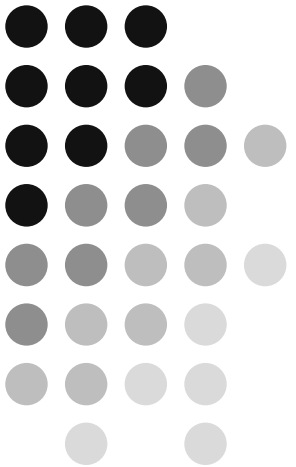
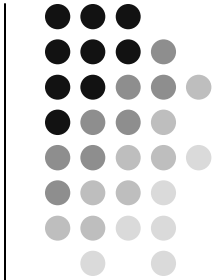
Green Infrastructure

ANJEC Environmental Congress

October 20, 2012



Today's Definition



- Green Infrastructure is defined in today's workshop as a **"suite of design techniques that replicate or mimic the functioning of natural systems".**

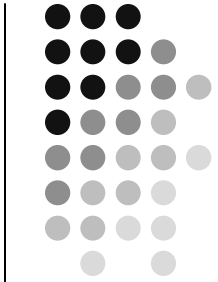
- The U.S. EPA has a more expansive definition that includes environmental, social and economic dimensions

"Green infrastructure is an approach that communities can choose to maintain healthy waters, provide multiple environmental benefits and support sustainable communities. Unlike single-purpose gray stormwater infrastructure, which uses pipes to dispose of rainwater, green infrastructure uses vegetation and soil to manage rainwater where it falls. By weaving natural processes into the built environment, green infrastructure provides not only stormwater management, but also flood mitigation, air quality management, and much more.

At a time when so much of our infrastructure is in need of replacement or repair and so few communities can foot the bill, we need resilient and affordable solutions that meet many objectives at once. Green infrastructure is one solution."

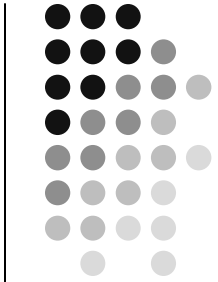
- While of great importance, maintaining the natural systems still remaining in your community, also commonly described as "green infrastructure", through open space protection, greenway development and other land planning techniques is not today's subject but complements and enhances this discussion.

Why Are We Having This Discussion?



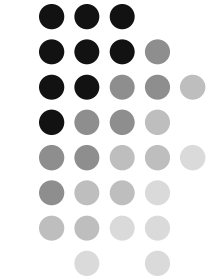
- New Jersey is the most densely populated state with and average population density of 1999.5 people per square mile.
- This is an *average* density. Some parts of the State are much more dense: Hudson County, 13,882 pc/sq. mi., while others are less dense: Salem County, 198.2 pc/sq. mi.
- This dense population has created large areas of impervious surfaces such as roads, parking, sidewalks and rooftops, in some places approaching 100% of the land surface.

And Impervious Cover Continues to Grow



- New Jersey's total impervious footprint as of 2007 was 508,681 acres or nearly **800 square miles** of concrete and asphalt.
- During the 2002-2007 period, New Jersey added 21,348 acres (33.4 square miles) of additional impervious surface.
- This is an annual rate of 4,270 acres of impervious surface increase per year or **9 American football fields of new impervious surface per day (including end zones).**

