An aerial photograph of a landscape in Ventura County, California. The foreground shows a hillside with dry, scrubby vegetation. A multi-lane highway, U.S. Highway 101, runs horizontally across the middle of the image. To the left of the highway, there are large, green agricultural fields. To the right, there are more fields, some of which appear to be fallow or recently harvested. In the background, there are some buildings and more fields under a hazy sky.

The Context for Climate Change Adaption Strategies on the Calleguas Creek Watershed

Henry Graumlich
Calleguas Creek Watershed
Steering Committee

Manager of Strategic Planning
Calleguas Municipal Water District

U.S. Highway 101 and Conejo Creek,
Ventura County, California



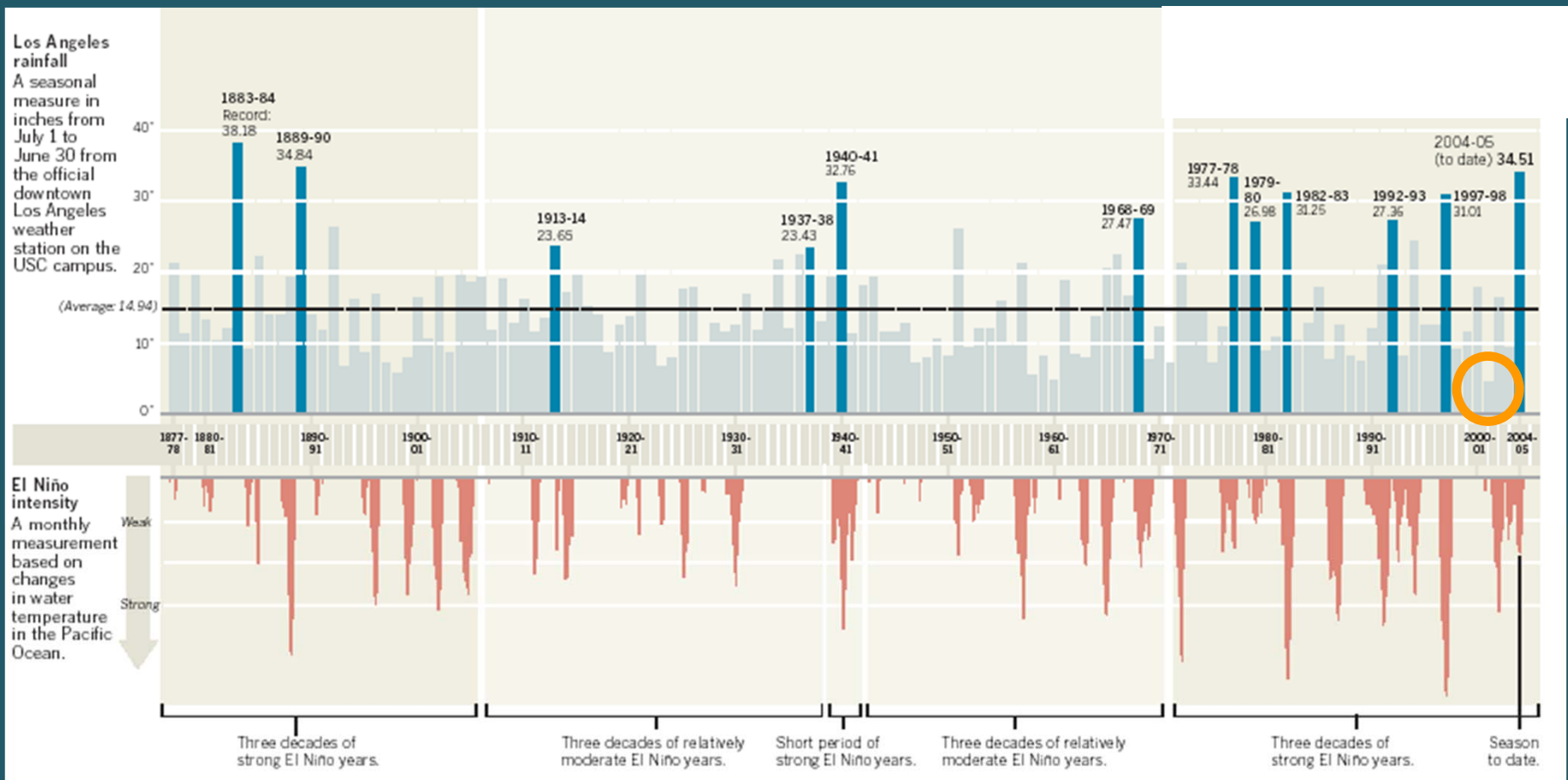
