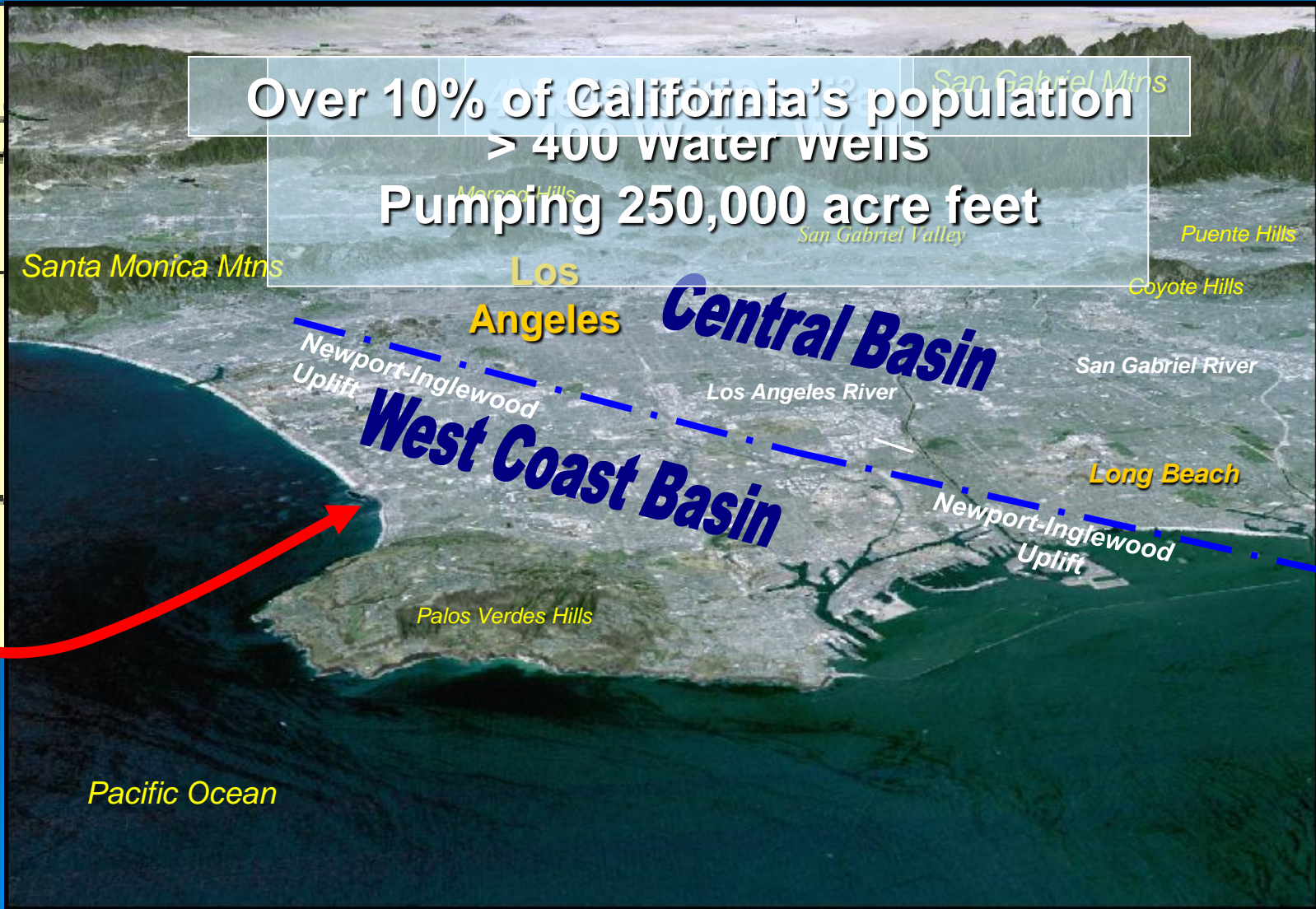
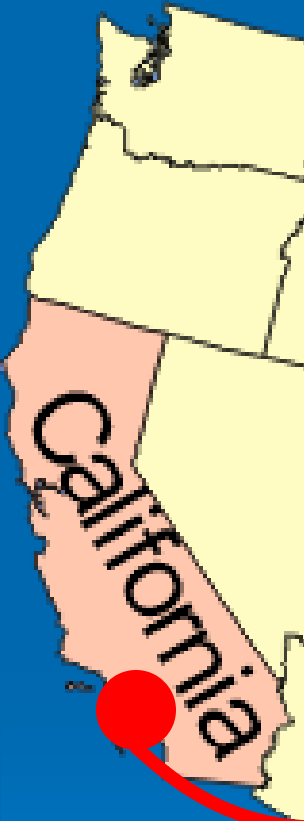




