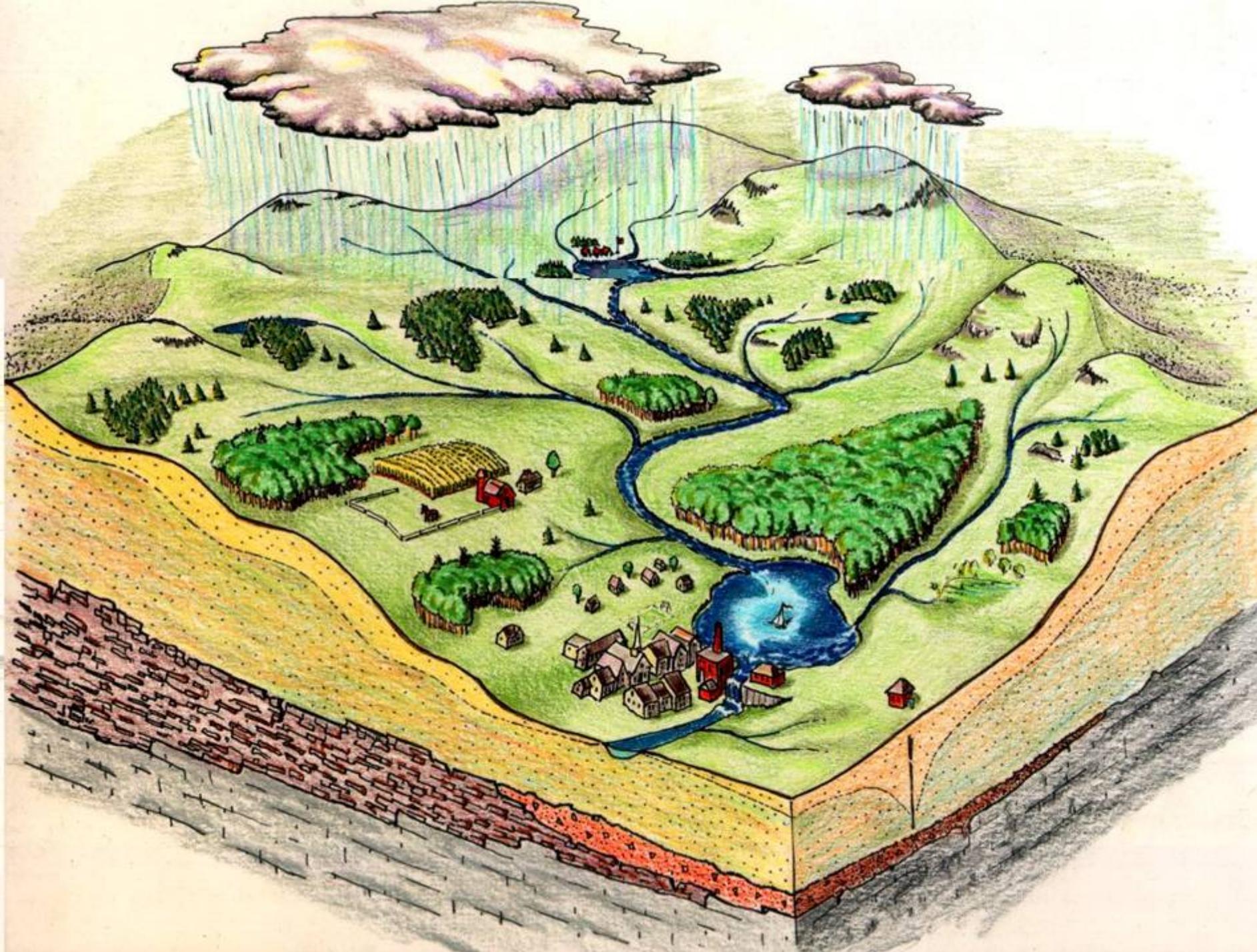


Rain Gardens Reconnecting with the Rain

A photograph of a rain garden. In the upper left, a paved surface has water runoff. The garden itself is filled with various green plants, including ferns and tall stalks with red flowers. Large grey rocks are scattered throughout the garden bed. The overall scene is vibrant and lush.

