



Cooperative Extension Service
Stormwater Training

Katie Teague

County Extension Agent- Agriculture/Water Quality

What is Extension?

- ★ Division of the Land-Grant Universities located in all 50 states & Puerto Rico
- ★ “Cooperative” effort
Federal, State & county partnership
- ★ **Outreach & Education**
 - ☐ provide informal public education
 - ☐ relay research information



NWA Regional Stormwater Education Program

Since July 2004...

University of Arkansas Cooperative Extension Service



12 Cities

Benton and Washington Counties

U of A – Fayetteville Campus

By working together, the Benton and Washington County MS4s are:



- **Educating each other about stormwater**
- **Reducing the financial cost for implementing mandated stormwater control measures**
- **Increasing the effectiveness of public education and participation programs**
- **Protecting water quality on a regional basis**

Let's take a quiz...

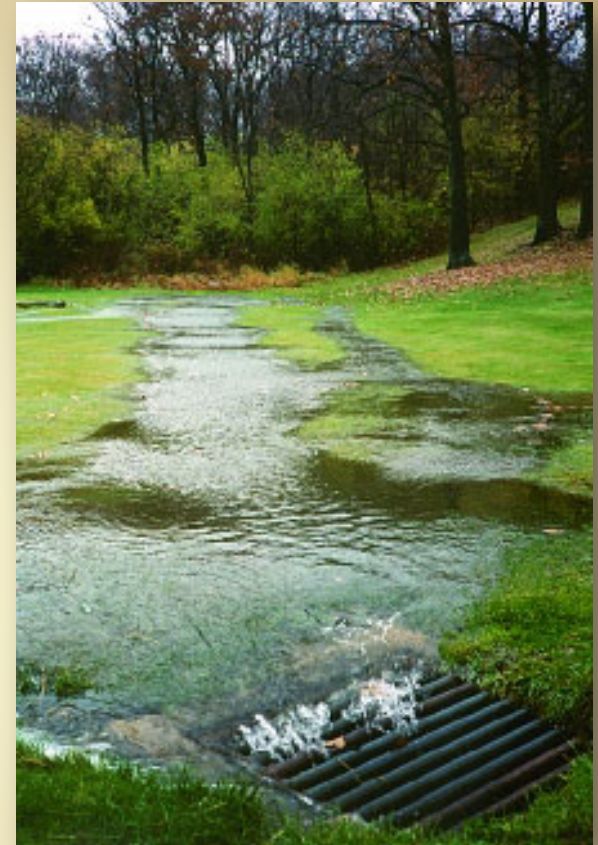


Stormwater Dynamics

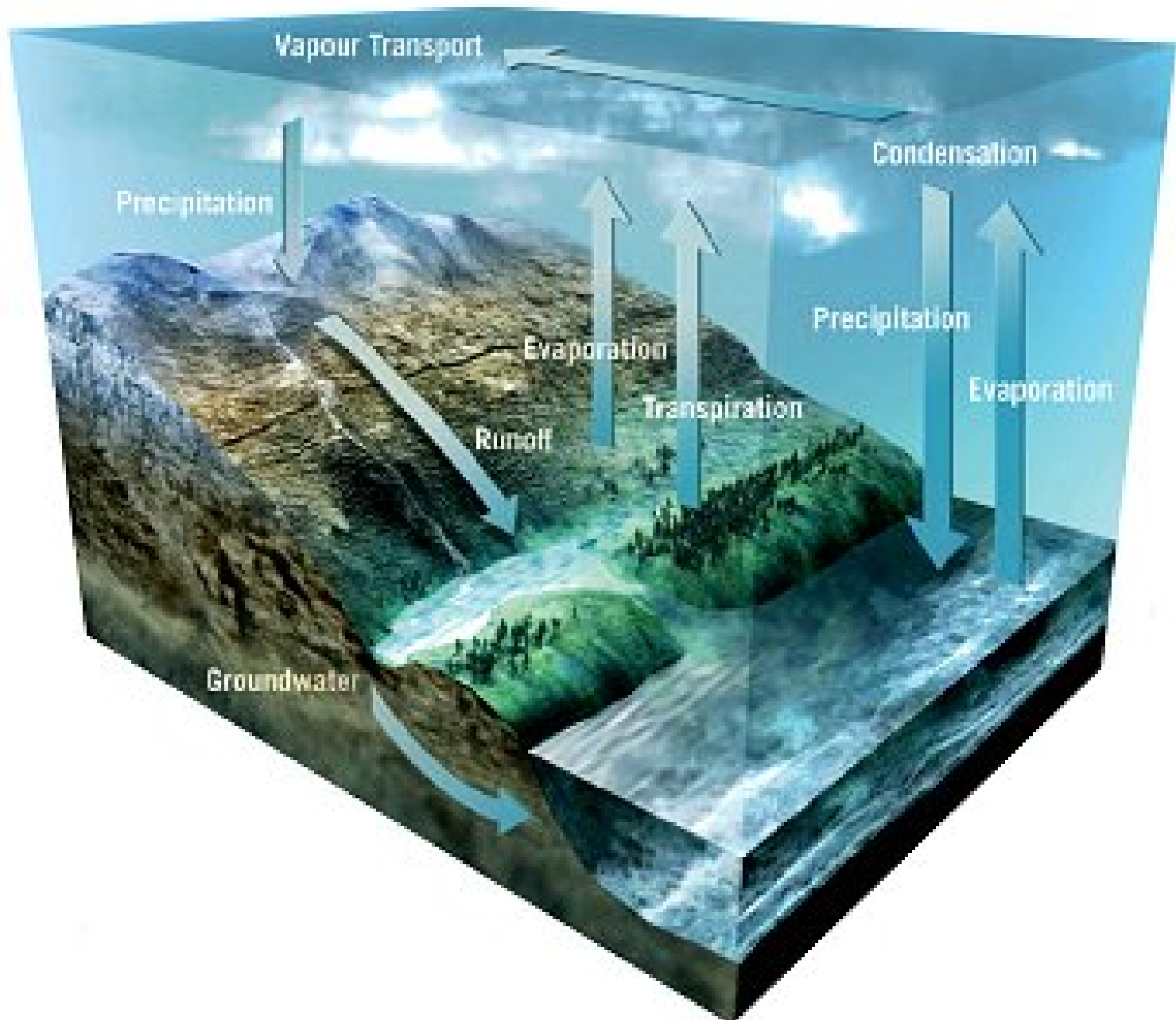




What is *stormwater*?

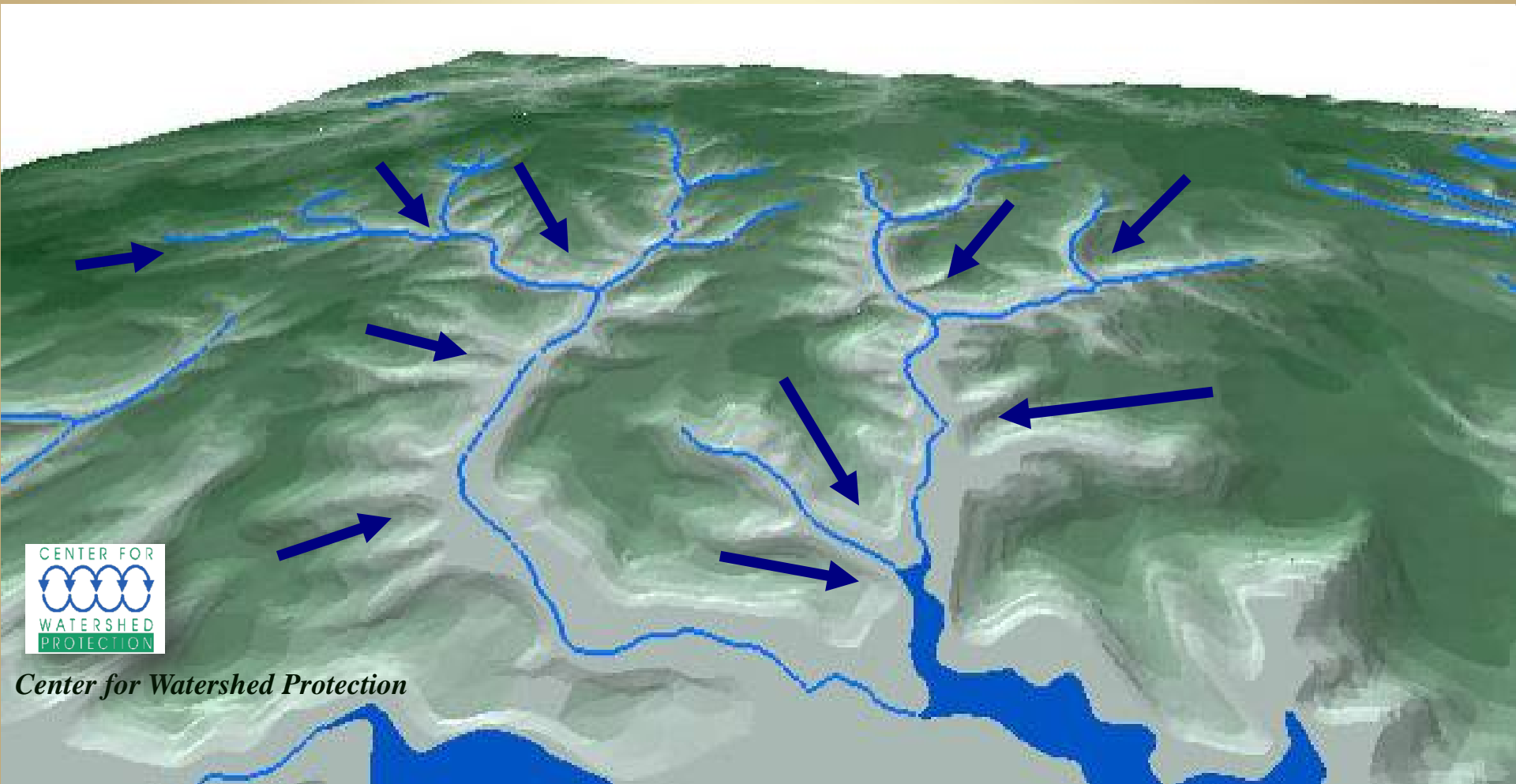


Runoff from natural precipitation, such as rain events and snow melt and other surface runoff and drainage



What Is a Watershed?

