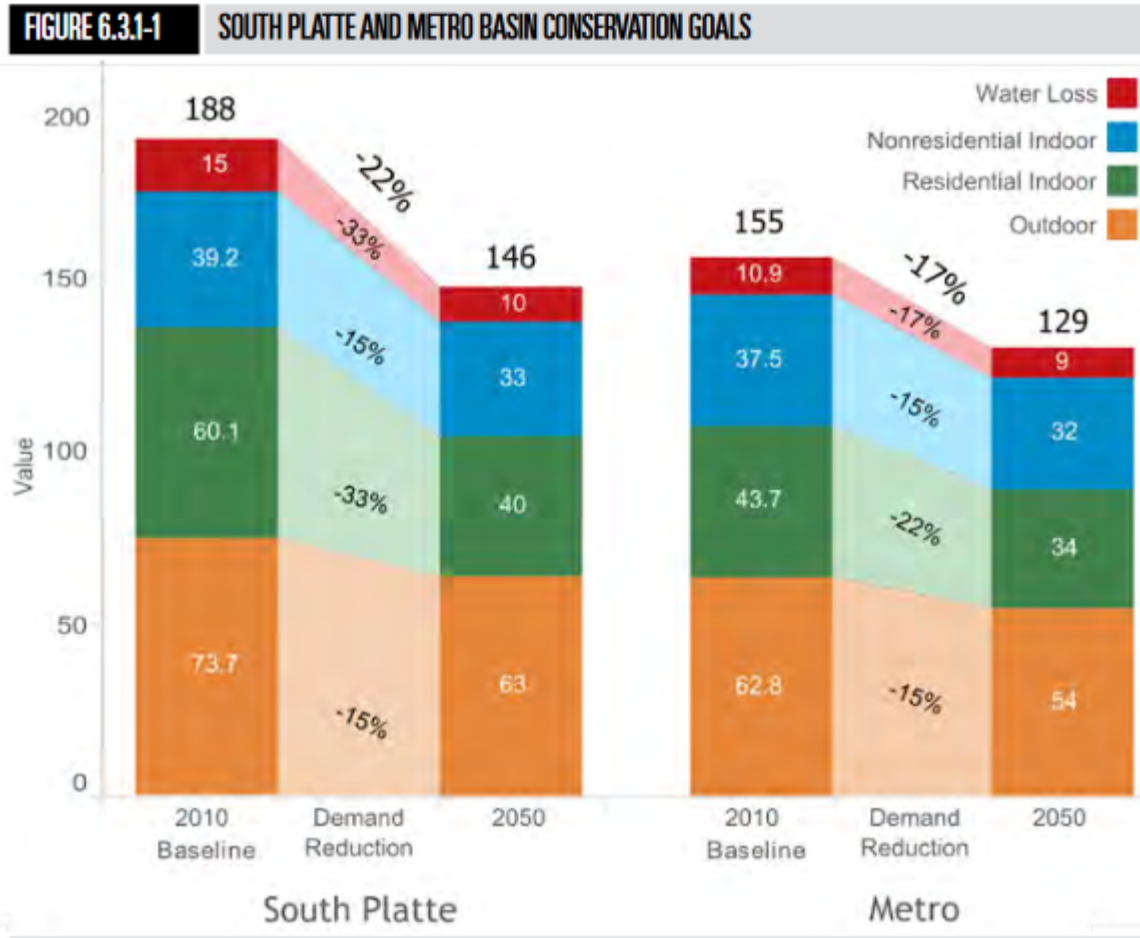


Transforming Your Lawn into a Xeriscape



Why Water – Wise?

