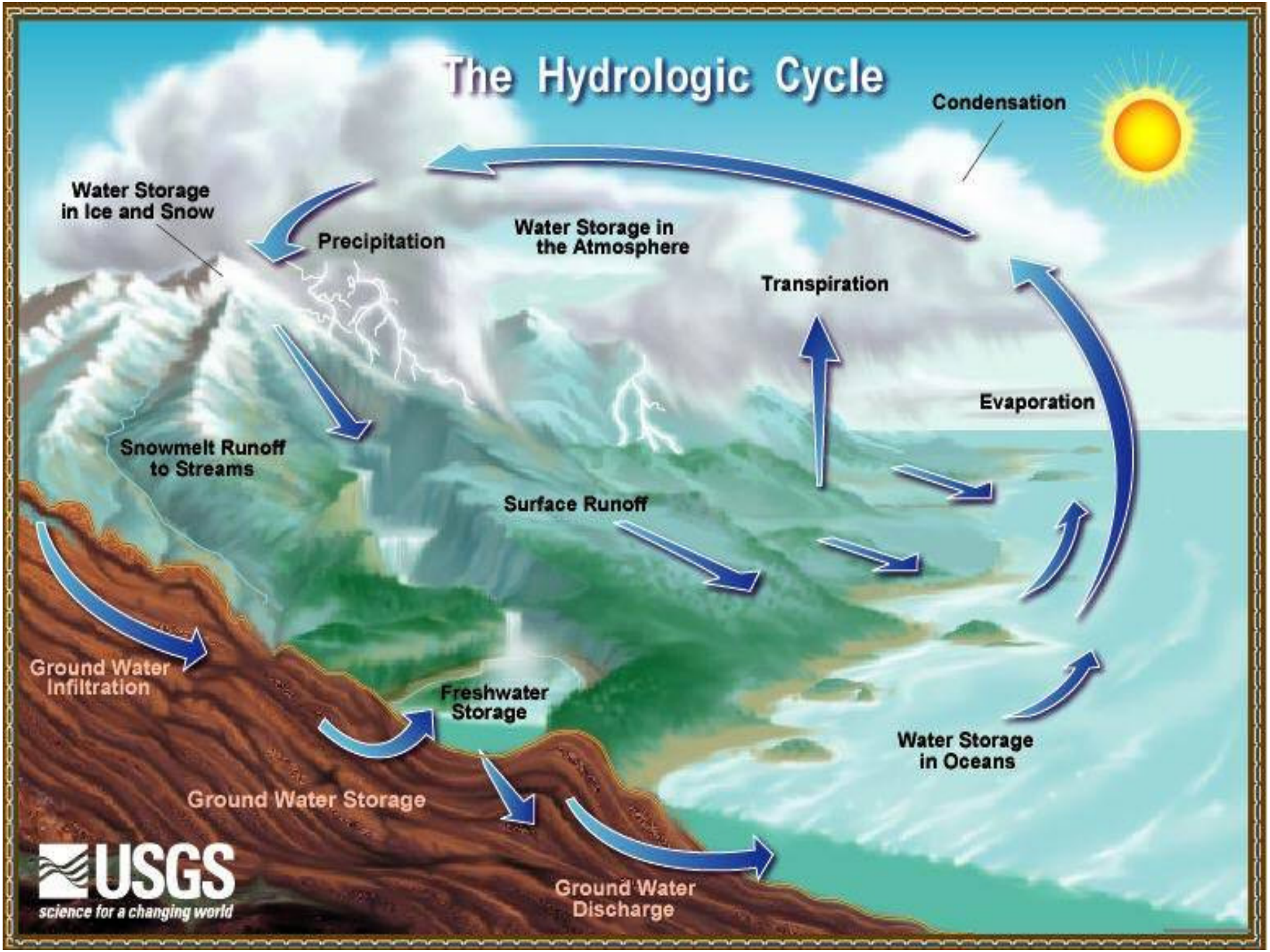
Water-Friendly Landscaping

Eric Berntsen

State Water Resources Control Board


The Hydrologic Cycle
Condensation
Water Storage in Ice and Snow
Precipitation
Water Storage in the Atmosphere
Transpiration
Evaporation
Snowmelt Runoff to Streams
Surface Runoff
Ground Water Infiltration
Freshwater Storage
Water Storage in Oceans
Ground Water Storage
Ground Water Discharge
USGS
science for a changing world