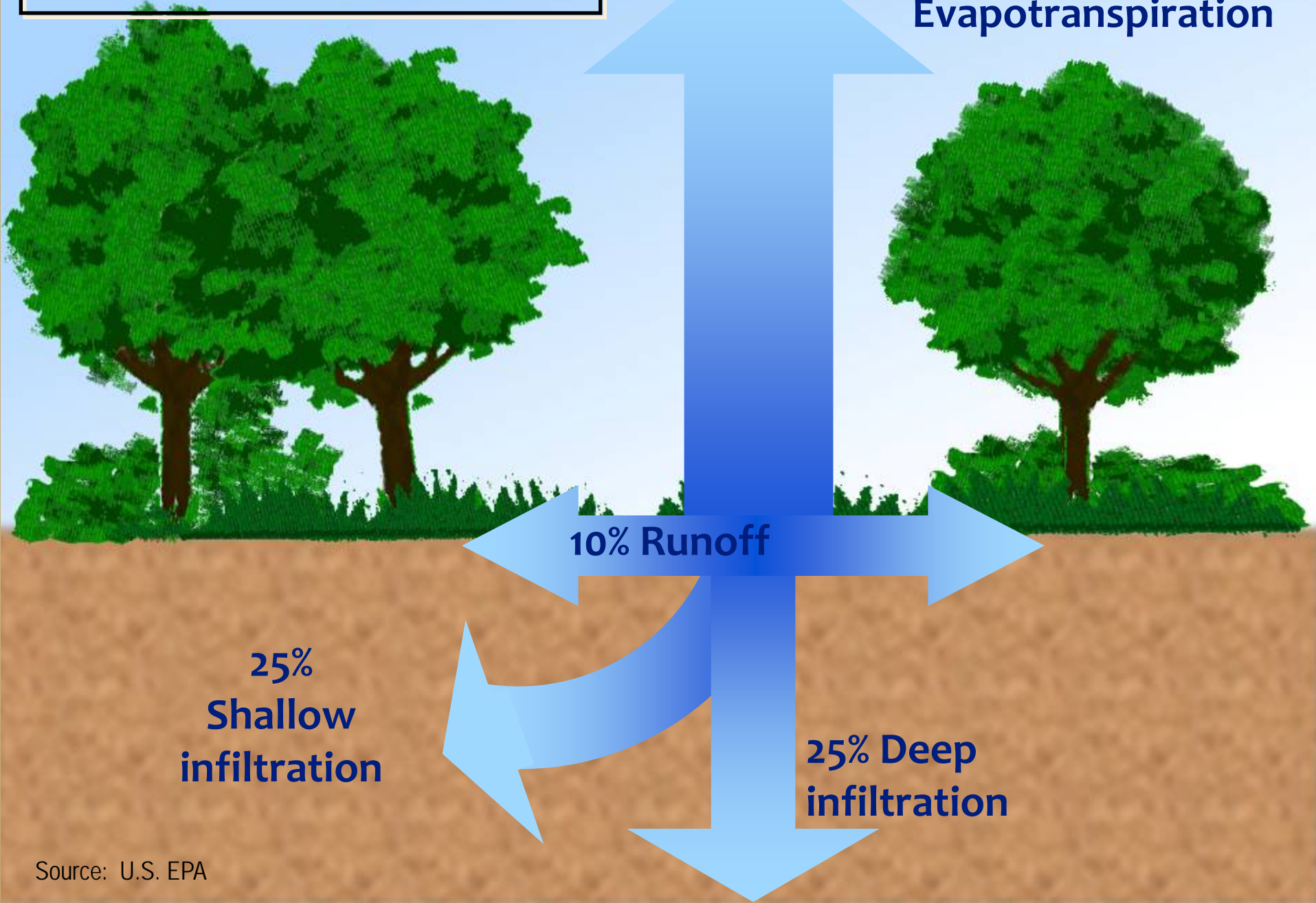
A watershed is the area of land that all drains to a particular point



