



# Practical Solutions to Create a Water-Wise Home

*Harvest the Rain and  
Slow the Flow*

# *Daily Acts*

- Nonprofit organization established in 2002
- *Mission: To transform our communities through inspired action and education that builds leadership and local self-reliance*
- Sustainability tours, workshops, presentations and events
- Partners include public agencies and municipalities, community organizations, schools and businesses



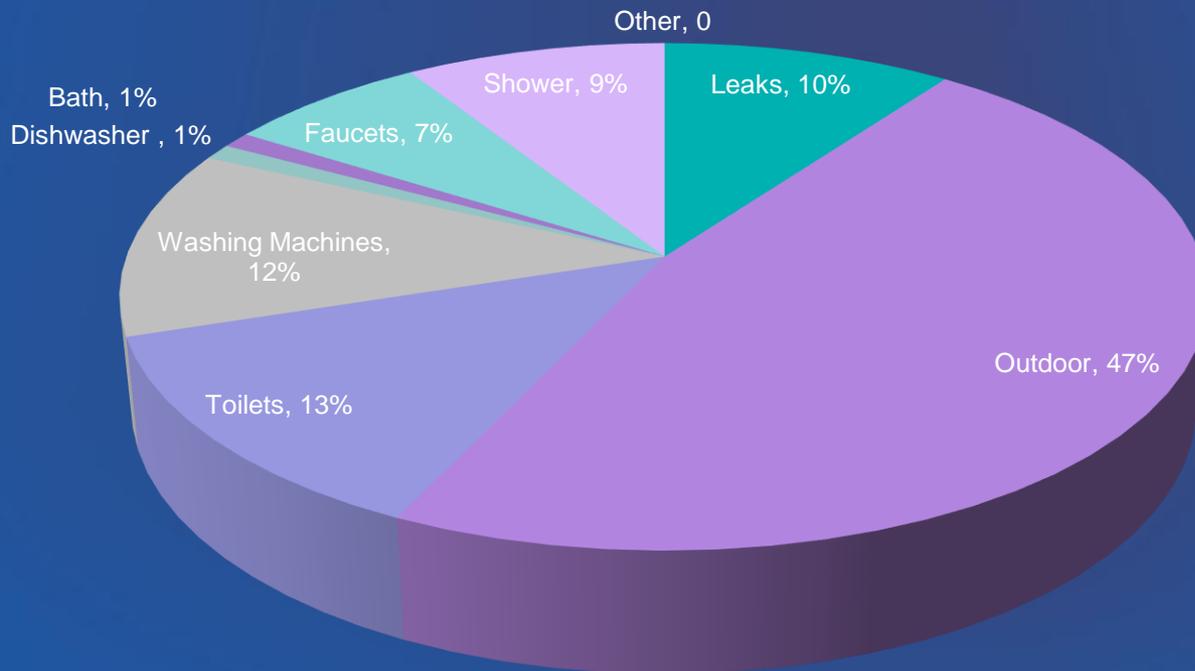
*because every choice matters*

“You must be the change you  
want to see in the world”