*Developing Local Resources for
Groundwater Replenishment*



Local Groundwater Supply Central and West Coast Basins



Over 10% of California's population
> 400 water wells

Pumping 250,000 acre feet

Central Basin

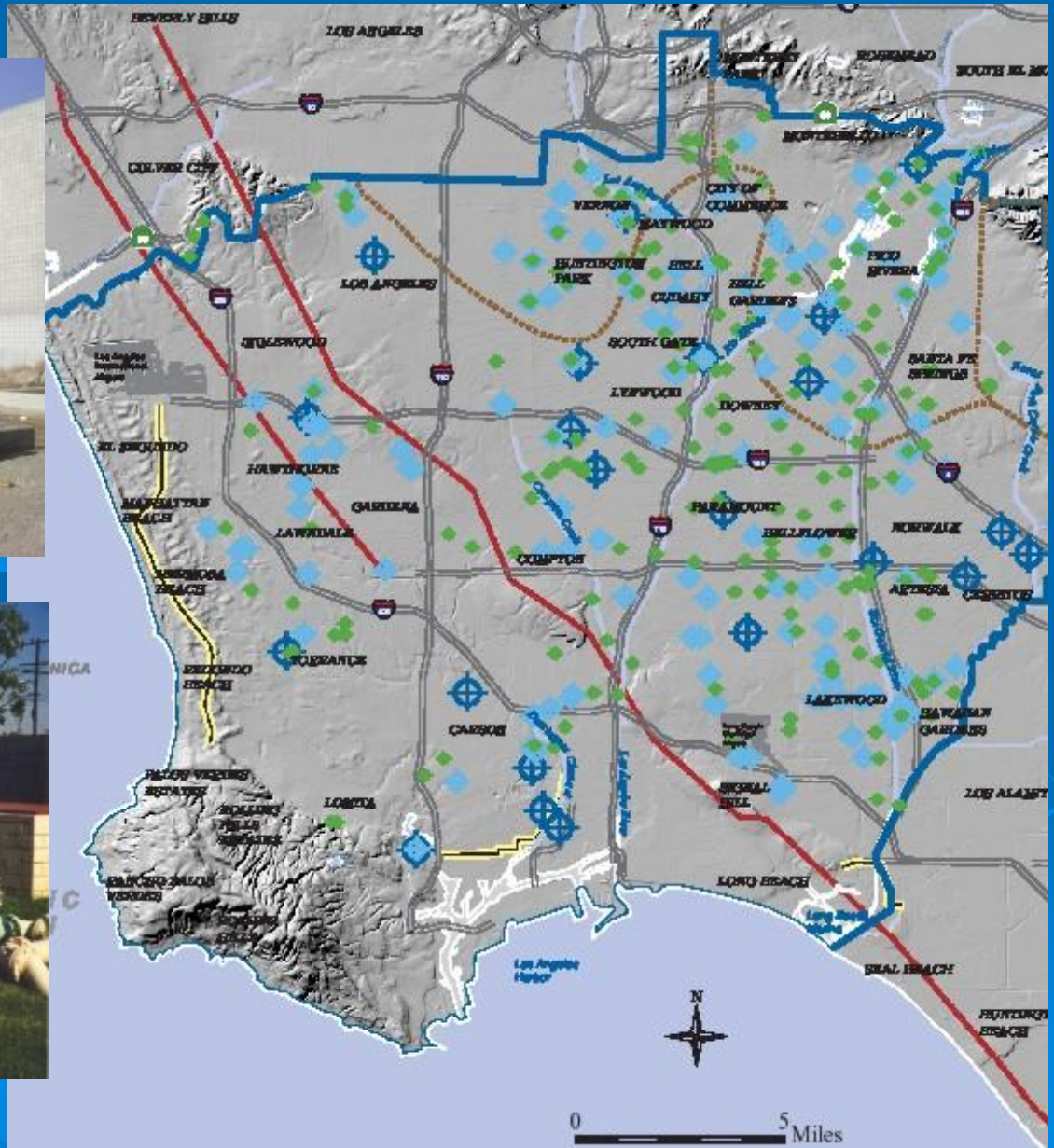
West Coast Basin

Los Angeles

Long Beach

Pacific Ocean

Water Wells – over 400 active wells

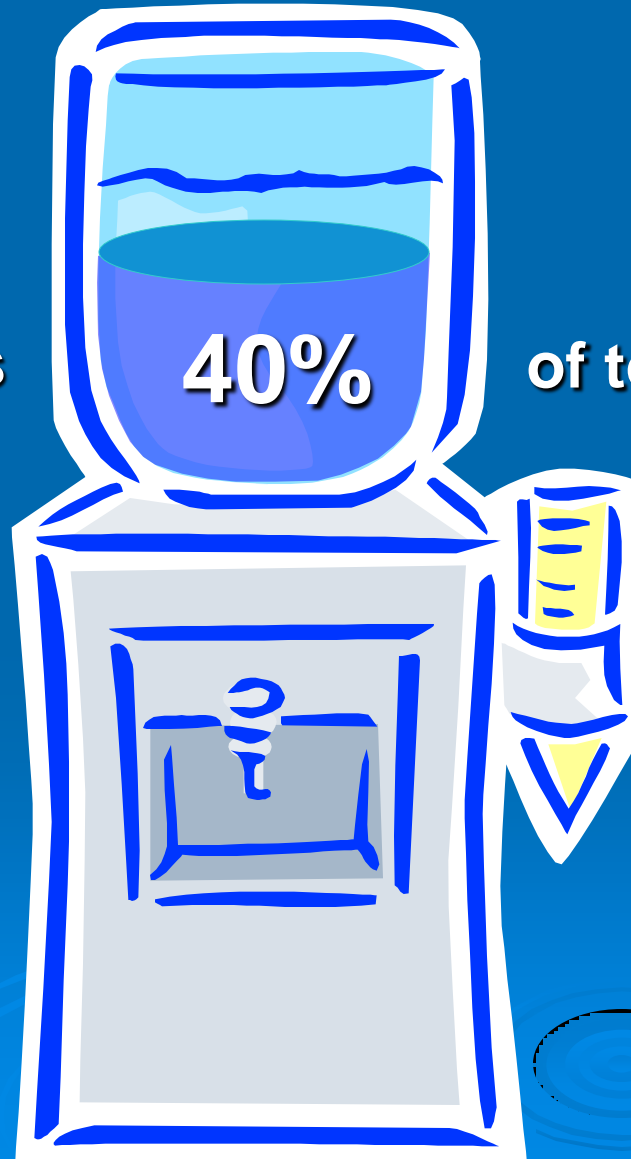


In our region...

Groundwater provides

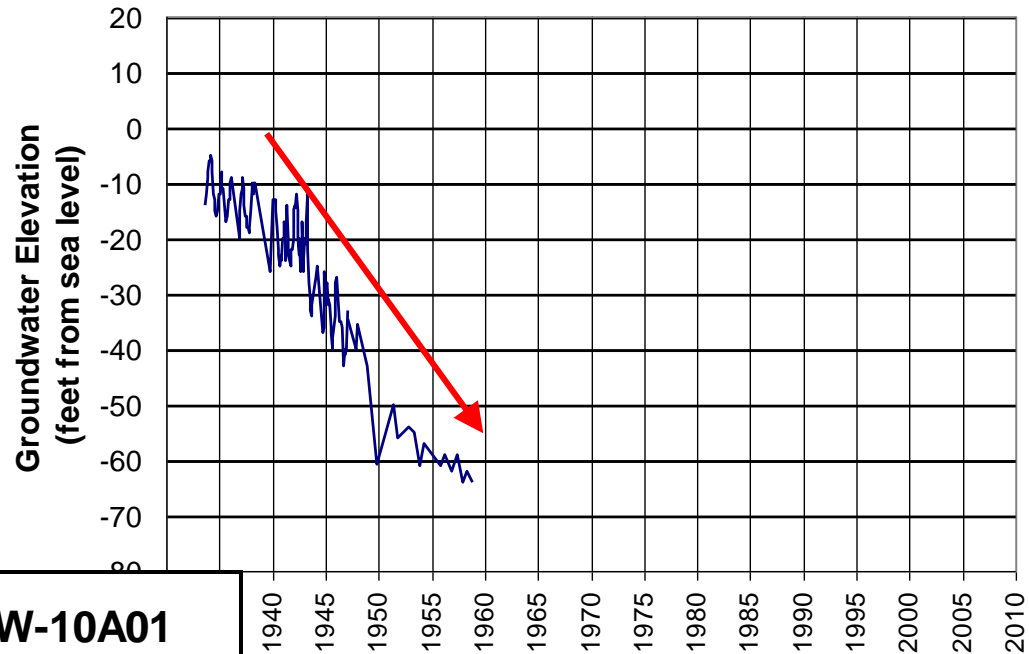
40%

of total water demand.

