An aerial photograph of a large water reservoir, likely a dam, with a prominent concrete structure across the water. The surrounding land is a mix of green vegetation and brownish, possibly cleared or developed areas. The sky is overcast.

# Perspective of the Northern Cities Water Supply

Presented by Jim Garing, Civil Engineer - Garing Taylor & Associates

# Lake Lopez Vista Lago Swim Area

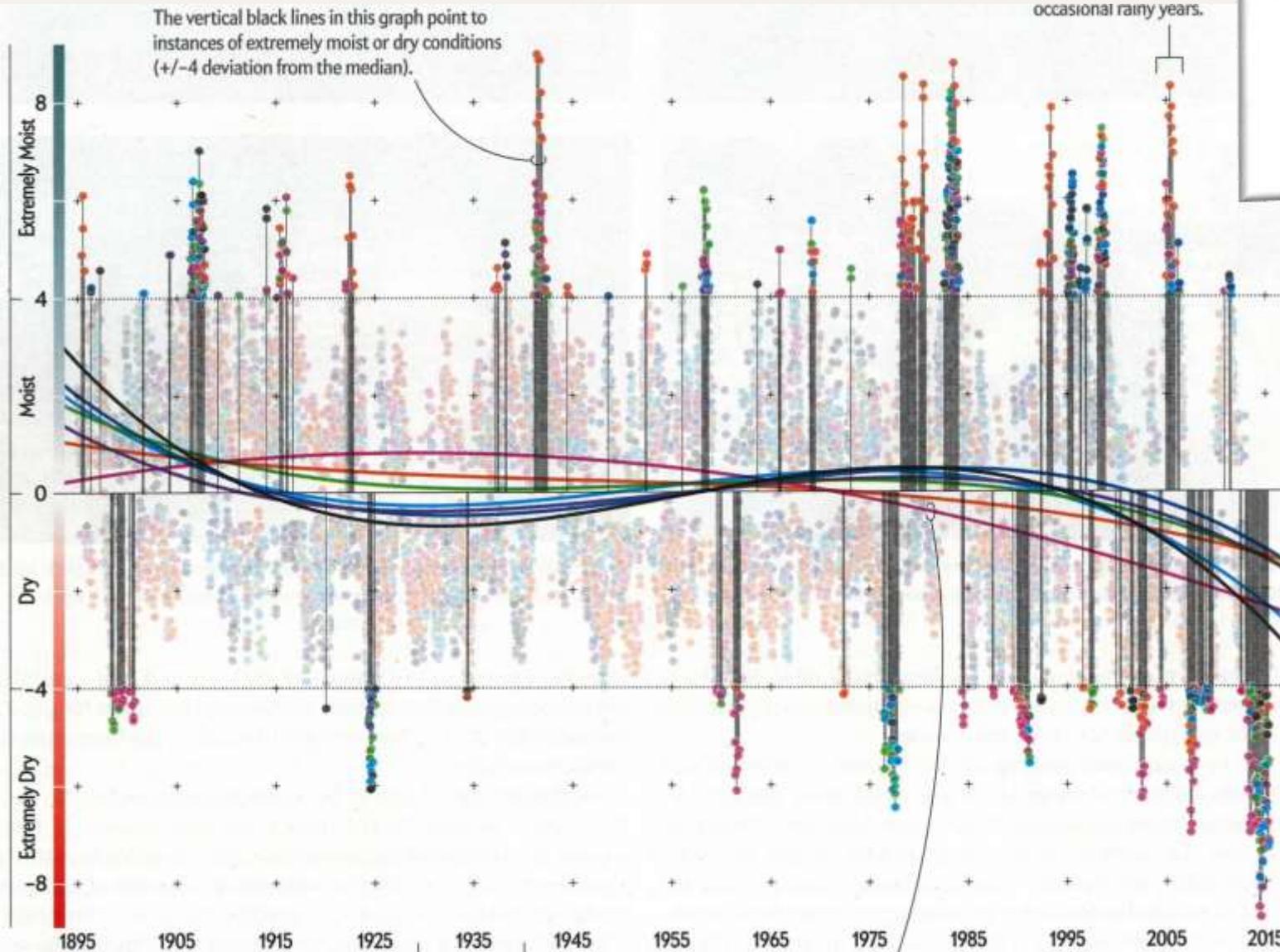


2013



2015

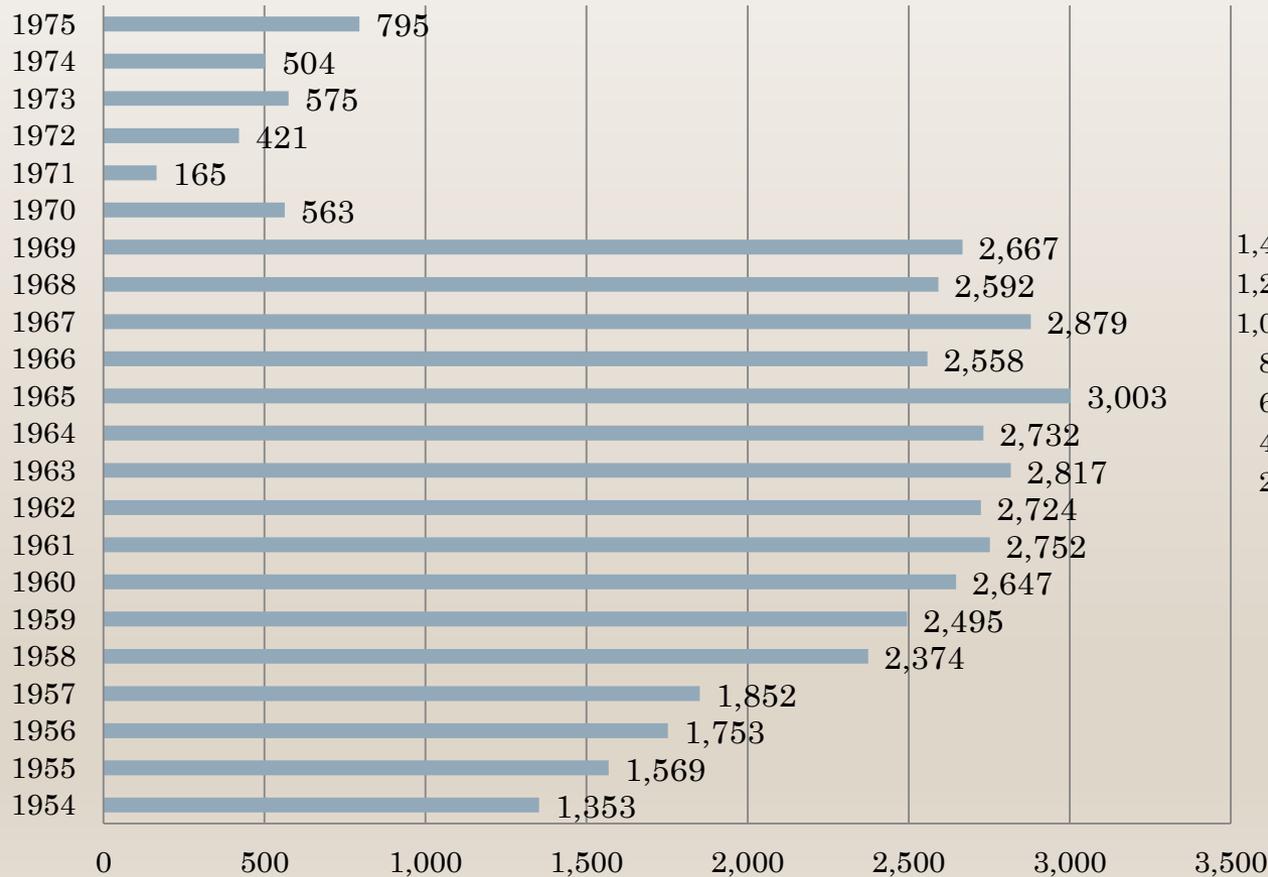
# Our Current Trajectory (Palmer Hydrological Drought Index)



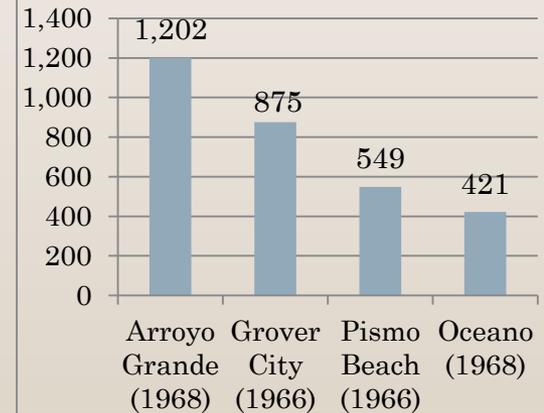
**Reference:**  
Scientific American,  
August 2015.  
Author Dan Baum.