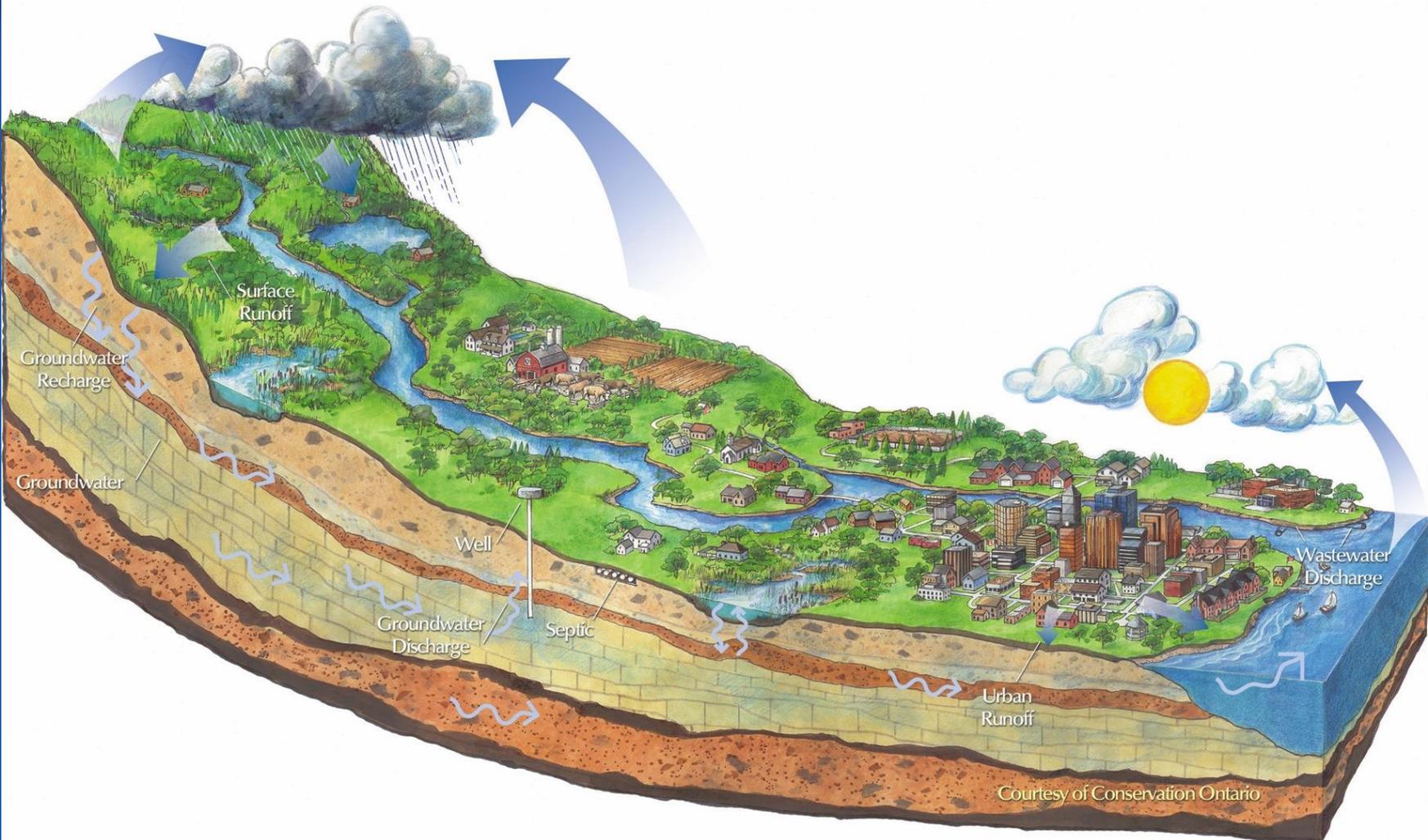
*- Mahatma Gandhi*



# *Typical residential water use*



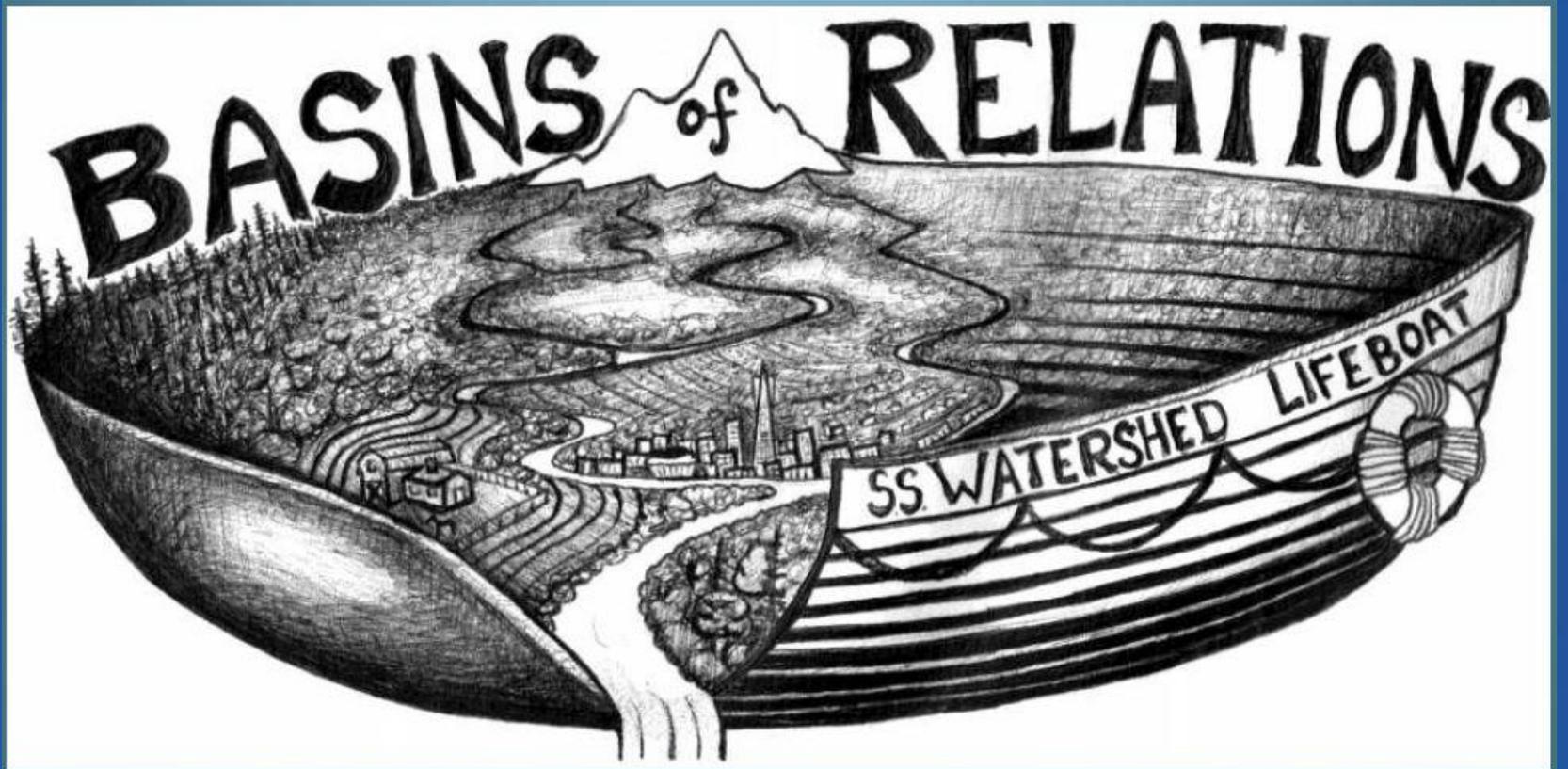
# The Water Cycle



# *Understanding our Watershed*

- A watershed is the area of land where all of the water that is under it or drains off of it goes into the same place.
- Or as scientist geographer John Wesley Powell describes, a watershed is “that area of land, a bounded hydrologic system, within which all living things are inextricably linked by their common water course and where, as humans settled, simple logic demanded that they become part of a community.”





# Rethink how you think about water



- Conservation isn't a sacrifice — it's about needing less.
- Start at the 'head' waters
  - Practice awareness & appreciation
  - Get educated, observe, interact, wonder why
  - Spend time in nature and get to know your watershed