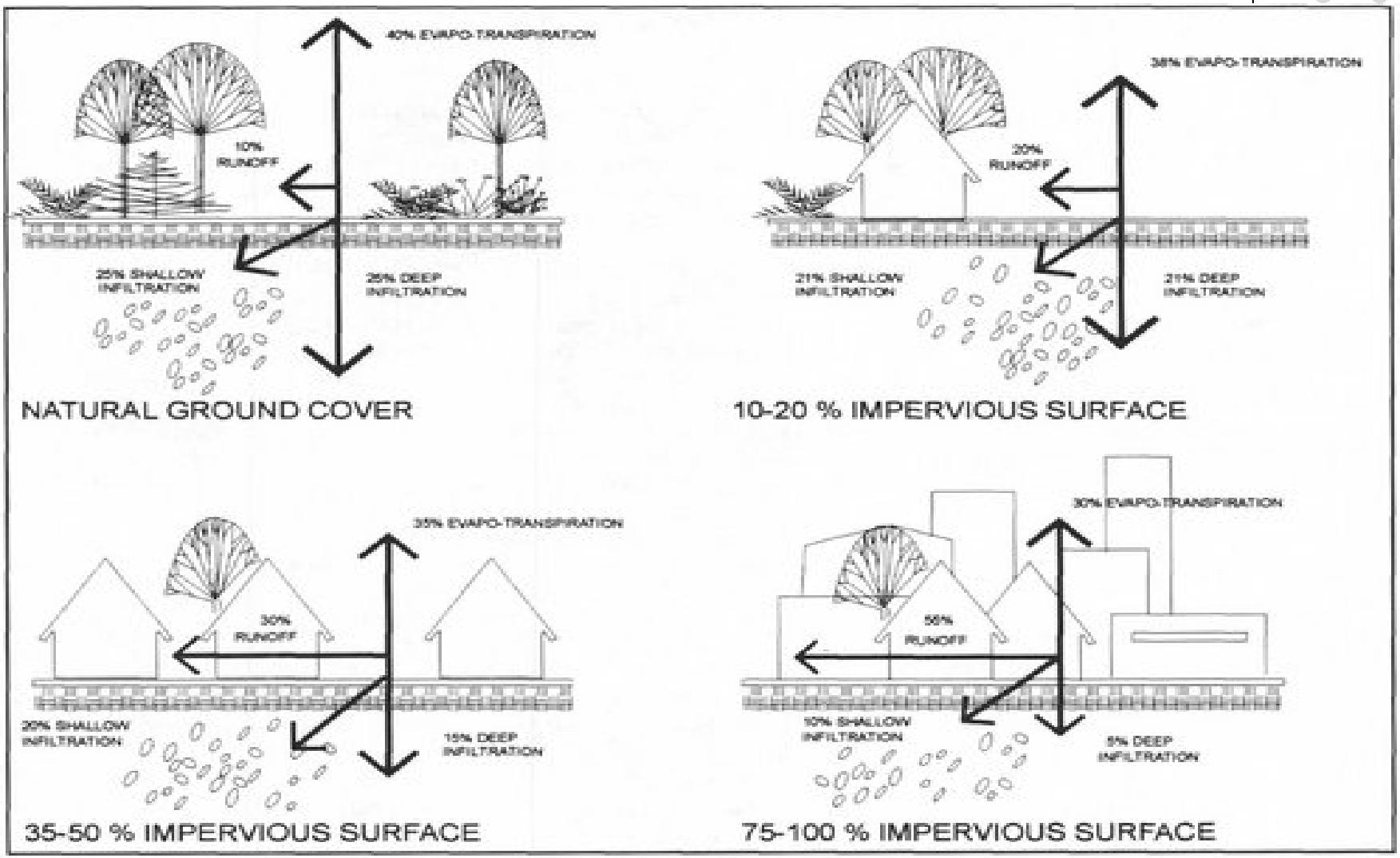
Resulting In Increased Run-off of:



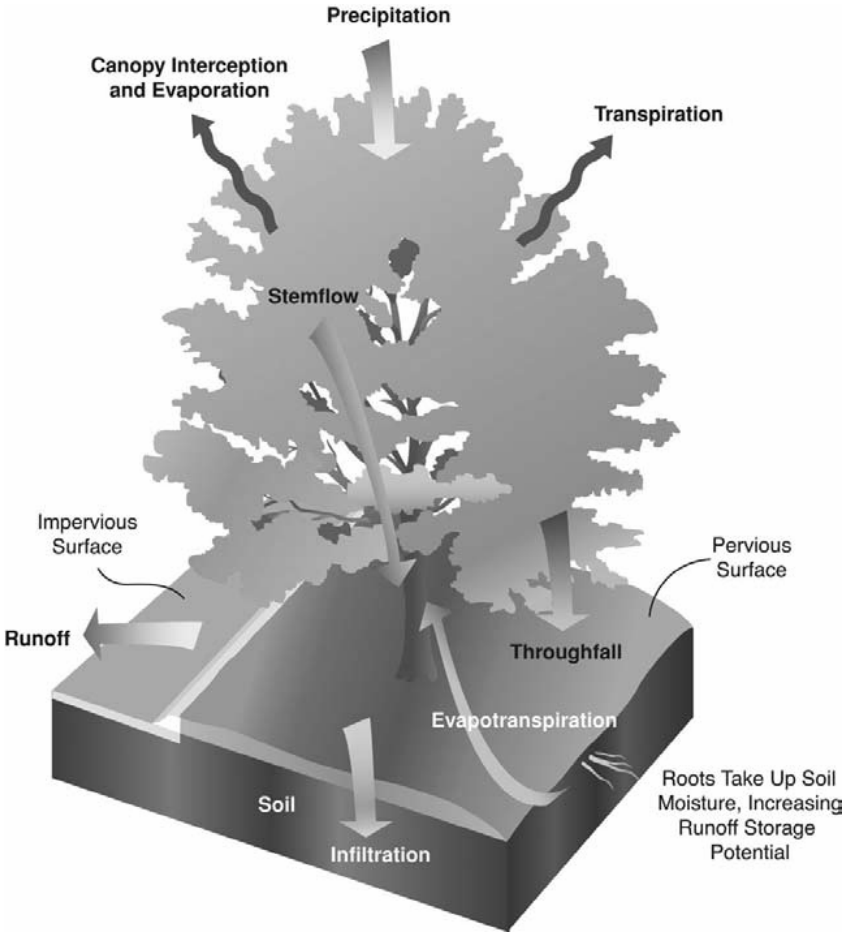
5,454,263,223.1 gallons per year*

*Assuming: Run-off is 98% of an annual rainfall of 48 inches.

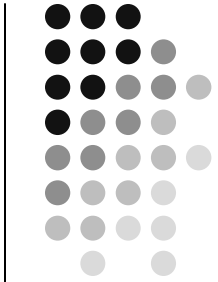
Some Impacts of Impervious Surfaces



Trees and Water

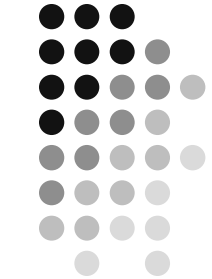


This Land Use History Has Existing Consequences



- Physical Damage to Streams
- Surface Water Quality Deterioration
- Deranged Flows
- Biological Stress
- Groundwater Depletion
- Base Flow Reduction
- Increases In Urban Heat
- Overwhelmed Infrastructure (stormwater and CSOs)
- More frequent and higher floods in smaller storms

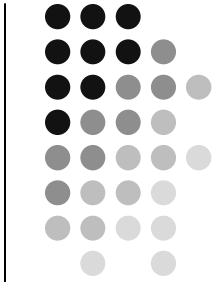
Climate Change is Happening and Accelerating



- Increasingly, climate change is being addressed by ***adaption***, not ***prevention***.

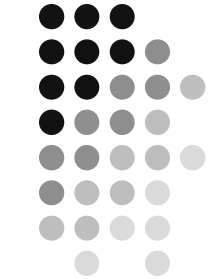
- Green Infrastructure is primarily adaptive in nature.

In the Northeast Climate Change is Expected To:



- **Alter the timing and amount of stream flow**, which would create:
  - **more high-flow events in winter**
  - **earlier peak flows**.
- **Increase winter precipitation** (much of which is expected to fall as rain) 20 to 30 percent by late-century
- **Reduce snowpack and shorten the snow season**
- **Increase the frequency of short-term (one- to three-month) droughts**
- **Increase the frequency of extremely hot days** (which can increase water demand) roughly five-fold
- **Increase the likelihood and severity of damaging rainstorms**
- **Raise sea levels** increasing the risk of saltwater intrusion into coastal aquifers.

Green Infrastructure Practices Can:



- Increase shallow and deep groundwater recharge.
- Stabilize stream flows (base flows).
- Reduce run-off percentages.
- Reduce flooding.
- Reduce run-off temperatures
- Improve both groundwater and surface water quality.
- Be cost effective and extend the life of existing stormwater and sewer infrastructure.
- Address urban heat island impacts and reduce energy consumption.
- Provide aesthetic and social enhancement.

Some Practices to Consider

1. Downspout Disconnection
2. Filter Strips
3. Infiltration Practices
4. Pocket Wetlands
5. Permeable Pavement
6 Rain Barrels / Cisterns
7. Rain Gardens / Bioretention
8. Soil Amendments
9. Street Trees and Afforestation
10 Tree Box Filters
11. Vegetated Roofs
12. Vegetated Swales

Thank You !

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