Colorado State Water Plan:



H₂O VERHAUL



Mountain Shadows

Designed by: Bill Melvin of [Ecoscape Environmental Design](#)

- **Covers:** 98 sq. ft.
- **Includes:**
 - 28 starter plants with 11 different varieties in 4-inch pots
 - 1 plant by number layout option (14 ft. x 7 ft. rectangle)
- **Exposure:** Full Sun (requires a minimum of 6 hours of full sun per day)
- **Mature Height:** 1 ft. to 10 ft.
- **Hardy To:** 6,500 feet
- **Colorful:** Early Summer to Fall
- **Benefits:** Locally grown and pollinator friendly



Rocky Mountain Retreat

Designed by: Kenton Seth of [Paintbrush Gardens](#)

- **Covers:** 96 sq. ft.
- **Includes:**
 - 28 starter plants with 11 different varieties in 4-inch pots
 - 3 plant by number layout options (16 ft. x 16 ft. rectangle, 12 ft. x 8 ft. rectangle, 14 ft. x 14 ft. triangle)
- **Exposure:** Full Sun (requires a minimum of 6 hours of full sun per day)
- **Mature Height:** 6 in. to 3 ft.
- **Hardy To:** 9,000 – 10,000 feet
- **Colorful:** Early Spring to Fall
- **Benefits:** Locally grown and pollinator friendly

Because it is Beautiful!



And Beyond Beautiful~



Colorado is beautiful,
and most of that beauty is dry



Transforming Your Lawn into a Xeriscape

Remove a 200 square foot area of lawn

- ❖ Must be existing and maintained
- ❖ Areas to consider:



- Small areas
- Hard to water
- Too shady



South facing slopes

**And replace it with 200 sf
of Xeric plants!**



WHERE, WHAT AND WHEN?

- **Garden in a Box** gardens should go in the appropriate microclimate:
 - **Mountain Shadows** in partial shade
 - **Rocky Mountain Retreat** in full sun, but not baking (extreme south exposure)
- Other plants can be chosen to fit your yard and microclimate.
- Consider planting shrubs as a low maintenance and water alternative to lawn



- If you have an existing irrigation system, convert a whole irrigation zone
- **DO NOT Mix high and low water use plants, NOR Drip and spray irrigation, or different types of sprinkler heads**
- Do it before it gets hot! Or after.

Xeriscape is not:

- Zero-scape
- Ex-er-scape
- Only native plants
- Landscapes without turf
- Landscapes that must survive without irrigation
- Rocks and cactus



XERISCAPE PRINCIPLES

- Planning and Design
- Limited/Practical Turf Area
- Low Water Use Plants
- Soil Improvement
- Efficient Irrigation
- Mulch
- Appropriate Maintenance

PLANNING AND DESIGN

- Create a landscape for you
 - What do you like to do? What would you enjoy outside?
 - What kind of maintenance do you like? Hate?
 - Consider landscaping for wildlife, and to increase the earth-friendliness of your yard
- Start with the problem areas – areas that are weedy, dry..
- Are you in a weedy neighborhood? Create a ‘weed mitigation plan’.
- Make your mistakes on paper
- Work with microclimates and soils
- Work with your existing irrigation system
- When to use a professional designer

Limited Turf











Low Water Plants



What to have instead of lawn?

- ❖ **PERENNIAL FLOWERS** - Colorful, relatively expensive, high maintenance, quick to mature
- ❖ **LOWER WATER USE GRASS** - Similar maintenance and look, relatively inexpensive and quick: Turf-Type Tall Fescue, Kentucky x Texas Bluegrass hybrids, Crested Wheatgrass, Blue Grama grass
- ❖ **HARDSCAPE** – Patios, decks, play areas, boulders... Expensive, low maintenance, quick
- ❖ **NATIVE MEADOW** – Inexpensive, very high maintenance to establish, skilled maintenance, fairly quick
- ❖ **SHRUBS** – Colorful, inexpensive, low maintenance once established, slow to mature
- ❖ **DRY CREEK/GRAVEL BED** - Cheap, fast, low maintenance with herbicides, high maintenance otherwise