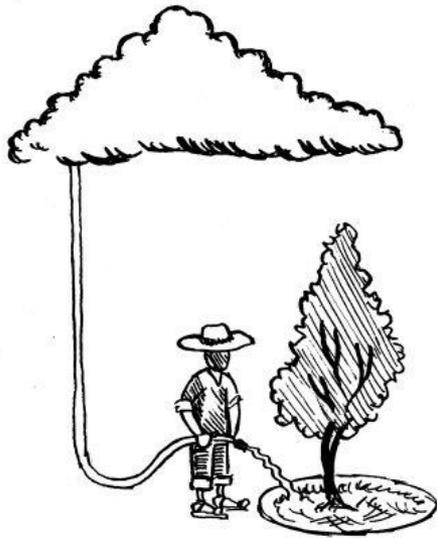


# STORMWATER

Problem or Solution







HarvestingRainwater.com ©2008 Brad Lancaster

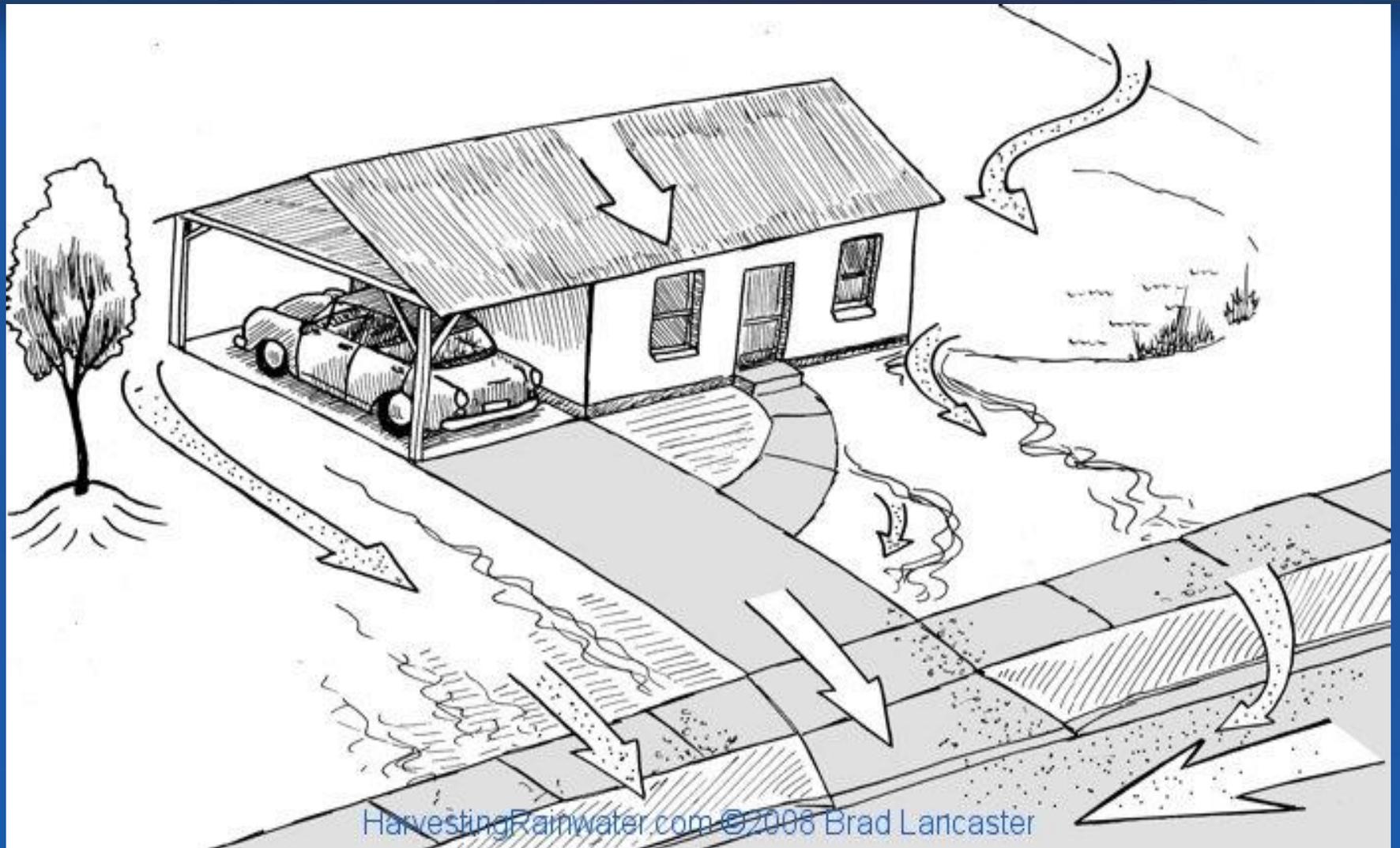


HarvestingRainwater.com ©2008 Brad Lancaster

# *Retain the rain*

- Assess your resource and retention opportunities
- Increase the living sponge
- Install swales or rain gardens
- Install a rain barrel or cistern
- Think: **Slow it, Spread it, Sink it and Store it!**

# *Retain the rain*



# *Retain the rain*



# *8 Principles of Rainwater Harvesting*

*from Brad Lancaster [harvestingtherain.com](http://harvestingtherain.com)*

- 1. Begin with long and thoughtful observation.*
- 2. Start at the top- or highpoint – of your watershed and work your way down.*
- 3. Start small and simple.*
- 4. Spread and infiltrate the flow of water.*
- 5. Always plan for an overflow route, and manage that overflow water as a resource.*
- 6. Maximize living, organic groundcover.*
- 7. Maximize beneficial relationships and efficiency by 'stacking functions'.*
- 8. Continually reassess your system: 'feedback loop'.*

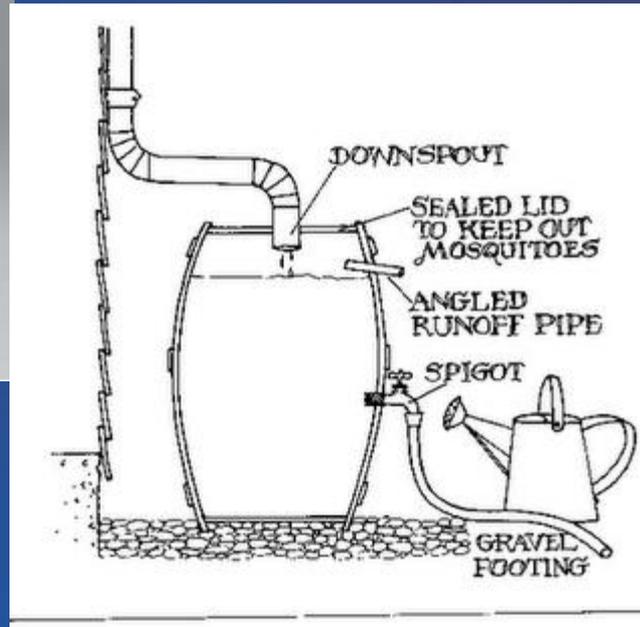
# *Retain the rain with Compost & Mulch*



