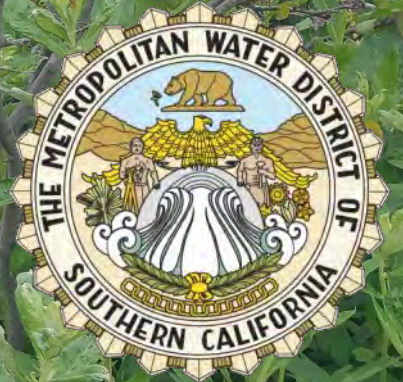


Rain Gardens: Water-Wise Investments in Our Future



Rod Abbott
Watershed Programs Coordinator





To improve water quality, conserve and rehabilitate natural resources, and protect the Santa Monica Bay's benefits and values.



Ballona Wetlands Ecological Reserve



Malibu Lagoon State Park



Stone Canyon Creek @ UCLA



Culver City Rain Garden



LAX Dunes Preserve




Kelp Restoration

Why Rain Gardens?



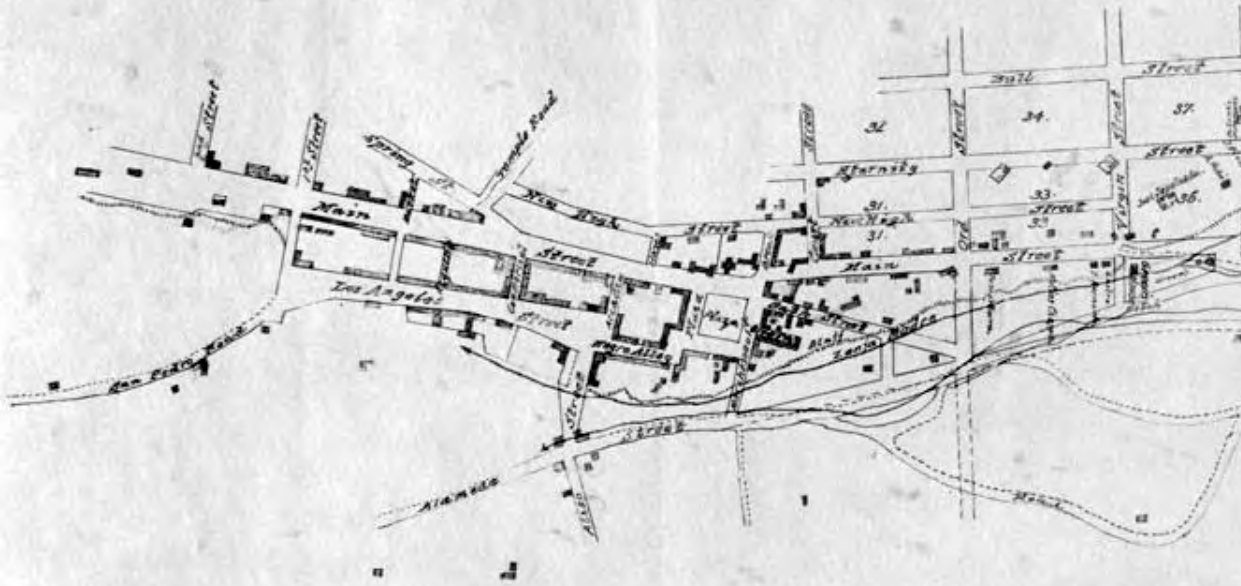


Mediterranean Climate Zones

A scenic view of a city from a hillside under a cloudy sky. The foreground is filled with green foliage. A large, blue, cloud-shaped graphic is centered in the image, containing the text "15 inches per year" in white, bold, sans-serif font.