Principal Watersheds of Ventura County



Chaparral, Lower Calleguas Creek, Ventura County, California

150 Years of Rainfall in Los Angeles

Total rainfall Jan. to Oct. 2002 = 2.09 inches





Ventura River, Foster Park, 10.18.02



Santa Clara River, Highway 118, 10.18.02



Lower Calleguas Creek, Potrero Road, 10.18.02



Revolon Slough, 10.20.02

It rains everyday on the Calleguas Creek Watershed

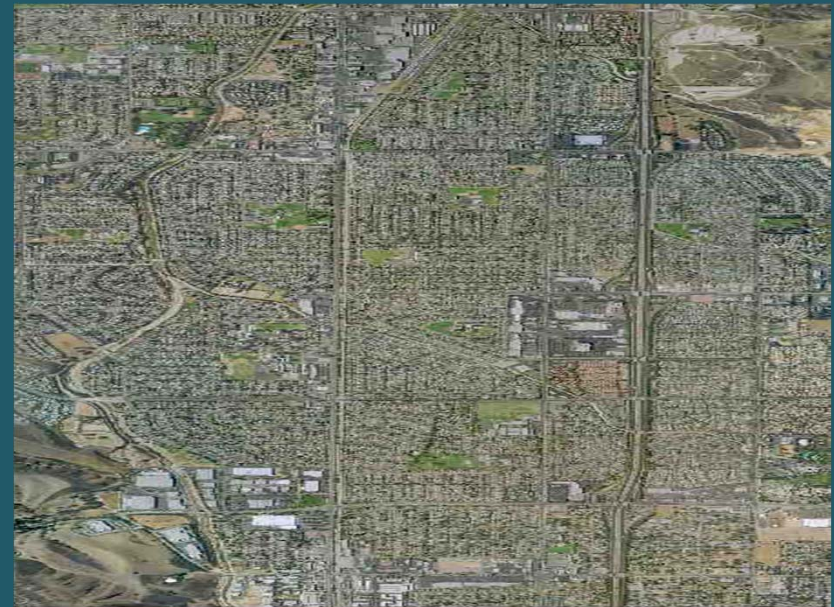


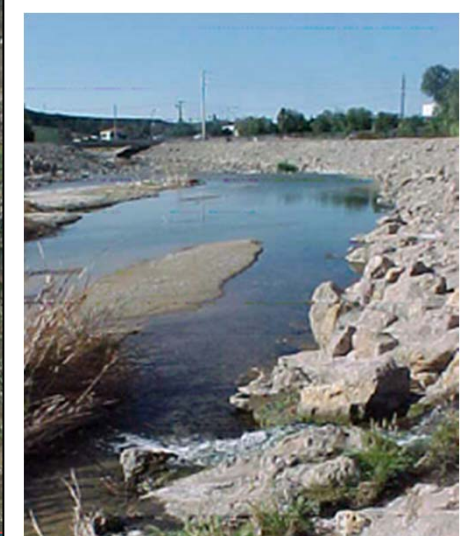
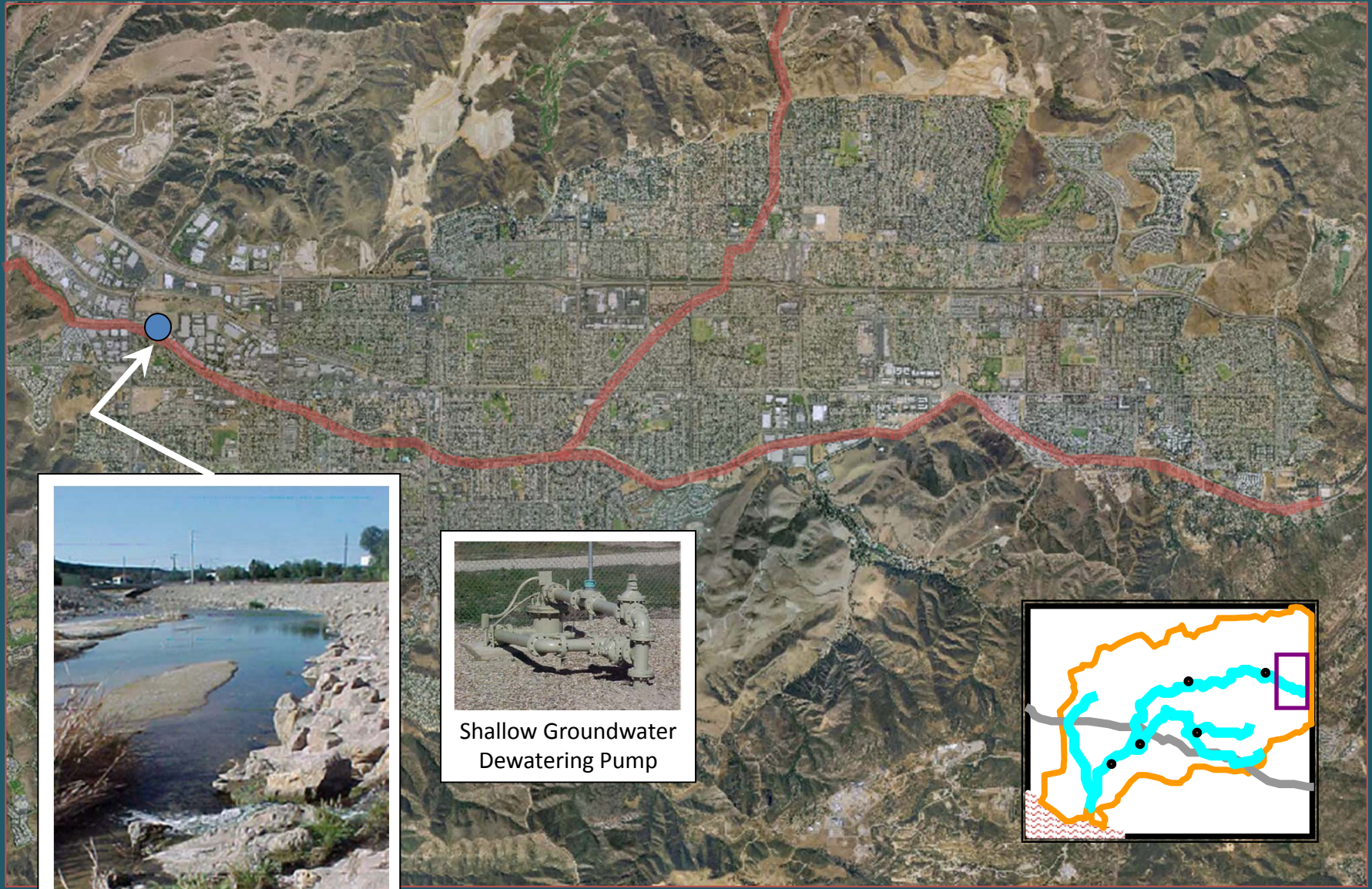
Row Crops, Santa Rosa Road, 10.24.02

IRWM Guidelines

“Given the currently predicted effects of Climate Change on California's water resources, IRWM Plans should address adapting to changes in the amount, intensity, timing, quality and variability of runoff and recharge.”