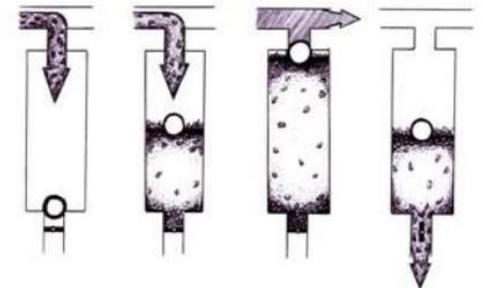
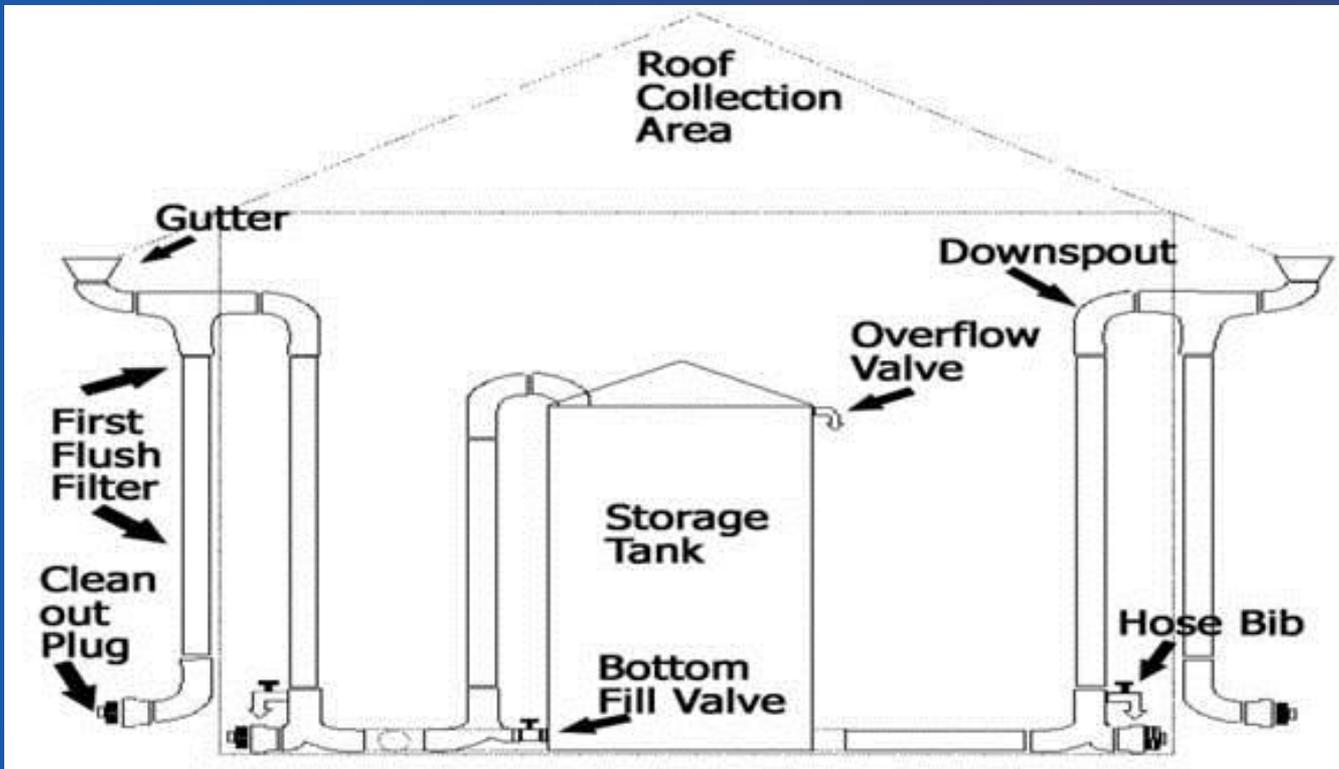
# *Retain the rain with Sheet Mulching*



# *Retain the rain with Rain Storage*



# Retain the rain with Rain Storage



# *Retain the rain in Rain Barrels*



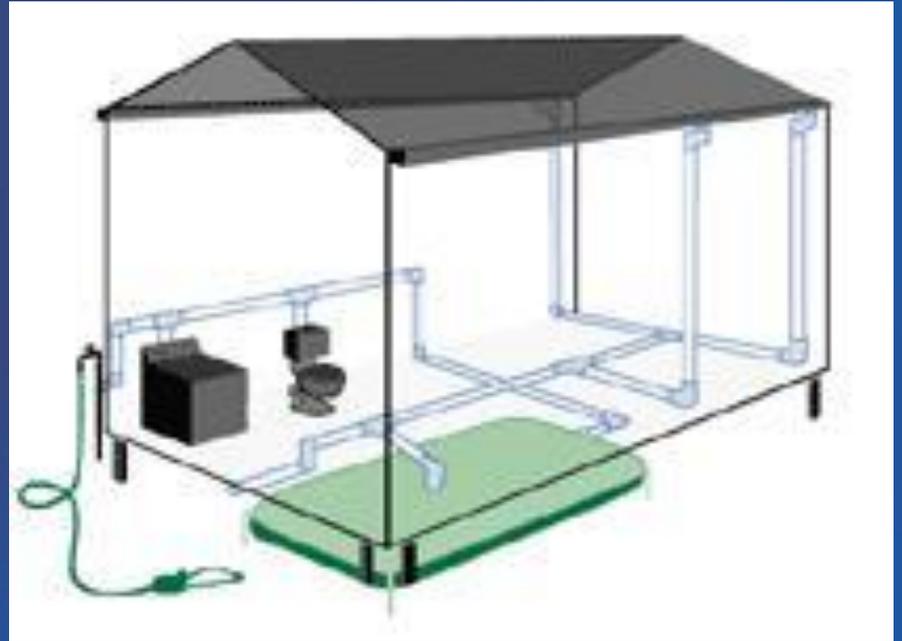
# *Retain the rain in Rain Tanks*



# *Retain the rain in Rain Tanks*



# *Retain the rain in Rain Bladders*



# *Retain the rain*

*Calculating rainfall volume from a given catchment surface in gallons:*

$$\mathbf{A \times R \times 7.5 \text{ gal/ft}^3 = \text{Total Rainwater (gal)}}$$

- A = Catchment area in square feet (length X width)
- R = Rainfall in feet = Rainfall in inches / 12
- There are about 7.5 gallons per cubic foot

You can collect 600 gallons of water per inch of rain falling on 1,000 square feet of catchment surface.