Xeriscape- Installation and Maintenance with costs and timing

	INSTALLATION		WATER USE	MAINTENANCE			CONVERSION DIFFICULTY
	COST	ESTABLISHMENT		FREQUENCY	COMPLEXITY	HERBICIDE	
Sod lawn	low	very quick	m-h	weekly	simple	yes	hard
Annual flowers	high	very quick	m-h	weekly	moderate	yes	hard
Perennial flowers	m-h	quick	l-h	infrequent	moderate	some	hard
Groundcovers	l-h	mod. to slow	l-h	infrequent	moderate	some	hard
Shrub beds	l-m	slow	l-h	very infrequent	simple	some	easy
Native meadow	low	moderate	low	very infrequent	complex	no	hard
Dry creek	low	very quick	none	inf. to frquent	simple	yes	easy
Hardscape	l-h	very quick	none	little to none	simple	yes	easy

INSTALLATION COSTS: Materials: low = \$1 to \$2, medium= \$2 to \$4,
high= \$5 to \$8,

INSTALLATION COSTS - Materials and labor/contractor: low = less than
\$4/sf, moderate = \$3 to \$9/sf, high = \$9 to \$30/sf

ESTABLISHMENT: very quick= 1-2 months, quick= 1 year, moderate= 2 years, slow= 3 to 5 years

WATER USE: high= 1 1/2" in summer, 20 gallons per square foot per season; moderate= 3/4" in summer,
10 gallons per square foot per season; low= 1/4-1/2" in summer, 5 gallons per sf per season



Group plants according to their water use:

- High – Bluegrass and water loving perennials and shrubs
1 ½" per week in July; 20 gallons per square foot per season
- Moderate – Turf-type Tall Fescue and most common landscaping plants
¾" per week in July; 10-12 gallons per square foot per season
- Low – Low water use grasses, many xeric landscaping plants
¼ " per week in July; 5 gallons per square foot per season

Microclimates

Microclimates are crucial in Front Range landscapes.
Use them when establishing hydrozones.



Microclimates are determined by:

- Sun exposure
- Wind exposure
- Soil slope
- Presence of fences, walls, boulders
- Nearby water

Microclimates do not depend on soils, but can shape soil formation and health

Hydrozones

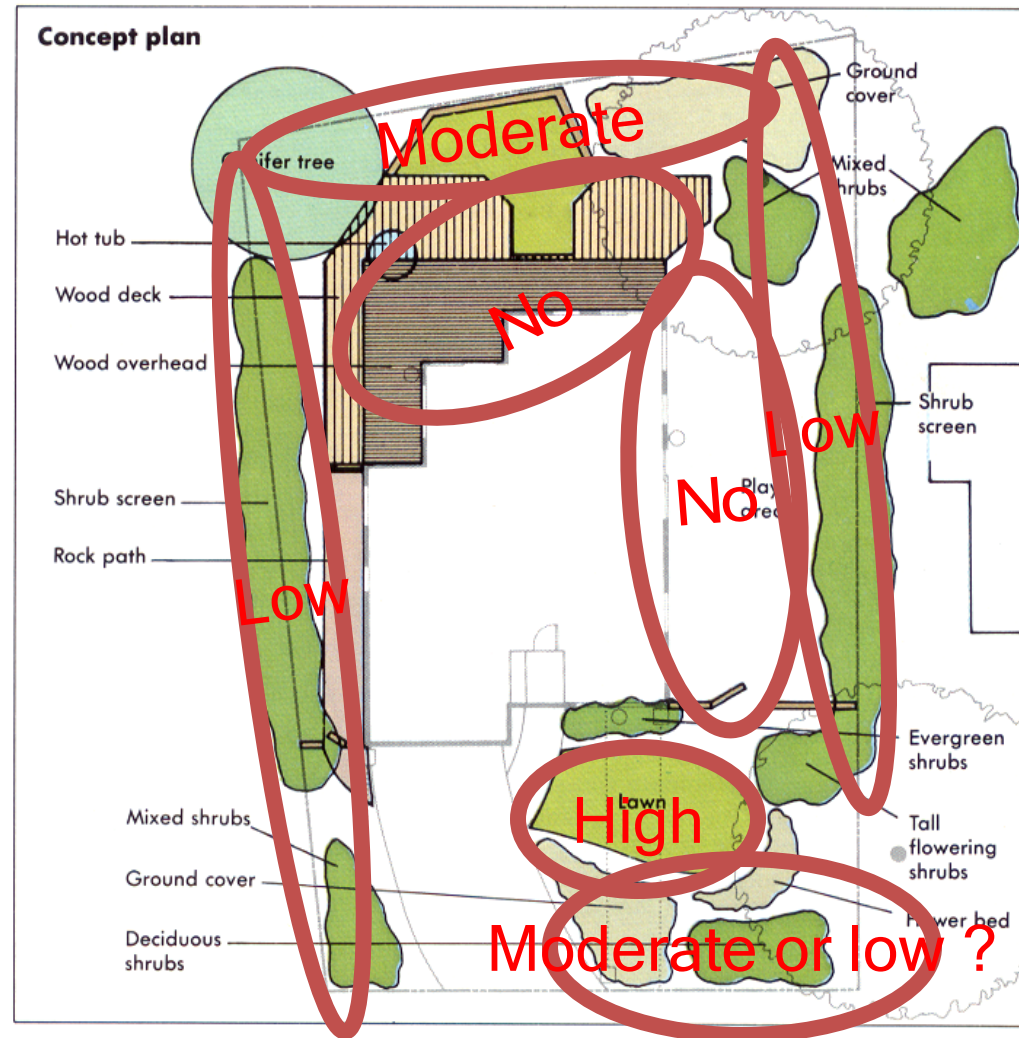
Are landscape areas that, by design, use specific amounts of irrigation.

