



***Management of the Central and  
West Coast Groundwater Basins***

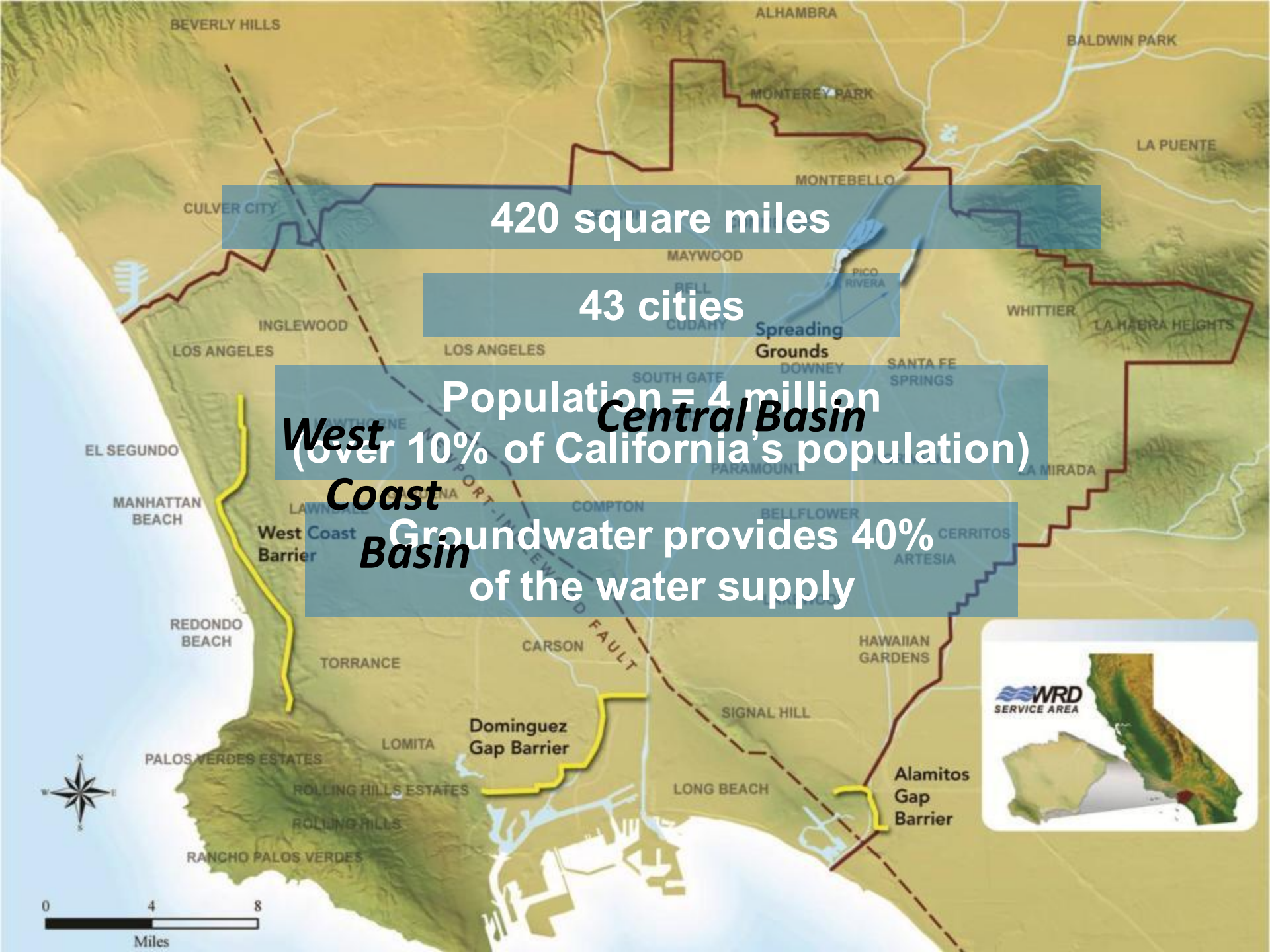


***Ted Johnson, PG, CHG  
Chief Hydrogeologist***









420 square miles

43 cities

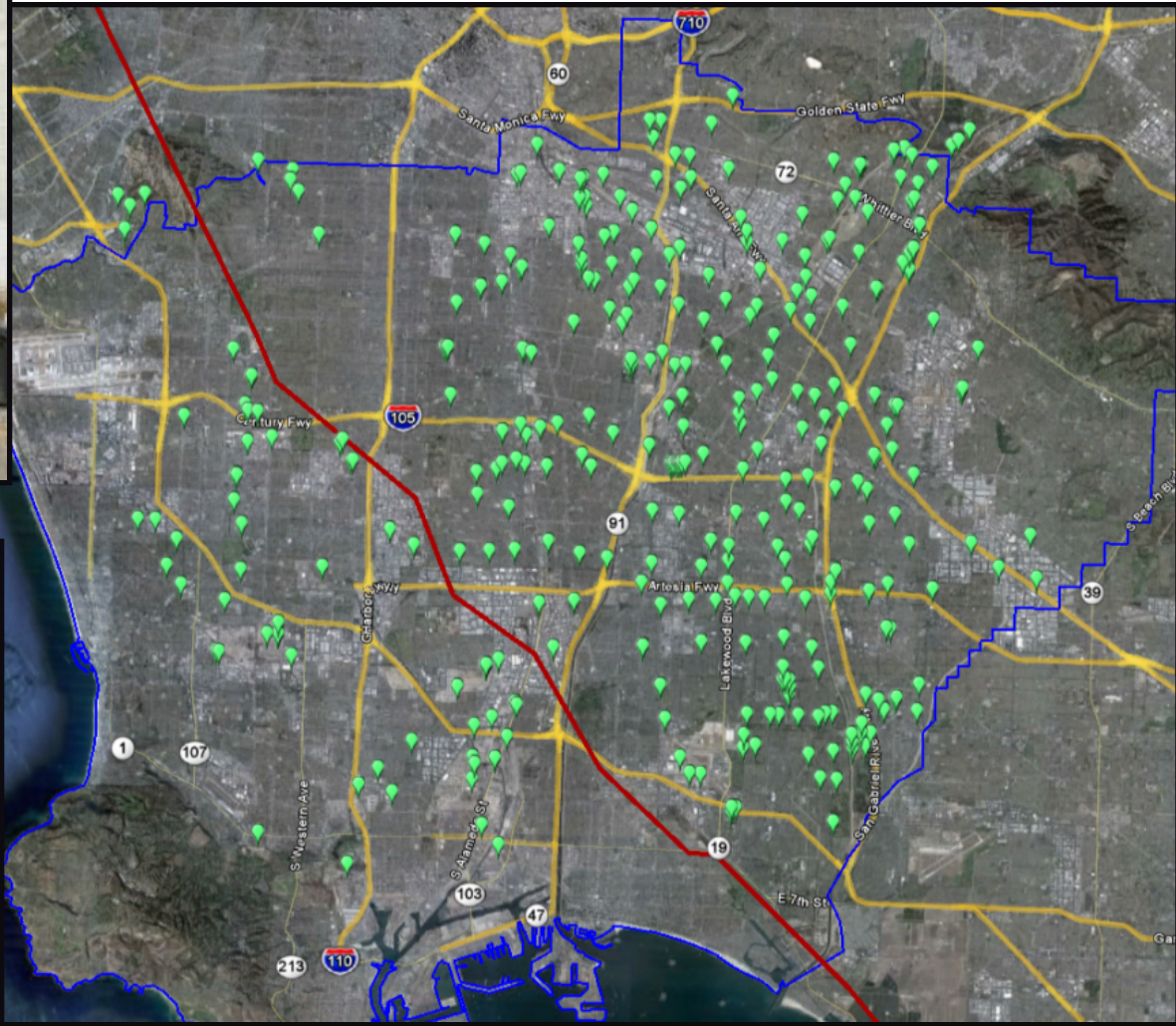
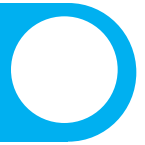
Population = 4 million  
*West Coast Basin* (over 10% of California's population)

