

# Reducing Stormwater with Trees and Native Plants

In Urban Areas



# Learning Objectives

*What are the challenges of urban stormwater management?*

*What are the benefits of trees in an urban setting?*

*What are the ecosystems services provided by trees in an urban environment?*

*What are the economic, social, ecological, and aesthetic benefits of trees within cities?*

# Stormwater

Stormwater is a term used to describe water that originates during precipitation events. It may also be used to apply to water that originates with snowmelt or runoff water from overwatering that enters the stormwater system. Stormwater that does not soak into the ground becomes surface runoff, which either flows directly into surface waterways or is channeled into storm sewers, ditches, culverts which eventually discharge to surface waters.

Stormwater is of concern for two main issues: one related to the volume and timing of runoff water ( flood control and water supplies) and the other related to potential contaminants that the water is carrying, i.e. water pollution.

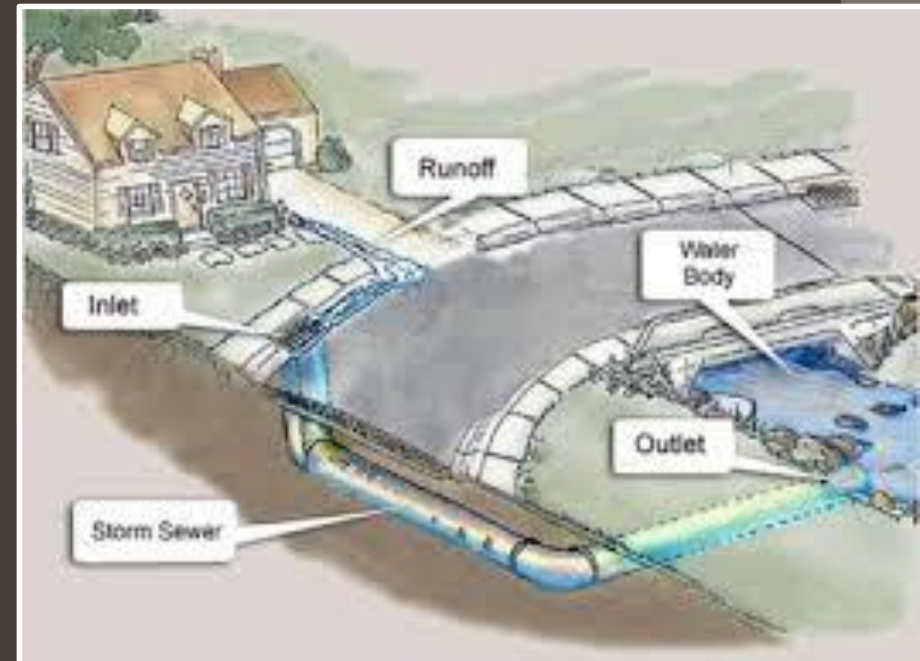
# Stormwater Management

## Challenges for Urban Settings

Impermeable surfaces  
and compacted soils

*leads to*

Decreased infiltration  
and Increased runoff



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# Stormwater Management

## Challenges for Urban Settings

### Paved Surfaces

- *No groundwater recharge*
- *Cannot store water*
- *Inhospitable to plant life*

Pollution laden runoff



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# Challenges of Common Stormwater Practices

## Infiltration Infrastructure



*Concentrated stormwater  
=  
higher risk of contaminated water*





# Challenges of Common Stormwater Practices

## Detention and Retention Ponds

- *Take up open space*
- *Lack distributed infiltration*
- *Issues with safety, pests, & aesthetics*