Are laid out to harmonize with microclimates

Hydrozoning dictates the plants that are used in an area and the design of the irrigation system.

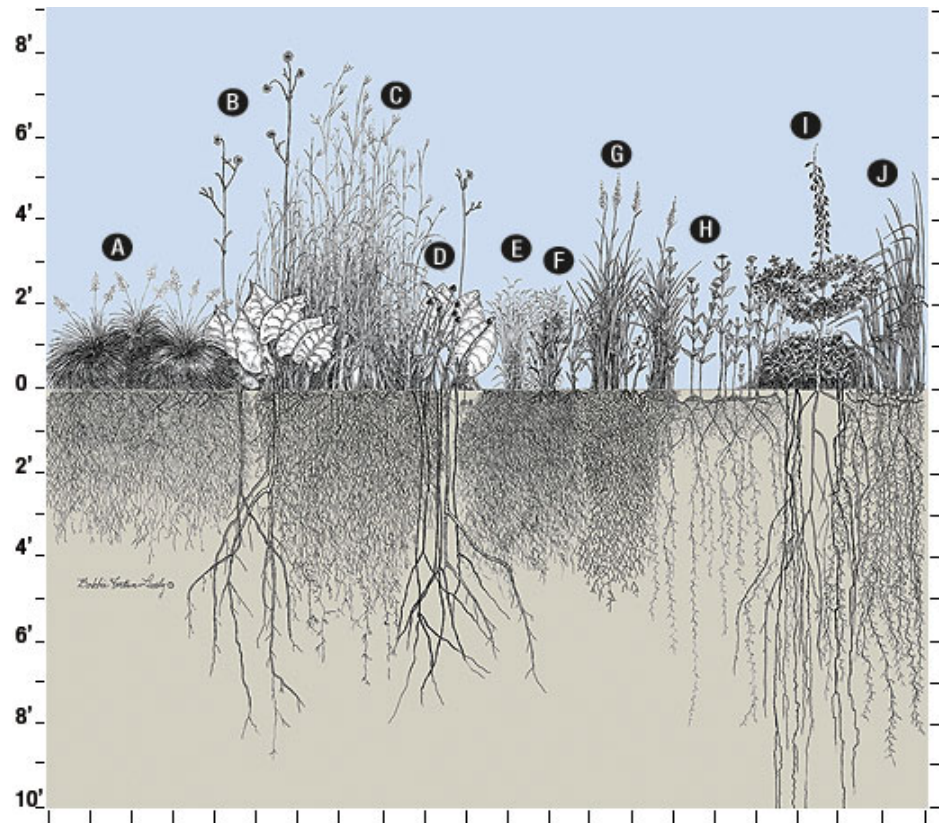
Hydrozone	% of ET_o	Irrigation in Gallons/square foot/season
High	75-100 %	20
Moderate	50-75%	10
Low	25-50%	5
Very Low	<25%	0

ET_o = water consumption of a high water, cool season lawn in inches of water per square foot.