Center for Watershed Protection

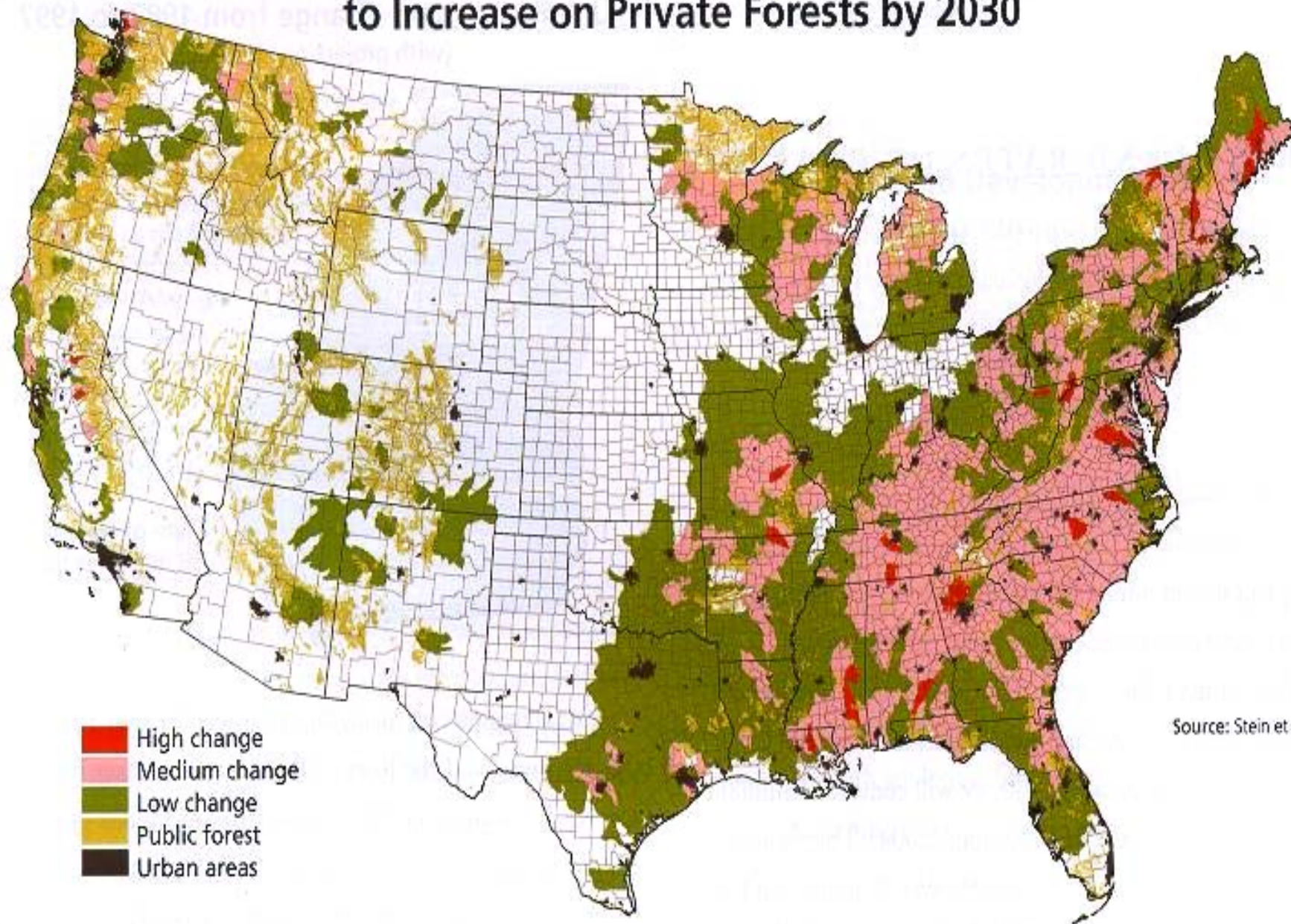
Natural Ground Cover

40%
Evapotranspiration



MAP 2

Watersheds in Which Housing Density is Projected to Increase on Private Forests by 2030



