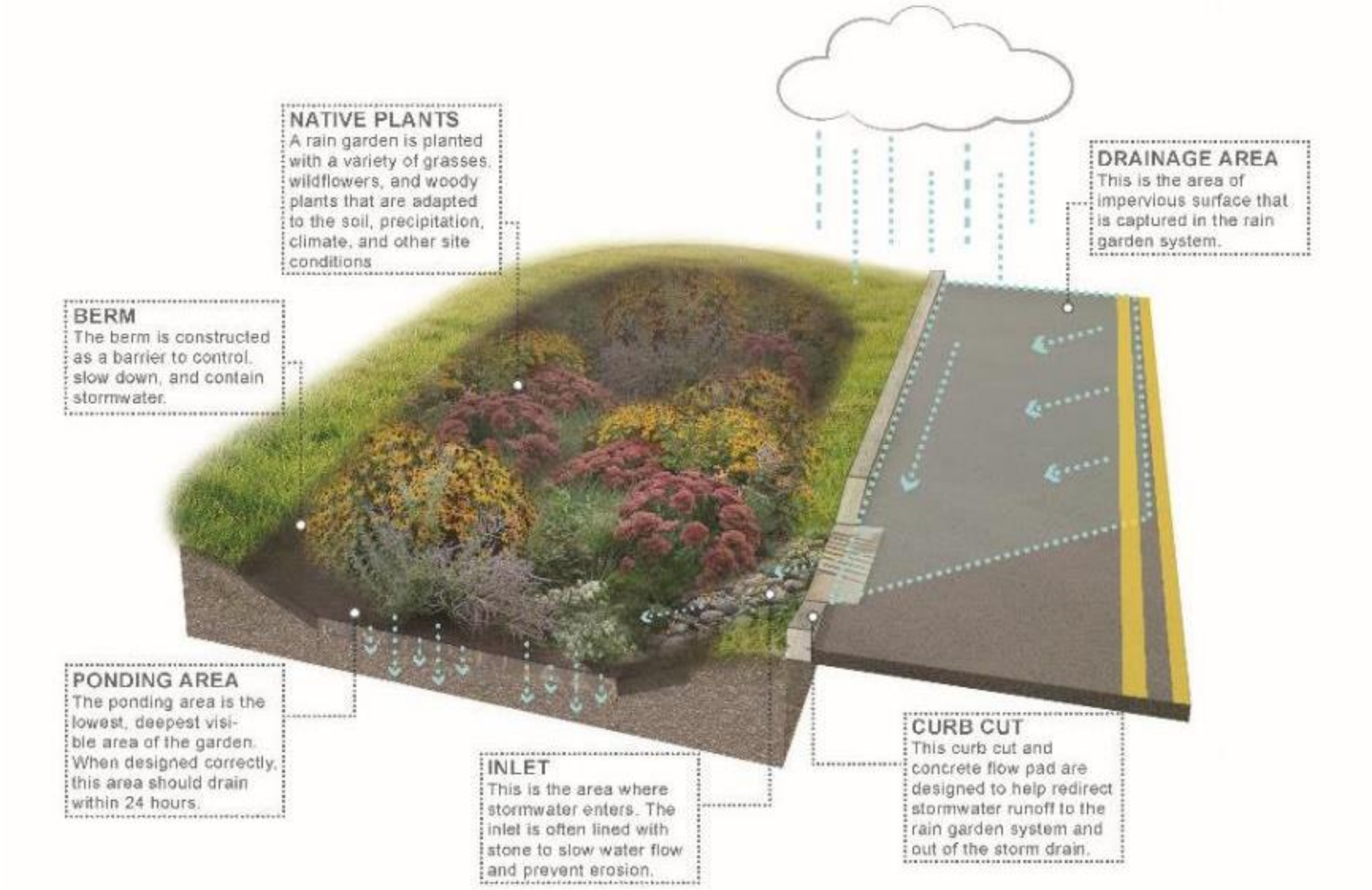
Simple Disconnection



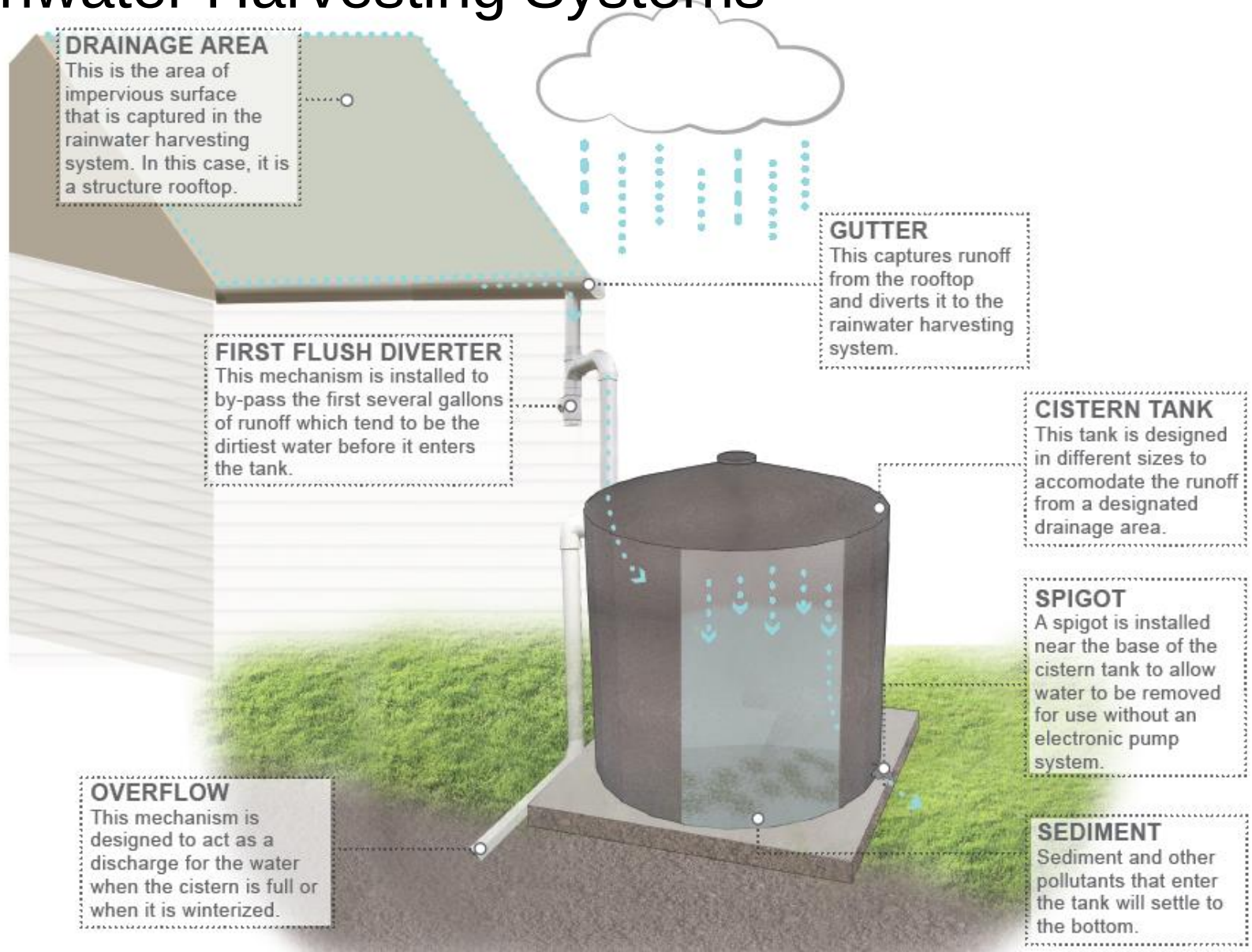
Pervious Pavements



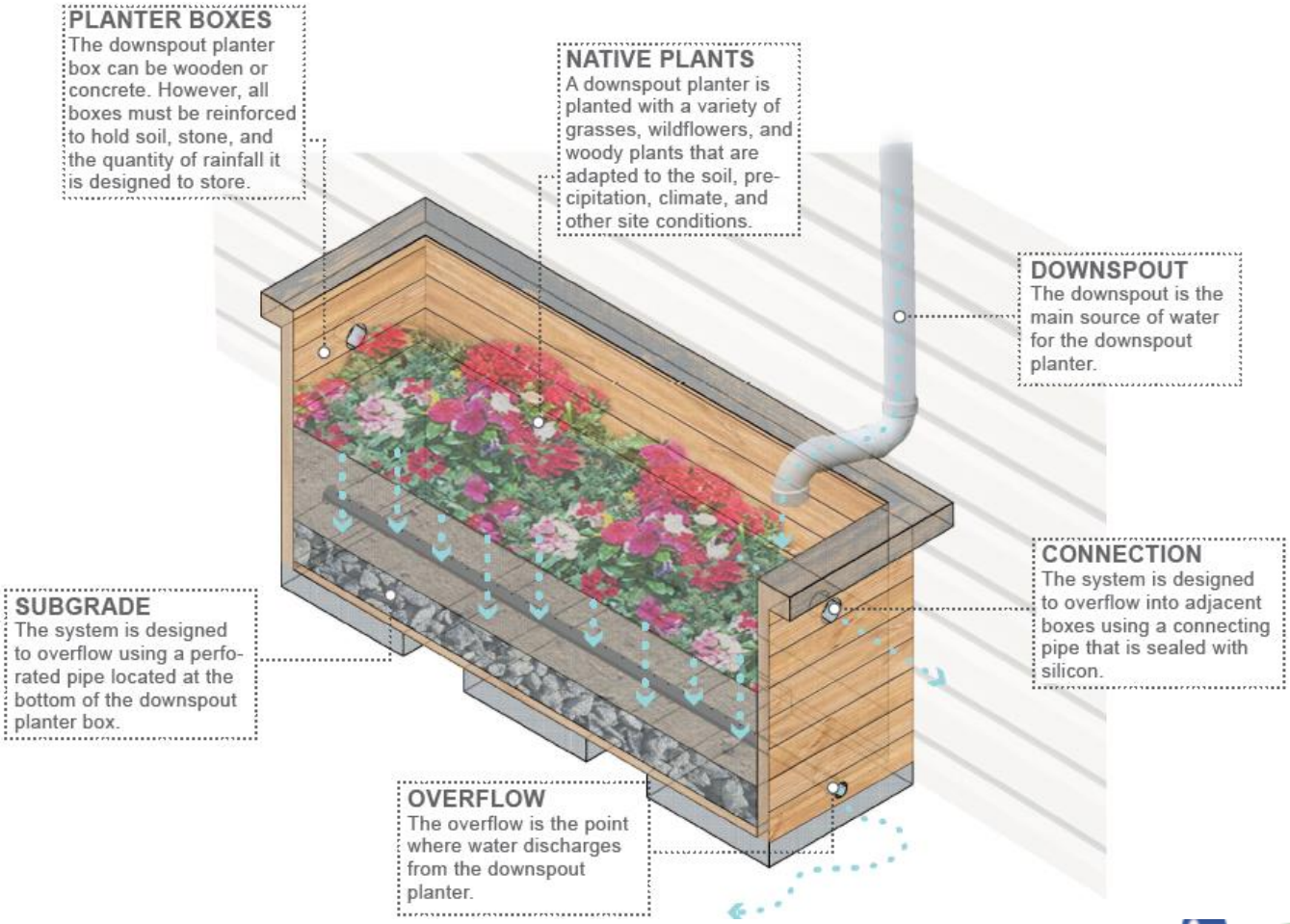