Soil Amendment

Building Strong Roots



A. Prairie Dropseed C. Big Bluestem E. Little Bluestem G. Indiangrass I. White False Indigo
B. Prairie Dock D. Purple Coneflower F. Black-eyed Susan H. Showy Sunflower J. Prairie Cordgrass

Soil Amendment

What, When, Where and How, Why

❖ **WHAT** - Weed and disease free organic matter:

- Compost
- Well aged, non feedlot manure
- Not peat

❖ **WHEN** - Before planting

❖ **WHERE AND HOW** -

- For irrigated lawns – bluegrass and turf-type tall fescue, add 1 ½” compost tilled in at least 6-8” deep. This is equivalent to 1 cubic yard per 200 square feet
- For moderate water shrubs and perennial flowers, add 1 to 1 ½” compost tilled in. 1” of compost is 1 cy per 300 sf
- For many low and no water use plants, do not improve the soil unless it is a new home with subsoil spread across the lot. In this case, add 1/2”-1” of compost

❖ **WHY** – To improve soil’s ability to absorb and hold water, to improve plant health





Efficient Irrigation

TOP TIPS TO SAVE WATER!

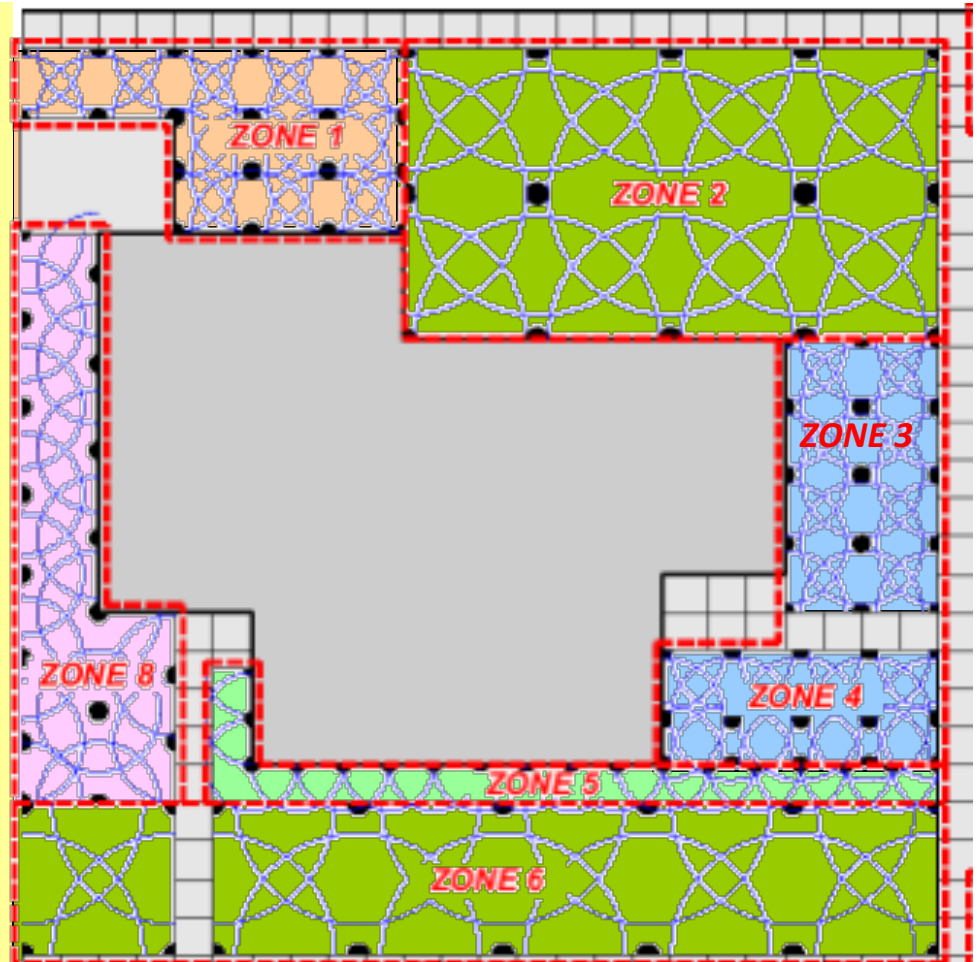
- Tune up your irrigation – Fix broken heads and leaks, correct head spacing, make sure heads have matched precipitation, minimize overspray
- Use a smart controller – ET or Soil Moisture Sensor
- Shift from sprinklers to drip and soaker irrigation:
 - For shrub, groundcover and flower beds, vegetable gardens
 - Can use buried soaker lines for lawns
- Shift from high water use plants to moderate and low water use plants