*Central Basin*  
Groundwater provides 40% of the water supply





# Wells Provide Local Water Supply



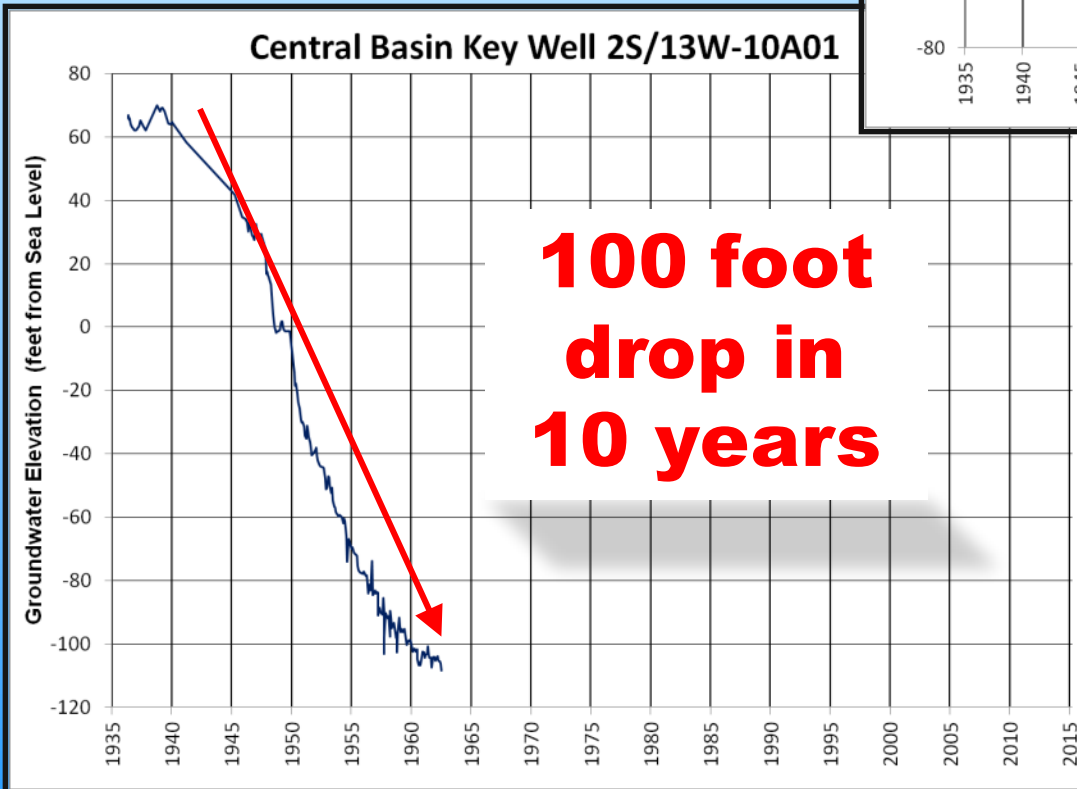
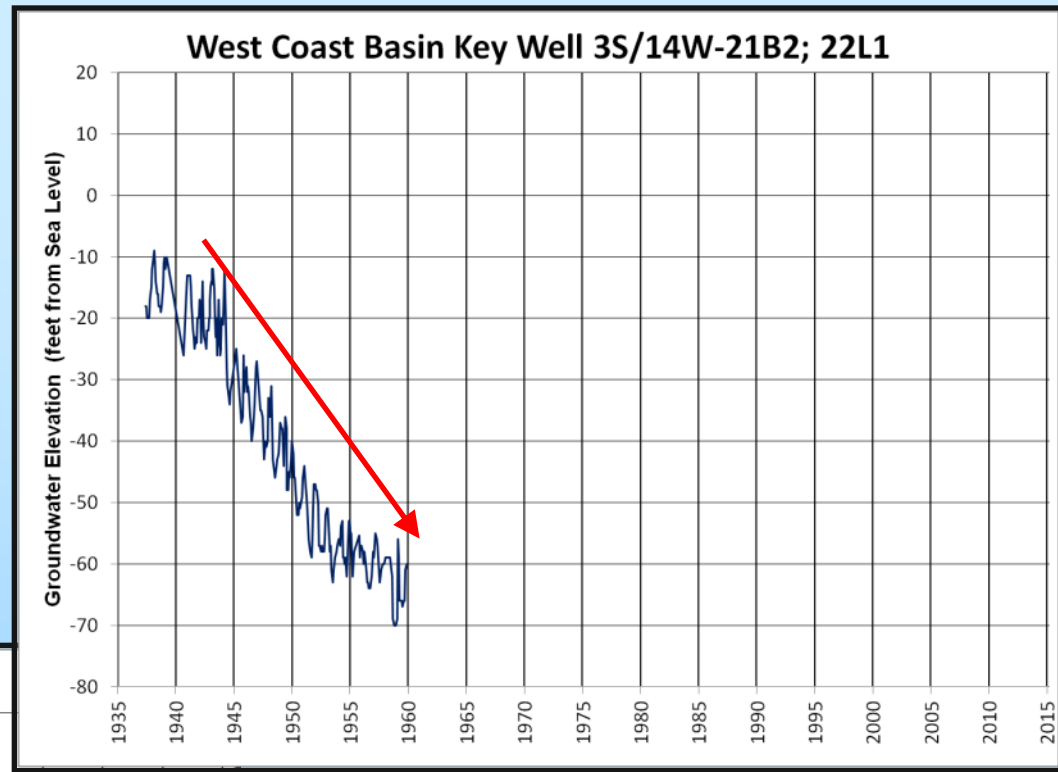