# Urban Groundwater Extractions (Arroyo Grande Basin)

**Total Water Extracted (ac-ft)**



**Pre-Lopez Lake  
Project Pumping  
(ac-ft)**



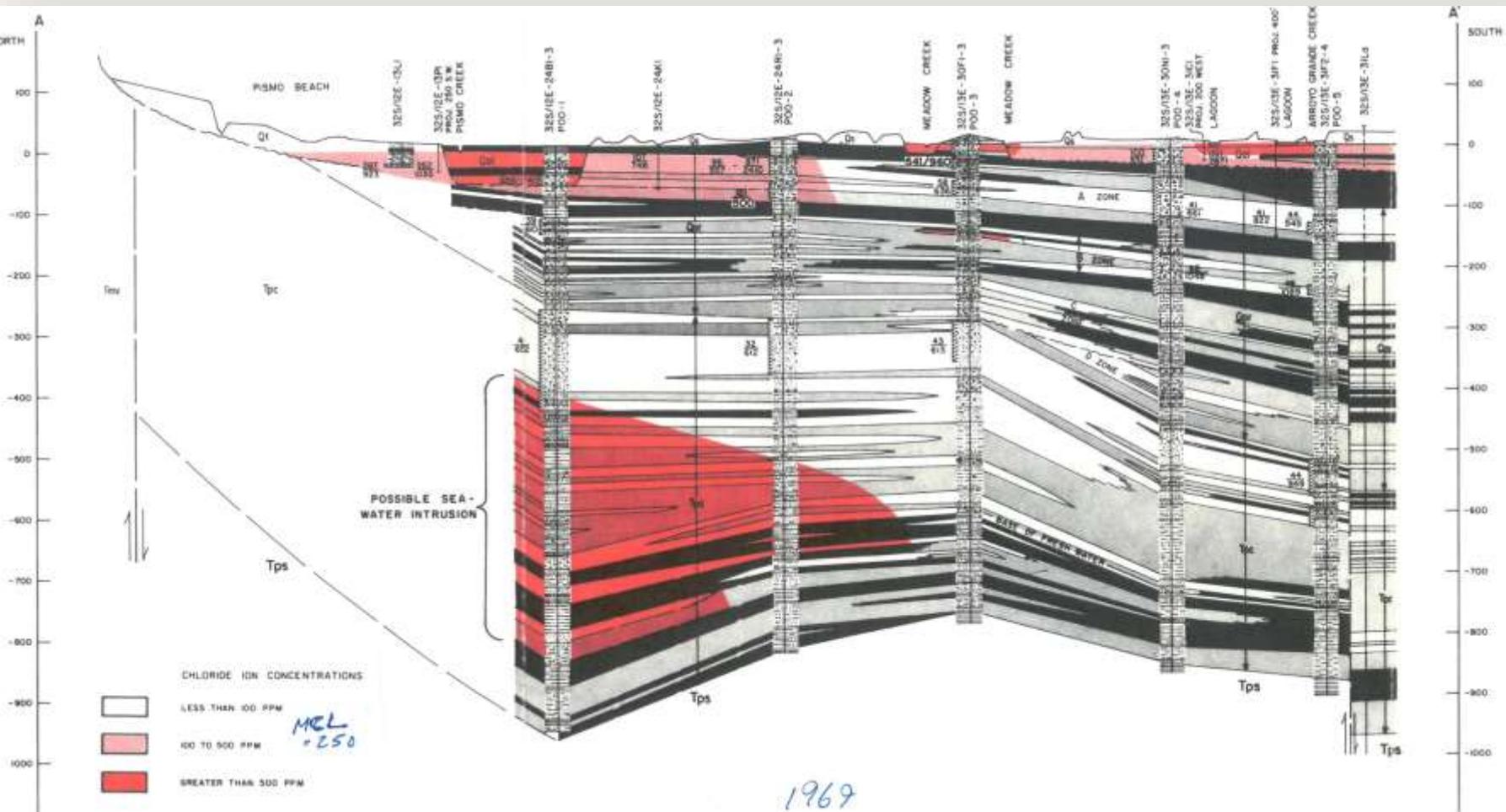
# The Lopez Lake Dam Project

In 1965, Grover City, Pismo Beach, Arroyo Grande and Oceano signed a contract with the San Luis Obispo County Flood Control and Water Conservation District to implement the Lopez Lake Dam Project.

## Compelling Reasons to Participate Included:

- Potential for Sea Water Intrusion
- Increasing Nitrate Concentration of Groundwater
- Future Needs

# Sea Water Intrusion: Pismo Guadalupe Area (1969)



# Nitrate Contamination

By 1972, Nitrate contamination had been changed to a primary standard for water quality.