Sprinkler Zones

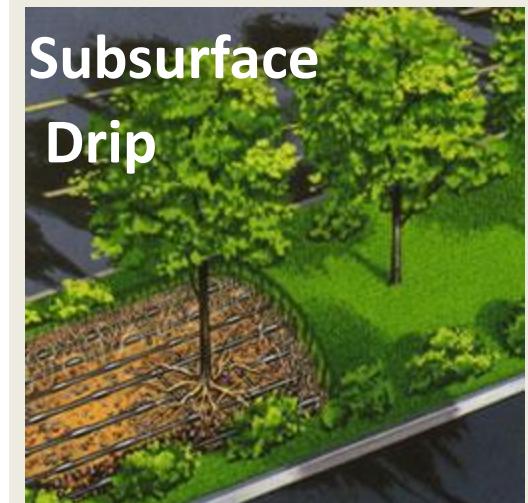
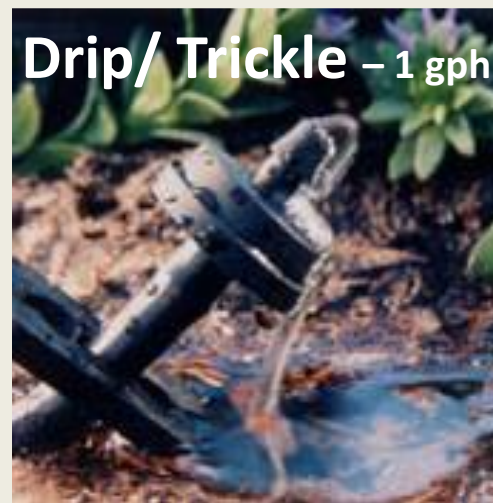
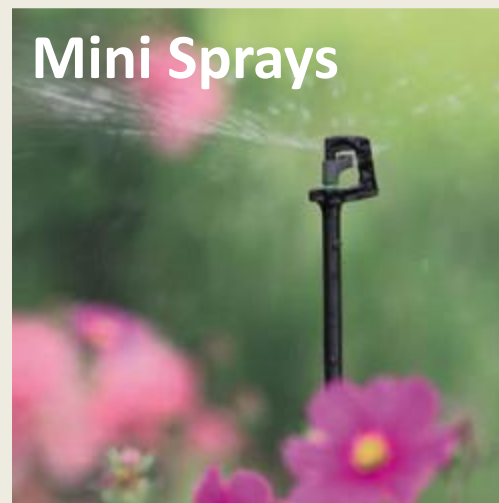
Sprinkler zoning is based on the site conditions

- Soil type
- Microclimates
- Regional ETo
- Slope, area, aspect
- Available Water pressure
- Budget, Etc

Should be designed to work WITH hydrozoning.