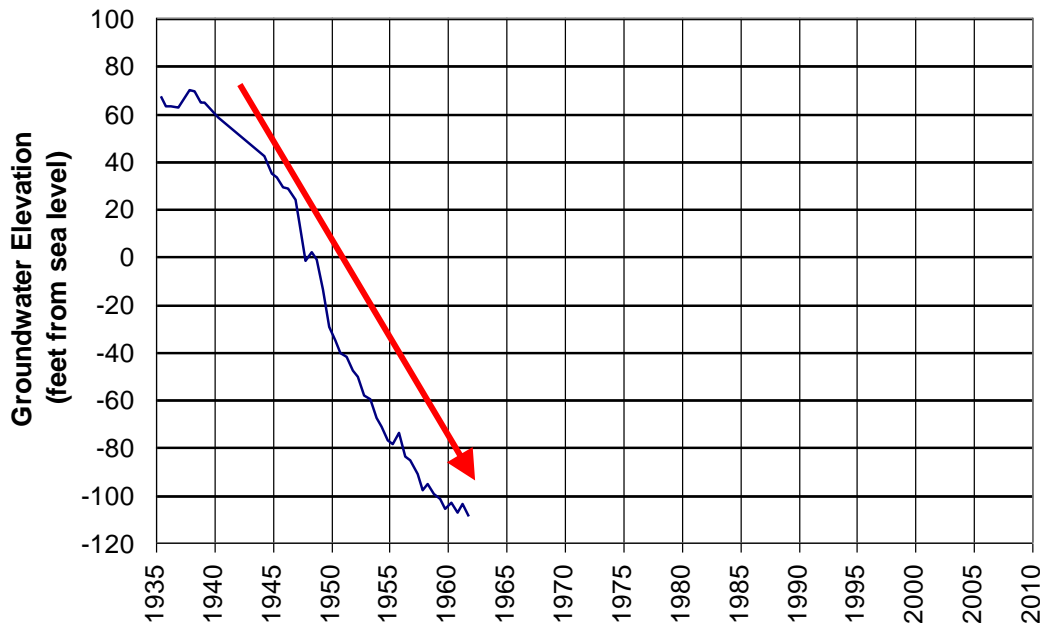


1900s-1950s OVERDRAFT

West Basin Key Well 3S/14W-22L01



Central Basin Key Well 2S/13W-10A01



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

Solutions

- 1) Court adjudicated (capped) groundwater pumping to 92 billion gallons per year (281,835 acre feet per year).
- 2) LA County Flood Control District installed 16 miles of injection wells along the coast to pump in freshwater and stop the seawater intrusion.
- 3) WRD formed in 1959 to replenish aquifers and protect groundwater quality.