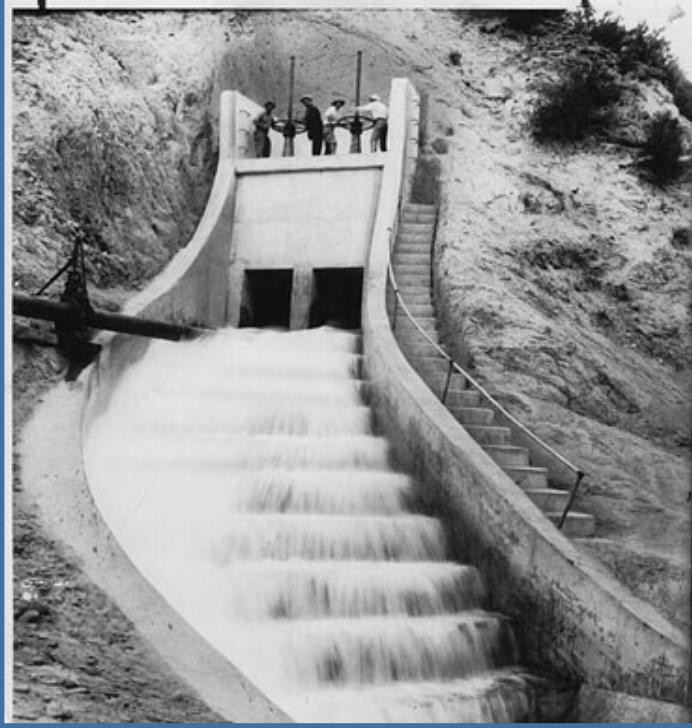
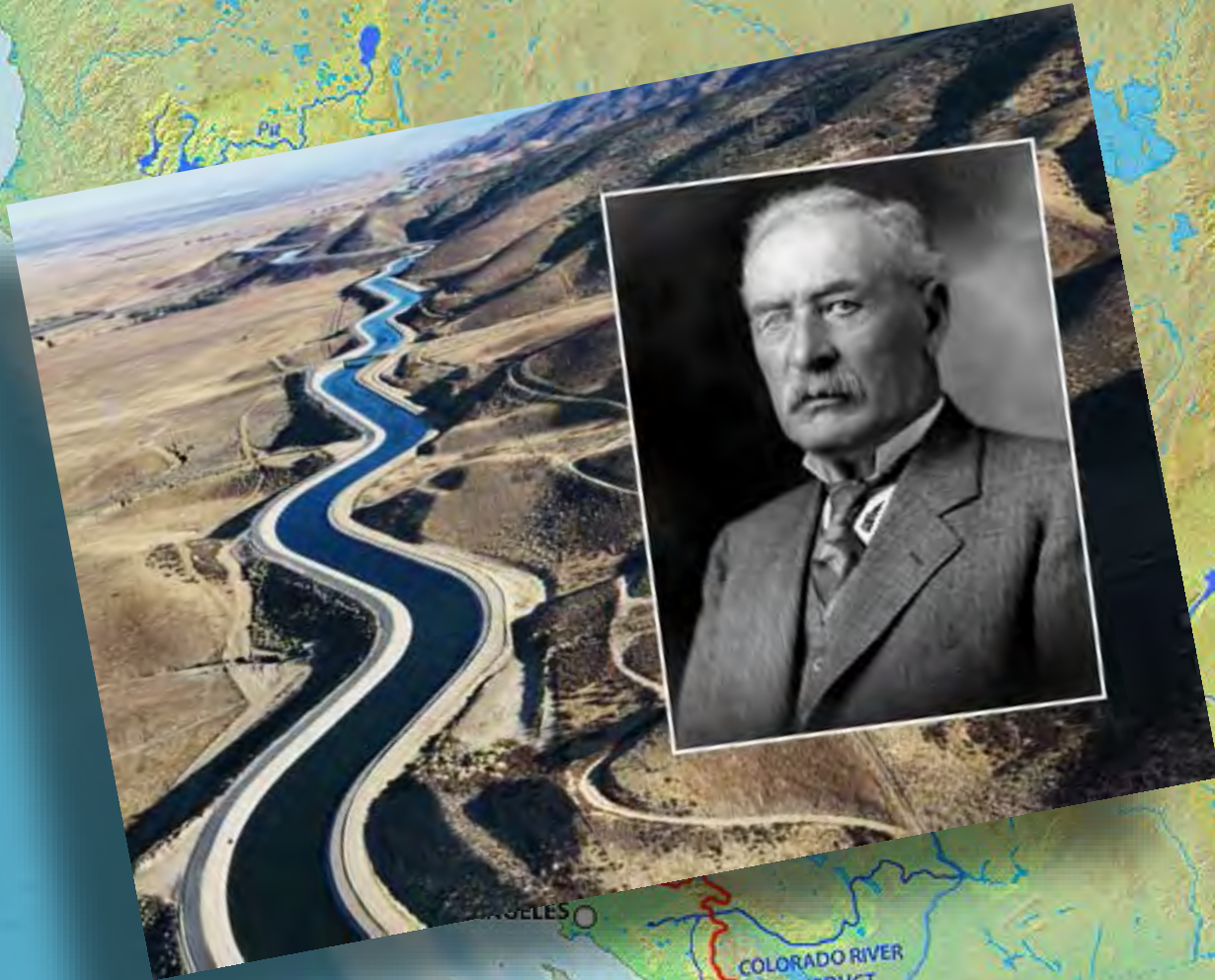
**15 inches
per year**