- 45 milligrams per liter (mg/L) maximum

Most municipal wells in Five Cities Area exceeded the maximum concentration (45 mg/L).

## **Nitrates were believed to come from:**

- Agricultural fertilizers
- Septic tanks

## **Of Note:**

- Grover City sewerred in 1965
- Oceano sewerred in 1967
- Western Arroyo Grande sewerred 1972

# Lopez Reservoir

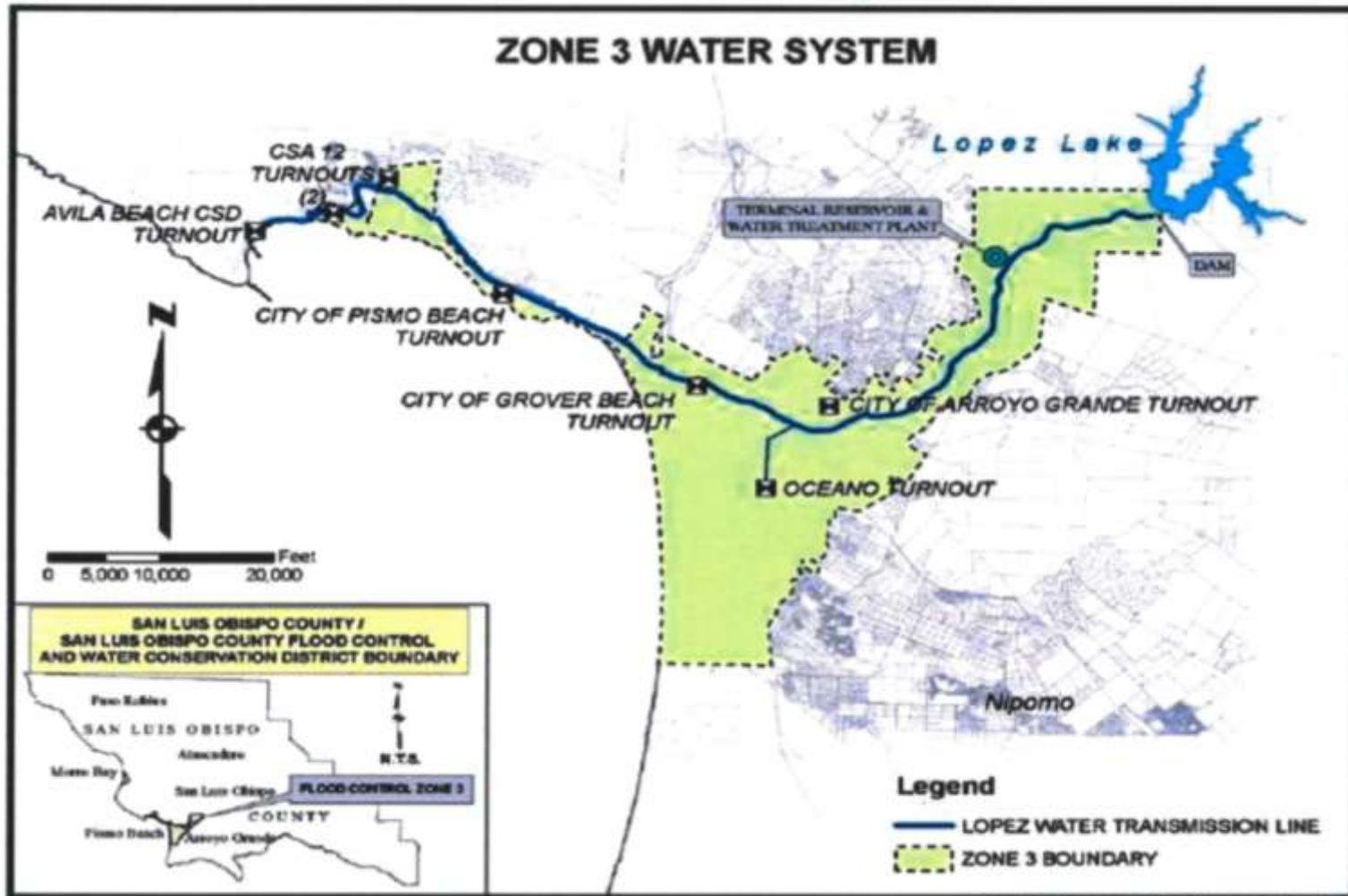


## Lopez Entitlement

- Urban 4,530 AFY
- Environmental/  
Agriculture 4,200 AFY

	Lopez Entitlement (AFY)
Arroyo Grande	2290
Grover Beach	800
OCSD	303
Pismo Beach	896
CSA 12	241
Total	4530