Simi Valley: Early 1960's Compared to 2003

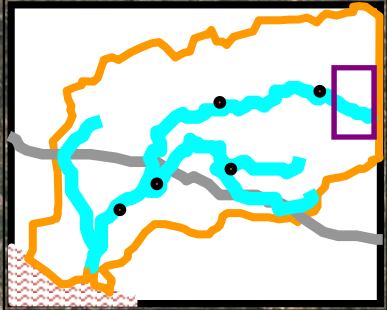




Arroyo Simi Near Madera Road



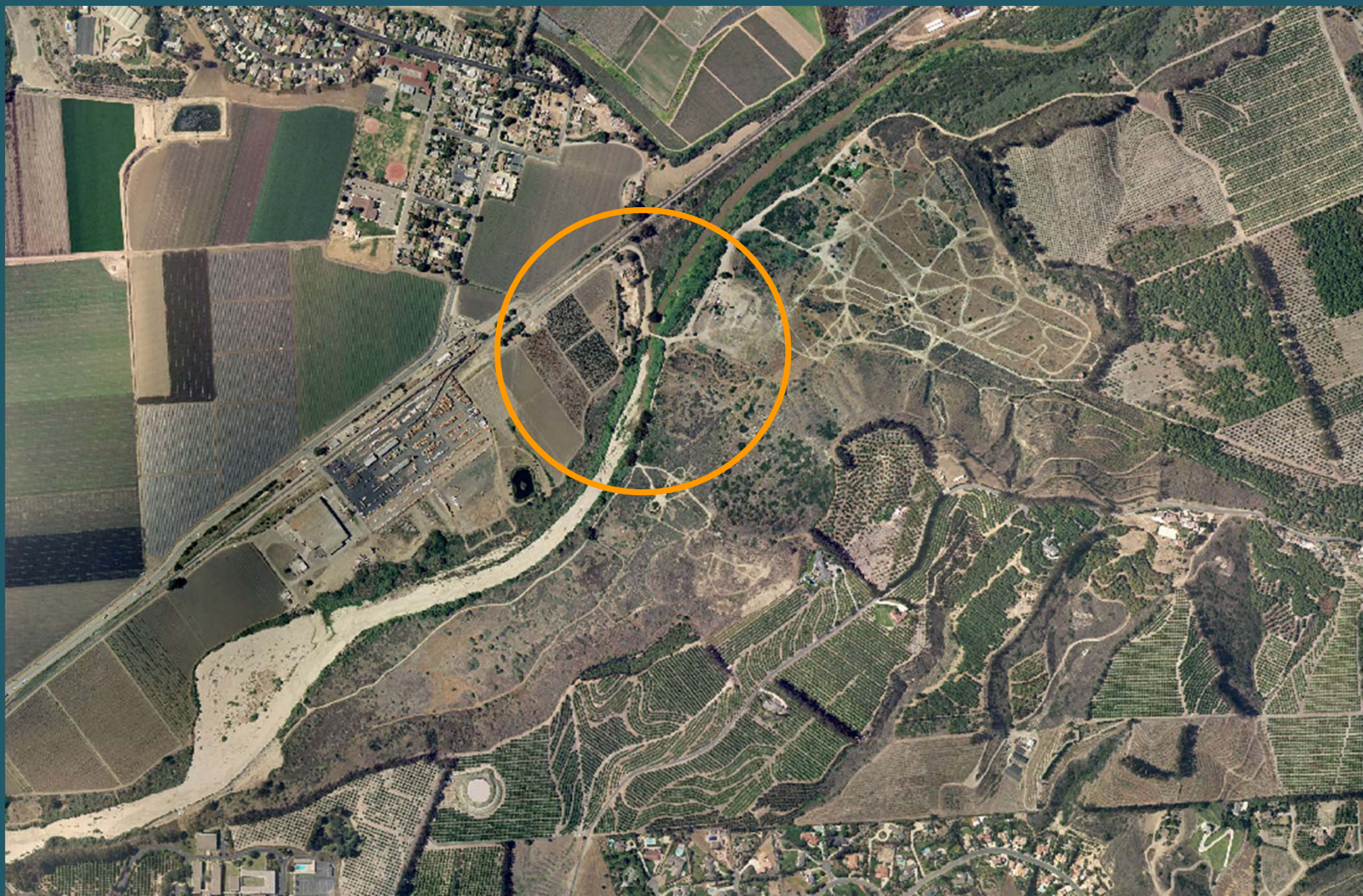
Shallow Groundwater Dewatering Pump



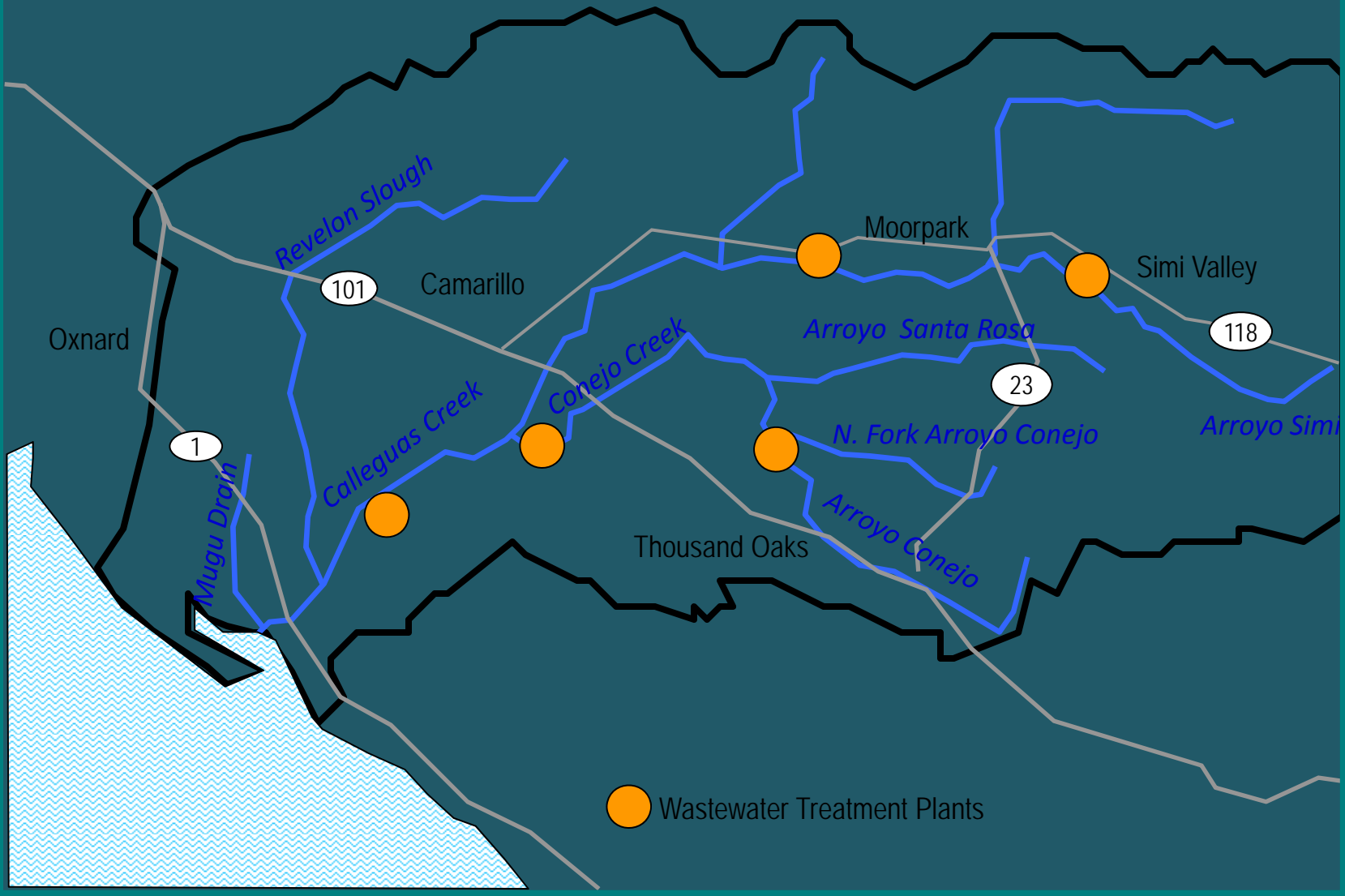


Simi Valley
Water Treatment Plant





Calleguas Creek Watershed

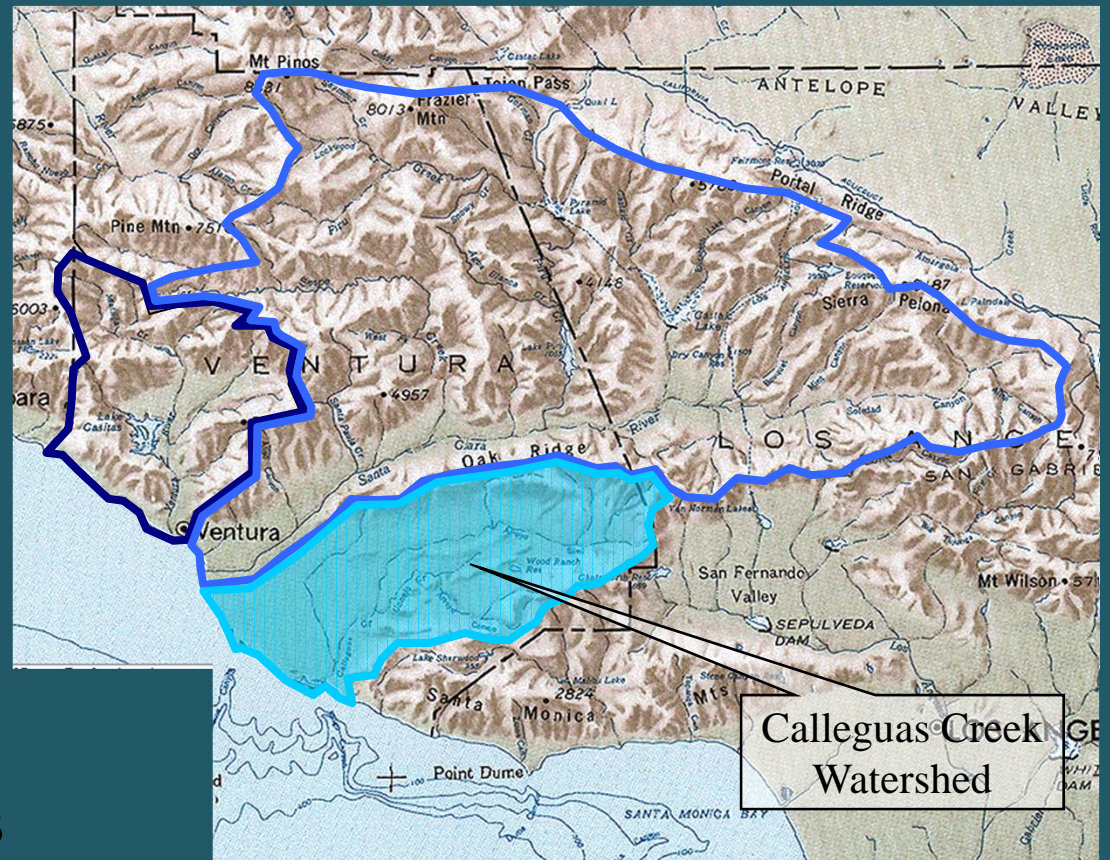


