

Brooklyn Centre Naturalists

March 27, 2012



NEORSRD Key Responsibilities

- Wastewater Treatment Plant Operation
Easterly, Southerly, Westerly
- Interceptor Sewers
- Combined Sewer Overflow (CSO) Control
- Regional Stormwater Management



NEORSD Key Responsibilities



- Wastewater Treatment Plant Operation
Easterly, Southerly, Westerly

NEORSD Key Responsibilities



Interceptor Sewers

NEORS Key Responsibilities



Interceptor Sewers

NEORSD Key Responsibilities



Combined Sewer Overflow (CSO) Control

**WARNING:
OVERFLOW EVENT
PUBLIC ADVISORY**

STORMWATER AND SEWAGE OVERFLOWED TO THIS BEACH AREA ON [DATE]

As a result, the beach area and water may have been affected. Visitors – particularly children, the elderly, and those in ill health – are advised to avoid contact with the water and debris.

FOR MORE INFORMATION ABOUT COMBINED SEWER OVERFLOW (CSO):	FOR MORE INFORMATION ABOUT WATER QUALITY AND HEALTH CONCERNS:
NEORSD PUBLIC AFFAIRS & COMMUNITY RELATIONS DEPARTMENT (419) 437-7700 www.neorsd.org	COLUMBIANA COUNTY DEPARTMENT OF PUBLIC HEALTH (614) 344-4900

THE BEACHES IN RUMBLEBUSH AREA, COLUMBIANA COUNTY, OF THE NORTHEAST OHIO REGIONAL SEWER DISTRICT

NEORS Key Responsibilities

Project Clean Lake

- Consent decree with EPA
 - 772 across the US have similar mandates
- 25 year program to meet Clean Water Act standards
- Address water-quality issues caused by sewage overflows (CSOs)

NEORSRD Key Responsibilities

Regional Stormwater Management

The program addresses the increasing:

- Flooding
- Erosion
- Water Quality Problems





Regional Stormwater Management



Paying For Stormwater Management:

Impervious Surface Fee

Residential property:



Roof + driveway

= 1.0 Equivalent Residential Unit (ERU)

= 3,000 square feet of impervious surface

“The more you pave the more you pay.”

2011 Stormwater Fee

Total revenue required (\$)

**Total impervious area
(in ERUs)**



**\$4.75 per
ERU per
month**

Stormwater Fees for Non-Residential Parcels

Non-residential parcels



Roof + parking lot

= 120,000 sq. ft.

= 40 ERUs (\$4.75)

= \$190/month

= \$2,280/year

(less any credits)



Stormwater Management

Watershed Management

What is a
WATERSHED?

An area of land where all water flows
to a common waterbody.