Natural groundwater wasn't enough to meet demand





Los Angeles

Surface Recharge

Whittier

Inglewood

Coastal Injection

Long Beach

Orange County

Pacific Ocean

Torrance

5 miles

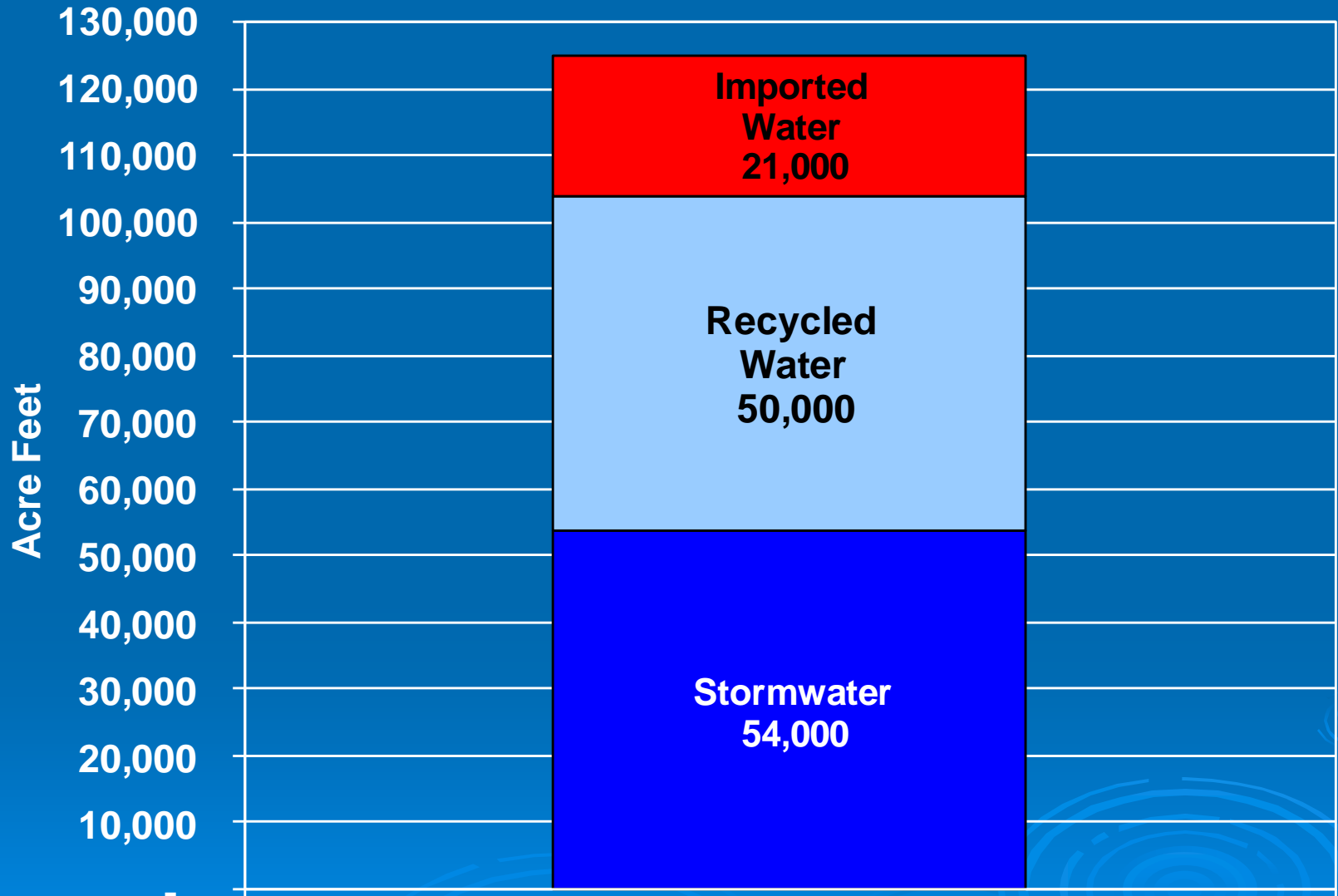
5 km

**Rio Hondo
spreading grounds**



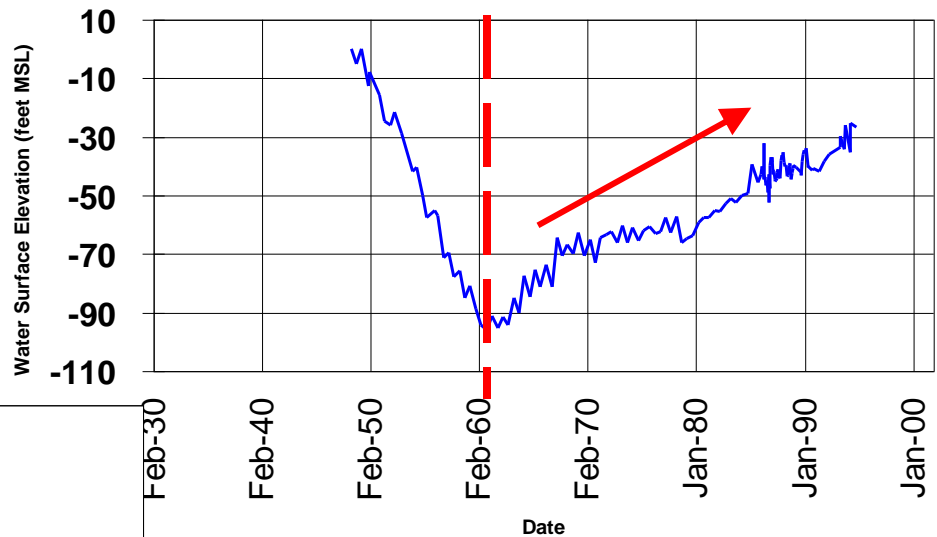