Calleguas Creek River Watershed

15" local rain equals
274,000
acrefeet/year

100,000 acrefeet/year
imported water equals
5 1/2" of additional rain
over entire watershed

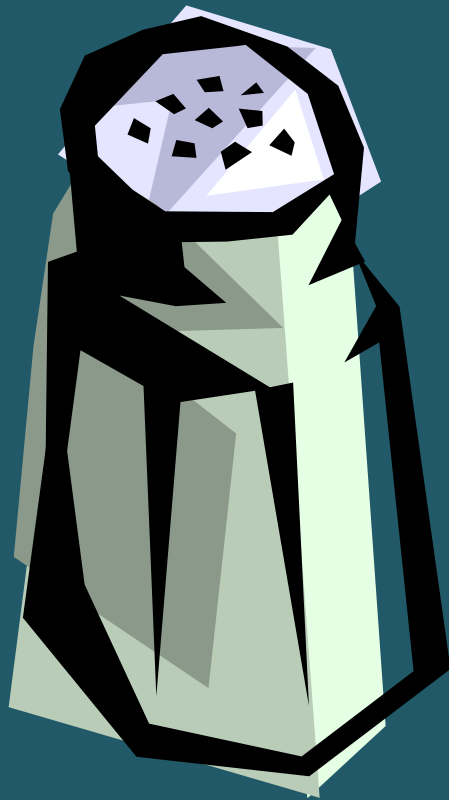
60,000 tons of salt
imported annually
with imported water



Five Wastewater
Treatment Plants
discharge 30 million
gallons per day or 33,600
acrefeet per year