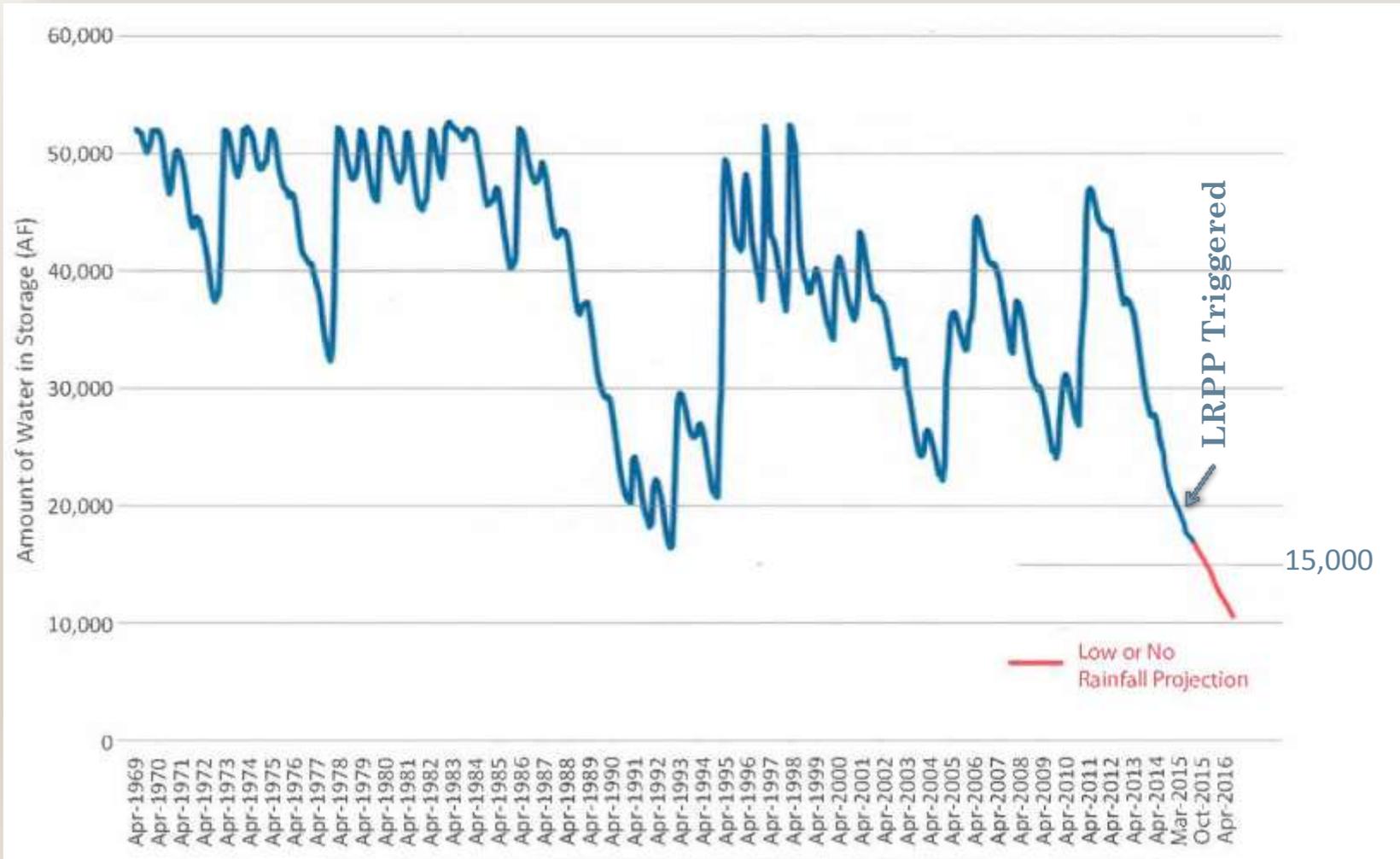
# Lopez WTP and Pipeline



Source: 2010 Urban Water Management Plan for Zone 3

# Lake Lopez Storage (acre-feet)

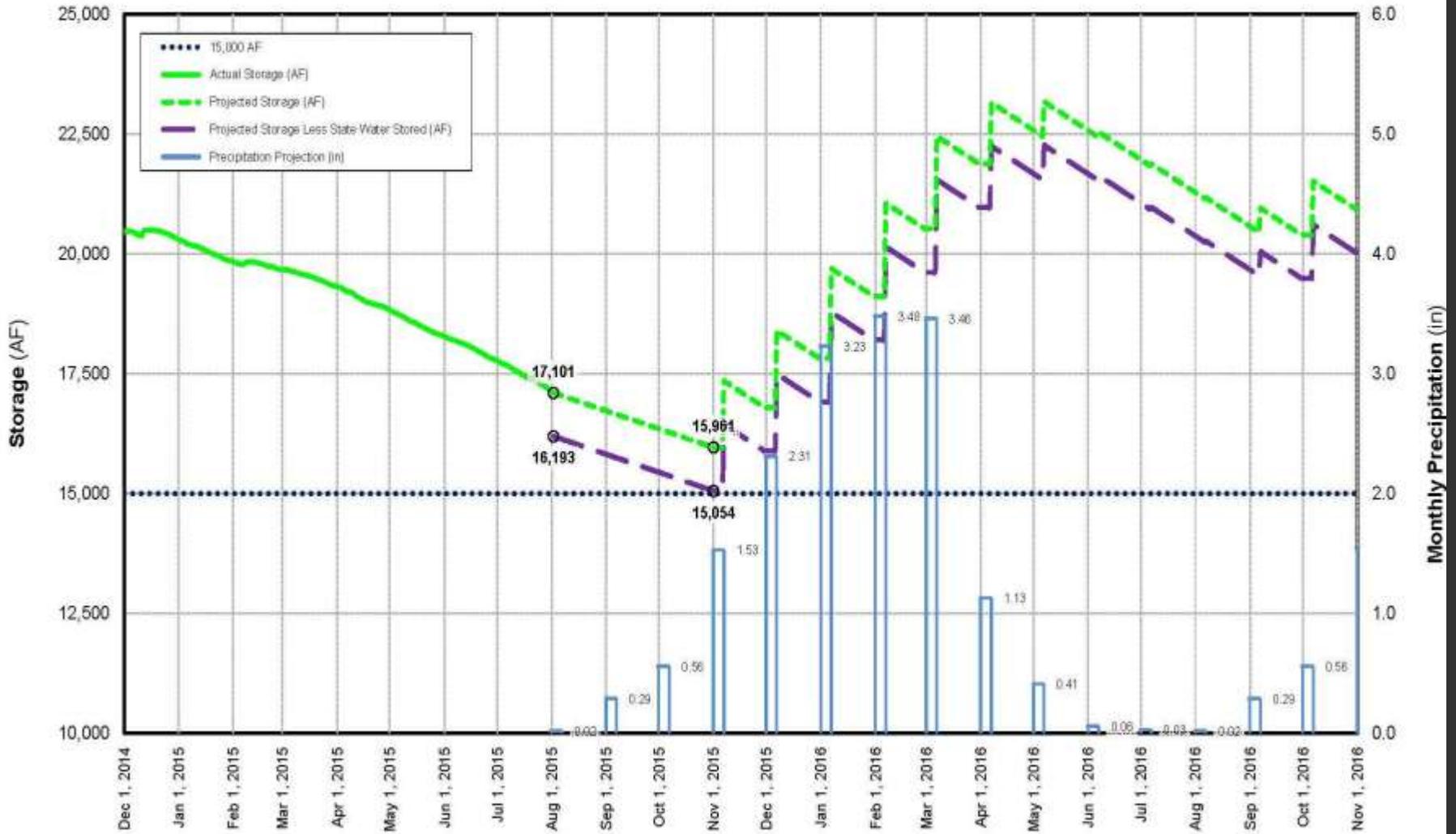
(1969 – Present)



### Lopez Reservoir Storage Projections

(precipitation scenario source: www.LongRangeWeather.com)

Revised: 8/2/2015