Rachel Calabro
Massachusetts Riverways Program

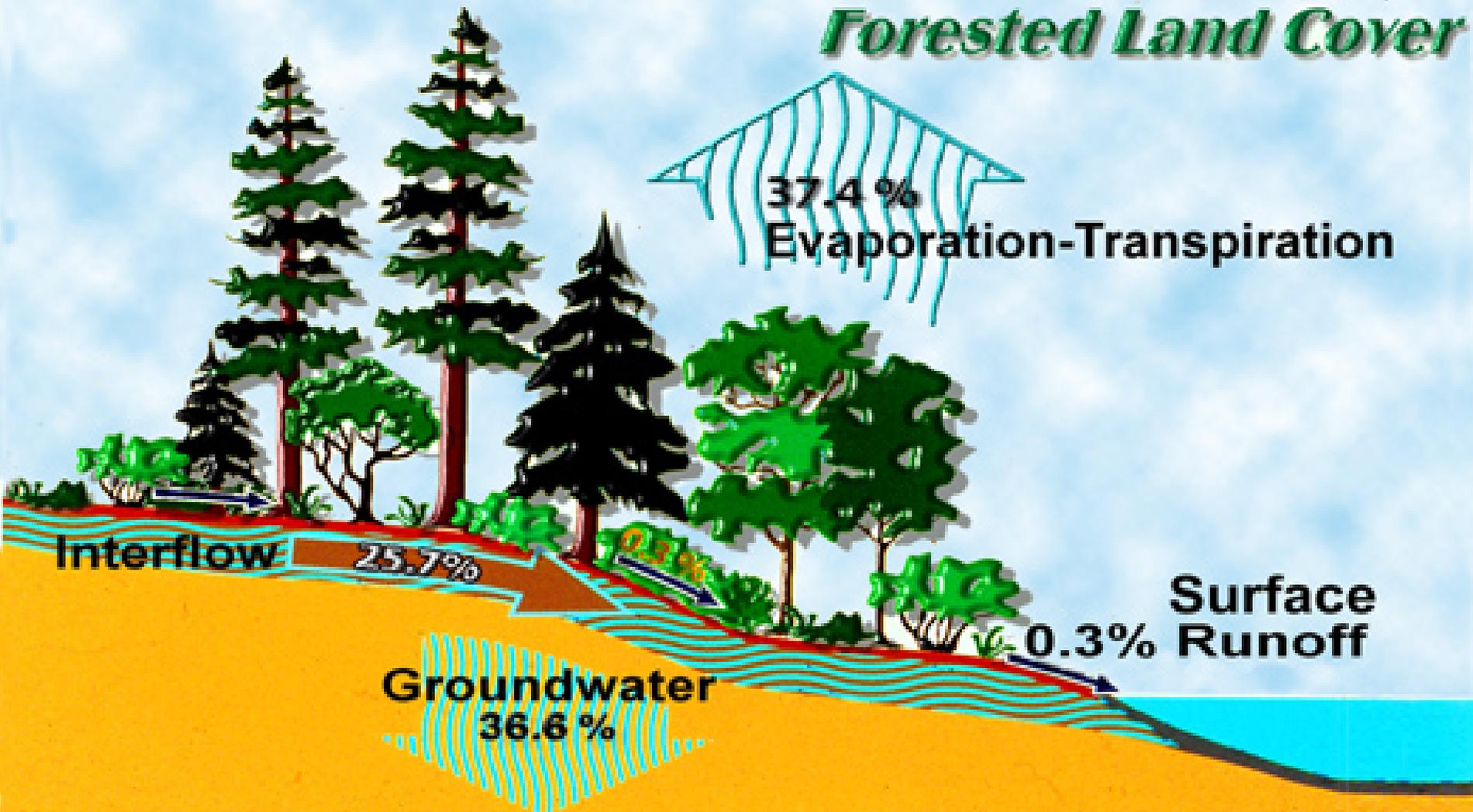
WETA WALK RAIN GARDEN



Natural Conditions

Typical Annual Water Budget

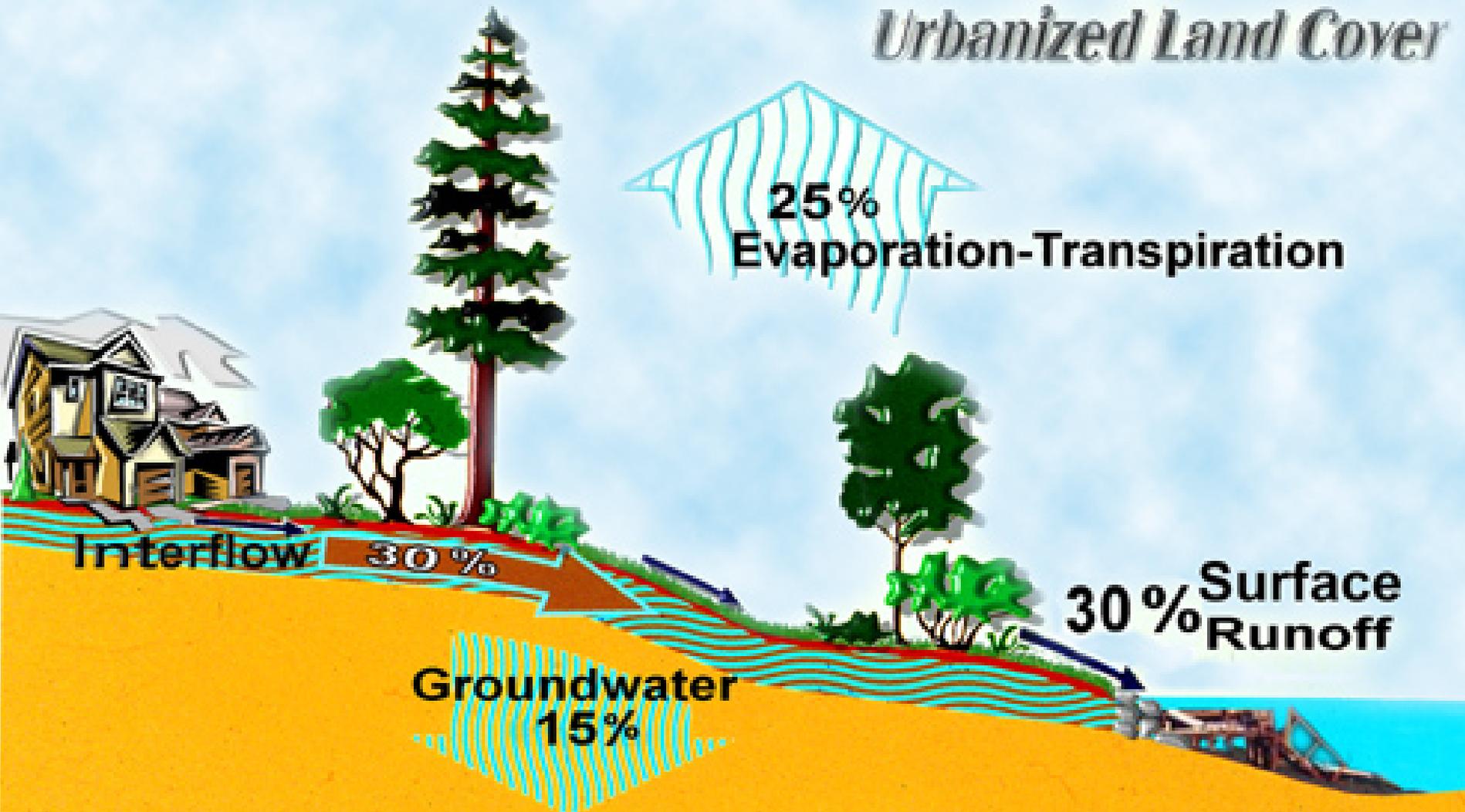
Forested Land Cover



Developed Conditions

Typical Annual Water Budget