Map of
Zanja Madre.
Los Angeles
Wm. Moore, 1868



1868: Zanja Madre "Mother Ditch"

Imported Water



Original watershed of Southern California metropolitan area outlined in red

SERIOUS DROUGHT
HELP SAVE WATER

2010-2011
20.20"

2012-2013
8.69"

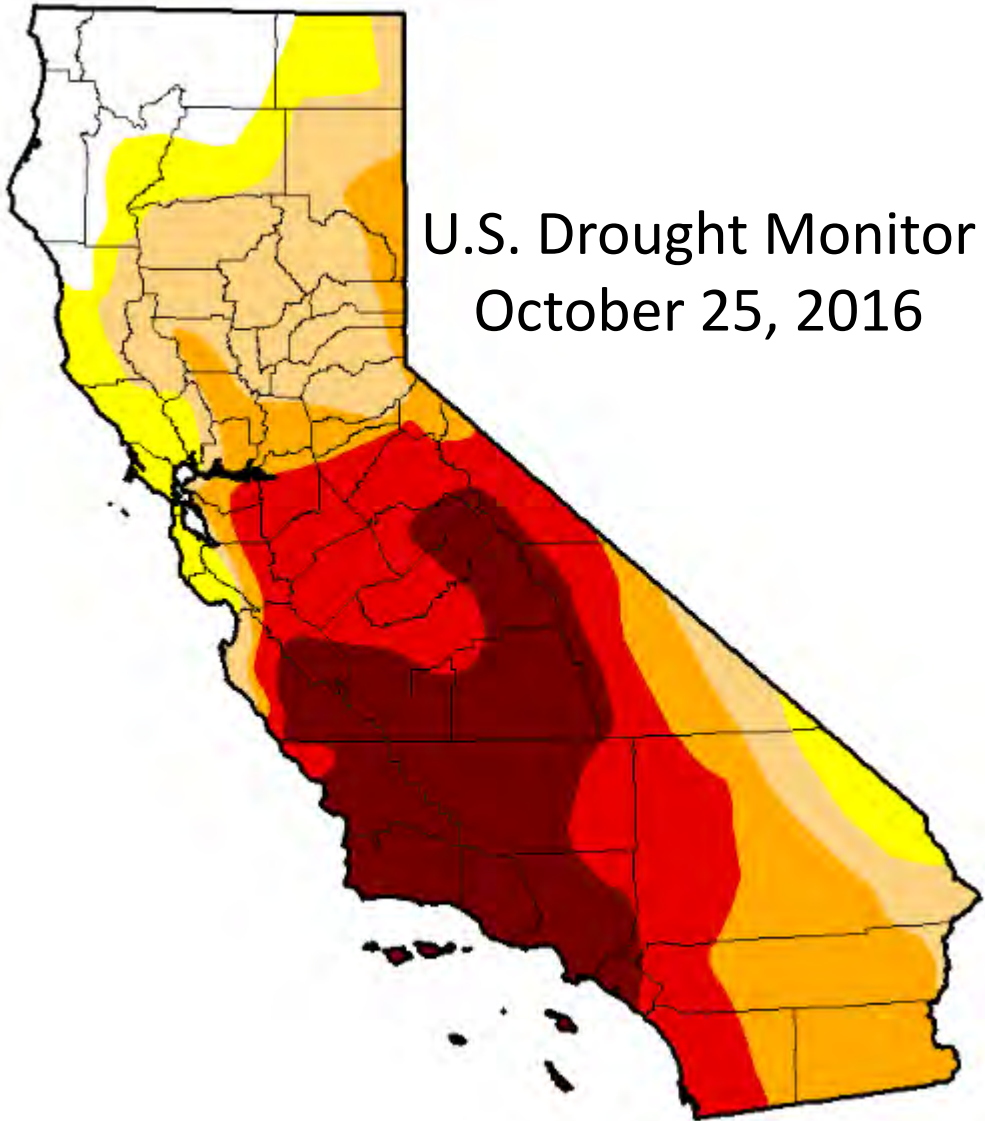
2011-2012
8.69"