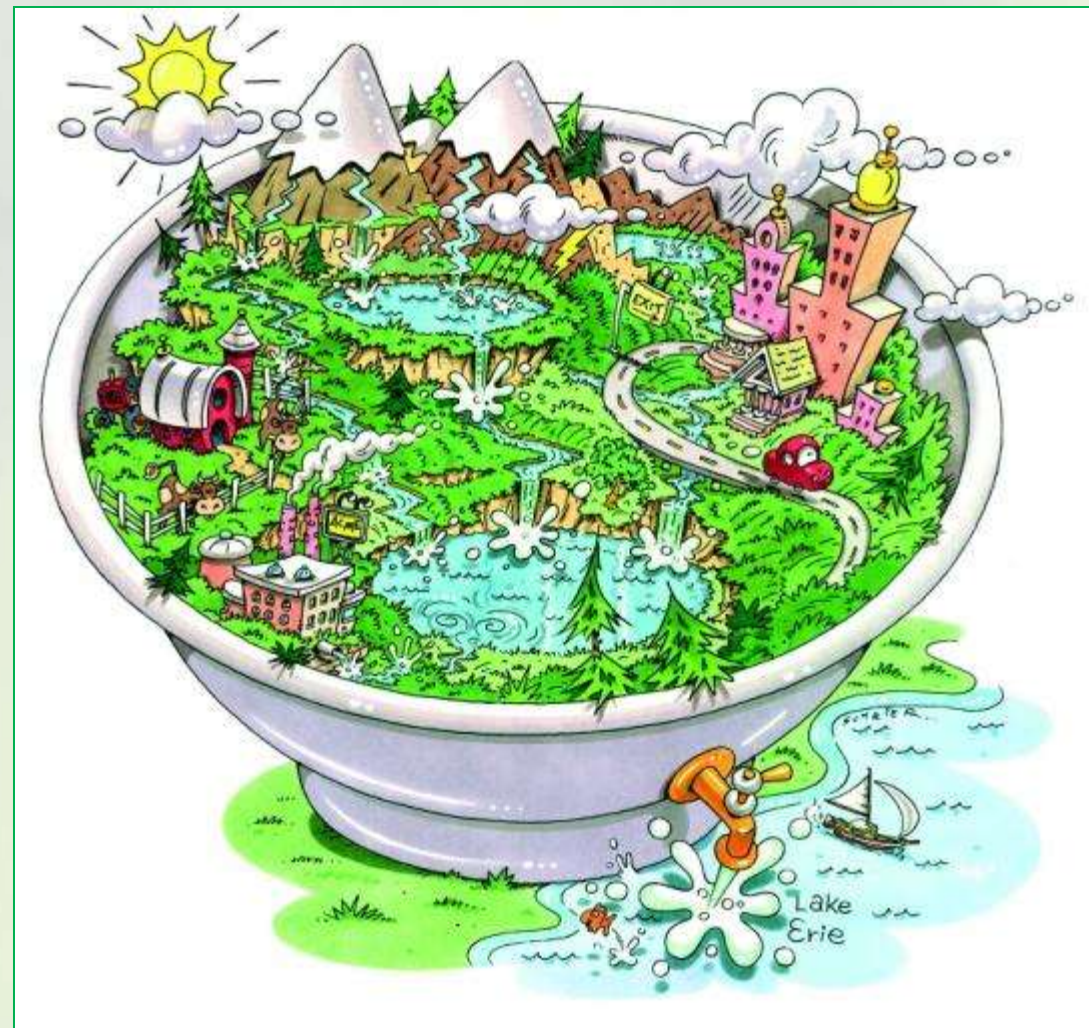
A watershed is a *geomorphological* structure.

It's the landform! **how the earth is shaped.**

Ge = Earth morph = form logos = study

What is a WATERSHED?

An area of land where all water flows to a common waterbody.



Everyone lives in a WATERSHED!



YOU live in a WATERSHED!