# *Retain the rain*

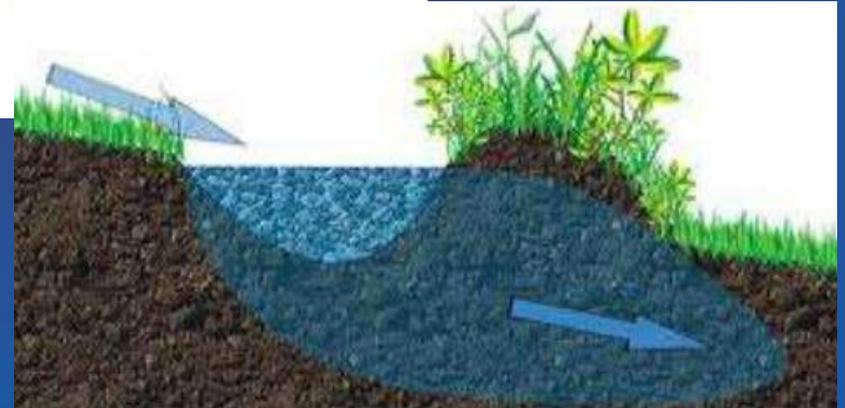
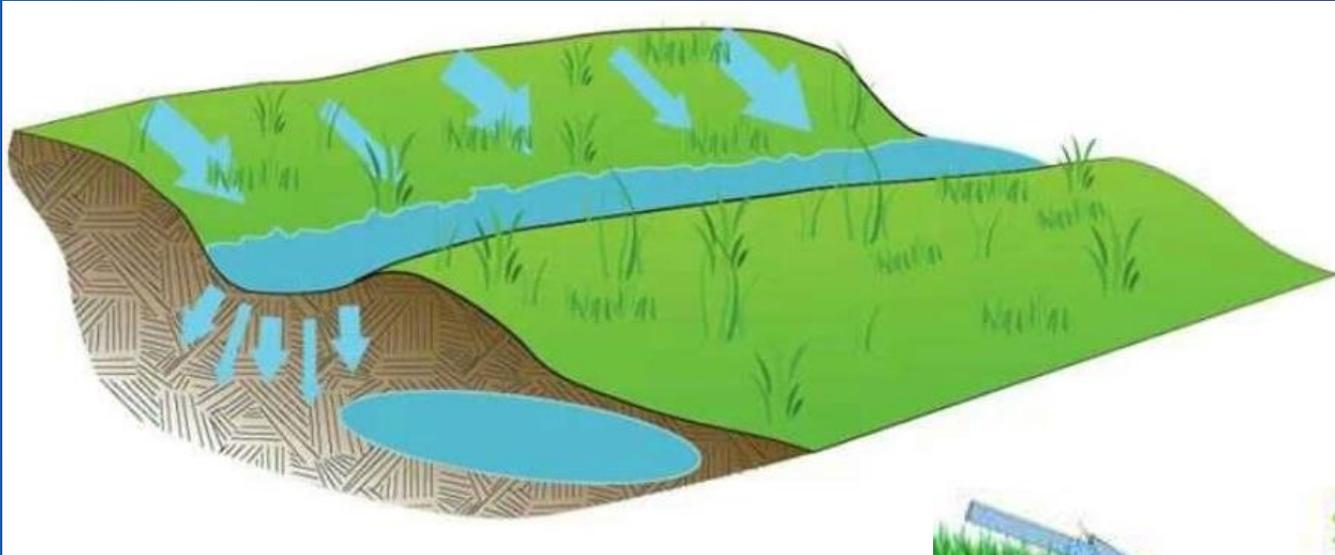
*Calculating rainfall volume from a given catchment surface in gallons:*