Source: Stein et al. 2005



Source: USDA/NRCS



Source: U.S. EPA



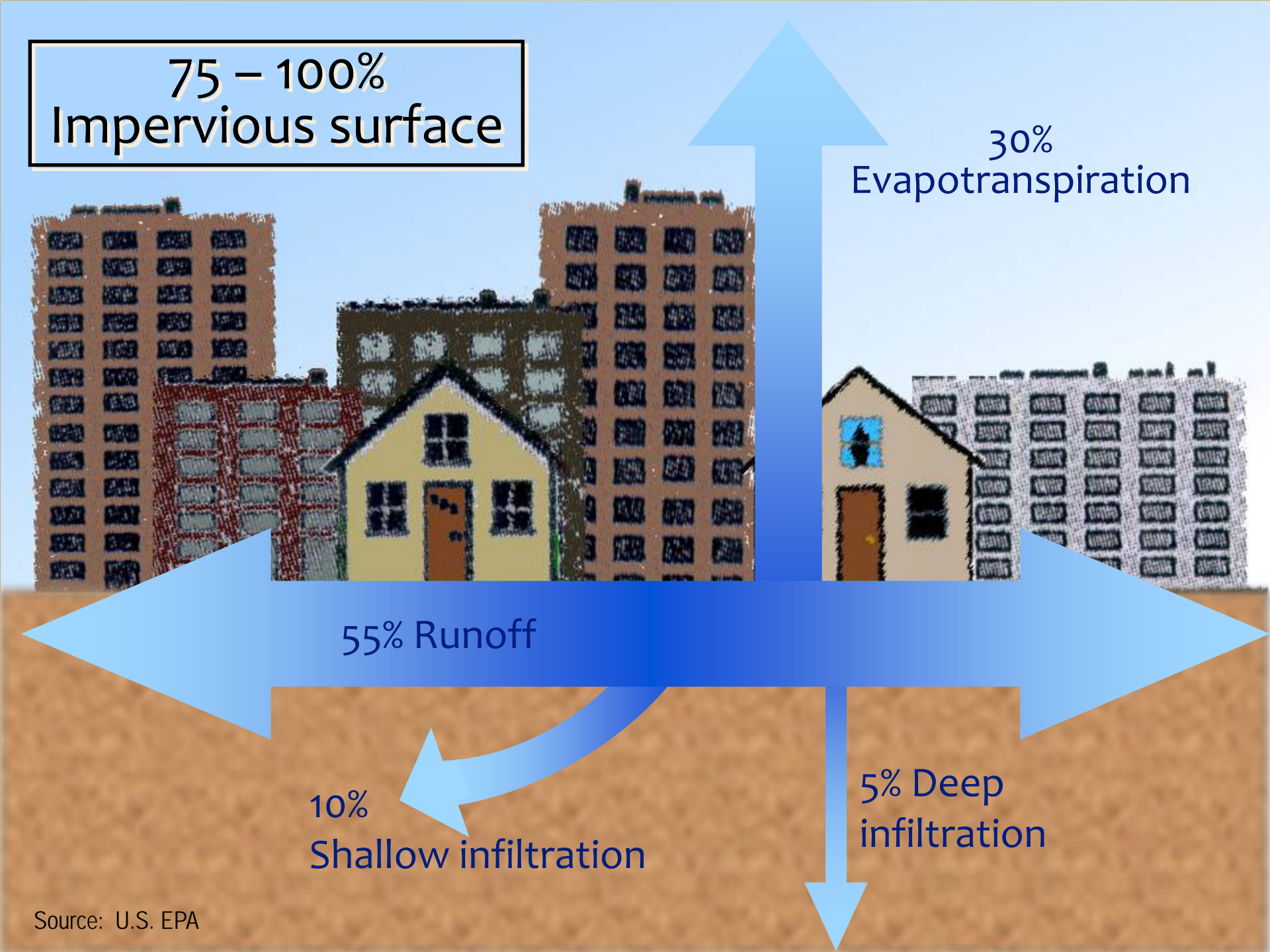
75 – 100%
Impervious surface

30%
Evapotranspiration

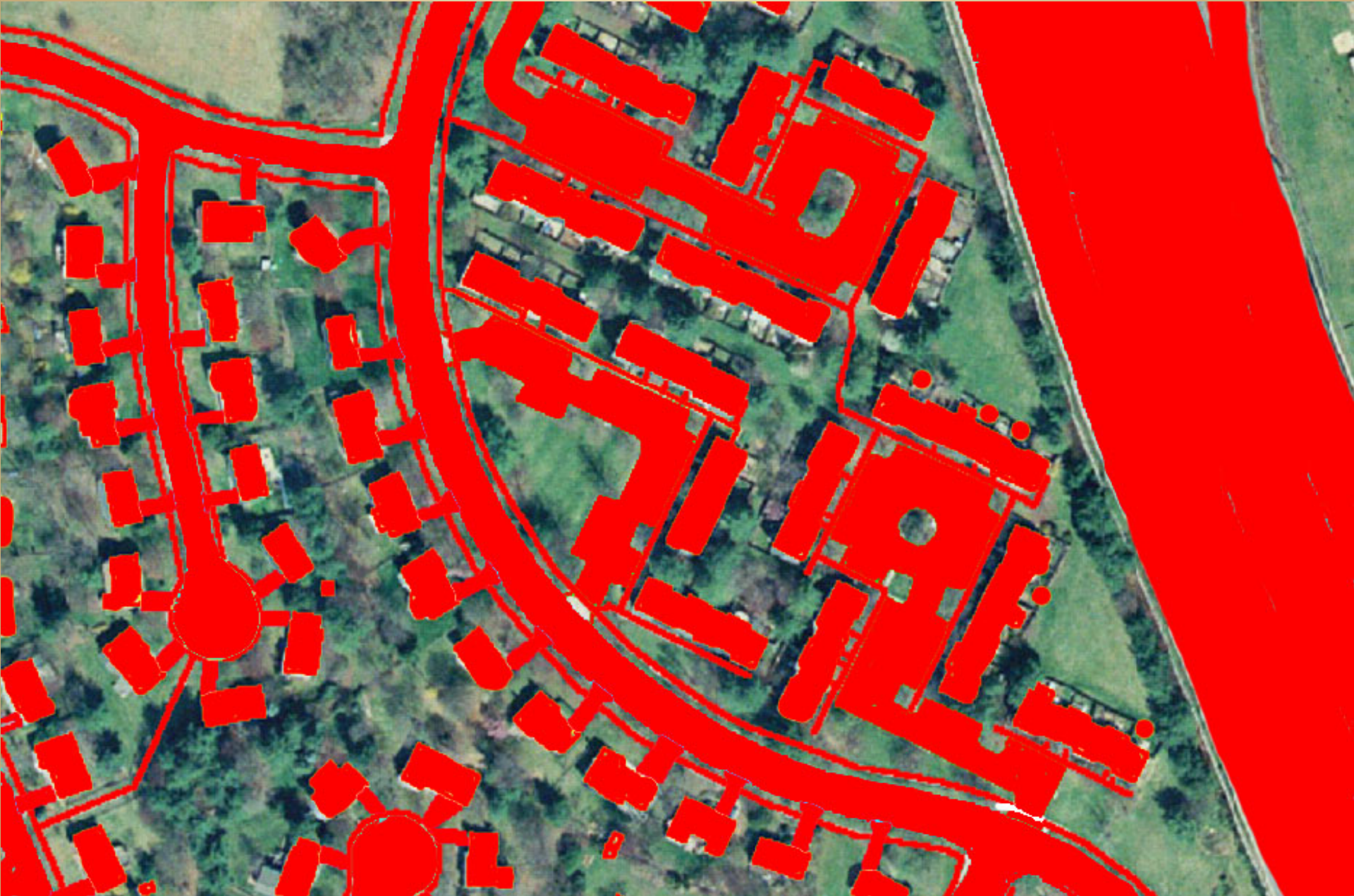
55%
Runoff

10%
Shallow infiltration

5%
Deep infiltration



Many Forms of Impervious Cover in the Urban Landscape





Impervious cover, such as this parking lot, is impermeable to rainfall, creating runoff flowing into storm drains.

Impervious Cover Influences Wet Weather Stream Flow

When it rains, a large amount of water . . .



Runs off of
impervious
surfaces