We live in a dry state…(ET, in inches)

From UC Davis

Location	Nov-Mar	Apr-Oct	Annual
North Coast	5.3	20.8	26.1
North Coast Interior Valleys	6.3	34.9	41.2
Northeastern Mountain Valleys	5.1	37.1	42.2
Sacramento Valley	8.5	40.7	49.2
San Joaquin Valley	7.9	40.7	49.0
Central Coast Interior Valleys	10.8	37.5	48.3
Sierra		30.0	
Central Coast	10.7	30.6	41.3
Southern Coast	12.1	32.3	44.4
Southern Inland Valleys	11.5	37.9	49.4
Southern Deserts	17.7	65.1	82.2

And rely on a water distribution system that's plumbed for snowmelt runoff…

From DWR

50-75% of per-capita water use is devoted to landscape irrigation…

….we can shift the balance by

• keeping more rainwater on site (rainwater harvesting);

• creating landscapes that require less water; and

•making irrigation systems more efficient.

Benefits of Rainwater Harvesting

- Minimize Pollution
  - Keep clean rainwater from coming in contact with polluted surfaces (driveways, roads, etc.). **Source control**

- Supplement Dwindling Water Supplies
  - Create/use supply of free irrigation water that is better for plants (no salt, contains sulfur, lacks calcium carbonate and magnesium – “soft”)

We're already doing it elsewhere

- Australia
- Malaysia
- Germany
- City of Tucson
- City of Santa Fe
- Case studies presented at this workshop

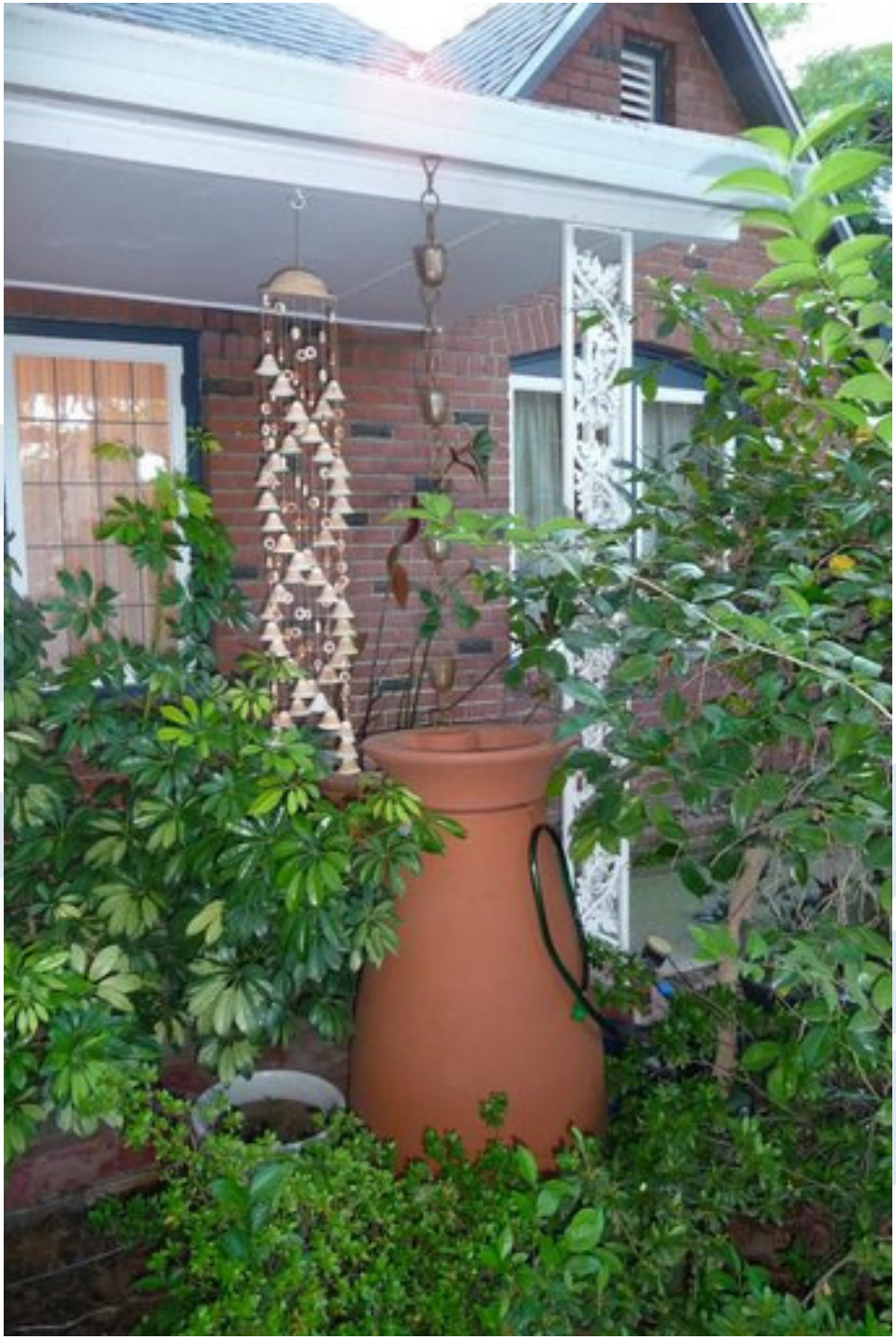
Eight Principles of Successful Rainwater Harvesting *(from Brad Lancaster)*