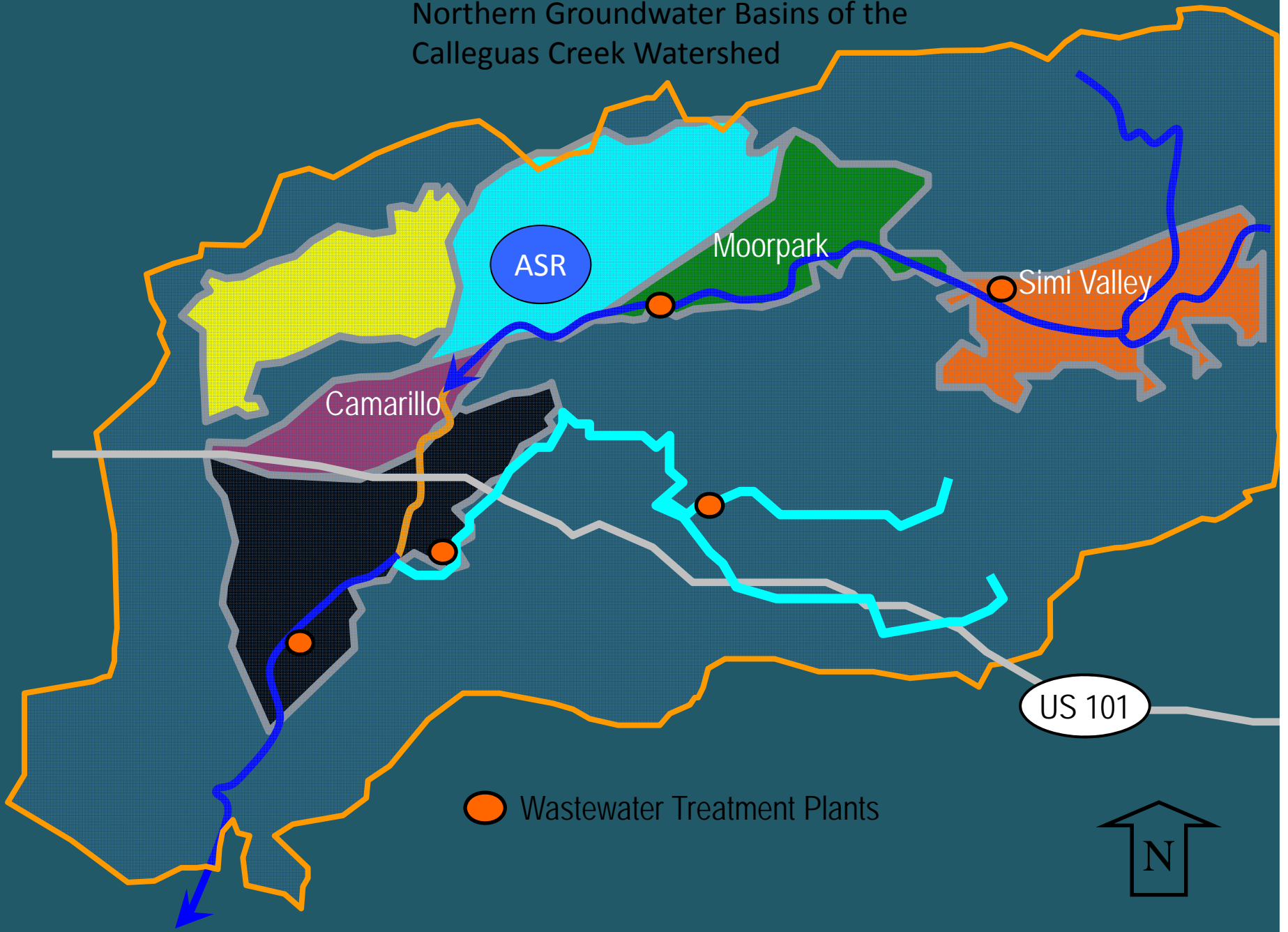
The Salts Problem

Salt coming in =
290 tons/day



Salt going out = 25
tons/day

Northern Groundwater Basins of the Calleguas Creek Watershed



ASR

Moorpark

Simi Valley

Camarillo

US 101

● Wastewater Treatment Plants



Over time shallow groundwater rose

FCGMA Groundwater Management Plan

May 2007

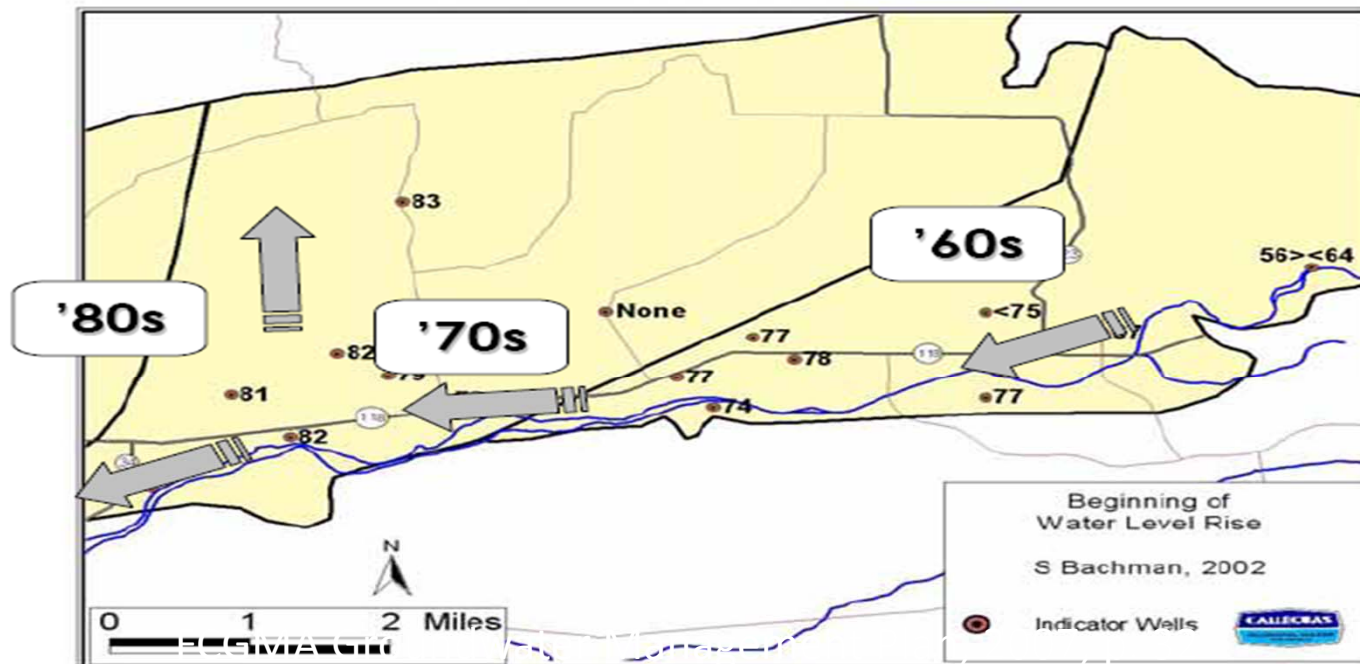


Figure 24. Beginning time of the progressive filling of the shallow aquifer along the Arroyo Las Posas in the South and East Las Posas basins. The number next to each well is the year when groundwater levels started to rise during the filling episode.