# Low-Reservoir Response Plan

**Table 1. Initial Prescribed Municipal Diversion Reduction Strategy**

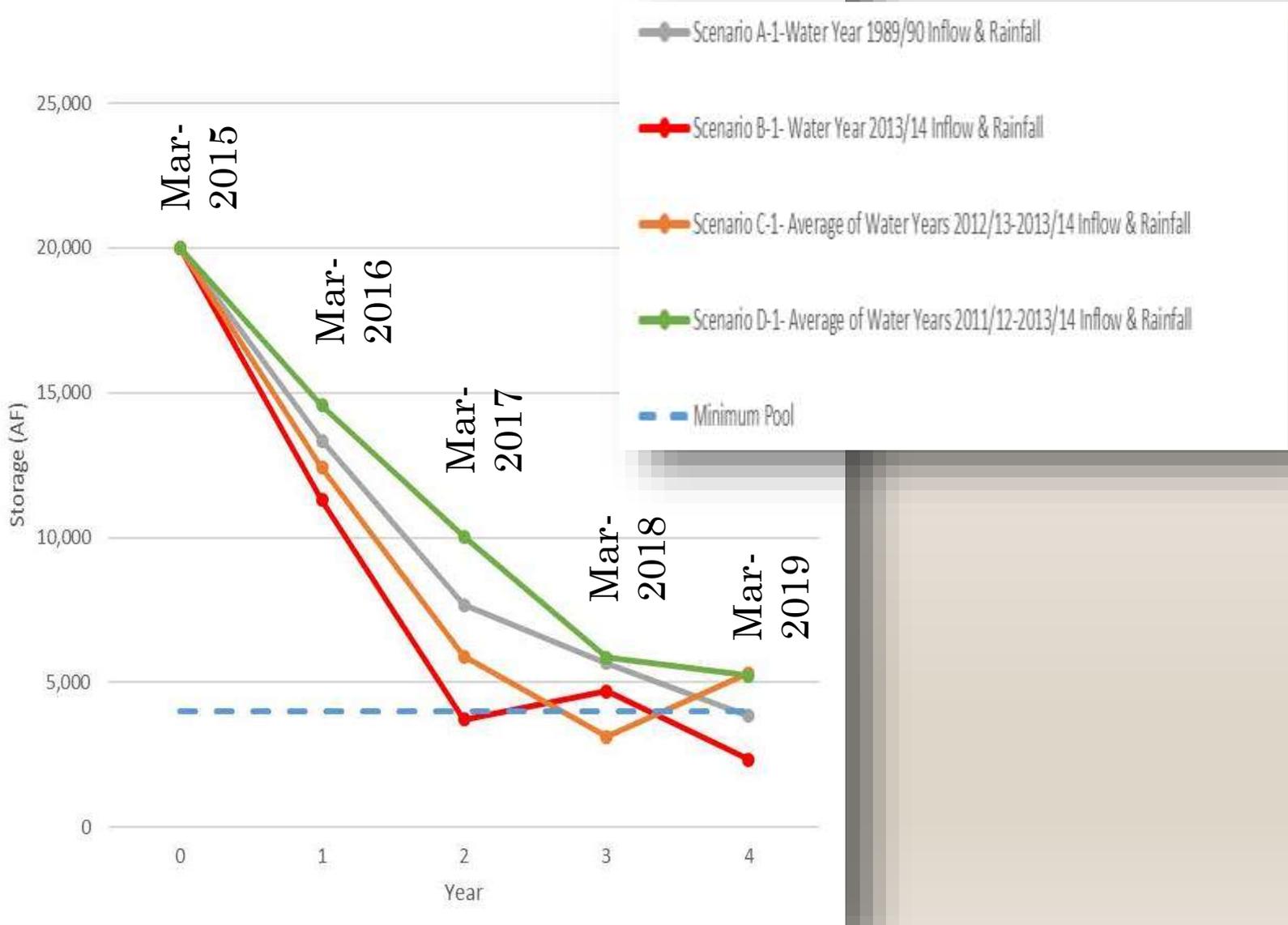
<b>Amount of Water In Storage (ac-ft)</b>	<b>Municipal Diversion Reduction</b>	<b>Municipal Diversion (ac-ft per year)</b>
20,000	0%	4,530
15,000	10%	4,077
10,000	20%	3,624
5,000	35%	2,941
4,000	100%	0