**San Gabriel
spreading grounds**

Central Basin Replenishment Sources

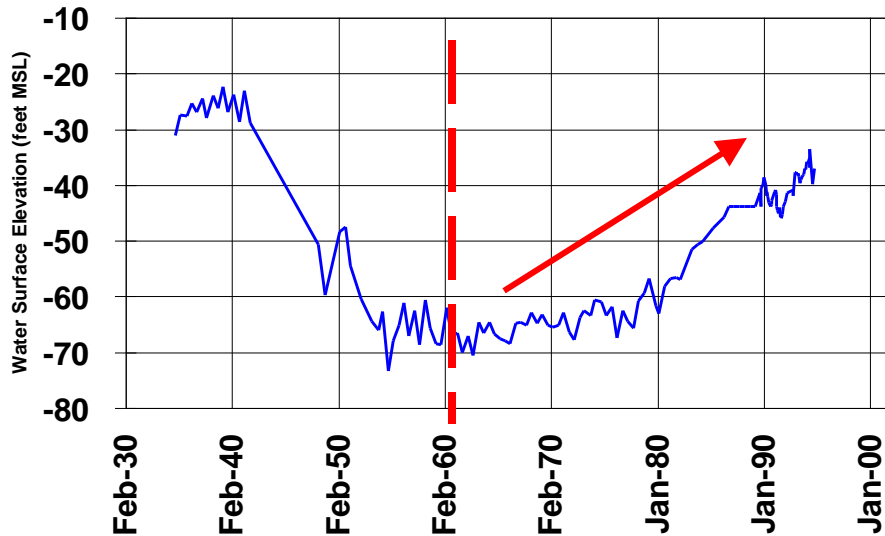


Results of WRD basin management

WEST COAST BASIN KEY WELL



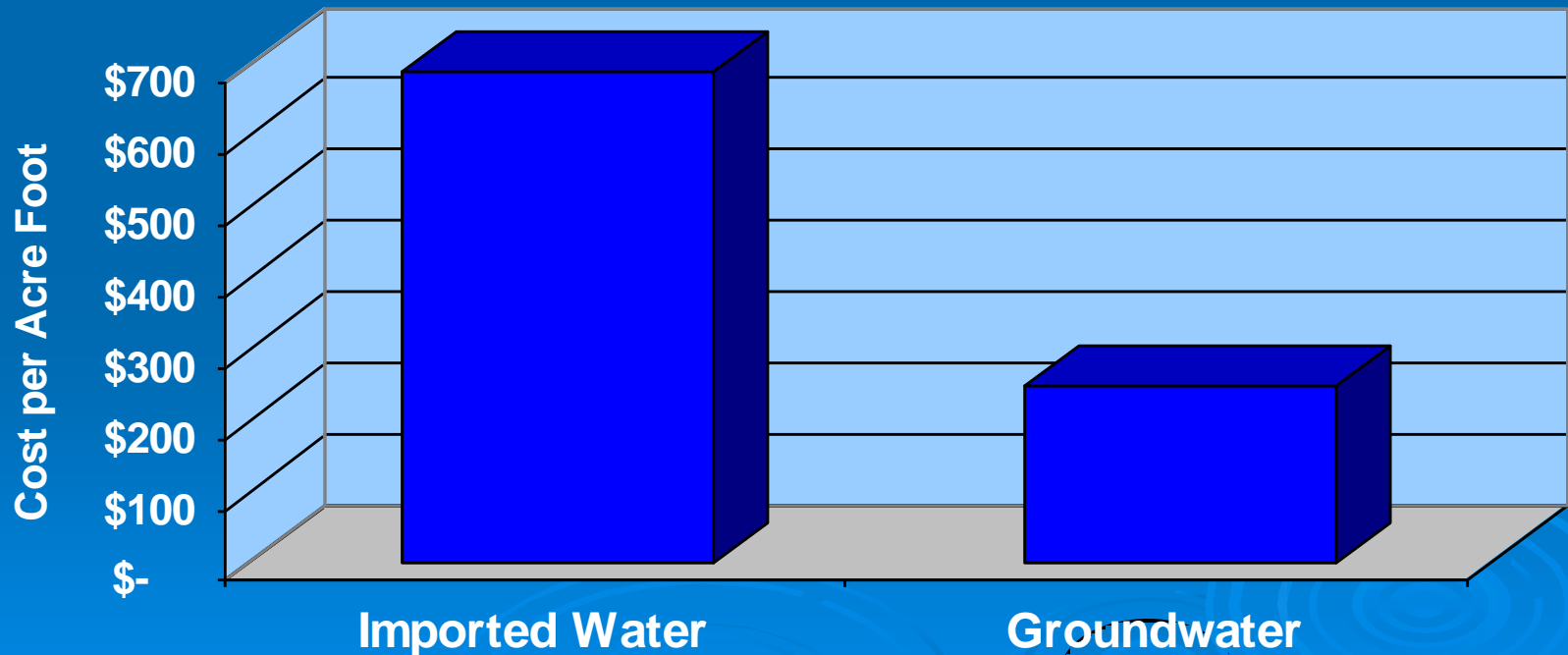
CENTRAL BASIN KEY WELL



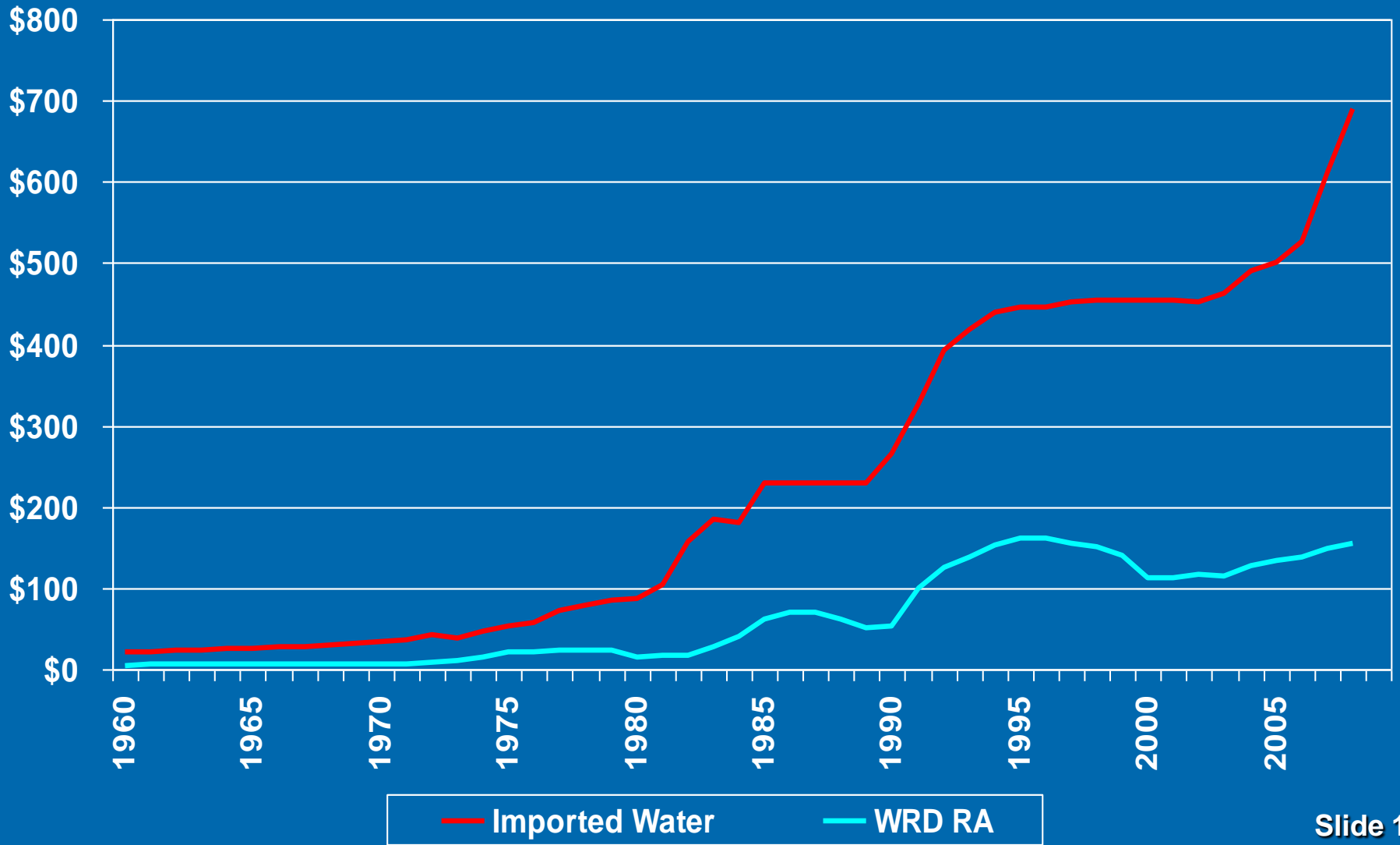
Rising water
levels & drought
protection