2014-2015
8.52"

2015-2016
9.65"

MELROSE AVE
AVENUE 53-473L
101 LA

Southwestern
Law School
LA City College
WEST EXIT



“Drought is the
New Normal”

L.A. Times
April 11, 2016

“Sierra Nevada
Snow Won’t End
California’s Thirst”

New York Times
April 11, 2016

“No, California’s
Drought Isn’t Over”

L.A. Times
April 4, 2016

“Weak El Nino Fails
to Fix California’s
Drought”

Sacramento Bee
Feb 28, 2016



Culver CITY
Rainwater Harvesting Program



Program funded
by the Santa Monica
Bay Restoration Commission



**THIS HOME PROUDLY
HARVESTS RAINWATER.**
Conserve water. Protect our rivers and ocean.

www.CCRainwater.BallonaWatershed.org



Please use water for irrigation only. Do not drink.

396



2012



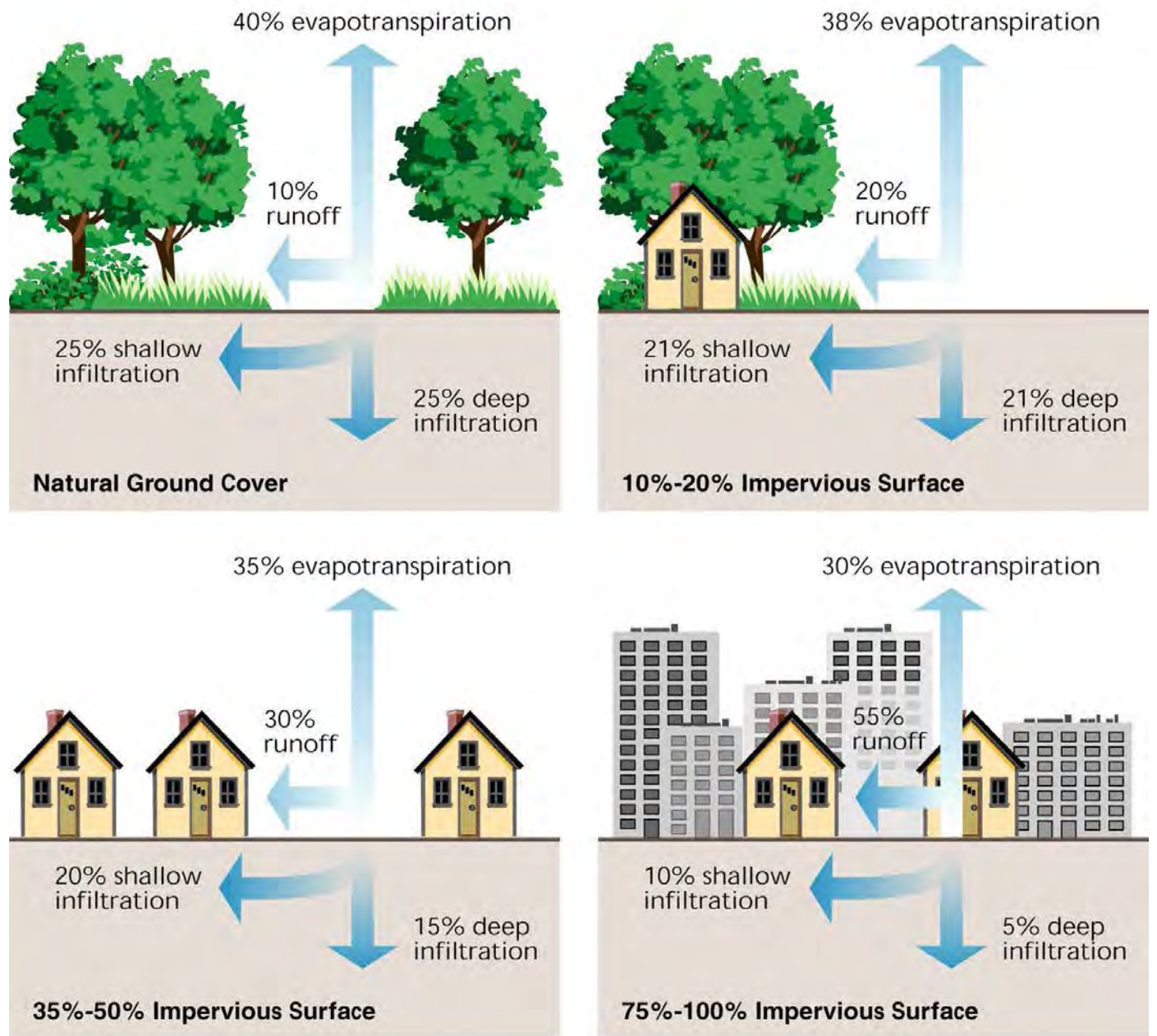


2015

A close-up, high-angle shot of rain falling onto a dark, reflective surface. The raindrops are captured in motion, creating a dense, blurred pattern of white streaks against the dark background. The overall tone is moody and atmospheric.

Rain Water Harvesting

- **Reduce (polluted) runoff**
- **Conserve water use**
- **Pollution reduction**
- **Flood control**
- **Reducing pressure on water supplies**
- **Saves money**
- **Energy reduction**
- **Groundwater recharge**



Before





Pre-Installation Monitoring

- Water Usage
- Stormwater



18,708
gallons per year



9
*months of
monitoring*



Measurements

Lawn Area

Roof Area

Downspouts

Calculating
Runoff
Potential...



Roof Area = Length x Width

Area x 0.623 = Gallons

**1,500 sq. ft. x 0.623 =
Over 900 gallons
per one-inch storm**

**~550 gallons captured
from two downspouts**



Remove the Grass!

Volunteers

Green
Waste

Roots



213



...and many others

Volunteers



Tiller

Trench



Remove Sprinkler System



Bioswale



Rain water and stormwater runoff can be redirected before entering the drainage system, allowing excess water to be utilized rather than discharged.

Native plants that have adapted to the climate can survive with minimal maintenance or supplemental watering, and provide food and habitat for birds and insects.