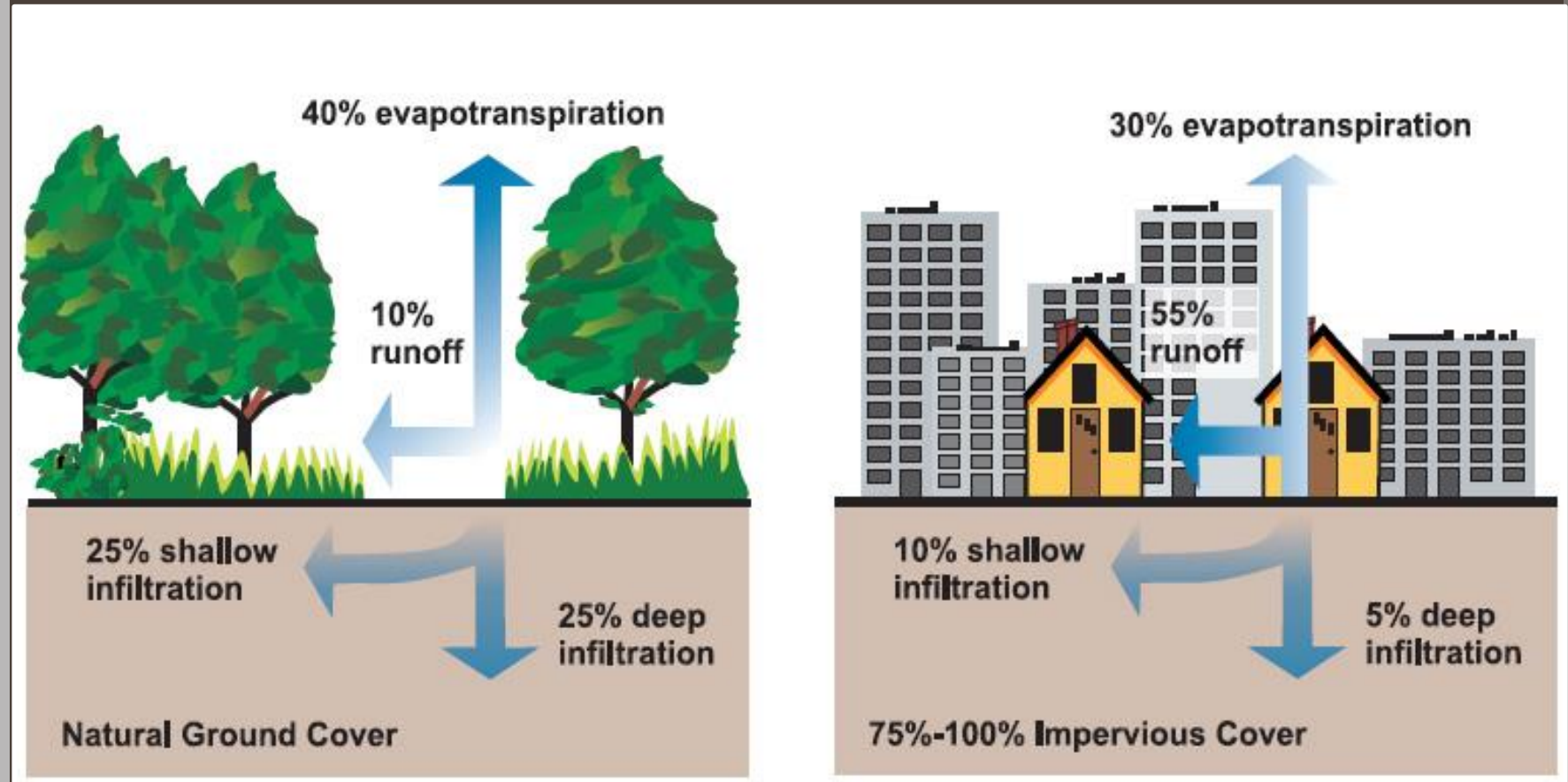


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*We can't mimic pre-development hydrologic cycles WITHOUT plants!*

# Stormwater Management

## The Role of Trees



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*Design to mimic the natural processes  
provided by native vegetative cover!*

How do we do  
it?