Bioretention Systems/Rain Gardens



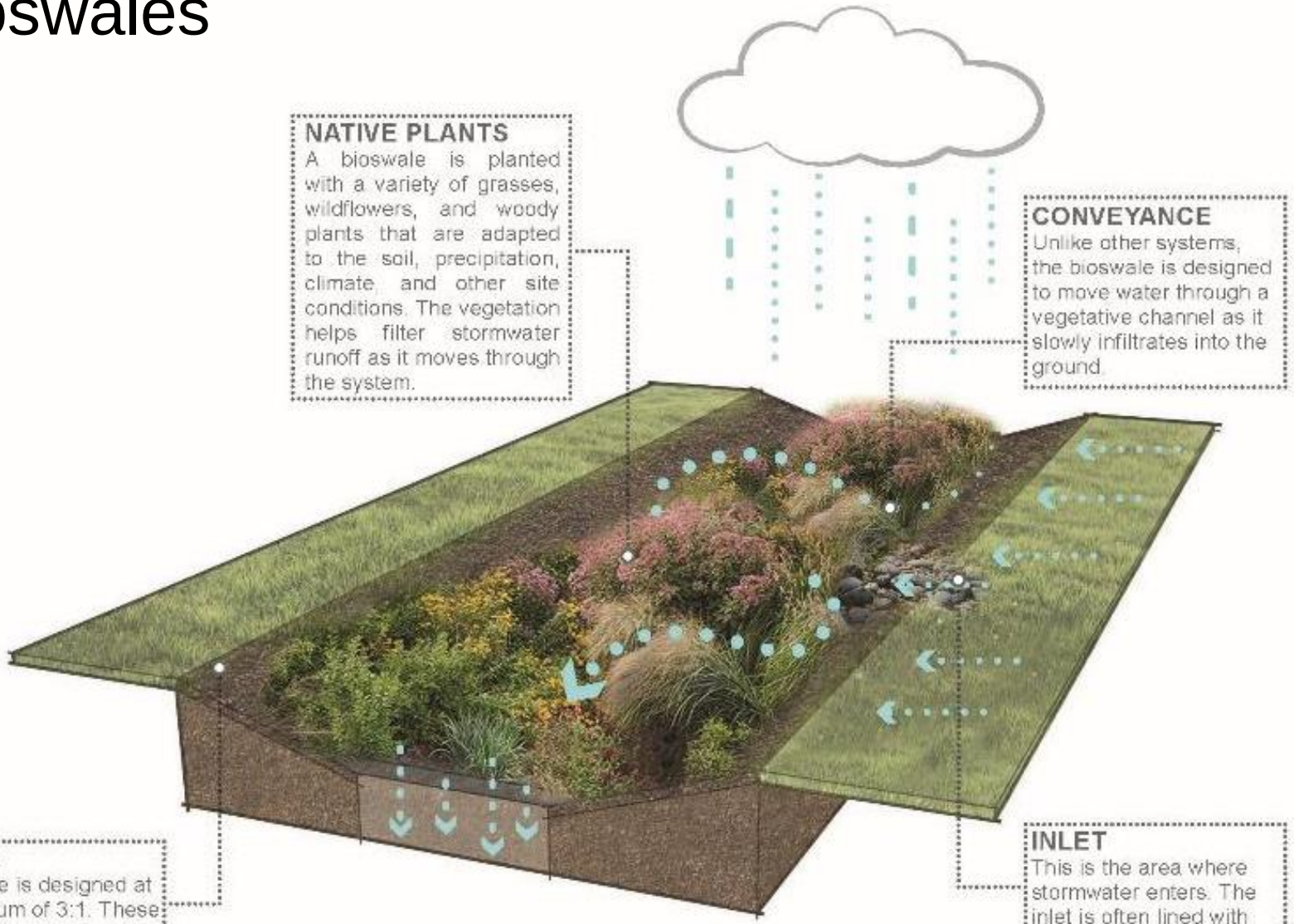
Rainwater Harvesting Systems



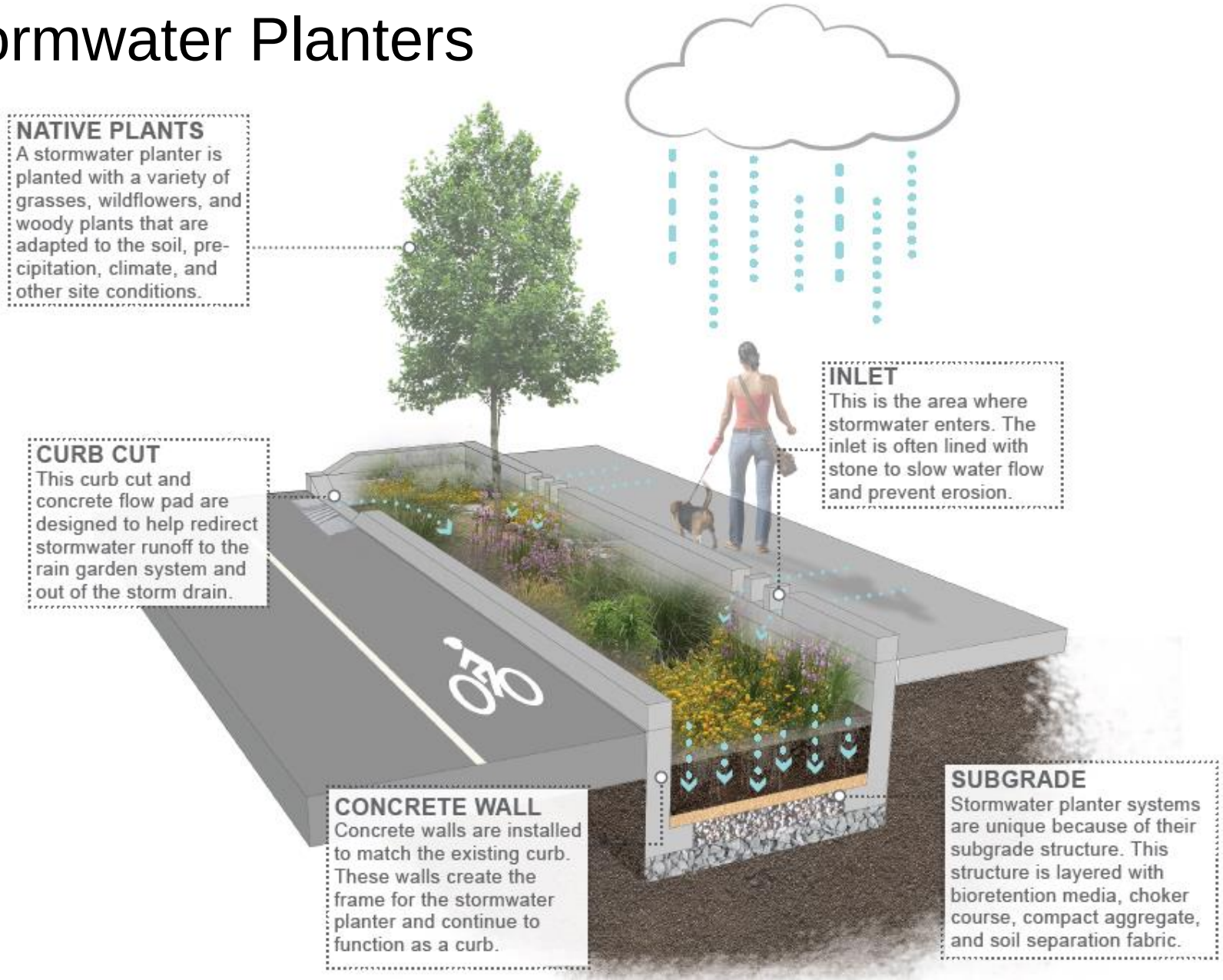
Downspout Planter Boxes