- Begin with long and thoughtful observation
- Start at the top of your watershed (usually the roof) and work your way down
- Start small and simple
- Spread and infiltrate the flow of water

Eight Principles of Successful Rainwater Harvesting cont'd

- Always plan an overflow route, and manage that overflow as a resource
- Maximize living and organic groundcover
- Maximize beneficial relationships and efficiency by "stacking functions"
- Continuously reassess your system: the "feedback loop"


From Ann Riley



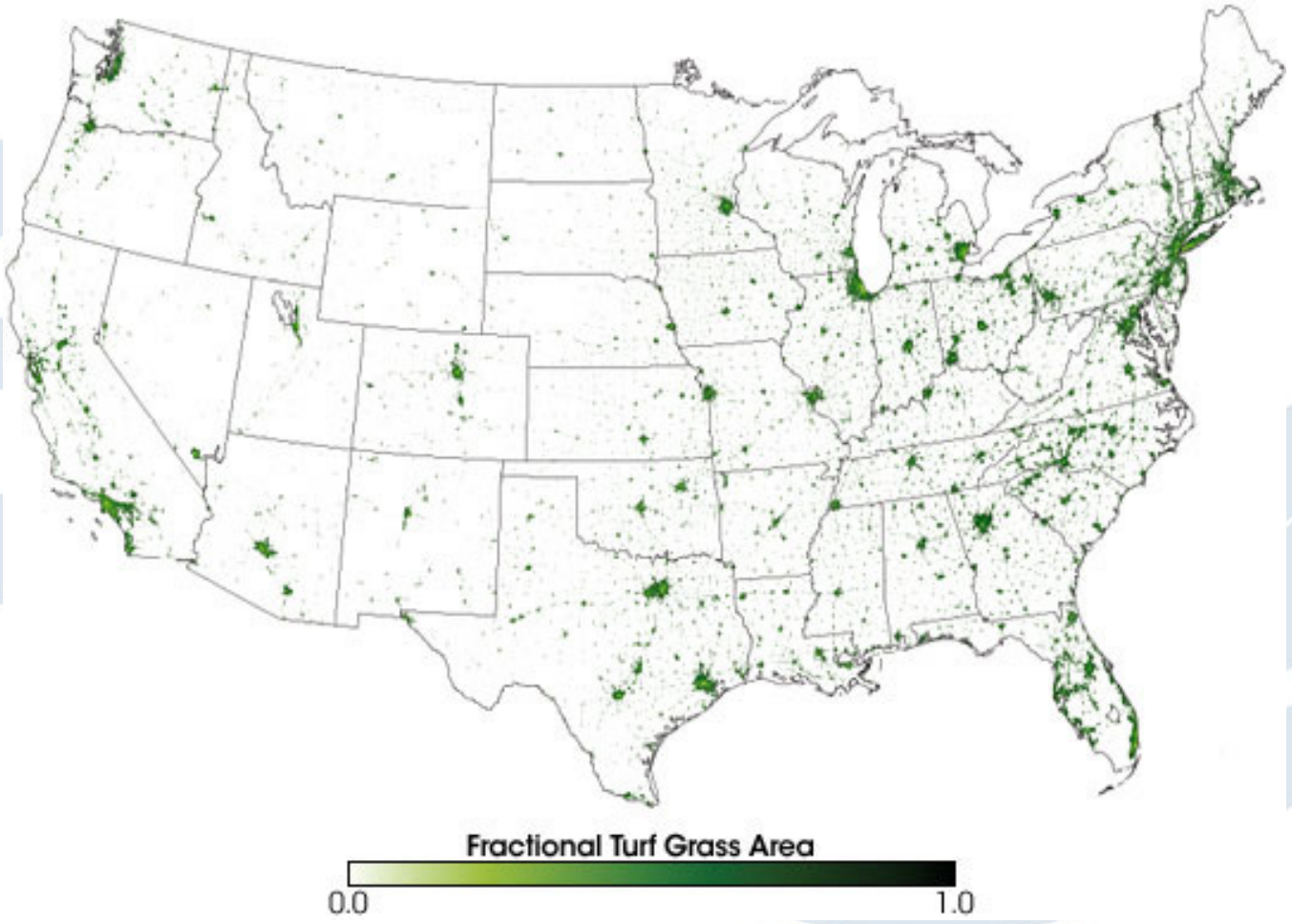
From Eric's Front Yard

Rain Gardens

http://learningstore.uwex.edu/pdf/GWQ037.pdf

- Three Questions
  - Where do I put the rain garden?
    - at least 10 feet away from foundation, not over septic, etc.
  - How big to I make it?
    - depends on soils, area draining to it, depth, and slope. Need to provide berm.
  - What do I plant it with?
    - Larger gardens can support more diversity. Must use plants that are moisture tolerant (e.g., *Carex barbarae*)
    - Larger gardens can accommodate more diversity

Lawn is the largest irrigated "crop" in the US



From NOAA

Lawn/turf is usually the most water-intensive feature on a landscape

- DWR Model Landscape Ordinance

Some jurisdictions offering “cash for grass” to conserve water (incentives are good)