Enters the
stormdrain
system



Is directed to
nearby streams

Impervious Cover Influences Wet Weather Stream Flow

The large amount of stormwater runoff in the stream system can cause:



More Frequent Flooding



Higher Flood Levels

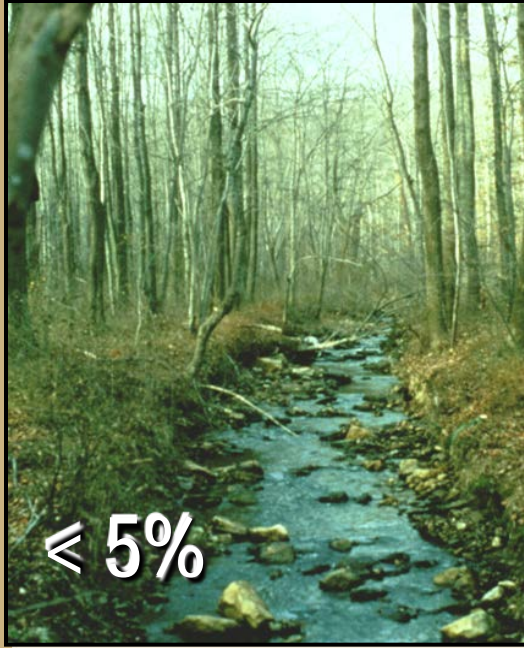
Impervious Cover Influences Stream Shape and Size

Large amounts of stormwater runoff due to impervious cover can:



- Erode stream banks, making the banks steeper and the channel wider
- Deposit soil on the stream bottom, making the stream more shallow
- Cause straightening of the channel