# Over 100 Years Ago – Flowing Artesian Wells





# 1900s-1950s Pumping Much Greater than Natural Replenishment. **OVERDRAFT**



**100 foot  
drop in  
10 years**

- **Plunging Water Levels**
- **Loss of Supply**
- **Wells going Dry**
- **Seawater Intrusion**



# Solutions...

- 1) WRD formed in 1959 to replenish the basins to eliminate overdraft and to protect water quality.***
- 2) Court adjudicated groundwater pumping in the 1960's to cap pumping at 281,835 acre feet/year. Still higher than natural replenishment, with WRD making up the difference.***
- 3) LA County Flood Control installed 16 miles of wells along the coast to stop seawater intrusion.***



# Spreading (infiltration) Basins

**West Coast Barrier**

**Dominguez Gap Barrier**

**Alamitos Barrier**

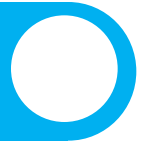
**Alamitos Gap Barrier**

**Spreading Grounds**





# L.A. County Replenishment Facilities



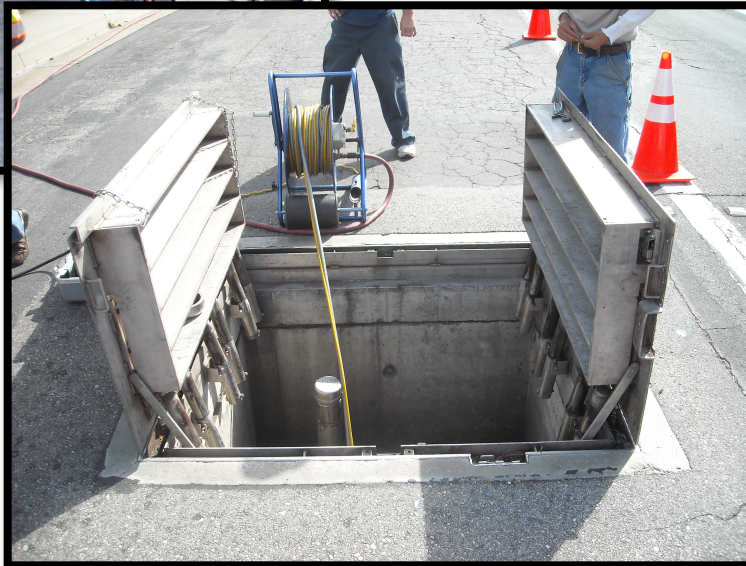
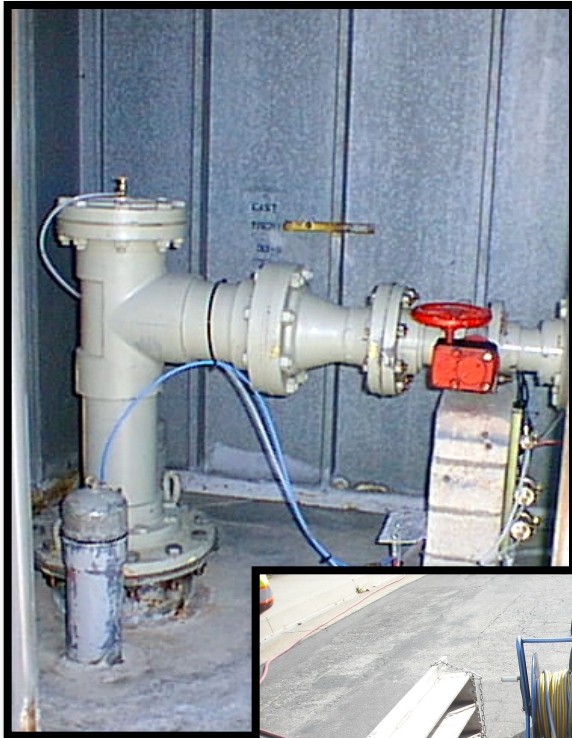
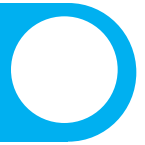
Rio Hondo  
spreading basins