Incorporating  
Trees into  
Stormwater  
Management



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# Benefits of Trees

## Reduction of Urban "Heat Island" Effect

*Water evaporating from leaves cools air*

*Block sunlight, causing shade which cools hard surfaces and surface water*



**Natural air conditioning!**



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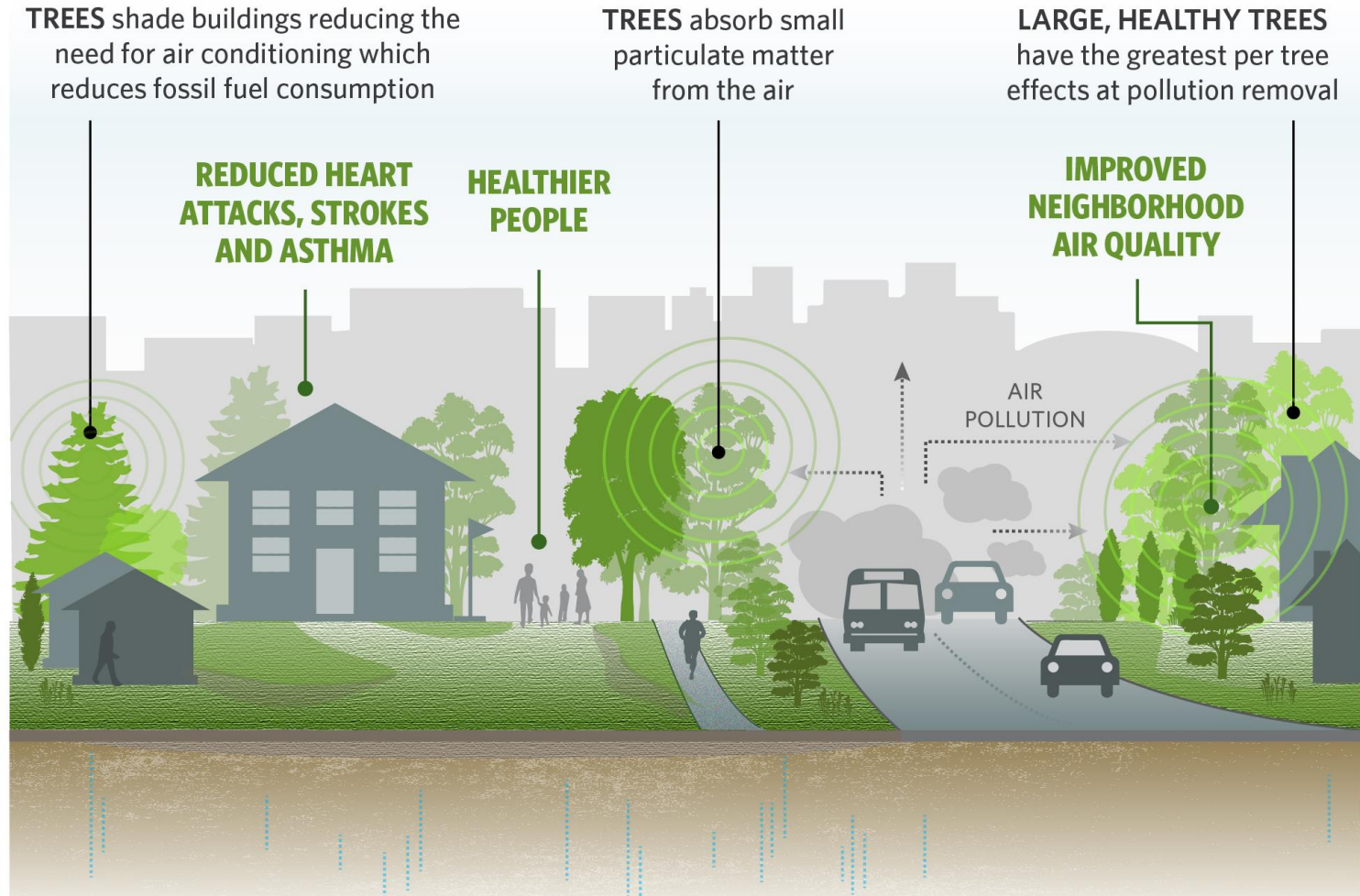


# Benefits of Trees

## Reduction of Air Pollution

### URBAN TREES, BETTER AIR QUALITY

Trees in cities can remove up to a quarter of the particulate matter pollution in their immediate vicinity. And when planted between a source of pollution and an apartment building, school or hospital, urban trees can help protect human health.



TNC\Erica Simek Sloniker



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# Benefits of Trees

## Ecosystem Services

- Provide habitat and food for wildlife and insects
- Fallen and decaying leaves provide nutrients, reduce soil temperature and soil moisture, and increase soil health

# Benefits of Trees

**Economic  
Benefits:  
City of Goshen**

<https://www.youtube.com/watch?v=1nHLOrdtwoo>

Follow the link above to hear from the City  
of Goshen how trees have an economic  
impact on urban spaces.

# Benefits of Trees

## Social Benefits: City of Goshen

<https://youtu.be/HrCwHYDvhko>

Follow the link above to hear from the City of Goshen how trees have an social impact on urban spaces.



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# Benefits of Trees

**Ecological  
Benefits:  
City of Goshen**

<https://youtu.be/f9vQWwwpgCQ>

Follow the link above to hear from the City  
of Goshen how trees have an ecological  
impact on urban spaces.

# Benefits of Trees

## Aesthetic Benefits: City of Goshen

<https://youtu.be/XoVOFWv2oJU>

Follow the link above to hear from the City of Goshen how trees have an aesthetic impact on urban spaces.



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Explore these links  
and the “notes”  
section below  
each slide for  
background  
information

*Learn More!*



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## Supporting Information, Resources, and Classroom Activities

**Want to borrow an Enviroscape model? It shows stormwater pollution from all different sources and is perfect to use as a demonstration in your classroom!**

[https://web.uri.edu/riss/files/Envir\\_lesson\\_teacher.pdf](https://web.uri.edu/riss/files/Envir_lesson_teacher.pdf)

You can borrow ours for your classroom!

### **Lesson Plans for Low Impact Development**

[https://serc.carleton.edu/integrate/teaching\\_materials/ecosystem\\_water/unit2.2.html](https://serc.carleton.edu/integrate/teaching_materials/ecosystem_water/unit2.2.html)

### **Best Management Practices for Stormwater**

<https://www.epa.gov/npdes/national-menu-best-management-practices-bmps-stormwater#edu>

Background information on stormwater BMPs

# Elkhart County Soil and Water Conservation District

Still want to know  
more?

Contact us!

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