Big Creek Watershed

Cleveland
Metroparks Zoo

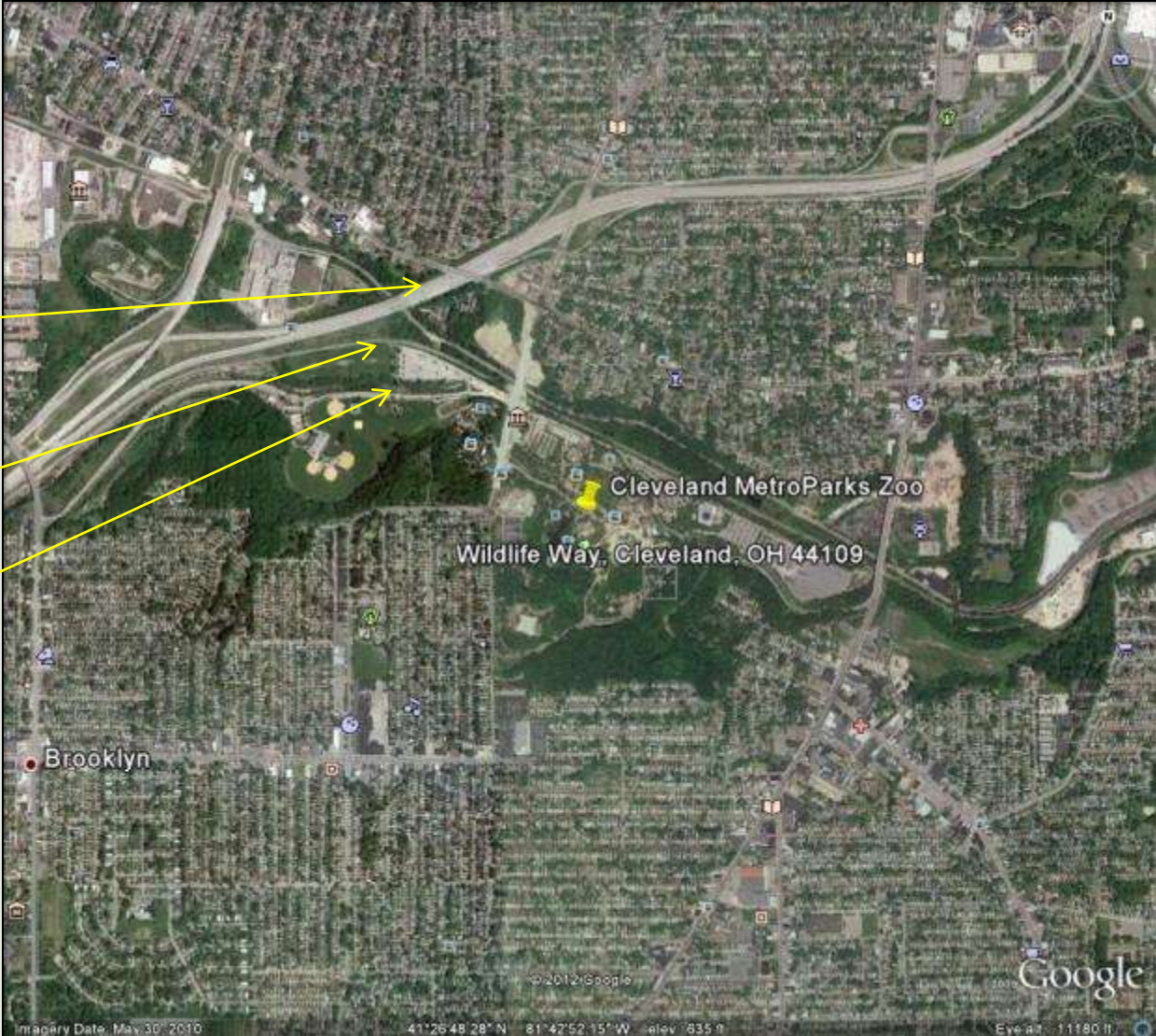


YOU live in a WATERSHED!