Benefits of Groundwater

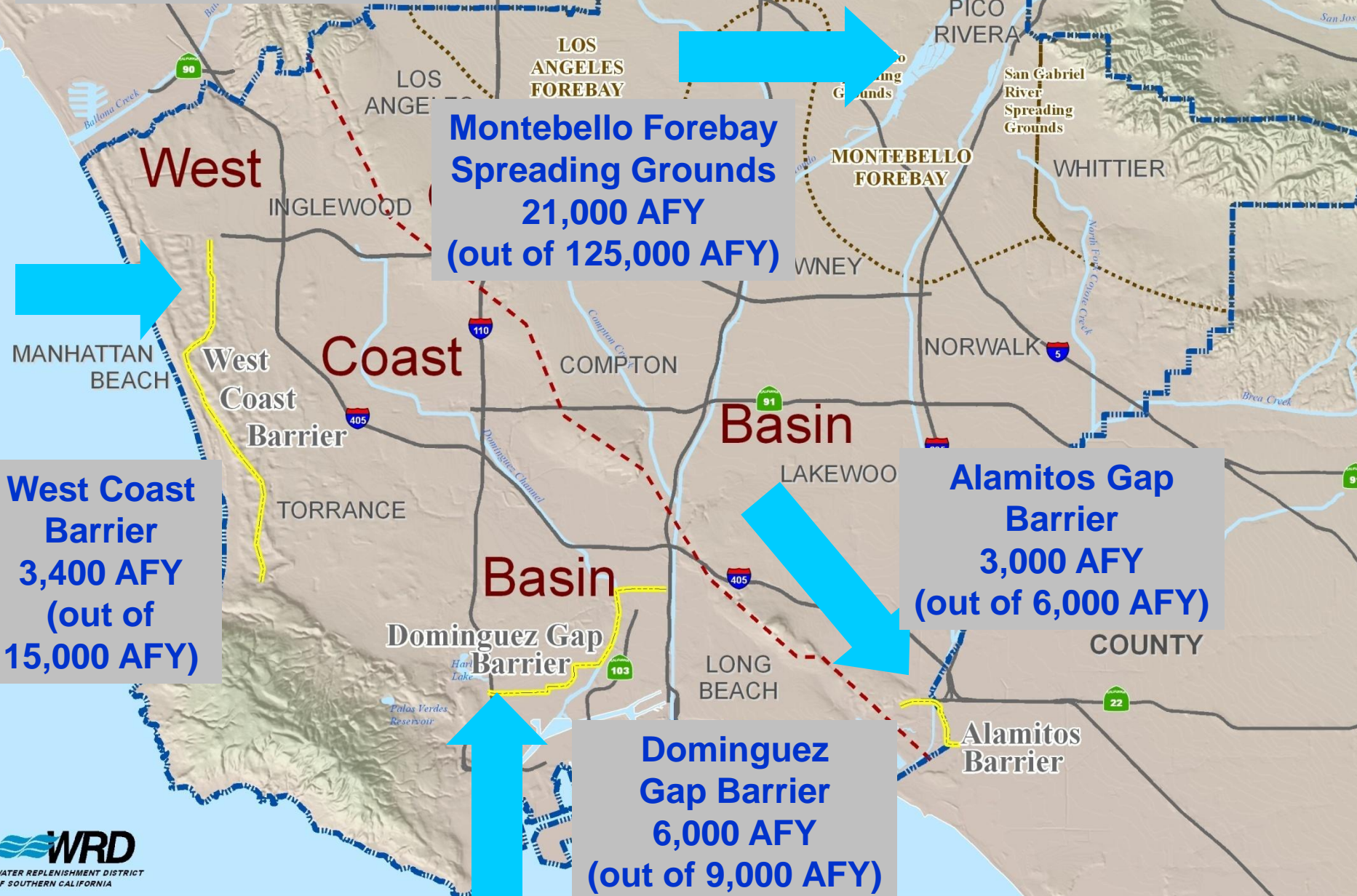
- 💧 Local reliable supply
- 💧 Drought protection
- 💧 Cost effective



Historical Cost of Groundwater compared to Imported Water (cost per Acre Foot)



Current Imported Water Demands



Montebello Forebay Spreading Grounds
21,000 AFY
(out of 125,000 AFY)

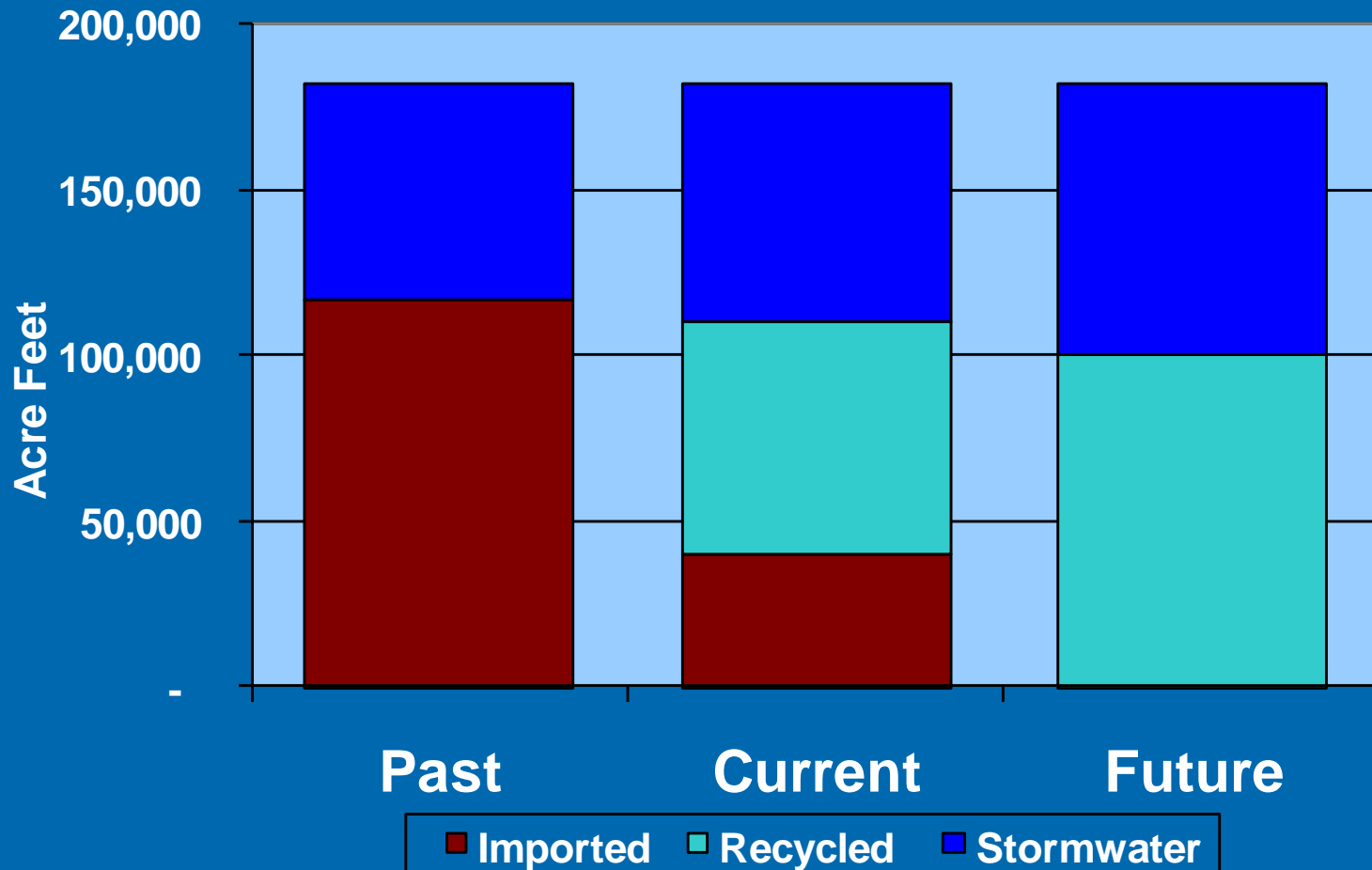
West Coast Barrier
3,400 AFY
(out of 15,000 AFY)