Urbanized Land Cover



Atmospheric Deposition

Pollutants carried away by wind and traffic

Pollutants emitted from motor vehicles

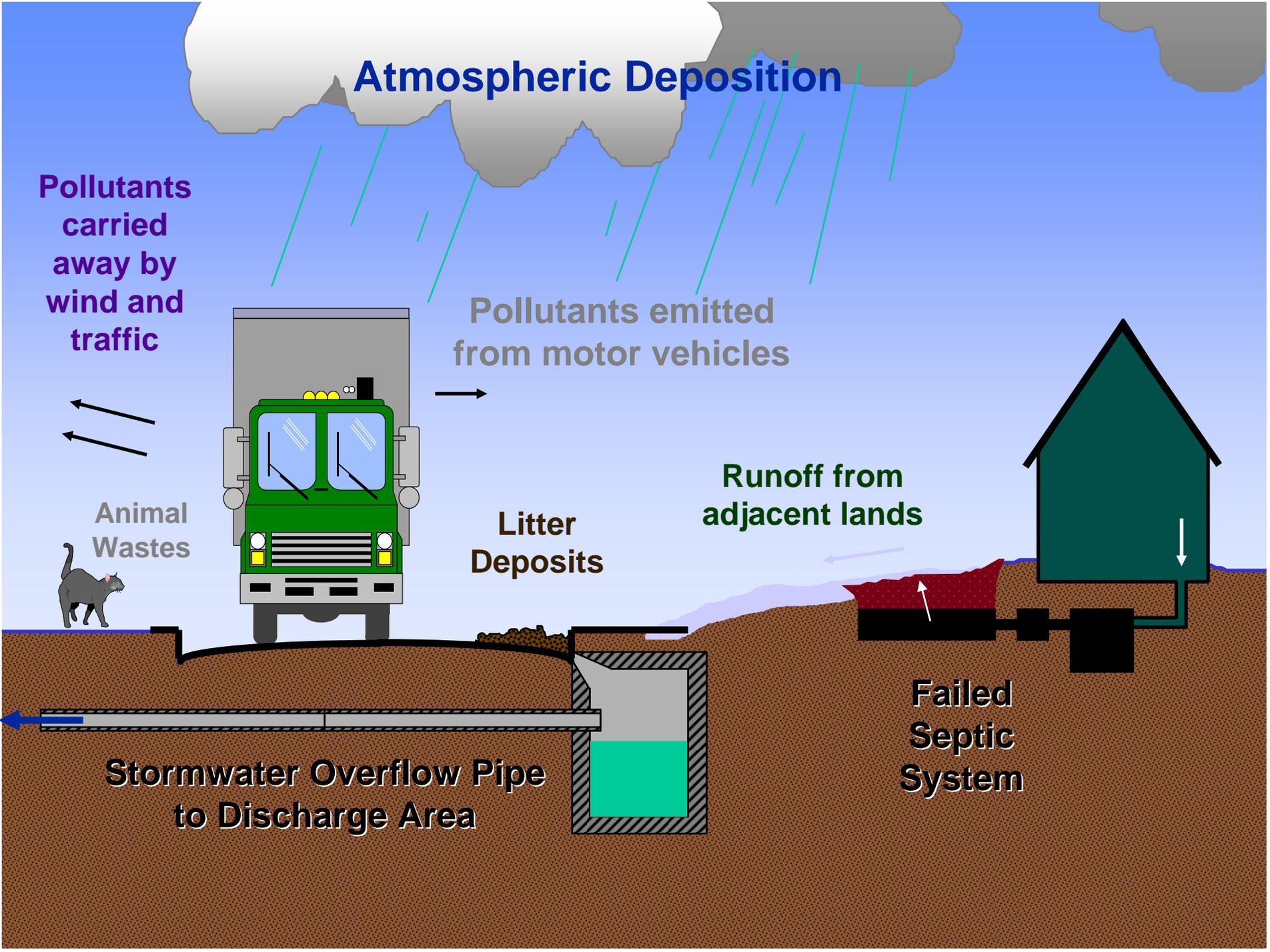
Animal Wastes

Litter Deposits

Runoff from adjacent lands

Failed Septic System

Stormwater Overflow Pipe to Discharge Area





Reduce: Conservation



Recycle:
Infiltrate
wastewater

Reuse:
Capture
rainwater

Remember This

Roof runoff
connected to *driveways*,
draining to *streets*,
draining to *pipe systems* =
dead fish, erosion of the
riverbank, and thirsty
people.