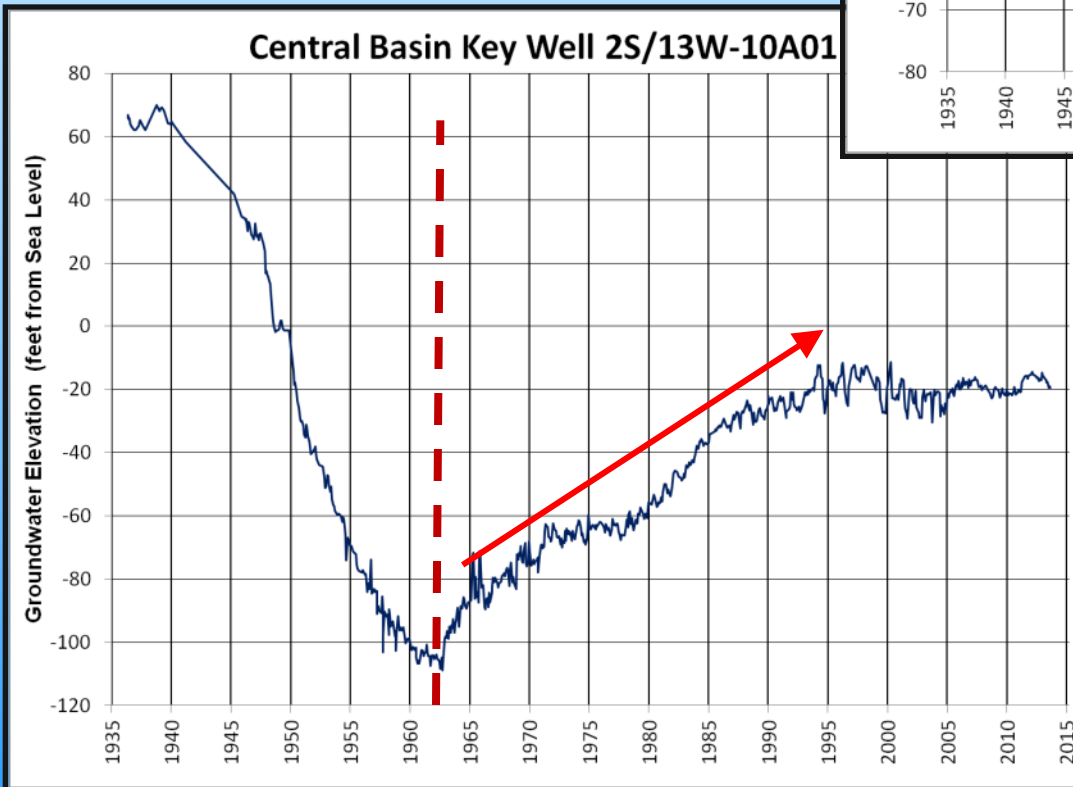
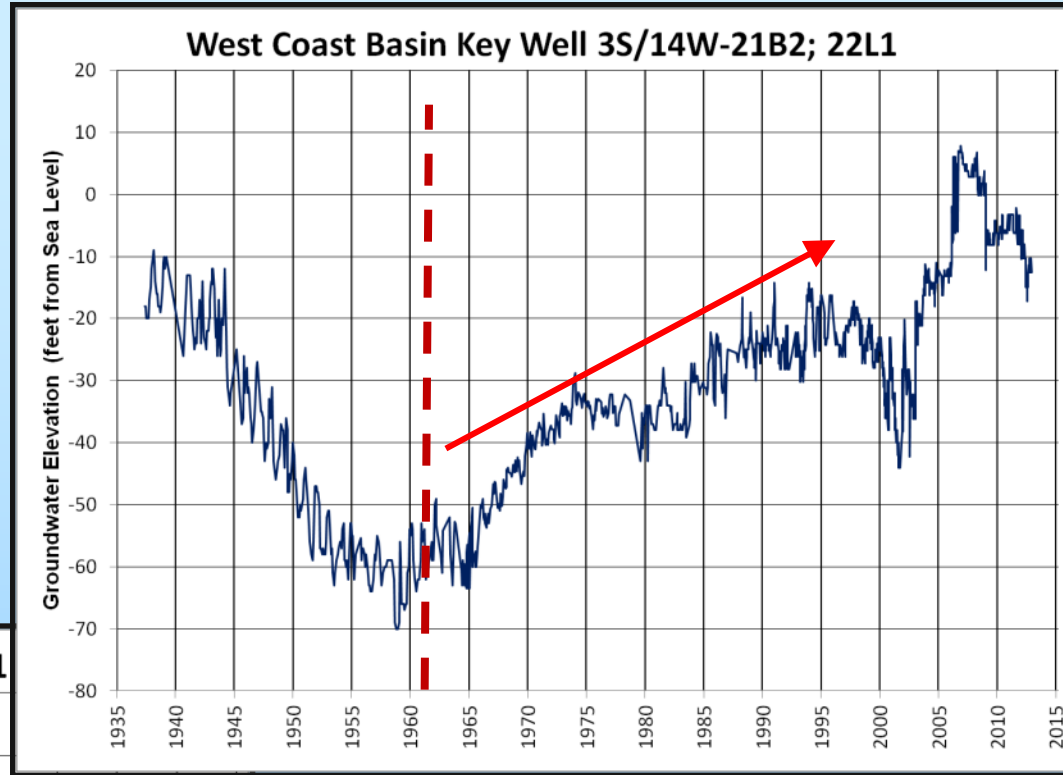
San Gabriel River  
spreading basins



# L.A. County Seawater Barrier Wells



# RESULTS of Groundwater Management ...



**... Rising Water  
Levels, Drought  
Protection,  
Seawater  
Intrusion  
Protection**



# Replenishment Water Costs

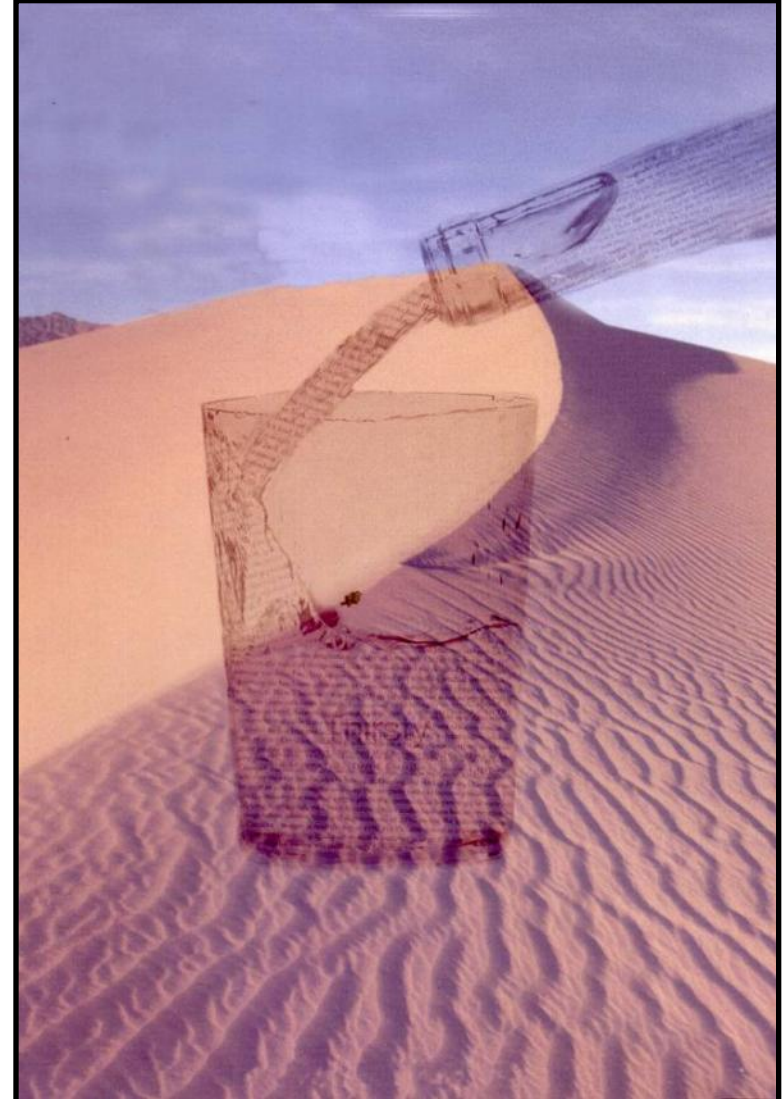
- *WRD's cost to replenish over 100,000 afy is \$42 million (< 1 cent per gallon).*
- *Additional cost for projects/programs, overall budget ~ \$68 million / year.*
- *Most expensive water source is imported water (\$744 - \$1,300 /af)*
- *Recycled is less expensive and more reliable (\$63 - \$900 / af)*
- *Monies are collected from a pumping fee (replenishment assessment) currently \$283 / af. Anyone who pumps groundwater pays to replace it.*