Sprinkler Head Options



IRRIGATION RENOVATION

- Convert an entire zone:
 - Method 1:
 - Cap all sprinkler heads except one or two
 - At the remaining sprinkler heads, use Rainbird 1800 Drip Irrigation Retrofit kit to connect new drip irrigation lines
 - Method 2:
 - Disconnect sprinkler line at valve box, run new drip irrigation from valve box

IN EITHER CASE, YOU MAY NEED TO PUT IN A NEW VALVE TO WORK WITH THE LOWER FLOW!

Drip irrigation recommendations:

- Shrubs – 1 1 gallon per hour (GPH) emitter per shrub
- Trees - for new trees, a ring of .6-12 soaker line inside root ball
 - For existing trees – stay with water requirement of tree, and water all plants under the tree
- Perennial flowers and groundcovers - .6-12 soaker line every 12-18”, depending on soil

SUGGESTED WATERING SCHEDULE:

Water one hour three times a week for the first few months

Water twice a week for 1.5 hours by the end of the first season

Water every 5-7 days for 2-3 hours the second year, after spring rains stop

RAINWATER HARVESTING

Restoring the water cycle ~ turning waste into wealth

Naturally, precipitation -snow and rain-

- Is absorbed by the soil where it nourishes soil life
and filters deeply into aquifers*
- Runs off into streams, rivers, lakes and the ocean*
- Evaporates to cycle back into precipitation*

We've broken the cycle~

By paving, building, compacting and eroding soil and desertification

Now urban stormwater is a big problem, causing:

- Destruction of native streams through erosion, pollution and unnaturally fluctuating flow
- Reduced aquifer recharge – leading to aquifer 'mining'

Urban stormwater projects are big and expensive, so there has been a movement towards Low Impact Development – LID, keeping as much precipitation on site as possible.

WHICH IS THE SAME AS RAINWATER HARVESTING!

How much water do we use in landscapes?

- Bluegrass lawn – 1 ½” of water per week for 20 weeks
 - ~20 gallons per square foot per season
 - 30” of water added over 20 weeks
- Turf-type tall fescue lawn - ~ half of bluegrass water
- Low water plants - ~ ¼ of bluegrass water
- Native plants - no additional water, or water diverted by boulders

For an average suburban home on a ¼ acre lot, if you could collect all the precipitation from a 1400 sf house and a 600 sf driveway (20’x 30’), you would collect ~18” of precipitation over 2000 sf, This is enough to double the precipitation in 2000 sf/ 1/5th of the yard, up to about 36” per year. This is enough for many vegetables and common landscaping plants.

How do we harvest rainwater in the Front Range?

Store water in the soil:

- Basins and swales
- Loosened soil
- Areas planted with deeply rooted plants
- Areas with soil improved to increase percolation and storage
 - Add compost
 - Add small rock chip
- Gravel basins

Front Range soils can store from ¼” to 2.5” of water
per foot of soil depth

What is different about Colorado's Front Range?

- Heavy clay soil:
 - Low infiltration rate. From .06" to 2" per hour in most clays. Sandy soils can absorb water at 20" per hour
 - Some soil is expansive clay soil which swells when wet. This can be used to line ponds, but can also destroy house foundations
- Grassland – grasses slow water flow, roots help infiltration
- Run-off is very rare:
 - In contrast to much of the southwest, we very rarely have run-off from planted/natural areas.
- Most of our soil is alluvial deposits – soil eroded from the mountains, with pockets of gravel stream deposits
- Precipitation is spread throughout the year
- Native vegetation has evolved to survive drought and erratic rainfall

Front Range Cautions

- Stay at least 10' away from house foundations
- If your yard has expansive clay soil, consult a soils engineer
- Make sure that water does not stand for more than 12 hours, and don't create saturated soils.
 - In heavy clay soils, plants can die from suffocation in saturated soils.
 - Don't create basins in the root areas of existing trees and shrubs that cannot tolerate poor drainage
 - Saturated soil becomes anaerobic – black and stinky
- Keep water away from existing leach fields