$$A \times R \times 7.5 \text{ gal/ft}^3 = \text{Total Rainwater (gal)}$$

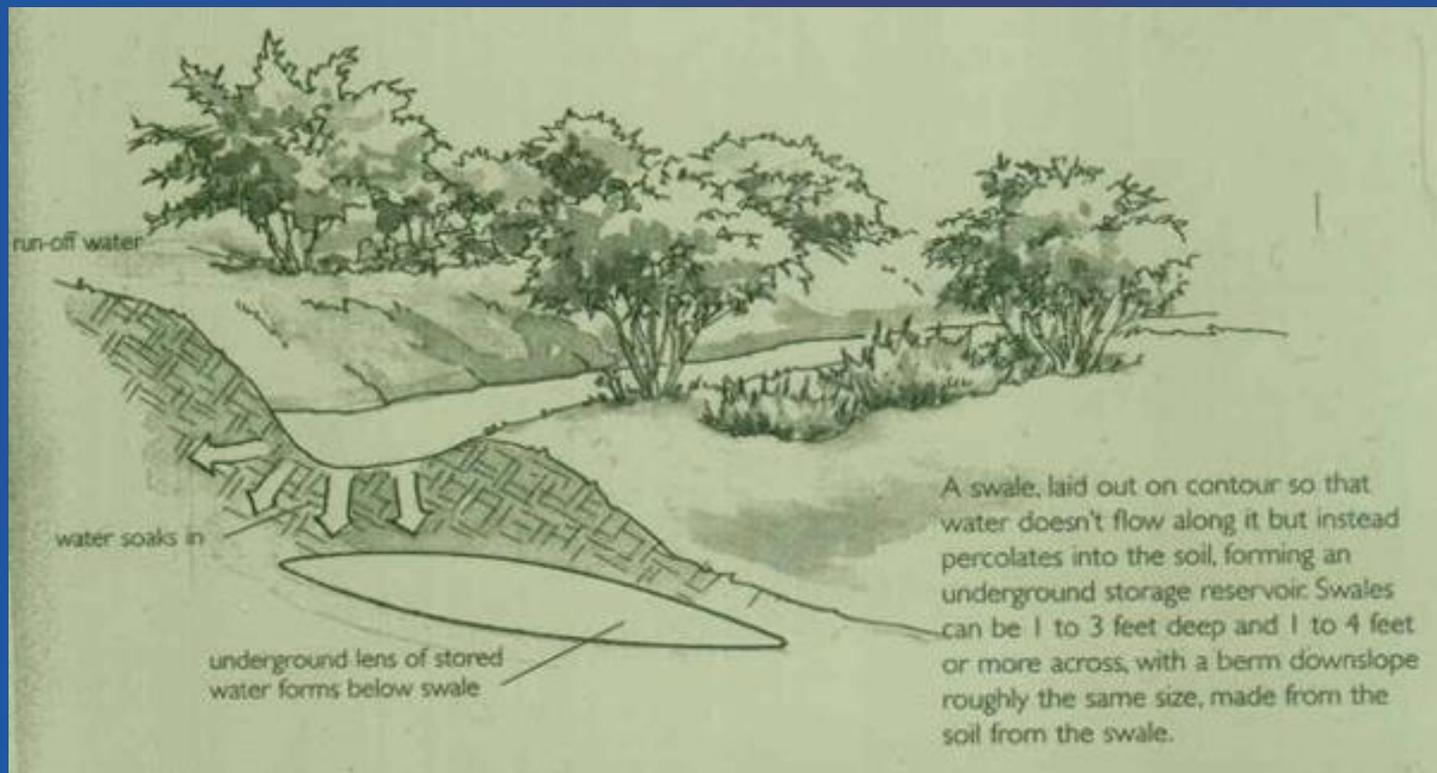
- A = Catchment area in square feet (length X width)
- R = Rainfall in feet = Rainfall in inches / 12
- There are about 7.5 gallons per cubic foot
- 36" of average annual rainfall in Healdsburg
  - 9.14" inches of rain fallen in a 24- hour period

**1,000 square feet of catchment surface. X area x 36 inch of average annual rainfall (3ft) x 7.48 gallons per cubic foot = 22,400 gallons of water per year**

# *Retain the rain with Swales*

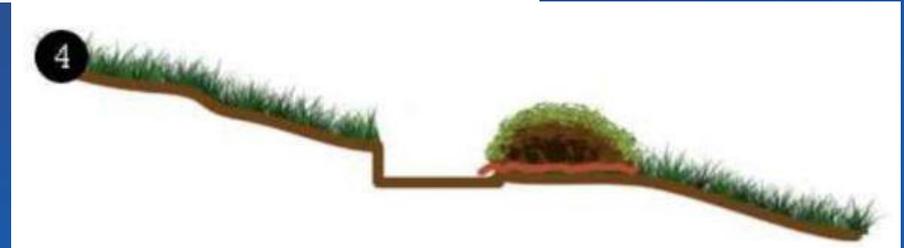
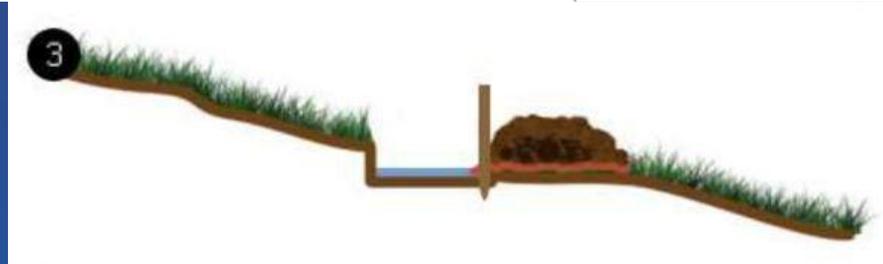
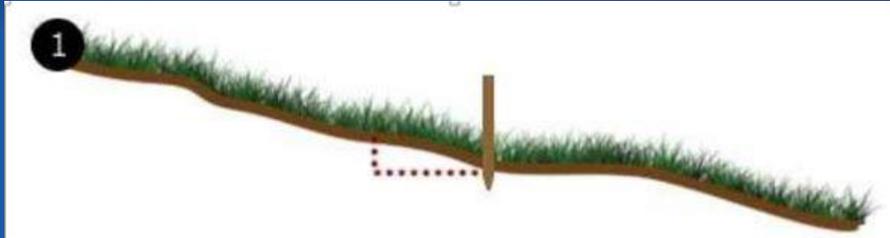


# Retain the rain with Swales





# *Retain the rain with Swales*



# *Retain the rain with Swales*





# *Retain the rain with Swales*



# Retain the rain with Infiltration Basins

## Making every drop count

Friday, April 20th, 2012 | Posted by [Diana Gilbert](#) | [no responses](#)



Christopher Peck and his wife, Genevieve Taylor, stand along a pathway covering a 175 ft long rainwater catchment system in their backyard. (BETH SCHLANKER/ The Press Democrat)

By DIANA GILBERT / Windsor Correspondent

To the casual observer, Christopher Peck's yard may not look different from anyone else's, but it is. Beneath the surface, his Windsor acre holds onto a lot of water.

As part of an effort to reduce his ecological footprint by reducing irrigation water use, he has installed four different systems that capture and retain as much water as they can.