I-71

Railroad

Big Creek



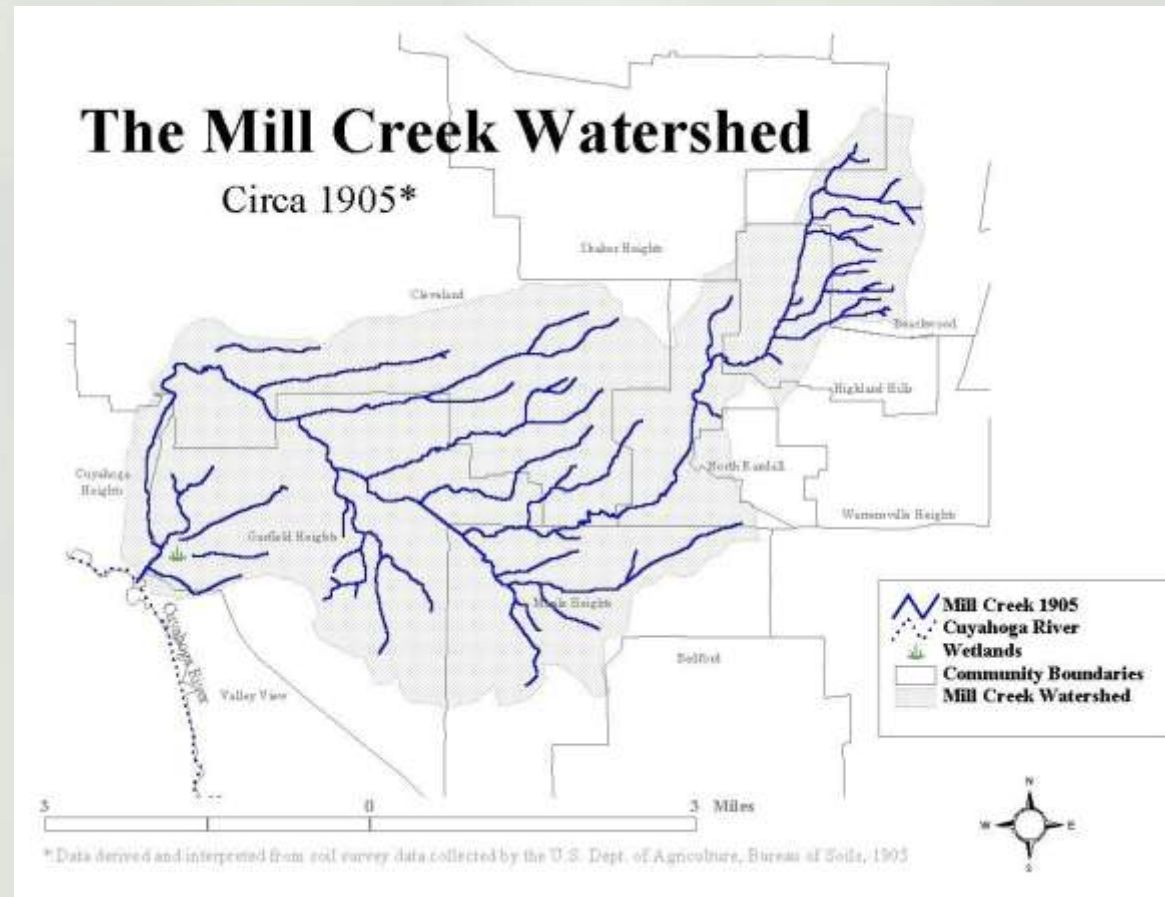
Why do we need a Stormwater Management?