- Marin County
- Placer County
- City of Roseville

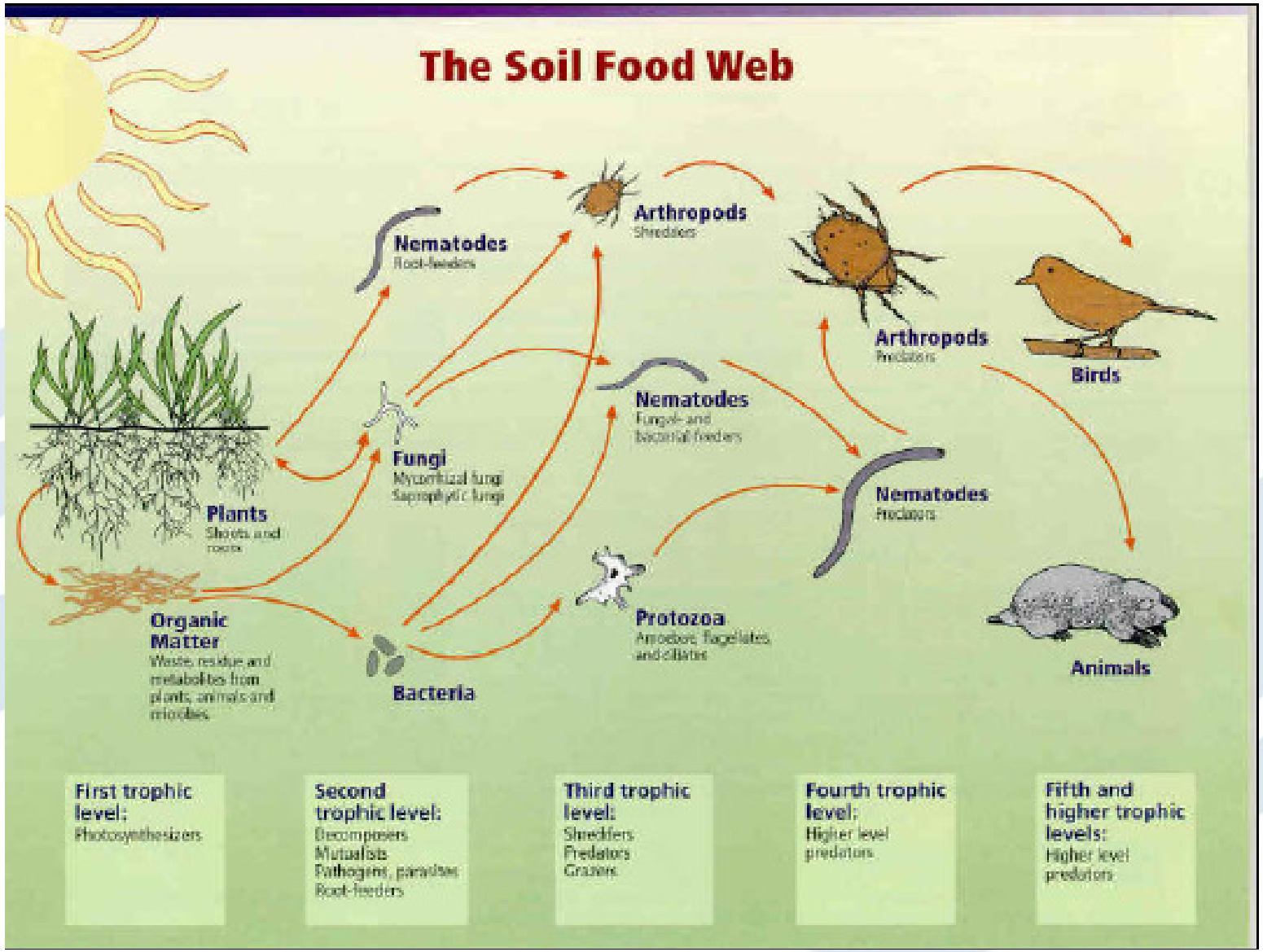
We tend to overwater our landscapes

- Stresses plants-makes them more prone to disease/infestations