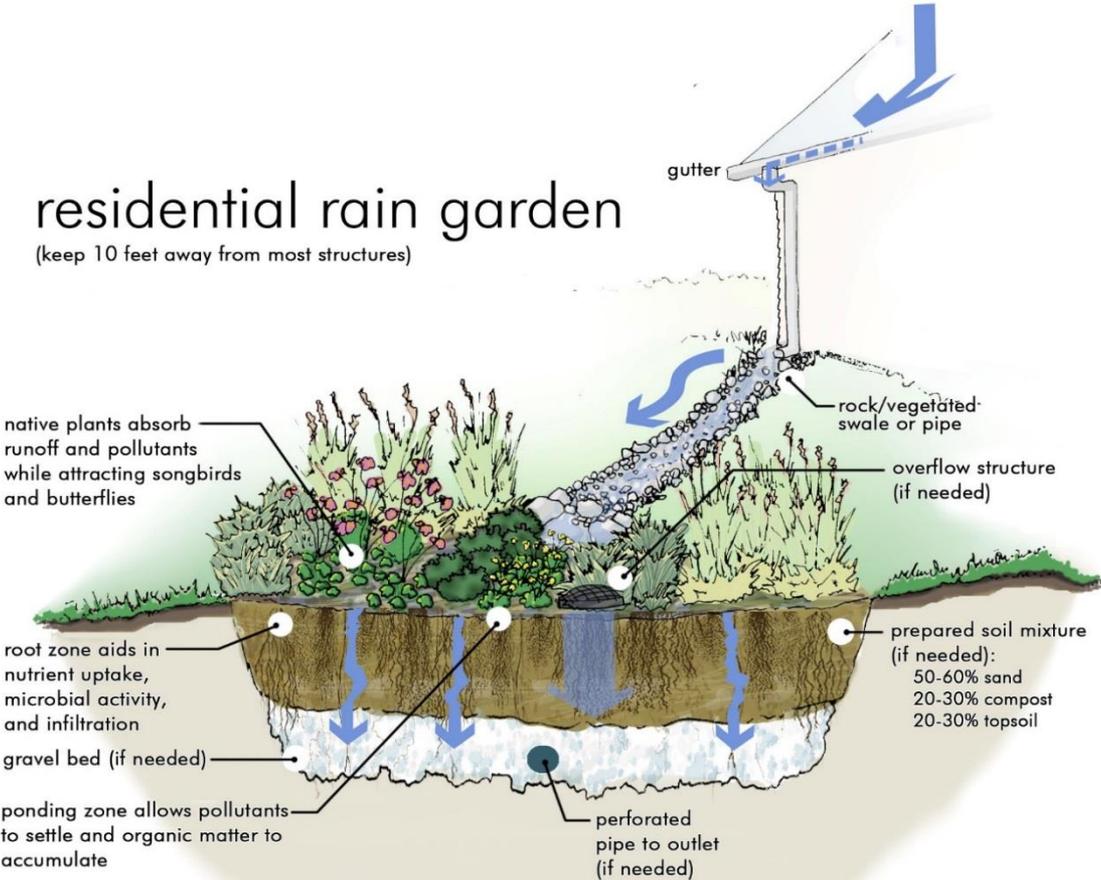
# *Retain the rain with Hugelkulture*



# Retain the rain with Rain Gardens

## residential rain garden

(keep 10 feet away from most structures)



# *Retain the rain with Rain Gardens*



# *Retain the rain with Rain Gardens*



# *Retain the rain with Rain Gardens*



# *Retain the rain with Swales*



**Sand**

If the water is clear and the soil has settled to the bottom; you have predominantly sand soil.



**Loam**

If the water is still a little murky with bits of matter suspended in it; you have loam soil.



**Clay**

If the water is still murky and there is a visible ring of sediment around the jar; then your soil is mostly clay.

# Retain the rain with Swales

Infiltration Rate (min/inch)	Area Needed (sq.ft/gal/day)	Example: After filling the hole four times, the water level dropped 6 inches in 75 minutes. 75 divided by 6 is about 13 minutes/ inch.
0-30	0.4	13 min/inch is between 0 and 30, so we use this line.
40-45	0.7	
46-60	1.0	
61-120	2	



Type of soil	Sq. ft/ 100 gal/day	GallonsMax. absorption/sq. ft/ 24 hrs
Coarse sand or gravel	20	5.0
Fine sand	25	4.0
Sandy loam	40	2.5
Sandy clay	60	1.7
Clay with considerable sand or gravel	90	1.1
Clay with small amount of sand or gravel	120	0.8

# *Retain the rain with Swales*

## *Calculate Swale Capacity:*

$$\text{Swale Volume (gal)} = 0.5 \text{ depth (feet)} \times \text{width (feet)} \times \text{length (feet)} \times 7.5 \text{ gal/ft}^3$$

- Size for the largest storm event... plus a little extra
- Healdsburg's largest storm event: 9.14 inches in 24 hours
- There are about 7.5 gallons per cubic foot .

# *Retain the rain with Swales*

## *Matching Runoff Potential with Swale Capacity:*

$$\text{Runoff Potential} = A \times R \times 7.5 \text{ gal/ft}^3$$

vs.

$$\text{Swale Volume (gal)} = 0.5 \text{ depth (feet)} \times \text{width (feet)} \times \text{length (feet)} \times 7.5 \text{ gal/ft}^3$$

- A = Catchment area in square feet (length X width)
- R = Rainfall in feet = Rainfall in inches / 12
- There are about 7.5 gallons per cubic foot
- Remember to take Soil Composition and Percolation Test results into account