Alamitos Gap Barrier
3,000 AFY
(out of 6,000 AFY)

Dominguez Gap Barrier
6,000 AFY
(out of 9,000 AFY)



WRD's WIN Program will reduce or eliminate need for imported water to replenish groundwater

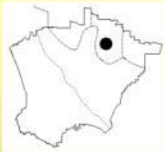




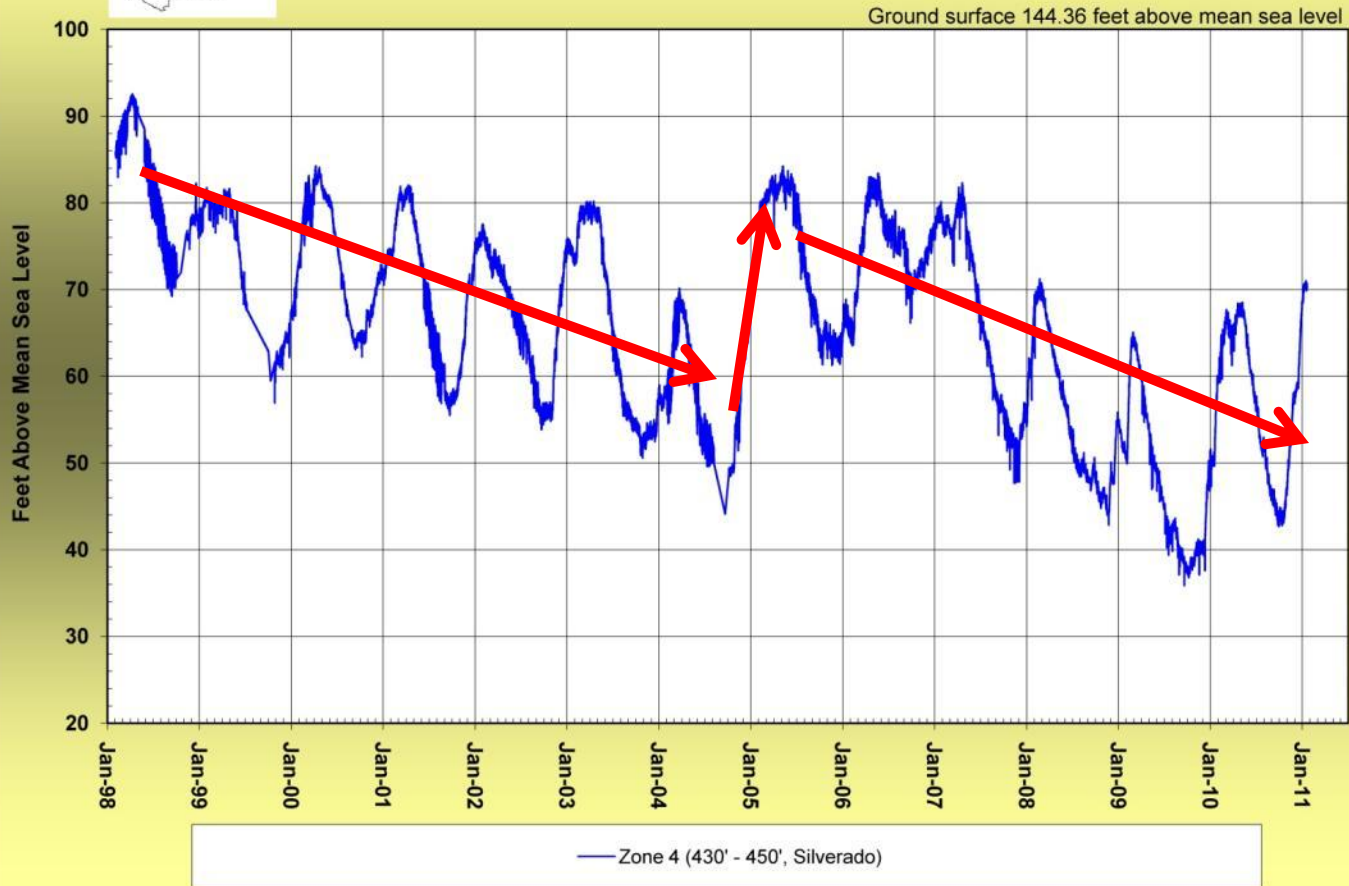
- **Collection of projects to eliminate WRD demand for imported water**
- **Projects to:**
 - *Capture and conserve additional stormwater*
 - *Increase use of recycled water for groundwater replenishment*
- **Creates locally self-sufficient groundwater supply for 10% of population of California (4 million residents in the Central and West Coast basins)**



Stormwater Projects under WIN Program



FLUCTUATIONS OF WATER LEVELS IN WRD NESTED MONITORING WELL RIO HONDO #1



Dam up the river (temporarily)

- 💧 *Inflatable rubber dams are proven technology to halt river flow and promote infiltration.*
- 💧 *2 new dams in 2008 in San Gabriel River. Joint project between WRD/LADPW.*
- 💧 *Provide 3,600 afy more storm water capture and infiltration.*