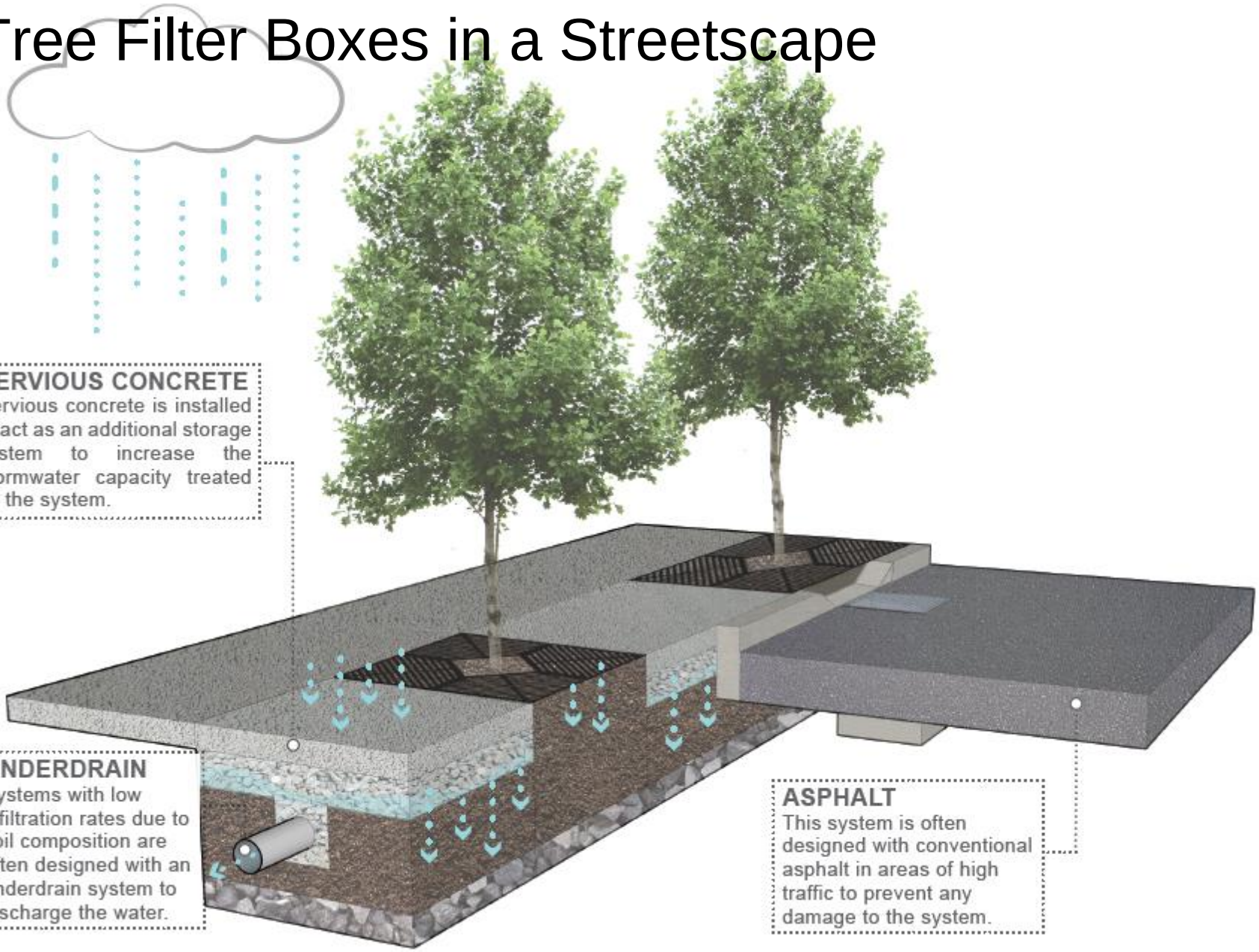
Bioswales


NATIVE PLANTS
A bioswale is planted with a variety of grasses, wildflowers, and woody plants that are adapted to the soil, precipitation, climate, and other site conditions. The vegetation helps filter stormwater runoff as it moves through the system.
CONVEYANCE
Unlike other systems, the bioswale is designed to move water through a vegetative channel as it slowly infiltrates into the ground.
SLOPE
The slope is designed at a maximum of 3:1. These slopes often require erosion control blankets for stabilization.
INLET
This is the area where stormwater enters. The inlet is often lined with stone to slow water flow and prevent erosion.