# *Retain the rain with Bioswales*



HarvestingRainwater.com ©2008 Brad Lancaster

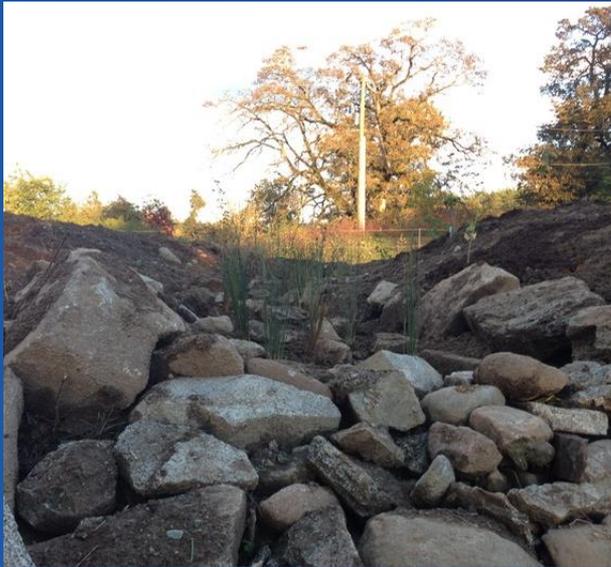
# *Retain the rain with bioswales*



# *Retain the rain with Bioswales*



# *Retain the rain with Level-sill Spillways*



# Retain the rain with Curb Cuts and Basins



# *Retain the rain with Curb Cuts and Basins*



# *Retain the rain by Increasing Permeable Surfaces*



# *Retain the rain by Increasing Permeable Surfaces*



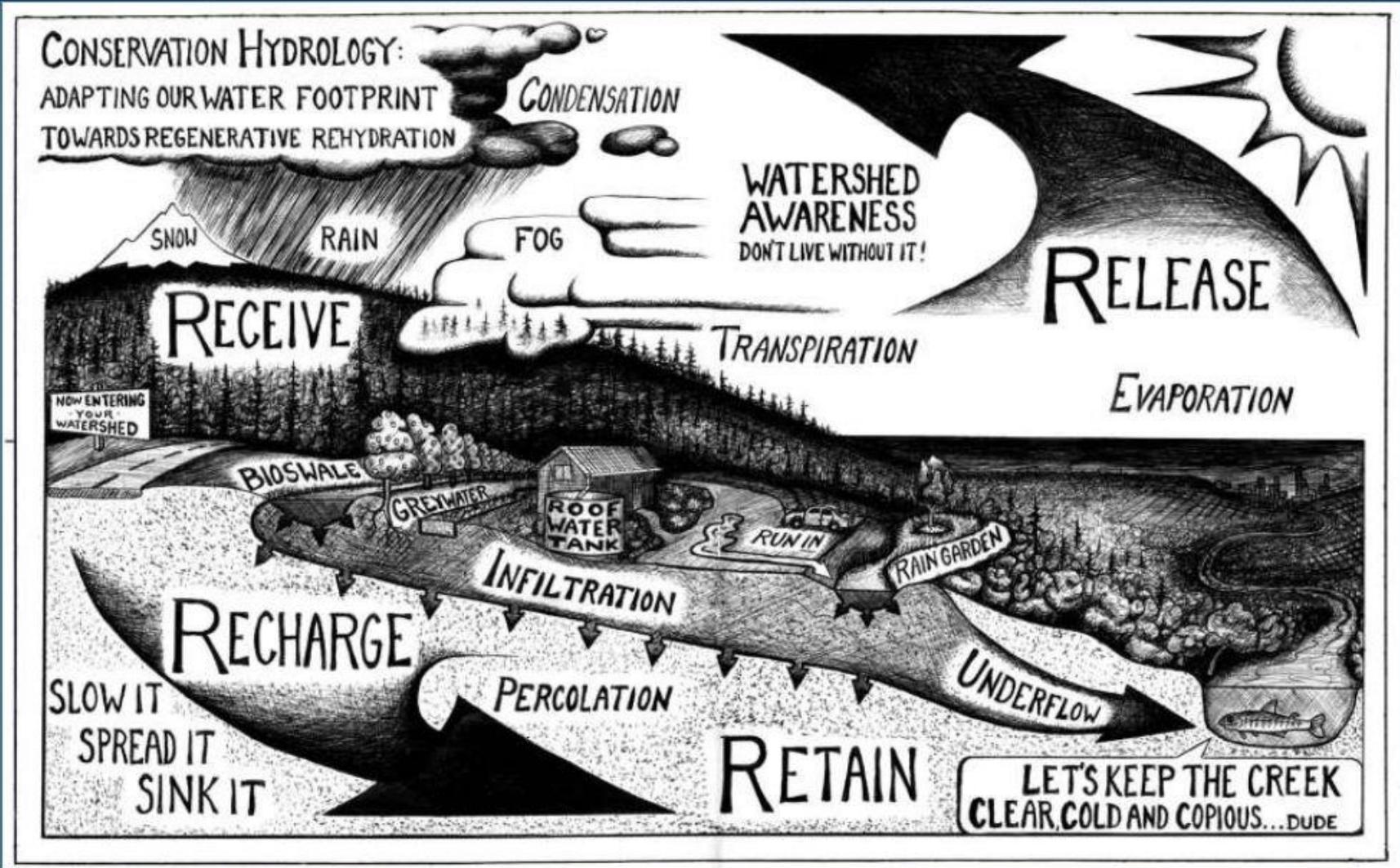
# *Retain the rain by Increasing Permeable Surfaces*



# *Retain the rain by Increasing Permeable Surfaces*



# We Are Our Watershed



## *Retain the rain with these Take Homes*

- We have a water storage issue, not a water shortage issue
- Implement many small solutions, rather than one large one
- Think: slow it, spread it, sink it and store it!



“Life is not about waiting for the storm to pass, its about learning to dance in the rain. ”

- *Anonymous Rainwater Harvester*

# Upcoming Events

- **Event: DIY Drought Solutions**  
*Saturday, August 29th | 10am FREE (thanks to the City of Santa Rosa!)*  
*City Hall, 100 Santa Rosa Avenue, Santa Rosa*
- **Workshop: Planting the Living Learning Lab Food Forest**  
*Saturday, September 19<sup>th</sup> | 10am FREE* *Santa*  
*Rosa Junior College, 680 Sonoma Mountain Parkway, Petaluma*
- **Workshop: Planting Your Paradise: Water-wise Plant Selection & Installation**  
*Saturday October 3rd | 10am FREE*  
*Corner of Foothill Drive and Hembree Lane, Windsor*
- **Workshop: Permaculture Design Course with Toby Hemenway**  
*Saturday, October 10<sup>th</sup> | 9am*  
*Multiple locations and Dates, see website for more details...*

# Thank You!



**Brianna Schaefer**

**(707) 789-9664**

**[brianna@dailyacts.org](mailto:brianna@dailyacts.org)**