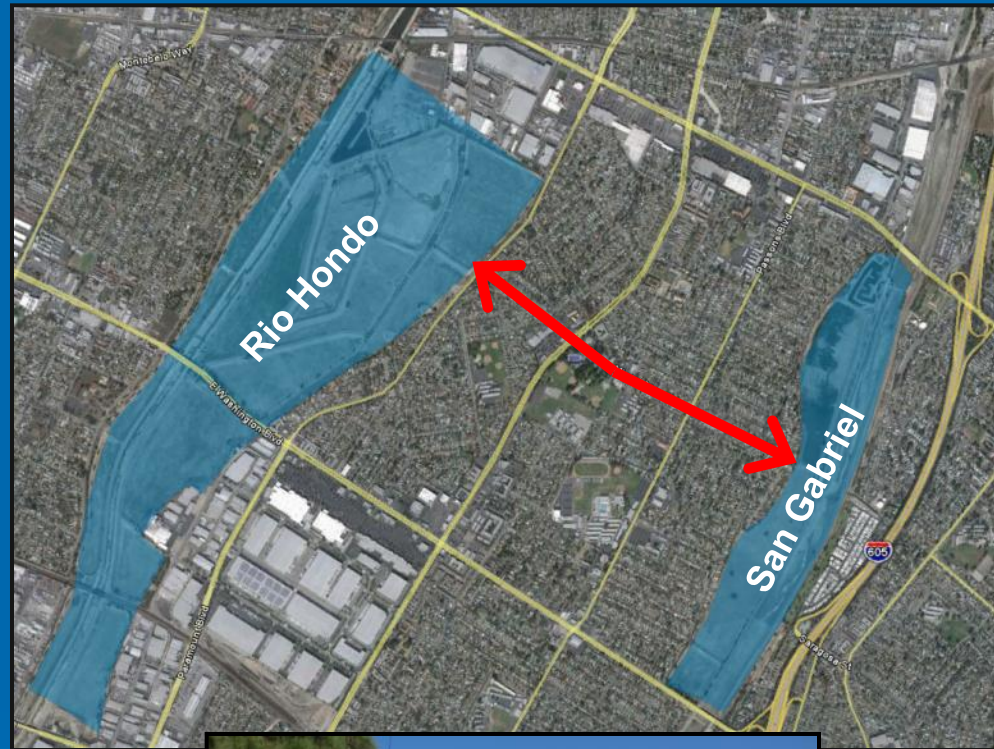
Increase Conservation Pool behind the Whittier Narrows Dam

- 💧 *WND is flood control project built by Army Corps 1957.*
- 💧 *Oil wells behind dam limited water storage capability (conservation pool).*
- 💧 *WRD/LADPW cooperated to remove oil wells.*
- 💧 *Conservation pool increased allowing 1,500 afy more storm water capture.*
- 💧 *Can increase by another 1,000 afy with additional study*



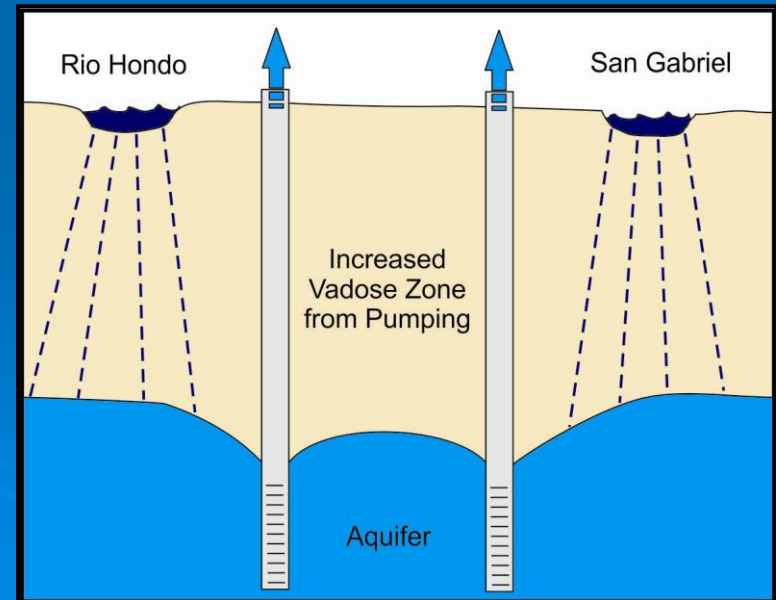
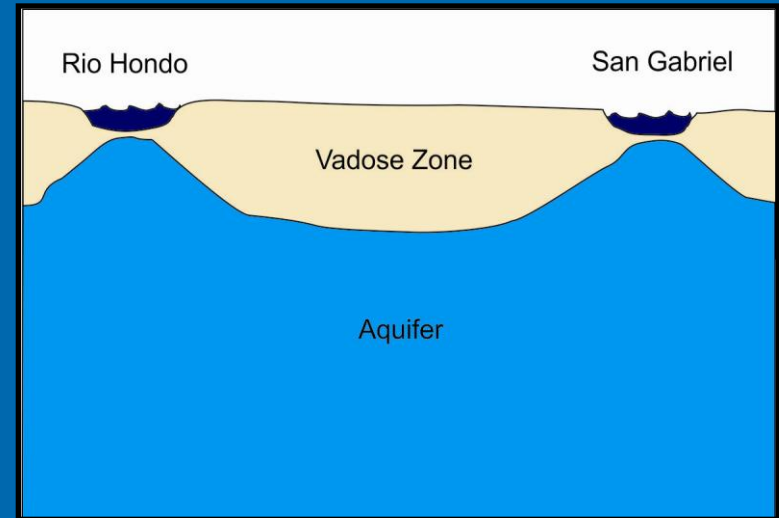
Interconnection Pipeline

- 💧 *Two-way pipeline (78" diam, 1.2 mi) to divert flows between Rio Hondo and San Gabriel.*
- 💧 *WRD/LACDPW project will go online March 2011.*
- 💧 *Will increase storm water capture by 1,300 afy, also more recharge flexibility.*



Increase Vadose Zone

- 🔹 *Shallow water table limits storm water recharge.*
- 🔹 *Concept to install pumping wells to drawdown water table, exposing more vadose zone, and freeing up more room for storm water capture / recharge.*
- 🔹 *Modeling shows 17,000 afy more storm water can be captured.*



Low Impact Developments (LIDS)

➤ *Set of approaches to reduce runoff and pollutants from reaching surface waterways, and promote recharge.*

- *Bioswales*
- *Porous Pavement*
- *Dry wells*
- *Rain Harvesting*
- *Smart Landscaping*



Elmer Avenue site,
LA and SG Rivers
Watershed Council



Robb Whitaker
rwhitaker@wrd.org