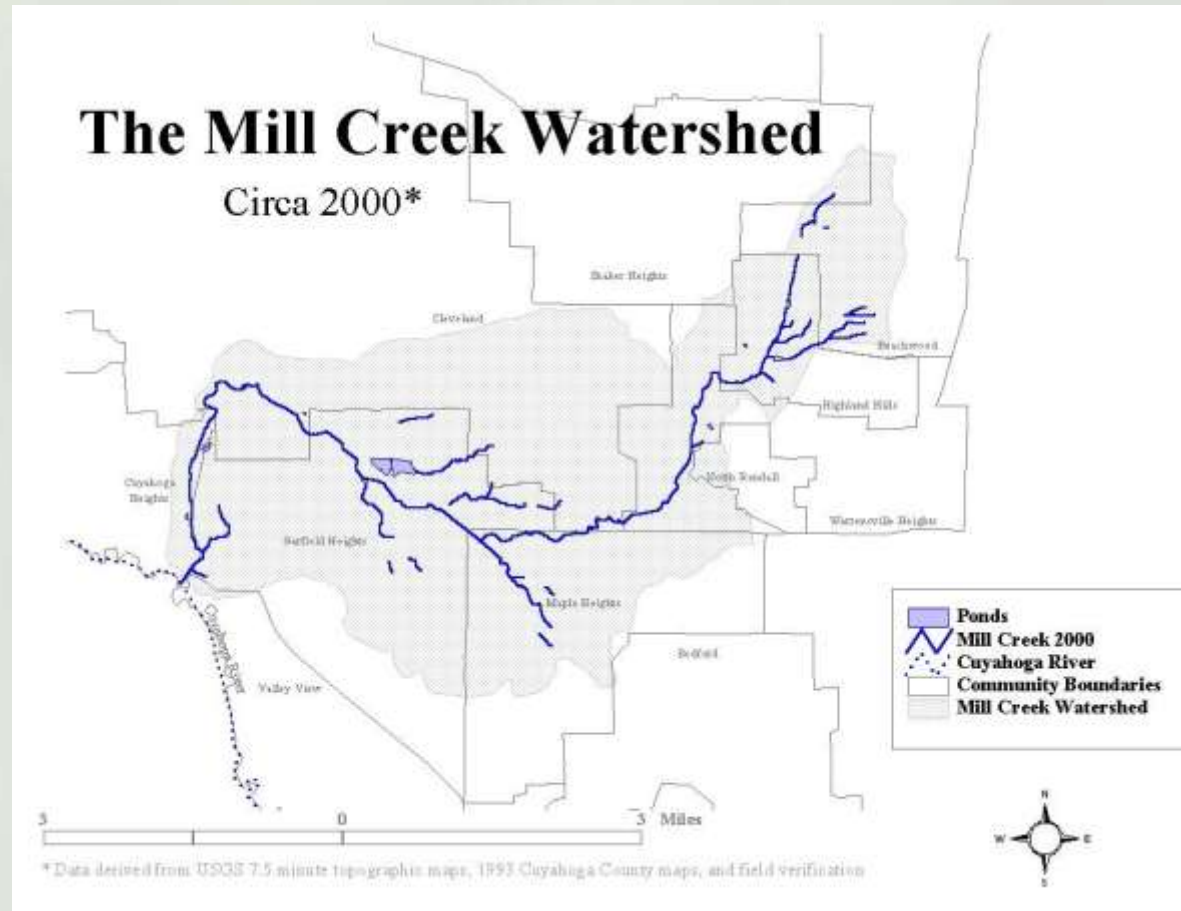
Why do we need a Stormwater Management?



Why do we need a Stormwater Management?



Why do we need a Stormwater Management?



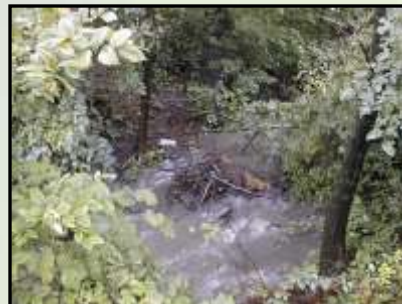
Urbanization can **reduce infiltration** and increase the volume of runoff, impacting streams and storm sewers by:

- ☔ Causing an increase in the volume of surface water that streams and sewer systems receive. In certain cases, if the sewer system is overloaded by surface water, a combination of sanitary and storm water (CSO) are released directly into the receiving water.
- ☔ The release of sanitary sewage into the environment due to CSO's compromises the water quality of the receiving water.



Urbanization can **increase the velocity** of stormwater to a receiving body of water because of the construction of efficient storm sewer systems and impervious surfaces.

- ☔ Increase in velocity and volume; reduces infiltration.
- ☔ Increases in velocity and volume increases flooding potential.
- ☔ Increases in velocity of the water will scour the stream bed, removing important biota.
- ☔ Increases in velocity and volume will accelerate stream side erosion.



Urbanization reduces the amount of depression storage because of regrading.

- ☔ Depression storage like wetlands and ponds are useful in absorbing runoff and slowing stormwater flow.
- ☔ Loss of a wetland, nature's natural water filter, may impact local water quality.
- ☔ Wetlands are nurseries to many aquatic and terrestrial organisms. Loss of wetlands impacts the integrity of animal populations.



Urbanization changes reduces **evapotranspiration** by removing vegetative cover.

- ☔ The removal of vegetative cover, and reduction of evapotranspiration increases surface water.
- ☔ The loss of vegetative cover along streambanks (riparian zones) promotes soil erosion.
- ☔ Vegetative cover along streams provides shelter and a cooling effect on the water. The removal alters terrestrial and aquatic habitats.