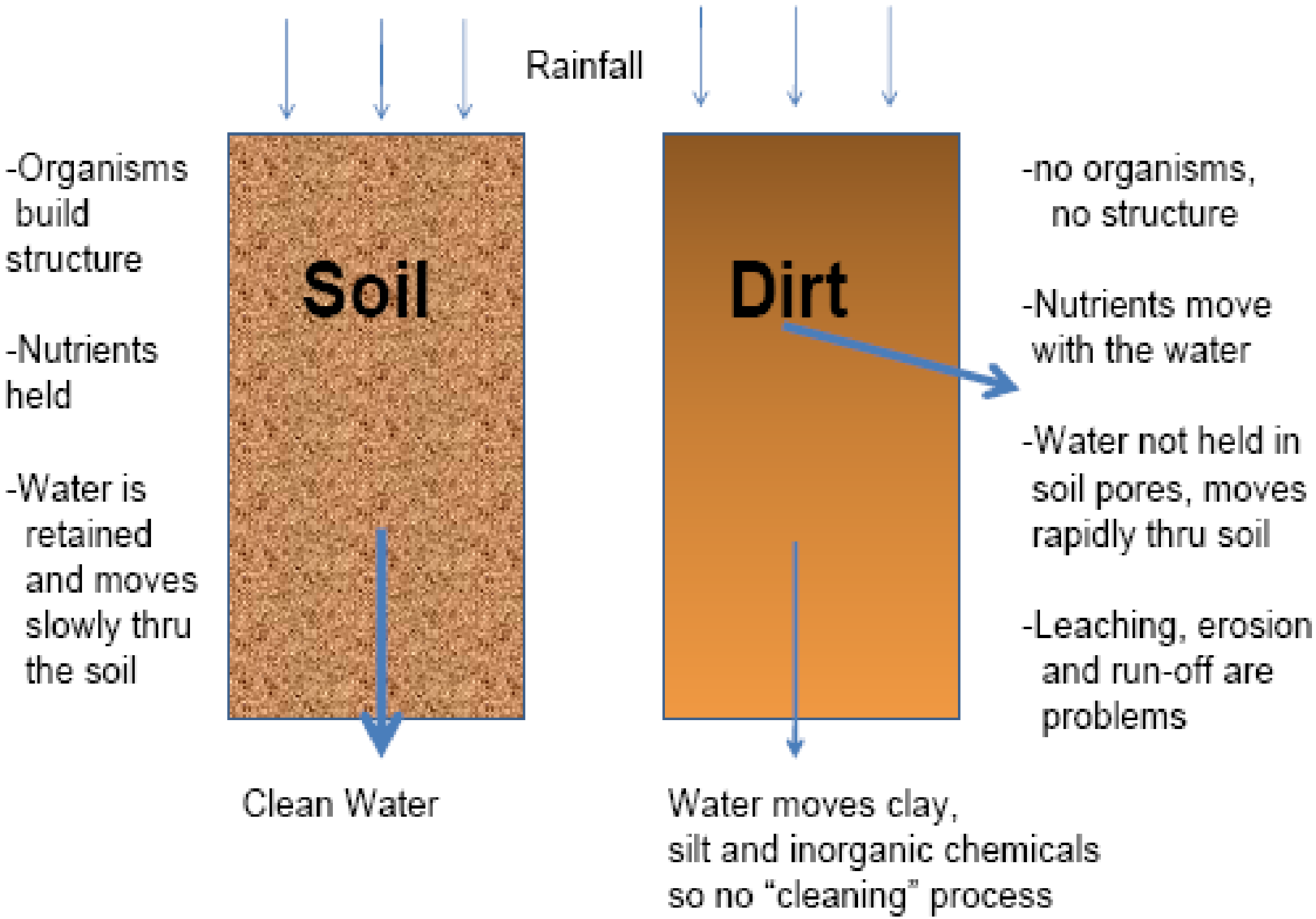
- We usually break out the pesticides (usually non-selective)

"The history of every nation is eventually written in the way in which it cares for its soil"