Sloped edges direct stormwater into the bioswale.

The root systems of plants redistribute moisture and sustain microbial populations, as well as filter contaminants from water runoff before entering the natural waterways via the drainage system.

A bioswale is a landscape element designed to redirect rainwater runoff for plant use and stormwater filtration. Water flows into the bioswale, over its sloped edges, where contaminants and inorganic materials are filtered by the soil and through the root system before entering the drainage system, and eventually into natural streams and water bodies.

BIOSWALE

Bioswale





Bioswale



Boulders!

*Bioswale
Drainage
System*



Cobble





*Prepping
to Plant*

*Prepping
to Plant*

*Tamping
the Soil*

Planting





*Carex
barbarae*

Santa Barbara Sedge

***Elymus
triticooides***



Creeping Wild Rye



*Carex
praegracilis*


Field Sedge

<http://www.calfloranursery.com/file/carex-praegracilis.jpg>

Sisyrinchium bellum

*California
Blue-Eyed Grass*





*Juncus
patens*

California Grey Rush

*Rosa
californica*



California Rose

http://www.nativeplants.com/images/new_botimages/large/0003_s.jpg

*Stipa
pulchra*

California State Grass

Purple Needle Grass

Weed Management





Mulch

Done!













*December
2015*





March
2016



**Common
Yarrow**

(Achillea millefolium)

**Snowy
Penstemon**

(Penstemon spectabilis)

**Common
Deerweed**

(Acmispon glaber)

Results

	Site 1	Site 2	Site 3	Site 4
Rain Garden Completed	April 2015	May 2015	June 2015	July 2015
Pre-Implementation Monitoring				
Pre-Implementation Monitoring Date Range	8/18/2014 – 3/21/2015	8/18/2014 – 5/22/2015	12/16/2014 – 6/14/2015	1/3/2015 – 7/14/2015
Monitoring Days	215	277	180	192
Gallons (total sub-meter reading)	8,405	5,808	4,977	2,641
Number of Sprinkler Heads Included	6 out of 12	9 out of 22	7 out of 15	6 out of 14
Total Gallons	16,810	14,197	10,665	6,162
Yearly Extrapolation	28,538	18,707	21,626	11,714
Post-Implementation Monitoring				
Post-Implementation Monitoring Date Range	5/18/2015 – 3/4/2015	5/28/2015 – 1/5/2015	6/15/2015 – 3/4/2015	7/21/2015 – 3/4/2015
Monitoring Days	291	222	246	216
Gallons (total sub-meter reading; one hose per site)	1,290	2610 ⁽¹⁾	1,695 ⁽²⁾	1,904 ⁽³⁾
Yearly Extrapolation	1,618	4,311	2,514	3,217
	March 2016			
Annual Extrapolated Percent Change	-94%	-77%	-88%	-73%



THE METROPOLITAN WATER DISTRICT
OF SOUTHERN CALIFORNIA

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The Garden Spot



California Friendly® Gardens - every bit as beautiful, not nearly as th



What's New

How-To Videos

Check out the California Urban Water Conservation Council's video library for landscaping ideas.

15 Water Conservation Facts

Check out our infographic of money-saving tips during this unprecedented drought.



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Local Plant Nurseries

Purchase native and California Friendly® p

California Friendly® Gardens

Visit gardens near you

California Friendly® Landscape and Gardening Classes

Take classes online or in your community

Local Plant Nurseries

El Nativo Growers, Inc.

Growers of Quality Plants for the California Landscape

Wholesale Professionals
General Public





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California Friendly Gardens



RANCHO SANTA ANA
BOTANIC GARDEN



Dominguez Rancho Adobe Museum



Descanso Gardens



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Classes



Thank You!

Special Thanks to:
Marcia Ferreira (MDW)
Karina Johnston
Ivan Medel
Mark Abramson
Homeowners
& Our Volunteers

Questions?

rabbott@santamonicabay.org