Best rainwater harvesting strategies for the Front Range

- Keep the water from the roof, and any paved surfaces, on your land. Don't allow downspouts to drain directly onto the driveway and into the storm sewer system
- Slow the flow of water so it can percolate into the soil. On sloped land, create almost flat terraces
- Loosen the soil and help the water infiltrate by planting deep rooted plants and mulching
- Create basins and swales to hold water
- Direct downspout water to gardens by creating shallow swales, flagstone 'waterways' or dry creeks.
- Connect downspouts into buried drainpipe to carry water under walkways or to distant beds.
- Direct downspout water into perforated drainpipe in gravel beds to help water infiltrate. Make sure that drainpipe daylights.
- Cut into driveways and large walkways and insert interceptor drains
- Use permeable paving
- Create buried gravel catchbasins

Steps towards rainwater harvesting~

- Check your soil. Dig a hole and fill it with water.
How long does it take to drain?
- Look at sources of water –
 - Roof and downspouts:
 - Which downspouts carry the most water/how big a roof area do they drain?
 - Which downspouts are the highest priority?
 - Any which drain directly into the storm sewer system
 - Those which are close to, but not quite reaching, gardens
 - Those carrying the most water
 - Those currently causing problems – draining near window wells, causing winter ice....
 - Those at the best location for use –high elevation, close to gardens..
 - Paving:
 - Most walkways drain into the yard already and don't need any work
 - Driveways usually drain large amounts of water into storm sewers:
 - Replace with permeable paving
 - Install an interceptor drain to send water into landscape
 - Parking areas:
 - Drain into adjacent landscapes

Mulch

Benefits

- Holds moisture in soil
- Adds organic matter to the soil
- Erosion control
- 'Soil Blanket' –evens out temperatures
- Reduces weeds
- Prevents soil splashing on lower plant leaves reducing some plant diseases

Pitfalls

- Weed barriers (usually)
- Rock mulches
- Mulch mountains

Types of Mulch

- Groundcovers
 - Living plants
- Organic mulch
 - Compost
 - Plant duff
 - Wood or bark
 - Etc.
- Inorganic Mulch
 - Rock of some sort
 - Ground rubber
 - Expanded shale



Marsilia mucronata photo courtesy La Porte Avenue Nursery.

Maintenance Of A Xeriscape

Maintenance goals:

- Keep landscape healthy and attractive while limiting water consumption:
 - Maintain irrigation system
 - Keep plants healthy & attractive
 - Remove weeds that compete for water
 - Maintain soil quality
 - Use sustainable practices



Site Preparation~

Removing Lawn – non-herbicides methods:

- **Clean bluegrass:**
 - Smother with mulch. Only will work with larger plants that can tolerate 3-4” of mulch
- **Weedy bluegrass or non-bluegrass sod**
 - Smother with mulch and paper/cardboard weed barrier. As above, will only work with larger plants such as shrubs and tall perennials and grasses



- Sod cutter - compost it!
- Till repeatedly - water before tilling

Solarize

Site preparation~

Weeds - what is growing on and around the site?

The weeds to be concerned about depend on what you will be planting:

- For example, bindweed is not a problem in large prairie plantings

You **must** take care of any perennial weeds on site before planting

The big three perennial weeds- spreading aggressively through seed and roots- are:

- Canada Thistle
- Bindweed
- Brome and quack grass

Easier to remove perennial weeds include:

- Mallow
- Dandelion
- Chicory
- ‘cancer of the garden’

Annual weeds include:

- Wild lettuce
- Lamb’s quarters
- Pigweed

Non-toxic control includes hand weeding, smothering and ‘top-kill’ products

Soil Preparation~

Loosen soil

- Many suburban soils are very compacted, often quite deeply
 - Till
 - Hand dig
 - Chisel plow

Organic soil amendment?

- Depends on the plant. Many native and xeric plants do not want amended soil
- Might amend soil to increase drainage –shale chip or biochar

Planting~

Plant small! Smaller plants are less expensive and recover from transplanting more quickly

Timing - easier in cool weather, possible April through September
Many southwestern plants need to be planted in early summer to be well enough established for cold weather