# Low-Reservoir Response Plan

**Table 2. Initial Prescribed Downstream Release Reduction Strategy**

<b>Amount of Water In Storage (ac-ft)</b>	<b>Downstream Release</b>	<b>Downstream Release (ac-ft per year)</b>
20,000	10%	3,800
15,000	10%	3,800
10,000	76%	1,026
5,000	93%	300
4,000	100%	0

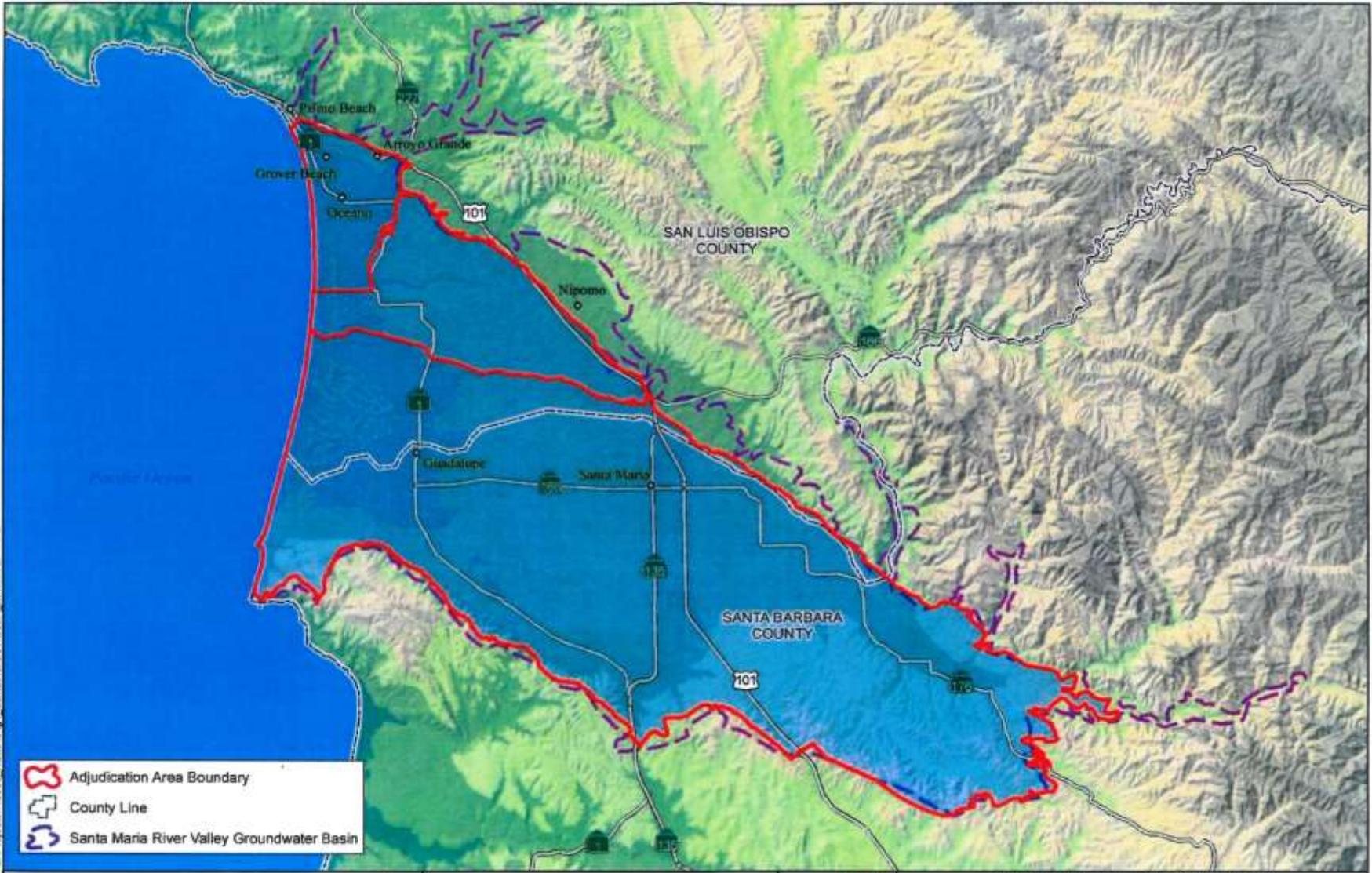
# Scenario 1- Initial Prescribed Reduction Strategy



# The Gentleman's Agreement

In 1983, Grover City, Arroyo Grande, Pismo Beach, OCSD and the San Luis Obispo Board of Supervisors adopted resolutions, amounting to what today is known as “The Gentleman’s Agreement”. The agreement provided for subdivision of the safe yield of the Tri-Cities Mesa Groundwater Basin among the Cities of Arroyo Grande, Grover City, Pismo Beach, OCSD and the agricultural community. This agreement provided that the division of the safe yield of the basin be accomplished based upon the following figures:

<b>Agreement Summary</b>	
<b>Use</b>	<b>Volume (acre-feet)</b>
<b>URBAN USES</b>	
City of Arroyo Grande	1,202
City of Grovery City	1,198
City of Pismo Beach	700
Oceano CSD	900
<i>Subtotal</i>	<b>4,000</b>
<b>OTHER USES</b>	
Applied Irrigation	5,300
Subsurface flow to Ocean	200
<i>Subtotal</i>	<b>5,500</b>
<b>TOTAL</b>	<b>9,500</b>



- Adjudication Area Boundary
- County Line
- Santa Maria River Valley Groundwater Basin