# Current Challenges Facing WRD...



- **Climate change / drought / environmental concerns reduces available recharge water.**
- **Imported water is less available and expensive.**
- **WRD needs to find alternative sources for recharge.**







- **Collection of projects to eliminate WRD demand for imported water**
- **Projects to:**
  - *Capture and conserve additional stormwater*
  - *Increase use of recycled water for groundwater replenishment*
- **Creates locally sustainable groundwater**

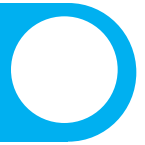


GROUNDWATER RELIABILITY  
IMPROVEMENT PROJECT

- **GRIP is the cornerstone of WRD's WIN Program.**
- **GRIP will provide 21,000 acre-feet per year of recycled water in place of expensive and less reliable imported water.**
- **Upon completion, groundwater basins will be completely locally sustainable**

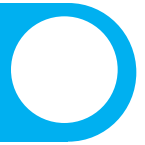


# Future GRIP Facility



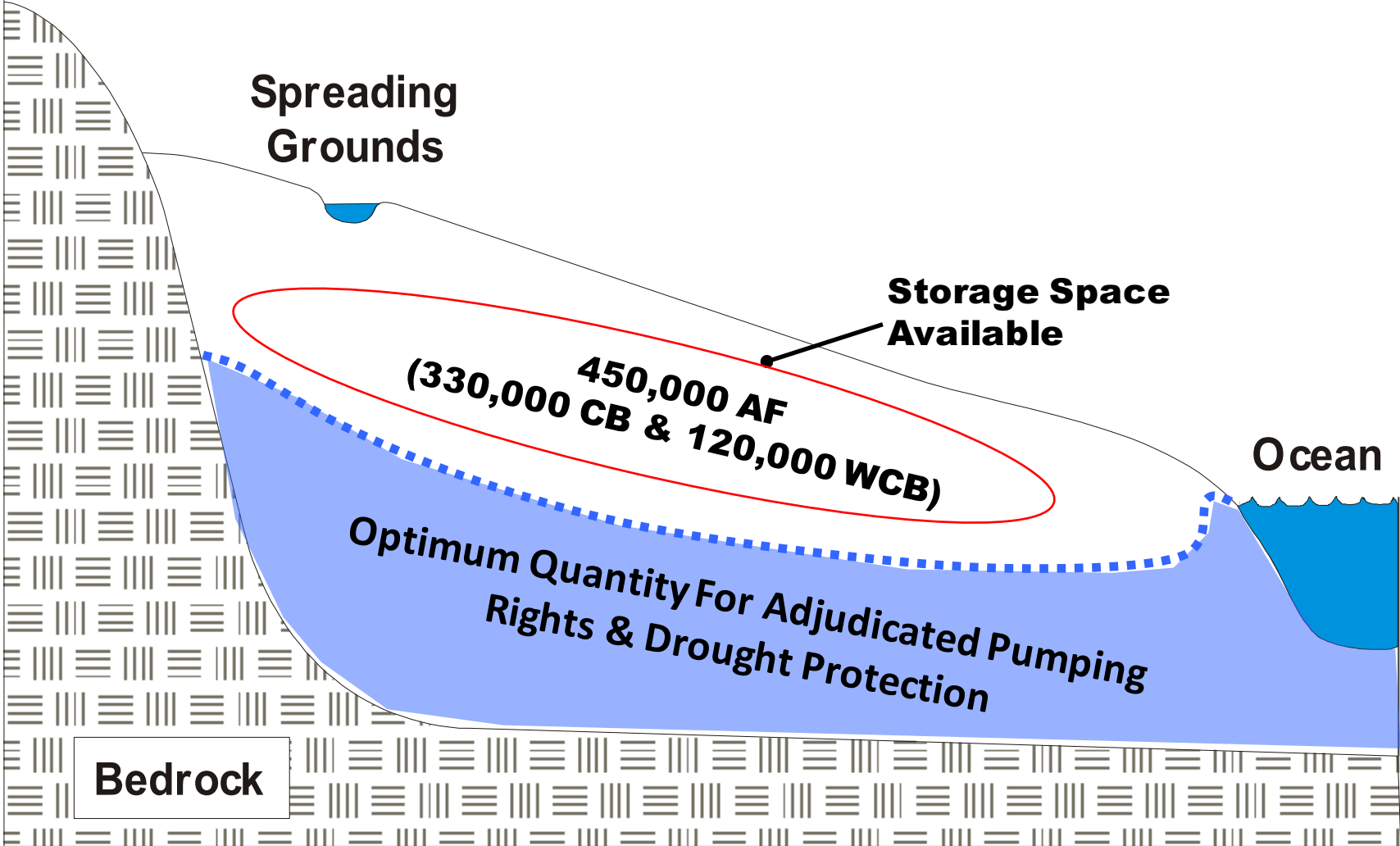


# Future GRIP Facility



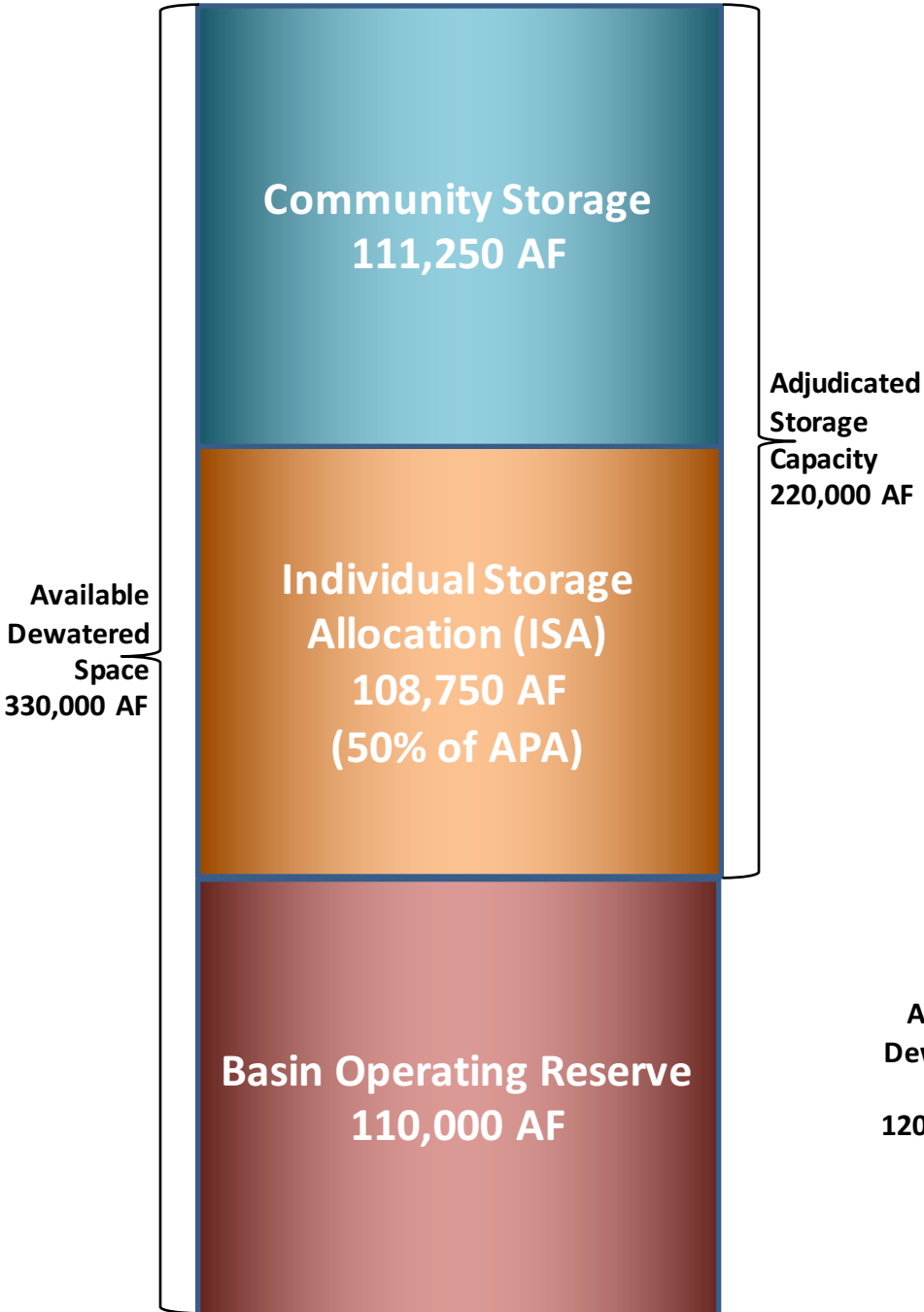


# Groundwater Storage

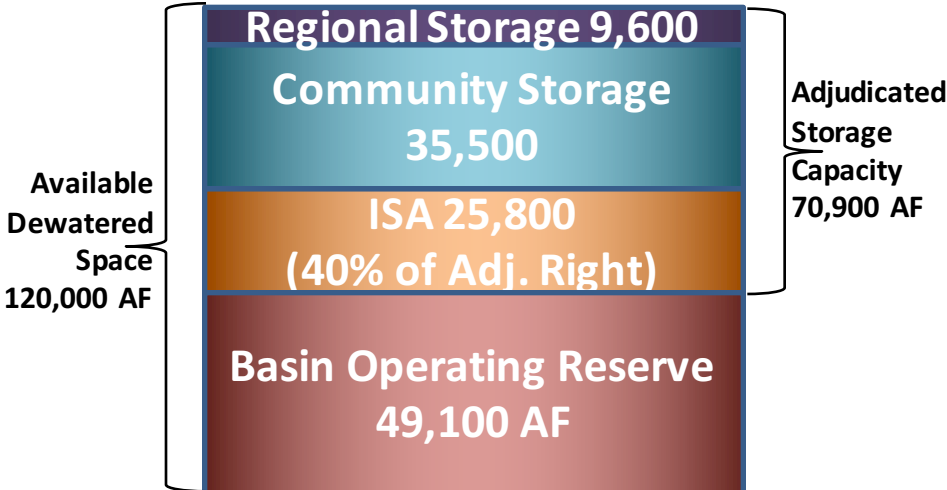


# Central and West Coast Basin Storage Categories

## CENTRAL BASIN



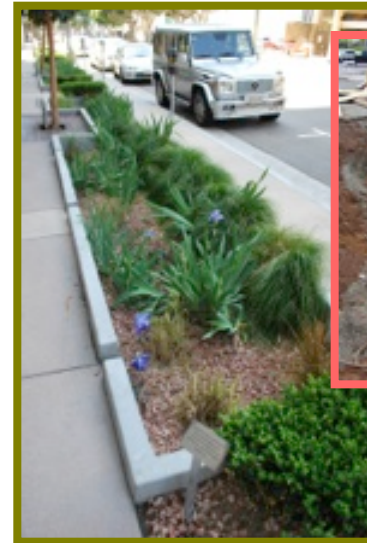
## WEST COAST BASIN





# Local Stormwater Infiltration Projects

- Neighborhood and local business scale distributed low-impact developments (LIDS).
- Expands options for stormwater capture beyond centralized facilities (spreading grounds).
- Smaller footprint, lower recharge amounts, and higher unit costs than centralized facilities, but potential for meaningful capture of stormwater and water quality improvement when taken together and done in the right places.