How can we make residential developments function hydrologically like natural systems



Solutions



Tree conservation • Rain gardens
Narrower streets • Open drainage
On-lot storage and infiltration of water



Conventional



Low Impact

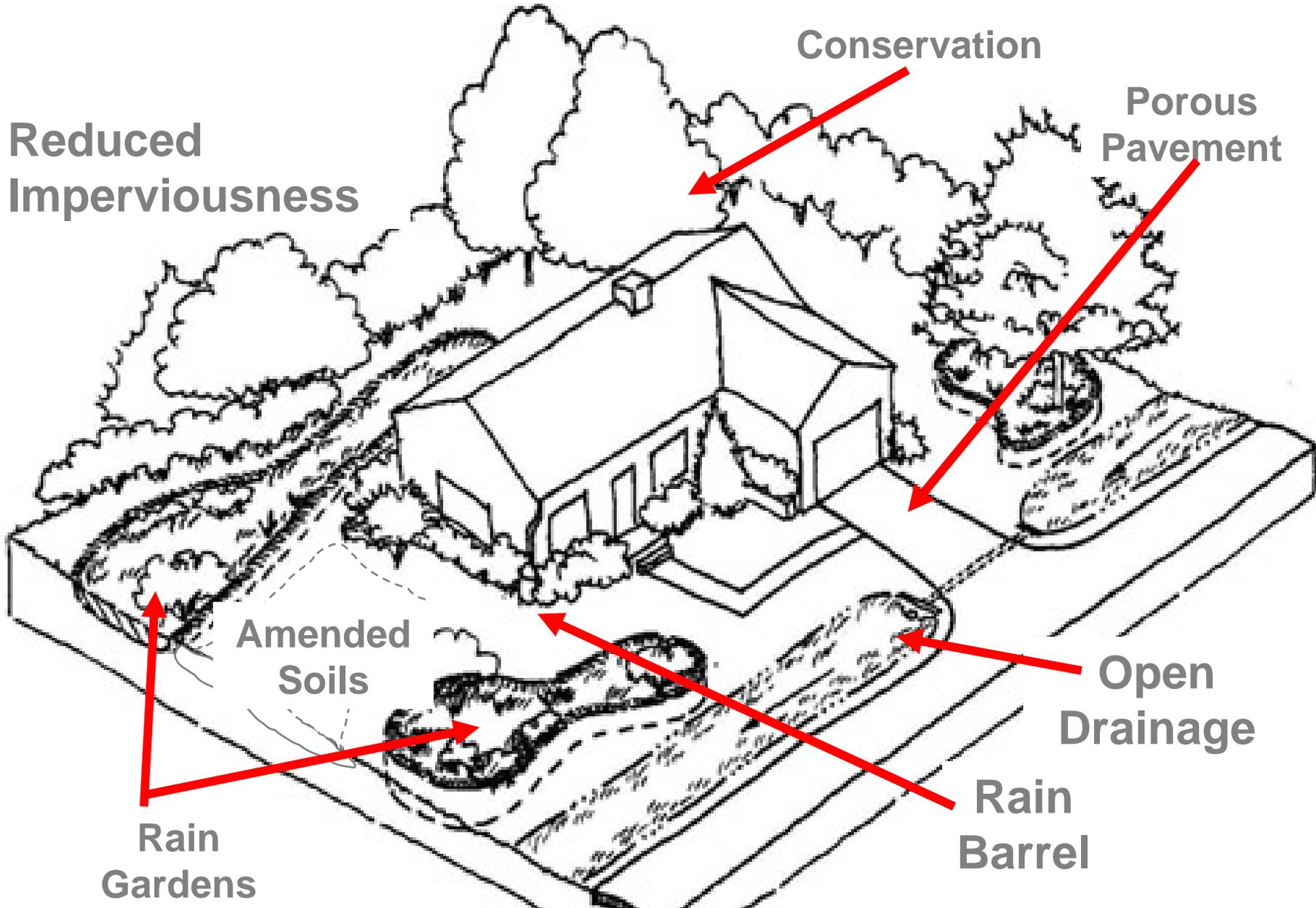


Conventional



Functional Landscape Design

Creating a Hydrologically Functional Lot



Porous Pavement



Rain Barrels



Redirected Downspouts



Soil Compaction





Natural Infiltration



Lawns: What's the problem?

- 67 million pounds of synthetic pesticides are used on U.S. lawns annually
- A lawnmower pollutes as much in one hour as a car does driving for 350 miles
- 30-60% of potable municipal water in the U.S. is used for maintaining lawns
- The average American lawn is only 1/3 acre, but generates almost 2 tons of clippings (over 330 trash bags full) a year
- The average homeowner spends the equivalent of a typical work week (40 hours) simply mowing the lawn each year

Benefits of Ecological Landscaping and Reducing the Size of your Lawn

- Attract wildlife
- Hardier lawns and gardens (native plants are drought resistant)
- Save water and money on water bills
(the average lawn consumes 10,000 gallons of water annually)
- Enhance passive recreational opportunities (bird watching, gardening, photography)
- Reduce pollution from chemical pesticides and fertilizers
- Reduce air and noise pollution from lawn equipment

Building Your Rain Garden

Location:

Keep the rain garden away from foundations and let the downspout end about 4 feet from the outside edge of the garden. Your garden should be about 1/3 of the size of the surface area providing the runoff.



Building Your Rain Garden

Depth and Soils:

Make a depression 6 to 18 inches deep throughout the area of the garden. The soil in your rain garden should be a mix that will allow fast infiltration of water. This can be done using a mixture of about 50% sand or stone aggregate, 30% compost and 20% topsoil. This mixture will allow excellent root growth and recharge of water.

Plants and Maintenance:

Plant at a density of about 1 plant per square foot and thin as plants grow. Put tallest plants in deepest part of garden. Weed about once a year and prune shrubs. Replace mulch as needed.

Cross-section of a typical rain garden





What to plant

- Native species
- Berry and nectar producers
- Combine shrubs, wild flowers and grasses.



Plants for Sun:

Marsh Milkweed

(*Asclepias incarnata*)

New England Aster

(*Aster novae-angliae*)

Marsh Marigold

(*Caltha palustis*)

Tussock Sedge

(*Carex stricta*)

Turtlehead

(*Chelone glabra*)

Joe Pye Weed

(*Eupatorium maculatum*)

Boneset

(*Eupatorium perfoliatum*)

Butterfly weed

(*Asclepias tuberosa*)

Bee Balm

(*Monarda didyma*)



Plants for Shade:

Cardinal flower

(*Lobelia cardinalis*)

Foam flower

(*Tiarella cordifolia*)

Bleeding heart

(*Dicentra eximia*)

Solomon's seal

(*Polygonatum falcatum*)

Columbine

(*Aquilegia canadensis*)

Royal Fern

(*Osumunda regalis*)

Maidenhair Fern

(*Adiantum pedatum*)

Ostrich Fern

(*Matteuccia struthiopteris*)

Sensitive Fern

(*Onoclea sensibilis*)



Shrubs:

Red Twig Dogwood

(*Cornus Sericea*)

High Bush Blueberry

(*Vaccinium corymbosum*)

Inkberry

(*Ilex glabra compacta*)

Winterberry

(*Ilex verticillata*)

Pussy Willow

(*Salix caprea*)

High Bush Cranberry

(*Viburnum trilobum*)

Black Elderberry

(*Sambucus canadensis*)









Neighborhood Projects

A neighborhood garden can become a community building project. Neighborhood rain gardens also can re-create wetlands, add aesthetic value, and restore natural spaces.