As a result, salts accumulate

FCGMA Groundwater Management Plan

May 2007

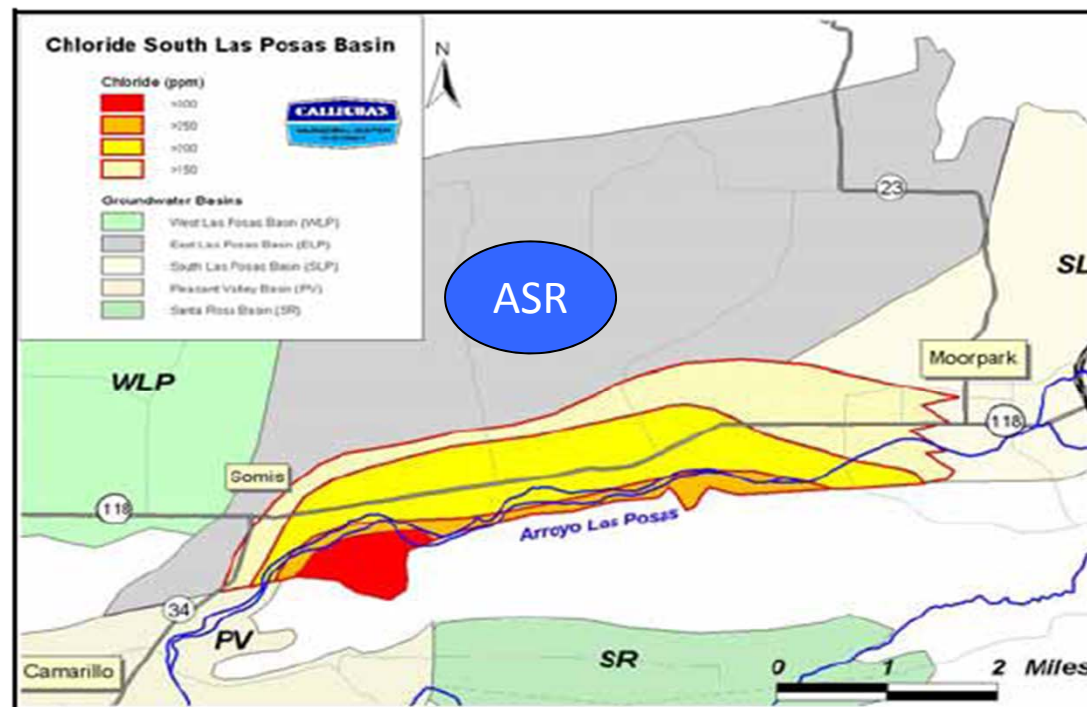
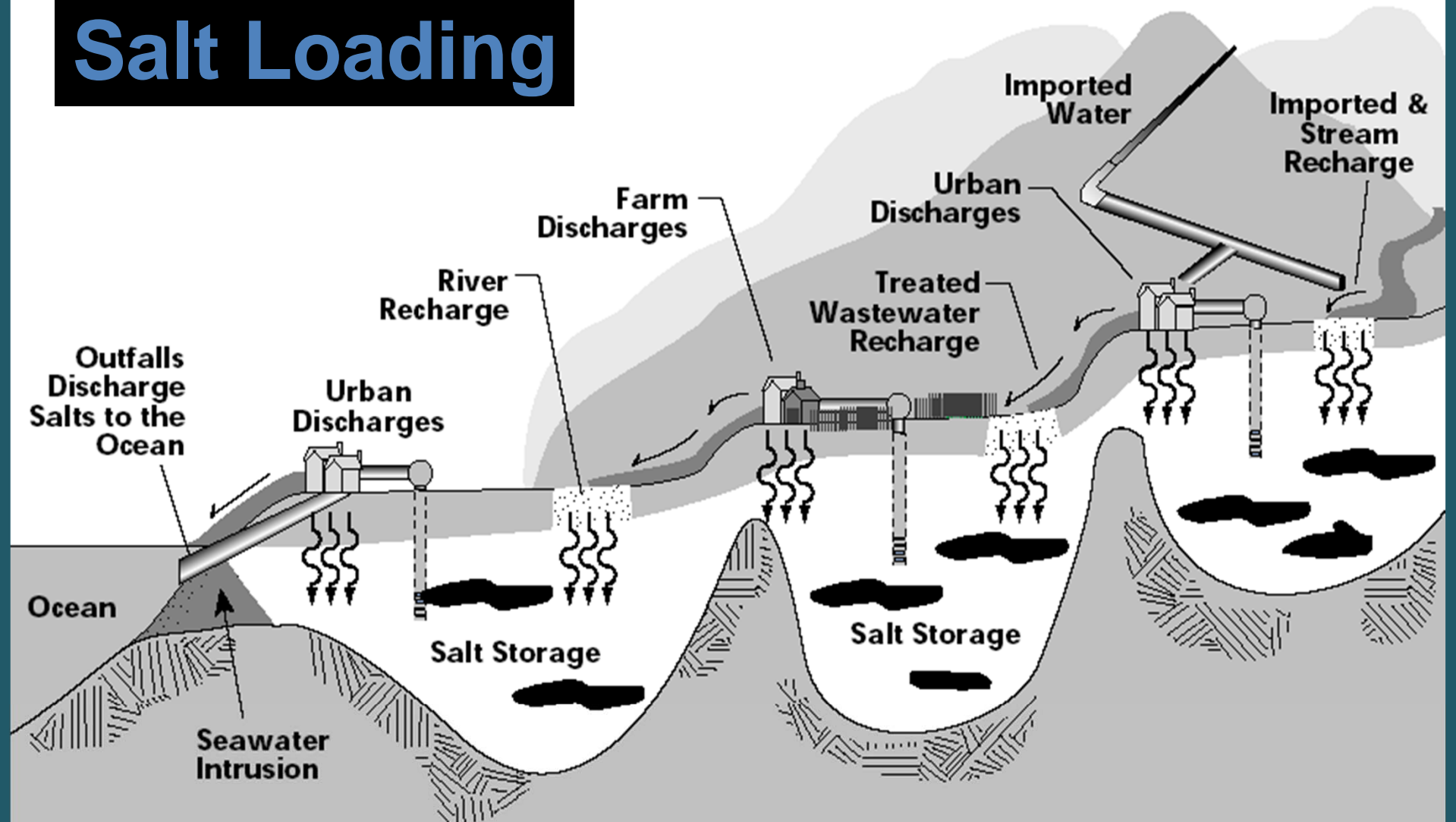
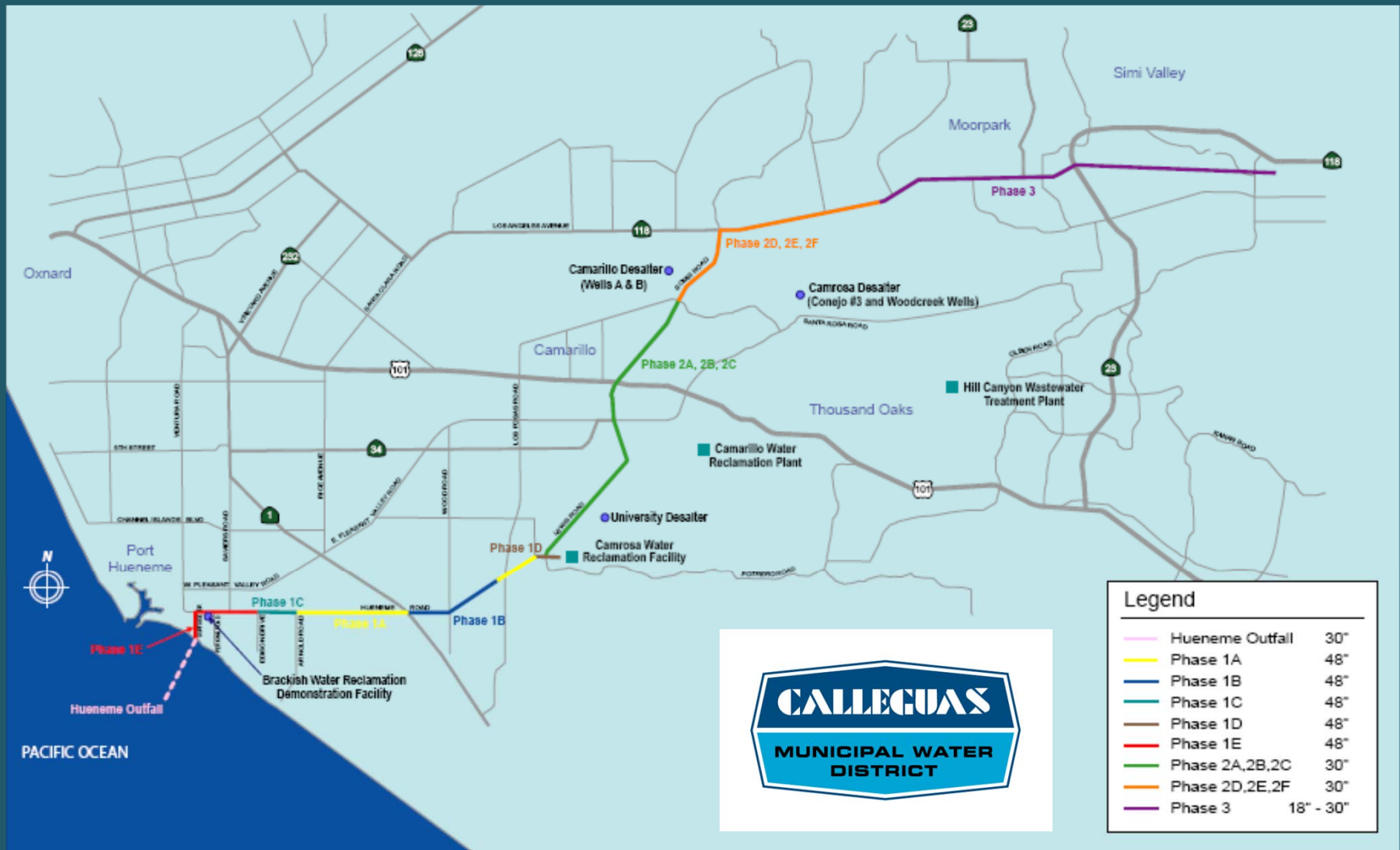