2012 Annual Monitoring Report  
 San Luis Obispo and Santa Barbara Counties  
 Northern Cities Management Area



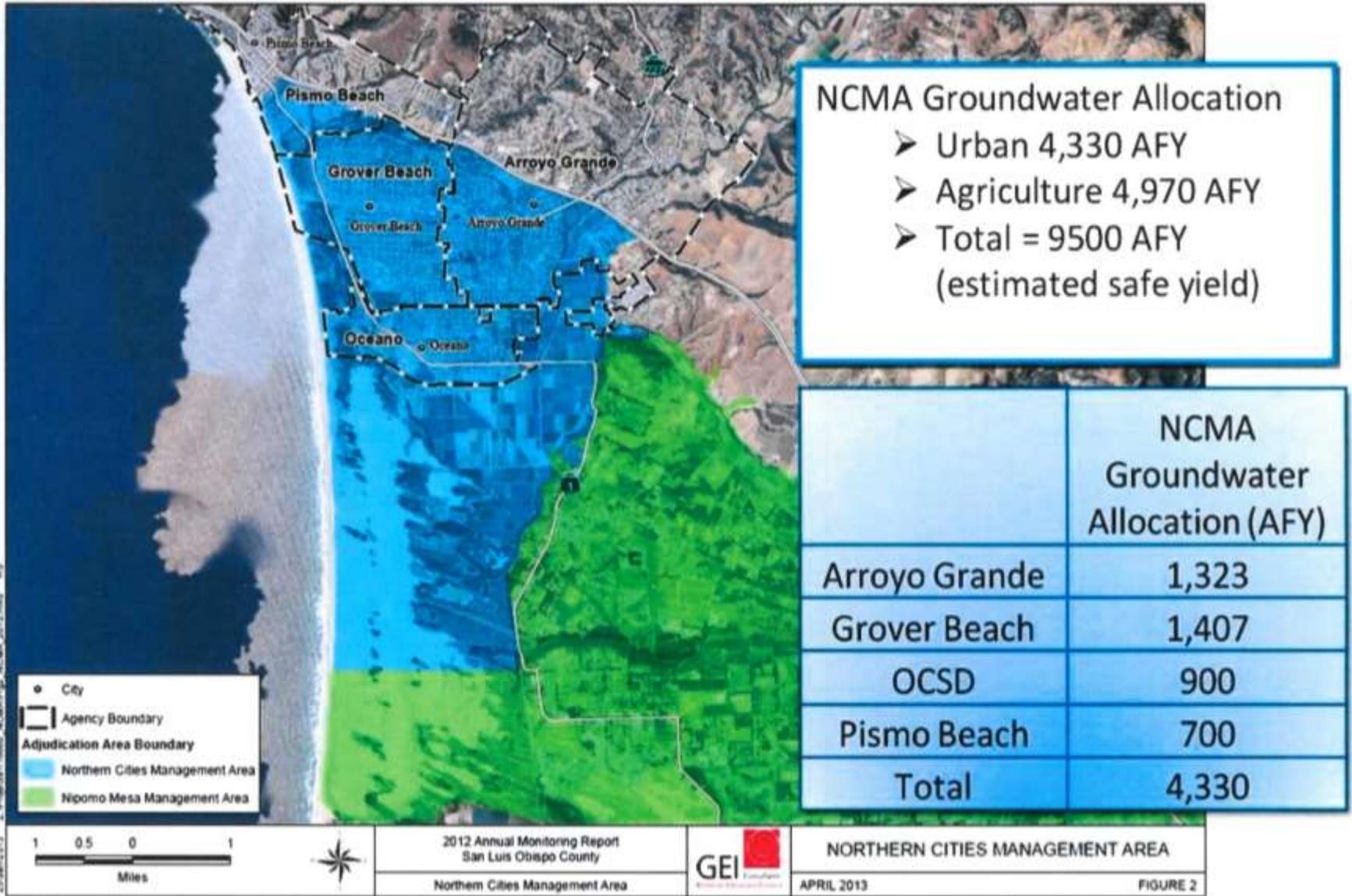
SANTA MARIA RIVER VALLEY  
 GROUNDWATER BASIN

APRIL 2013

FIGURE 1