What can we do?

Nature has shown us how to effectively manage watersheds and stormwater!



What can we do?

- **Trees and forests** reduce stormwater runoff by capturing and storing rainfall in the canopy and releasing water into the atmosphere through evapotranspiration.
- In addition, **tree roots and leaf litter** create soil conditions that promote the infiltration of rainwater into the soil.
- This helps to **replenish** our groundwater supply and maintain streamflow during dry periods.

What can we do?

Urban areas could reduce their stormwater runoff potentially save millions of dollars by **increasing their tree cover.**

A Fayetteville, Arkansas study revealed that by:

- An increase tree canopy from 27% to 40%
- Reduction in their stormwater runoff could reach 31%
- Realize a value at a \$43 million in capital improvement savings

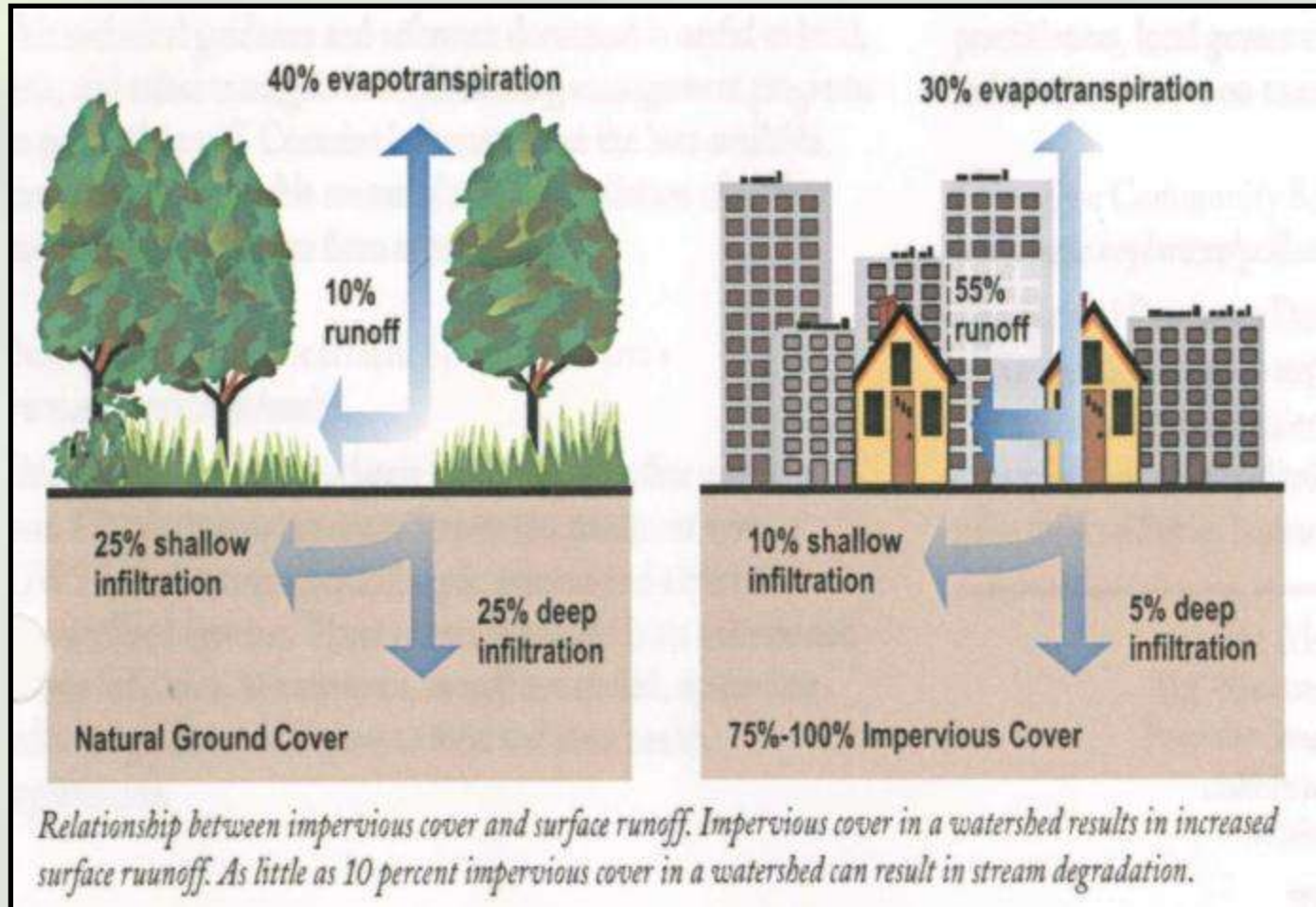
American Forests, UEA of Benton and Washington Counties, Arkansas, 2002)