Figure 22. Chloride concentrations (2005-06) in aquifers beneath the Arroyo Las Posas in the East and South Las Posas basins. These concentrations have increased during the last two decades as the shallow aquifer beneath the arroyo has filled to its spill point, caused by increased flow in the arroyo from discharges from dewatering wells and wastewater treatment plants. (Bachman, 2002).

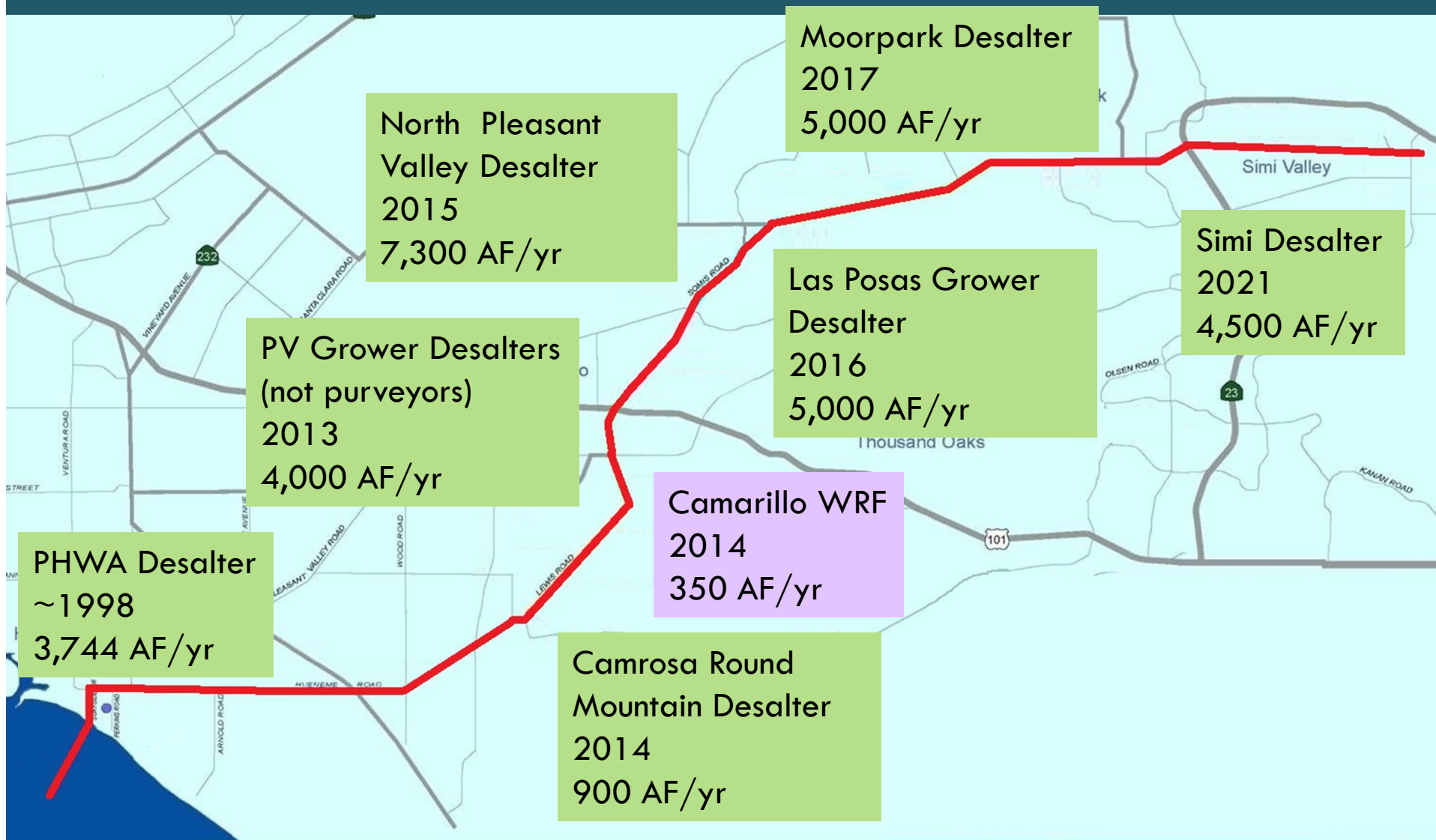
Salt Loading