Franklin D. Roosevelt

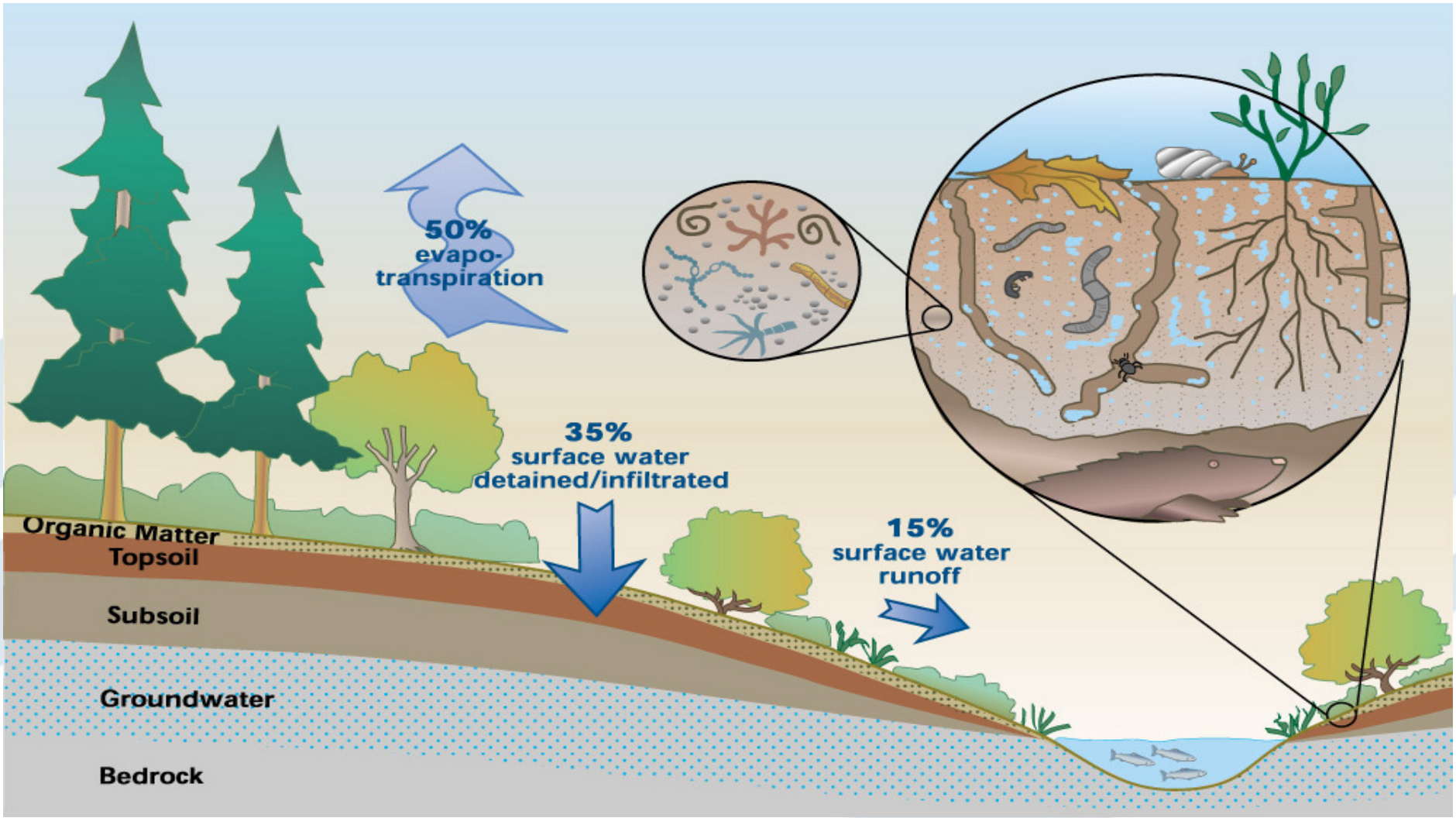


From Soil Food Web, Inc



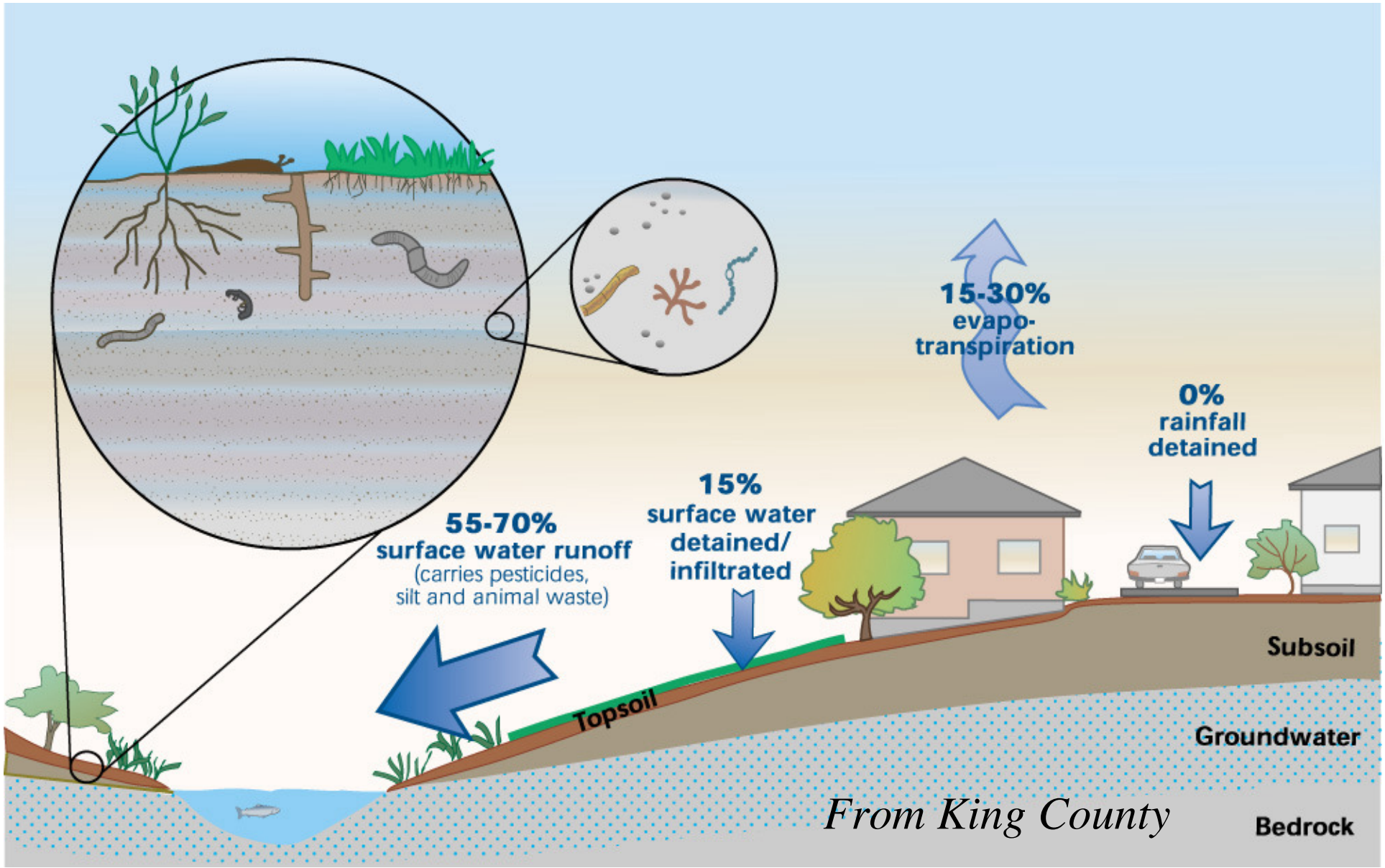
From Soil Food Web, Inc

Native Soil



From King County

Disturbed Soil



From King County


MetroList®

Irrigation Efficiency

- Group plants together with similar water needs (hydrozones)
  - Species factor (WUCOLS)
- Match precipitation rates
  - Fixed spray sprinklers – 1.8 inch/hr
  - Point source drip – 0.35 inch/hr

Irrigation Efficiency, cont'd

- Irrigate according to water budget
  - Run time depends on
    - Reference Et (CIMIS)
    - Species factor (WUCOLS)
    - Precipitation rate (Manufacturer)
    - Distribution efficiency (catch can for overhead sprinklers, drip = 0.9)

Irrigation Efficiency, cont'd

- Make seasonal adjustments
  - Cheap option – use % water function on timer, June/July peak Et
  - More expensive option – Et and soil moisture based timers (Rebates!!)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