Stream Quality is Related to Impervious Cover



Impervious Cover

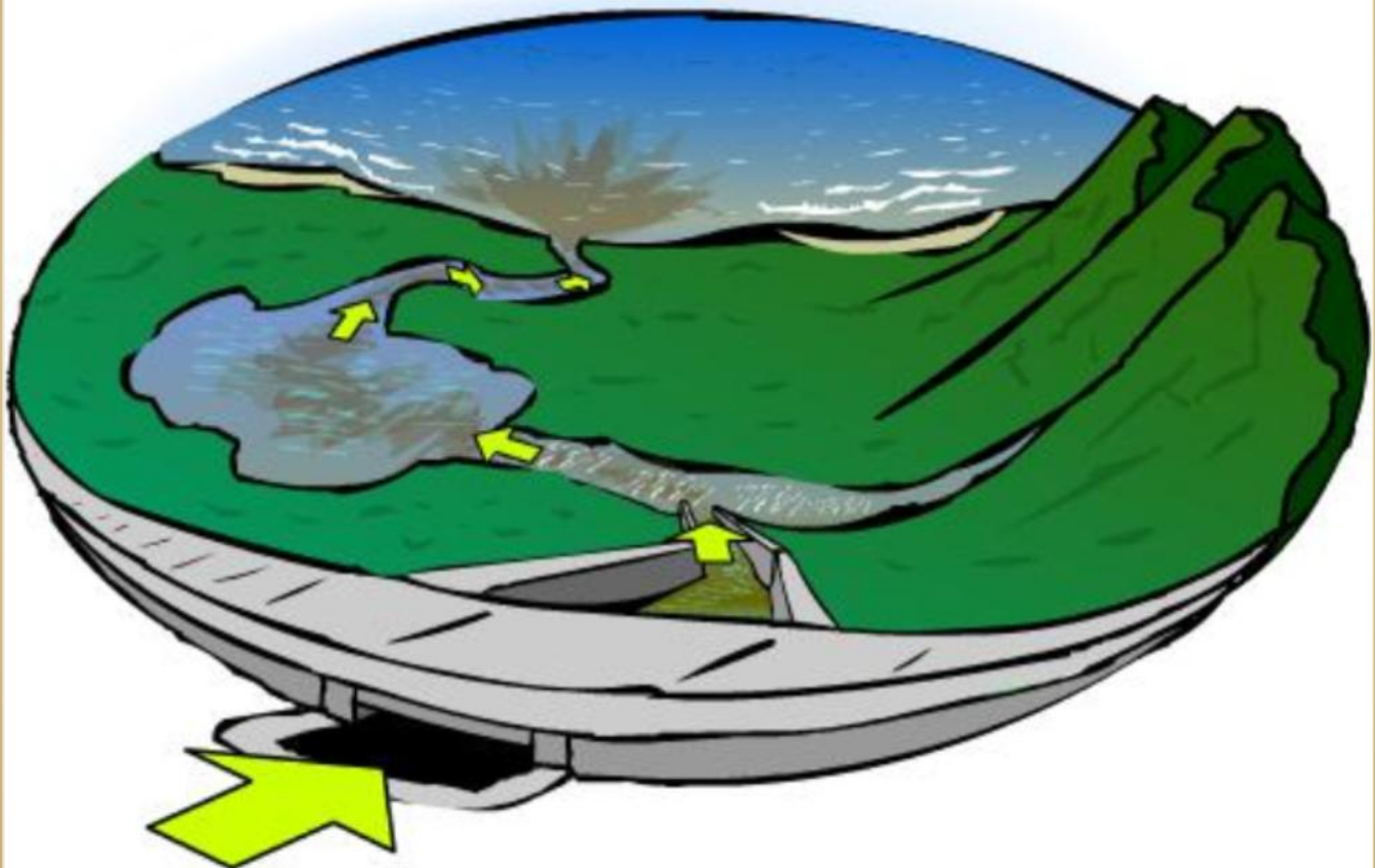


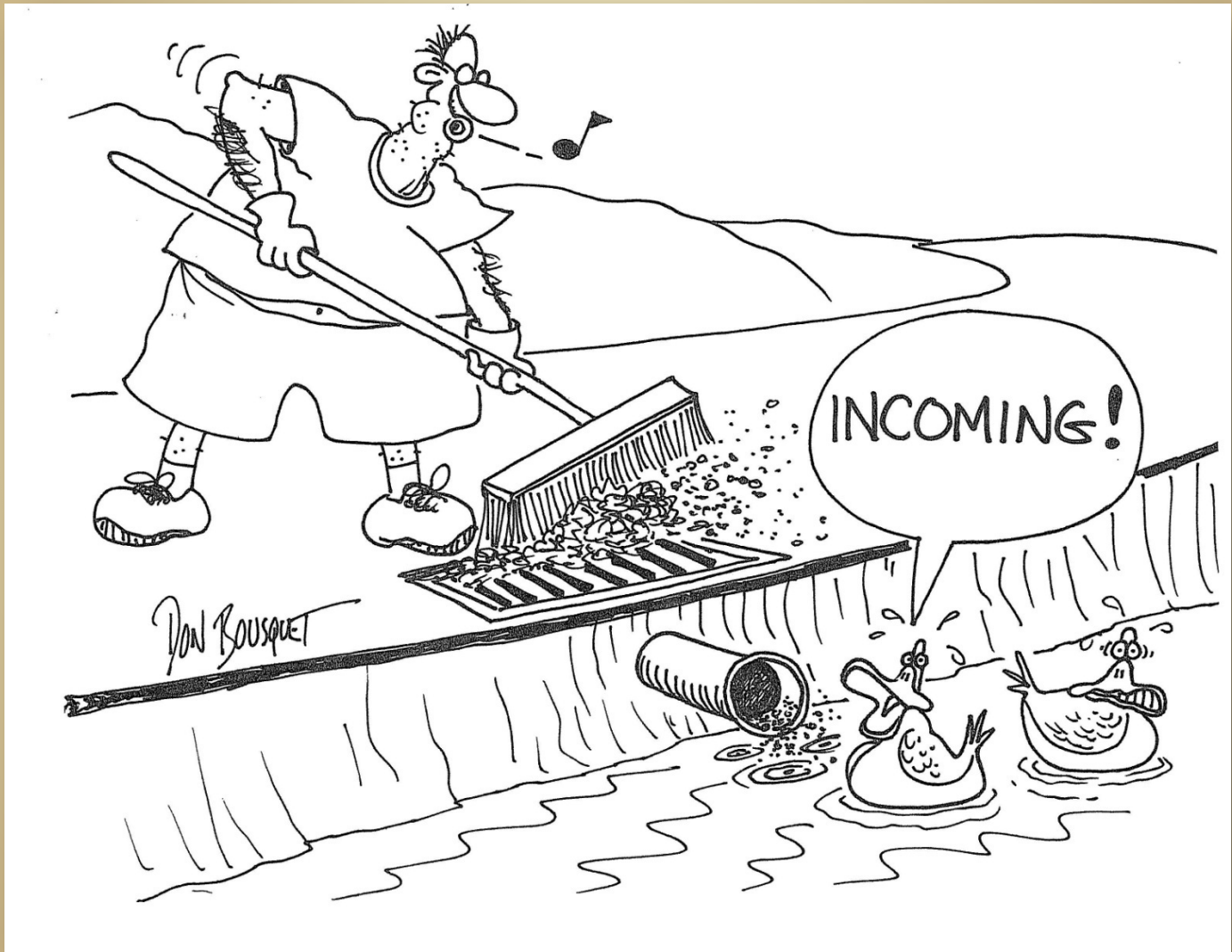
Storm Drainage System:

All surfaces, structures and systems that contribute to or convey stormwater runoff



Where Storm Water Goes After the Curb Inlet





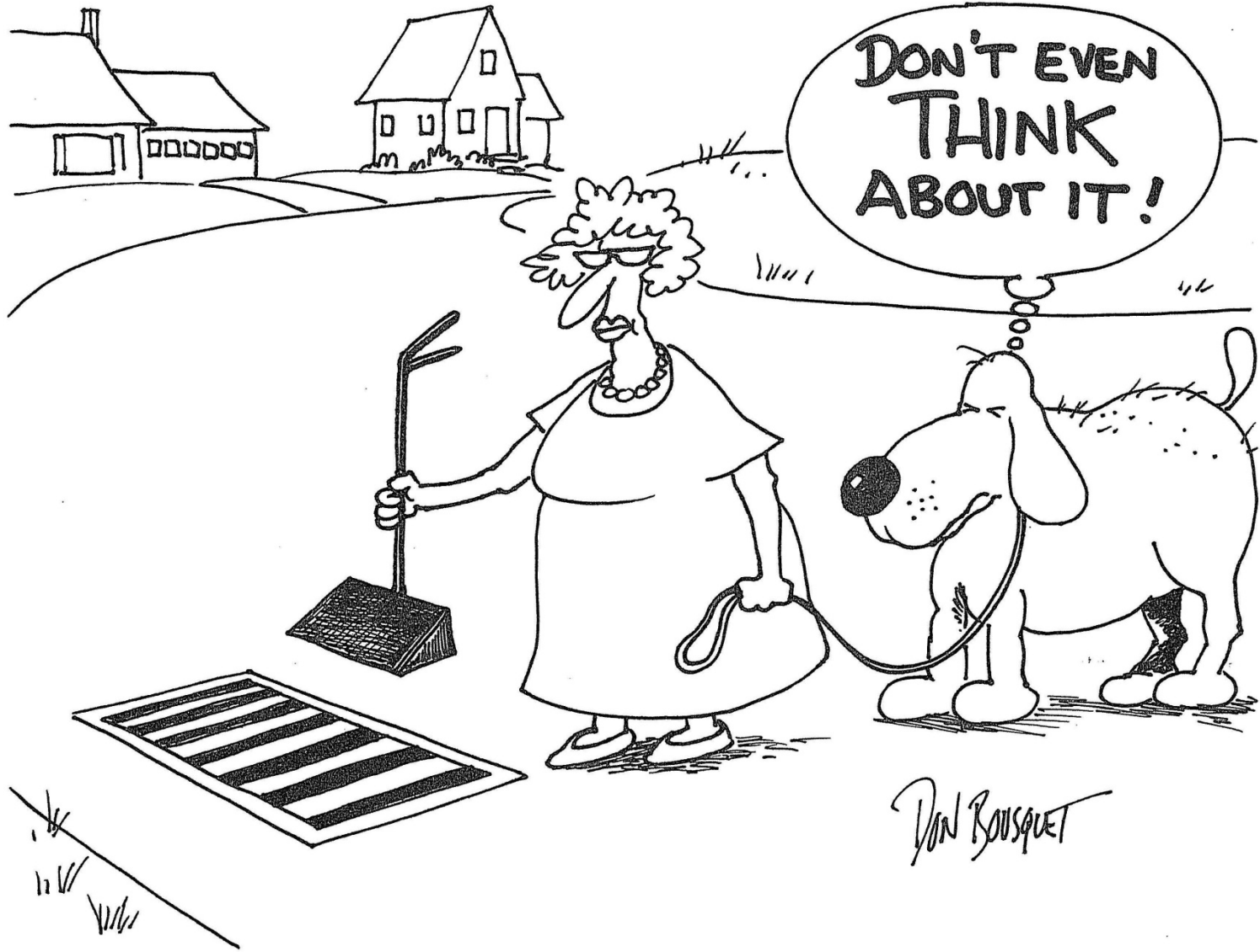
INCOMING!

DON BOUSQUET



Pollutant: Any substance that contributes to water pollution, including:

Rubbish, garbage, solid waste, litter, debris, yard waste, pesticides, herbicides, fertilizers, pet waste, animal waste, domestic sewage, industrial waste, mechanical fluid, oil, motor oil, grease, petroleum products, antifreeze, surfactants, solvents, detergents, cleaning agents, paint, heavy metals, toxins, household hazardous waste, small quantity generator waste, hazardous substances, hazardous waste, soil and sediment



DON'T EVEN
THINK
ABOUT IT!

DON BOUSQUET

Stormwater Issues...

Developed and disturbed land contributes to problems in terms of:

Water quality

Water quantity

Other pollutants enter storm sewers and pollute stormwater:

Illicit discharges

Illicit connections