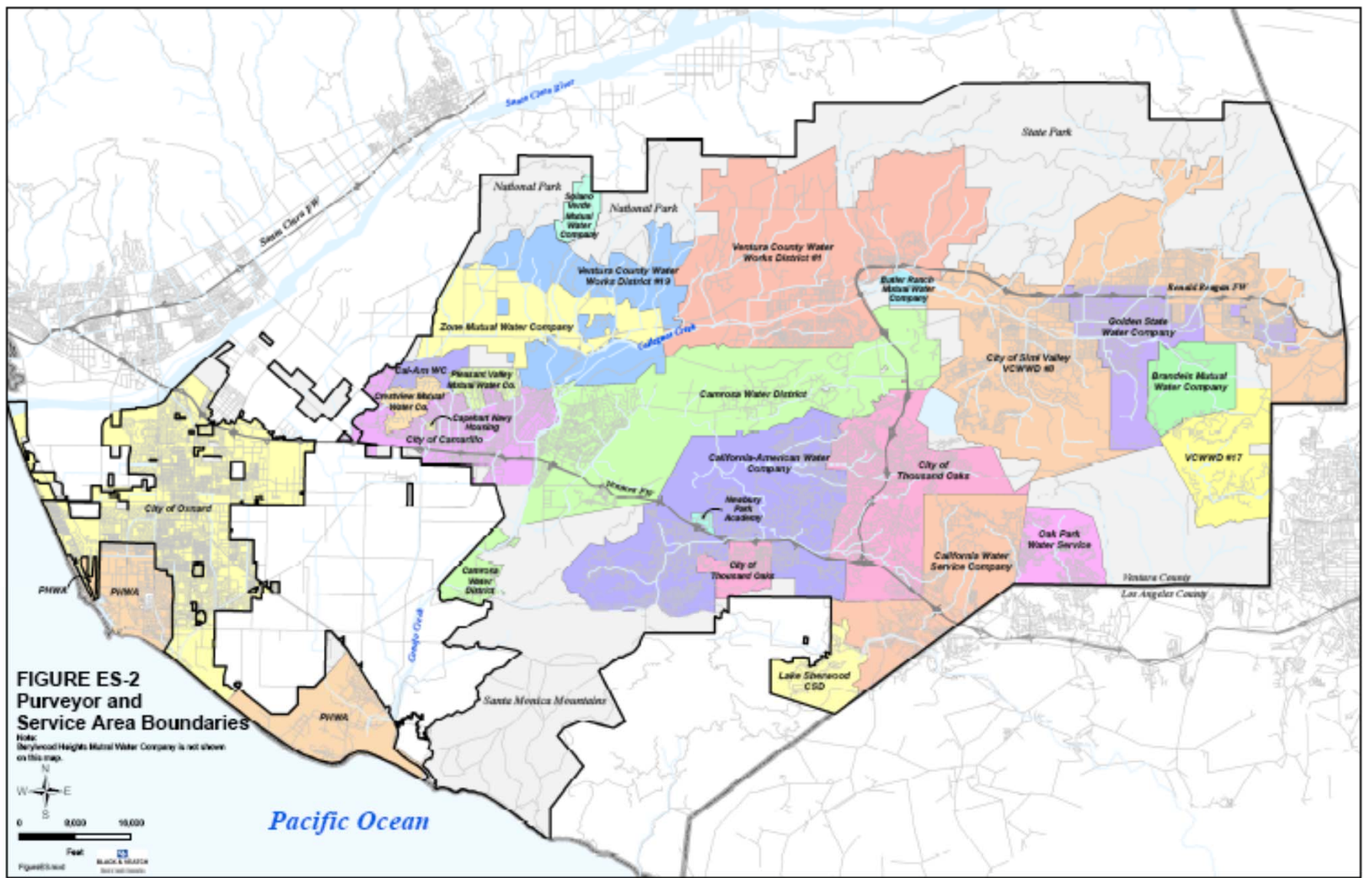


Salinity Management Pipeline

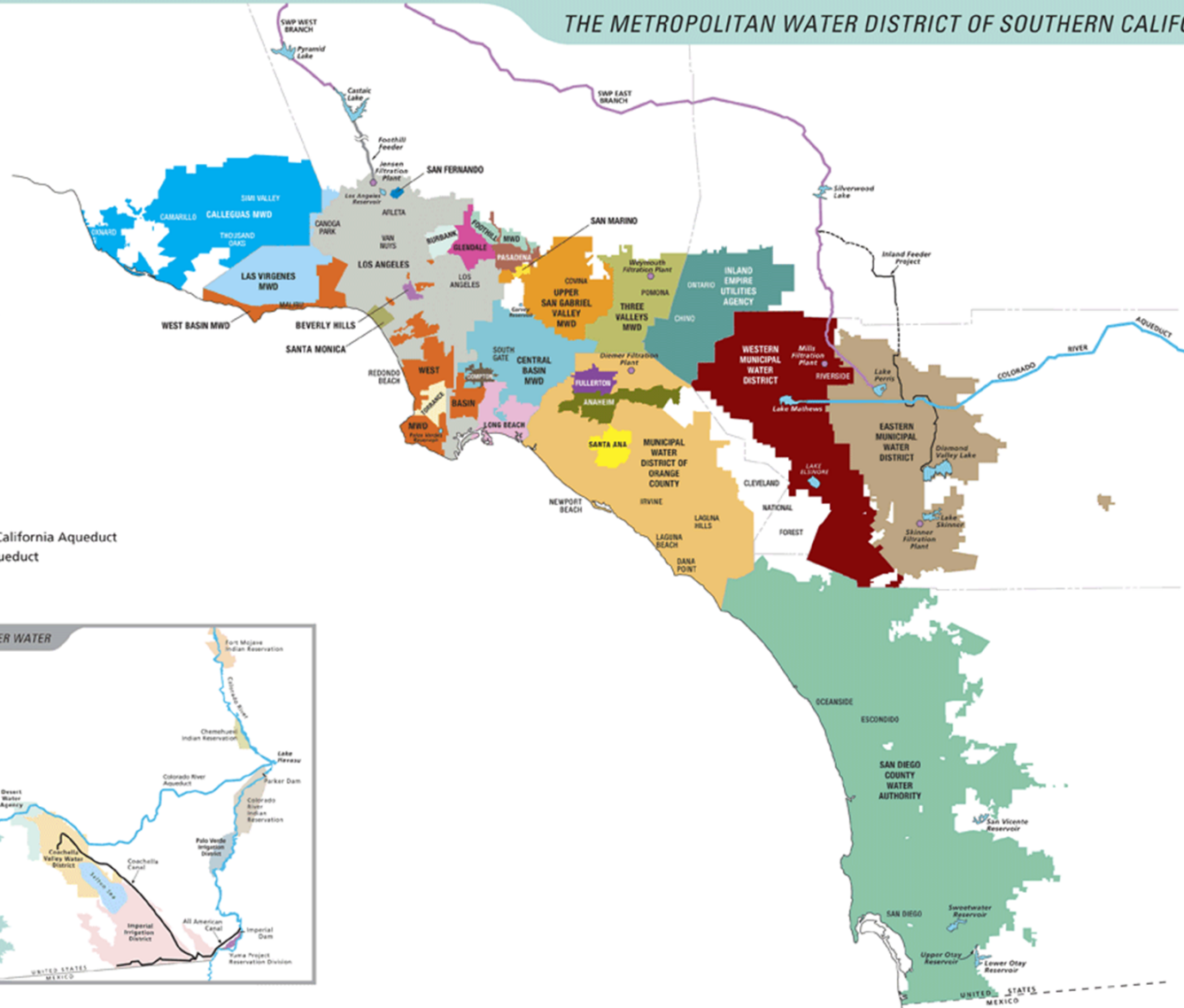


New Water





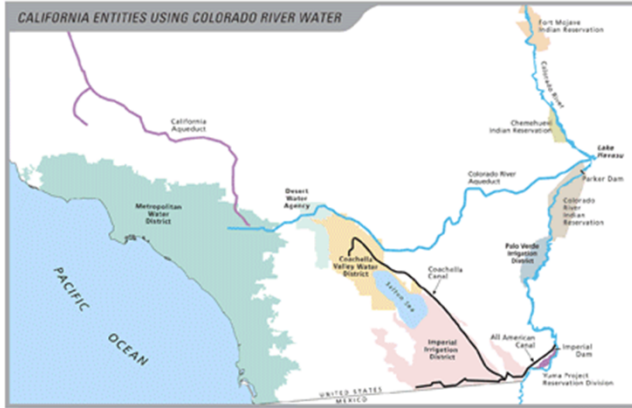
THE METROPOLITAN WATER DISTRICT OF SOUTHERN CALIFORNIA



METROPOLITAN'S MEMBER AGENCIES

LEGEND

- Department of Water Resources' California Aqueduct
- Metropolitan's Colorado River Aqueduct
- Water Filtration Plants





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