## Main Objectives

- Develop a prioritized list of locations for stormwater capture and recharge.
- Develop and model pilot project to assess recharge contribution.

## Key Questions

- Which areas are most suitable for stormwater recharge projects?
- Can distributed stormwater infiltration be implemented cost-effectively for recharge purposes?



# Prioritizing Stormwater Catchments



Sought regional expertise to evaluate:

## Opportunities

- Existing or planned projects
- Demonstrated success
- Potential partners

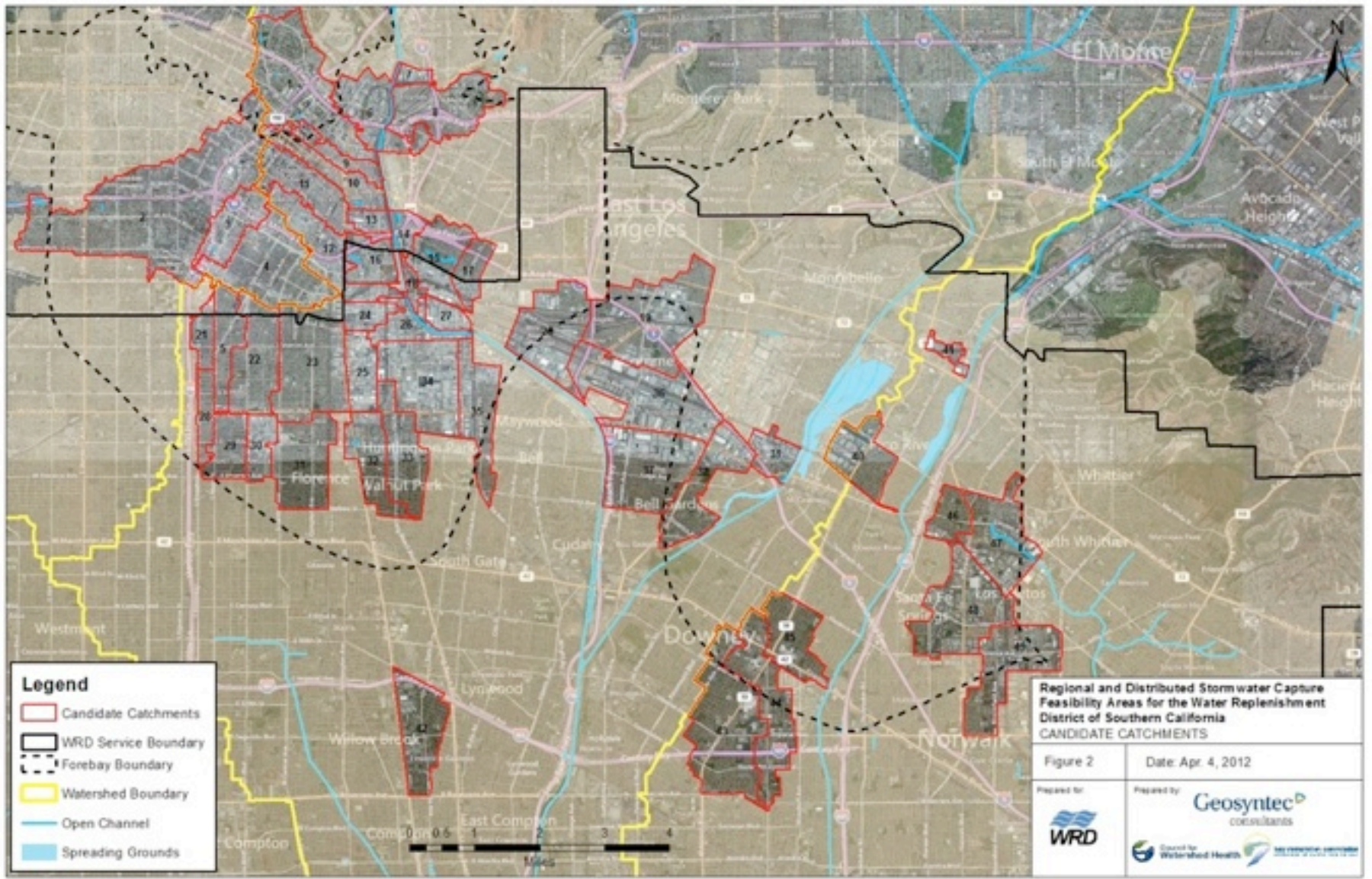


## Constraints

- Soil & Groundwater Contamination (GeoTracker, Envirostar)
- Surface Water Impairments & TMDLs (LARWQCB)
- Dewatering Permits (LARWQCB) and maps of shallow groundwater
- Land Disposal Sites (GeoTracker)
- Waste Discharge Requirement Sites (Geotracker)
- Soil Types (catchments overlying soils and geology not conducive to recharge aquifers).