Stormwater Planters

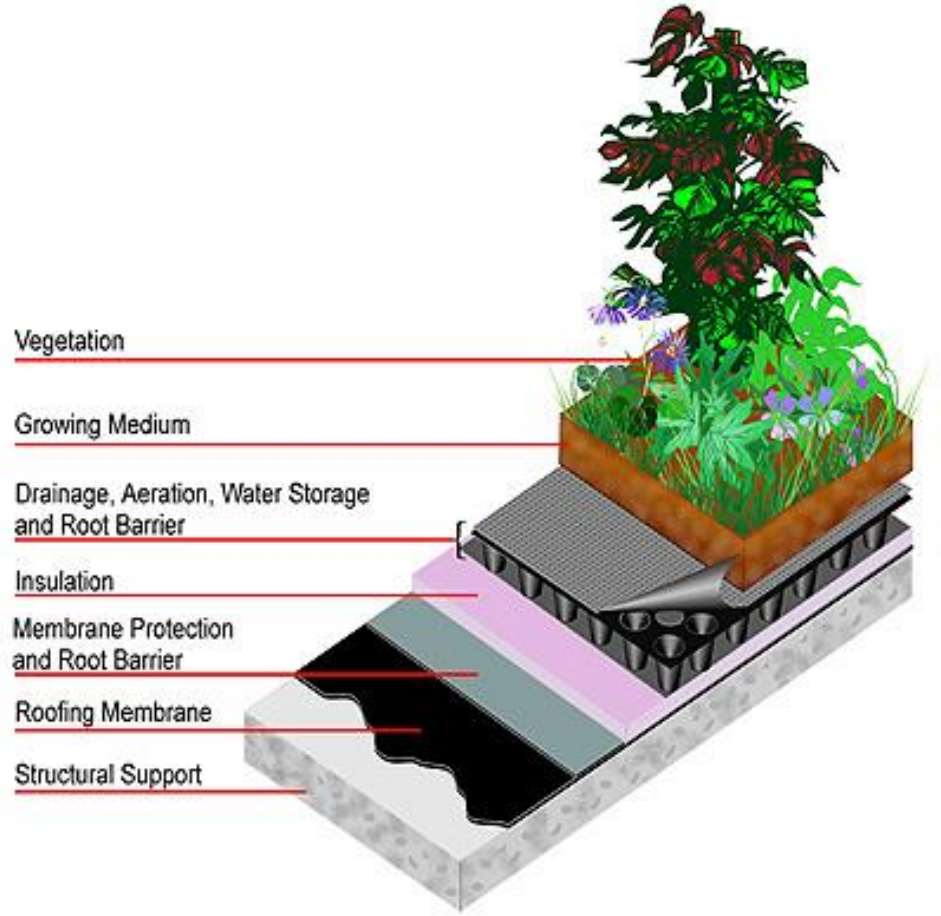


Tree Filter Boxes in a Streetscape



Green Roofs

- Green roofs provide numerous functions:
  - improving stormwater management
  - improving air quality
  - regulating temperature, which moderates heat island effect
  - provides carbon dioxide-oxygen exchange
  - increases wildlife habitat



GREEN INFRASTRUCTURE GUIDANCE MANUAL

FOR NEW JERSEY

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Additional Resources Available to You

- www.water.rutgers.edu
- www.water.rutgers.edu/E-learning.html
- www.epa.gov/greeninfrastructure
- www.nj.gov/dep/gi/
- www.njstormwater.org/bmp_manual2.htm
- www.njstormwater.org/training.htm
- www.phillywatersheds.org
- www.newarkDIG.org
- www.camdenSMART.com
- www.patersonSMART.org

Thank you

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doing infrastructure green

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SURDNA FOUNDATION

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QUESTIONS?

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