What can we do?

- **Infiltration** refers to the movement of **water** into the **soil** layer.
- The rate of this movement is called the **infiltration rate**.
- If **rainfall intensity** is greater than the infiltration rate, water will accumulate on the surface and **runoff** will begin.

Why do we need a Stormwater Management?



Why do we need a Stormwater Management?

**Centralized,
efficient
control of
large floods.
Uses curb and
gutter systems
leading to
storm sewers.**



Traditional Stormwater Management

What can we do?

Rain Barrels

- Capture the rain water from roofs
- Reduce the water that gets to storm drains and streams
- Provide a source of natural rain water for watering gardens



What can we do?

Rain Gardens

- Improves infiltration and reduces runoff.
- Require less maintenance than lawns because they do not need to be mowed, fertilized, or watered once established.
- Reduce storm drain overload and flooding if adopted on a community or neighborhood scale.
- Provide habitat for wildlife and, with the proper plants, increase the number and diversity of birds and butterflies for those who enjoy watching them.
- Provide an attractive and creative alternative to traditional lawn landscapes.

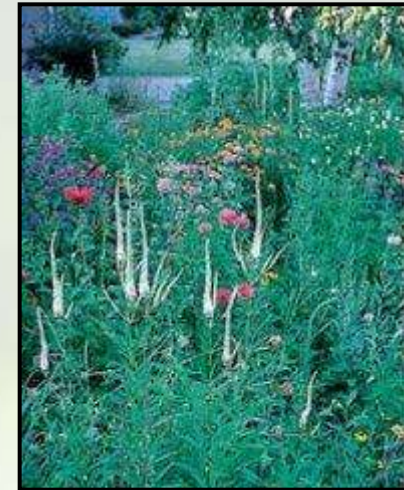


Michigan Artist Ruth Zachary

Reduce Lawns

Reducing lawns to the minimum size needed, maybe even do away with a lawn entirely. Traditional mowed lawn landscape can become. Consider one or more of these environmentally friendly alternatives:

- create or expand beds of native flowers and shrubs
- plant a wildflower meadow or another form of native groundcover
- **Plant TREES!**



What can we do?

Cleveland Metroparks Zoo

~A stormwater management demonstration project

Features:

- Downspout disconnection and realign gutter
- 550 gallon cistern
- Soaker hoses (drip tubes)
- Overflow drain to rain garden
- Two rain gardens
- Bioswale
- Educational signage



What can we do?

Northeast Ohio Regional Sewer District

Features:

- Re-use black granite
- Reduce impervious surface by removing 500 SF of cement
- Re-use electrical and sprinkler systems
- Disconnect downspout from awning
- Trench drain to view water conveyance from disconnect
- Rain garden
- Native plant/ non-invasive plant species
- Re-use redwood timbers from Southerly aeration tanks for footbridge
- Pervious pavers
- Plant markers
- Educational signage



What can we do?

Green Infrastructure:

A TOOL FOR EFFECTIVE
STORMWATER MANAGEMENT

- **Water Quantity Control**
- **Water Quality Control**
- **Environmental Improvement**



QUESTIONS?