Used Geographic Information System (GIS) layering to evaluate

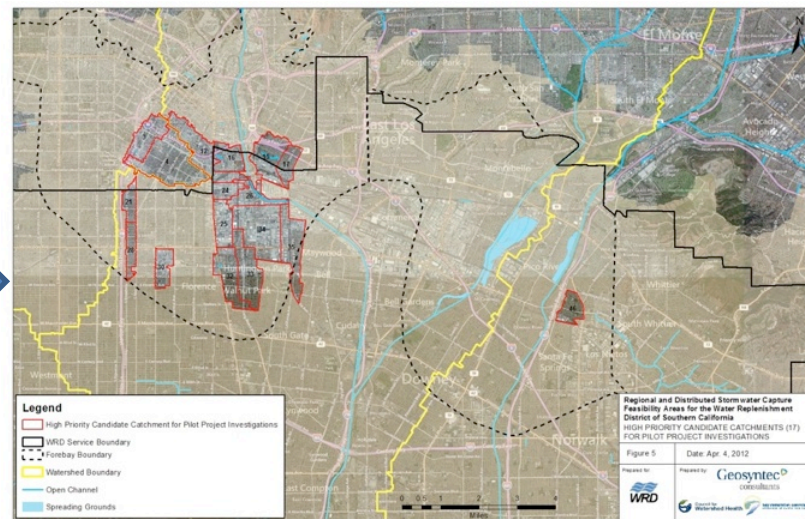
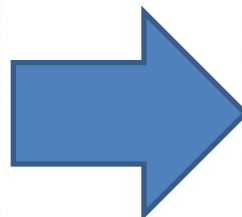
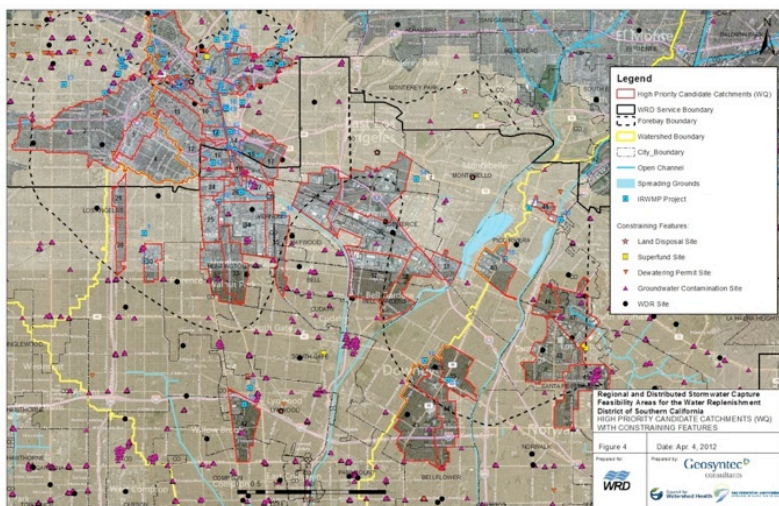
# Initial Feasibility Analysis Identified 49 Candidate Catchments out of 1,129 Catchments Investigated (4%)







## Opportunities + Constraints Analysis Resulted in 17 High-Priority Catchments

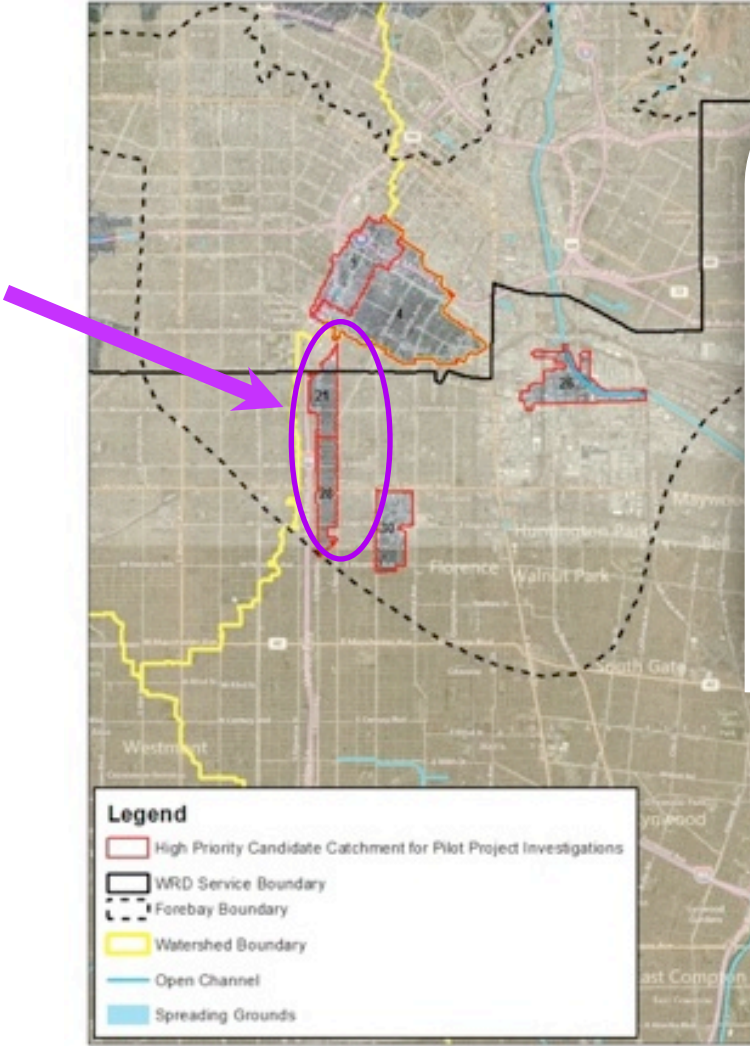


# Findings:

- **17 catchments show greater feasibility for stormwater capture to augment Central Basin and West Coast Basin**
  - ✓ Implementation of 17 distributed and subregional BMPs could capture ~4,300 AF/yr during an average rainfall year.
  - ✓ 32 additional opportunity catchments show potential for another ~12,700 AF/yr of stormwater capture with appropriate projects.
- **Most stormwater capture projects are *very expensive (\$/af)* for a water supply agency to fund alone. Show multiple benefits for multiple funding partners. Apply for grants & loans.**



# First Project Completed: Broadway Neighborhood Stormwater Greenway Project



COUNCILMEMBER CURREN D. PRICE, JR., THE NEW 9TH AND LA SANITATION

INVITE YOU TO THE

## Broadway Neighborhood Stormwater Greenway Project

### Ribbon-Cutting Ceremony

May 26, 2016 at 10:00 a.m.

5000 S. Broadway, Los Angeles, CA 90037  
(parking lot of the Paradise Baptist Church, 5100 S. Broadway)

Legend	
	High Priority Candidate Catchment for Pilot Project Investigations
	WRD Service Boundary
	Forebay Boundary
	Watershed Boundary
	Open Channel
	Spreading Grounds

Regional and Distributed Stormwater Capture Feasibility Areas for the Water Replenishment District of Southern California	
HIGH PRIORITY CANDIDATE CATCHMENTS (8) FOR PILOT PROJECT INVESTIGATIONS	
Figure 6	Date: Apr 4, 2012
Prepared for:	Prepared by:



***Thank You***



**WATER REPLENISHMENT DISTRICT  
OF SOUTHERN CALIFORNIA**