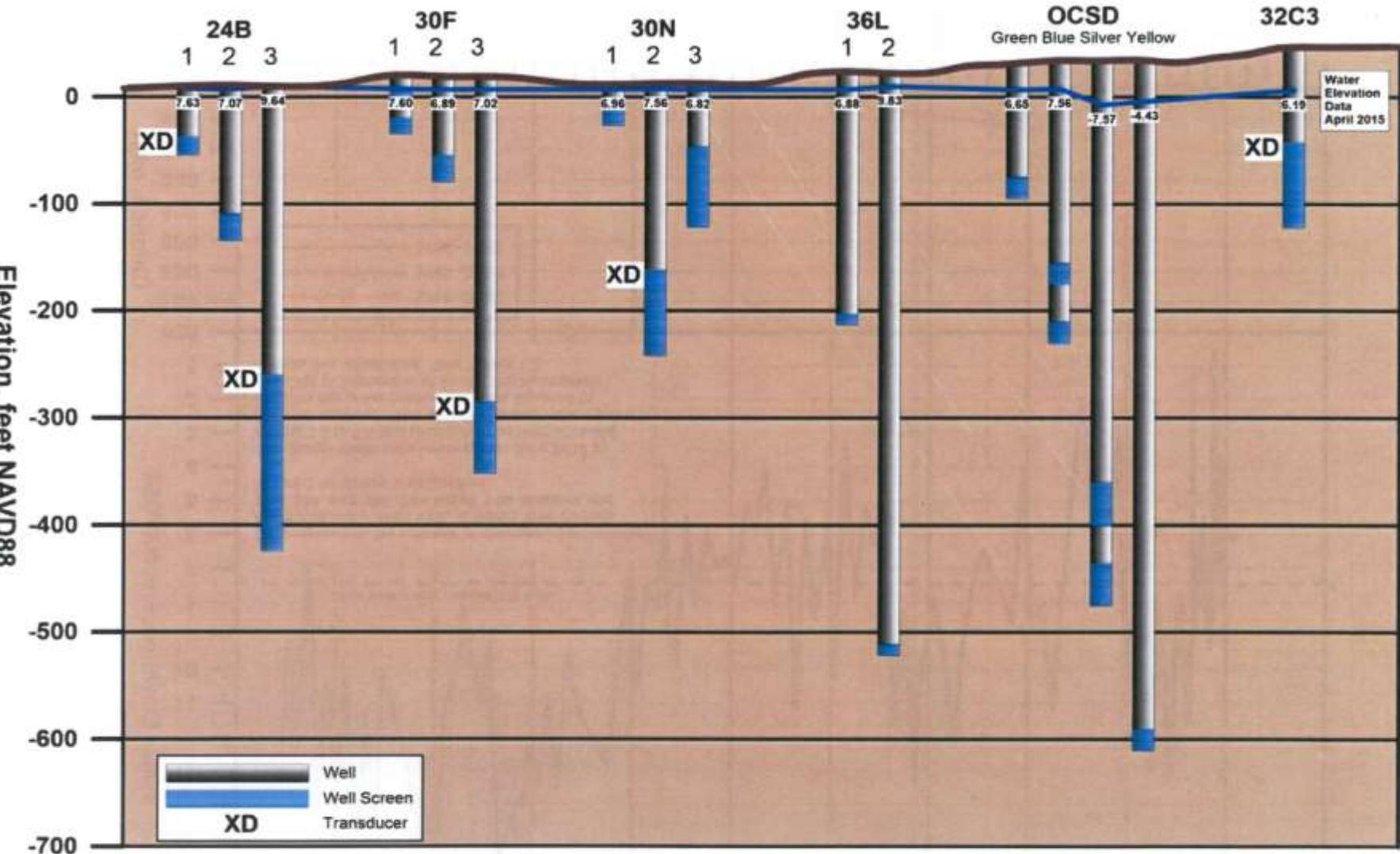
2013-Jan-2013 Z:\Projects\115660\_NCMAR\Fig1\_SantaMariaGVBasin\_2012.mxd RS

# Northern Cities Management Area

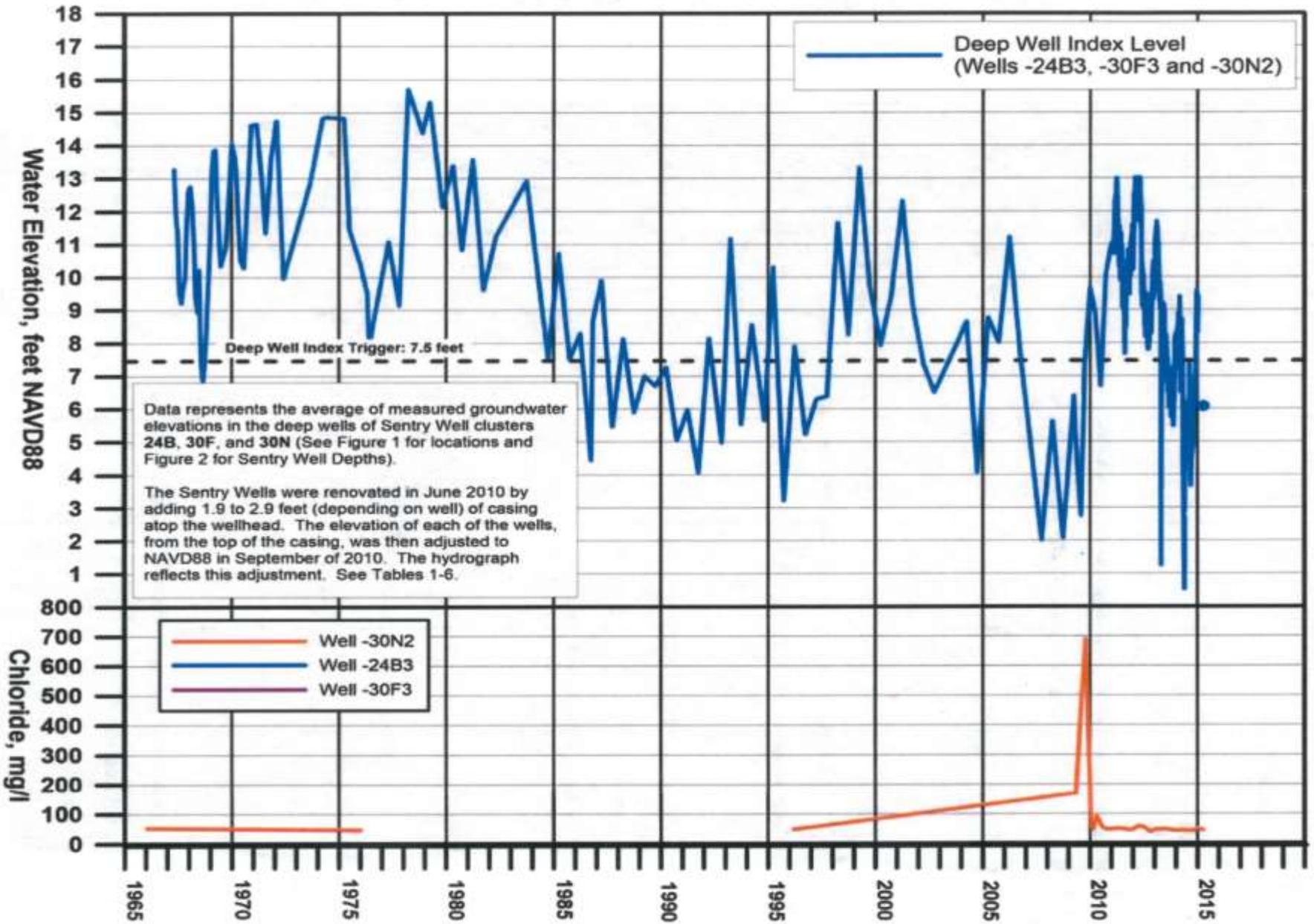


# Location of Sentry Wells Northern Cities Management Area





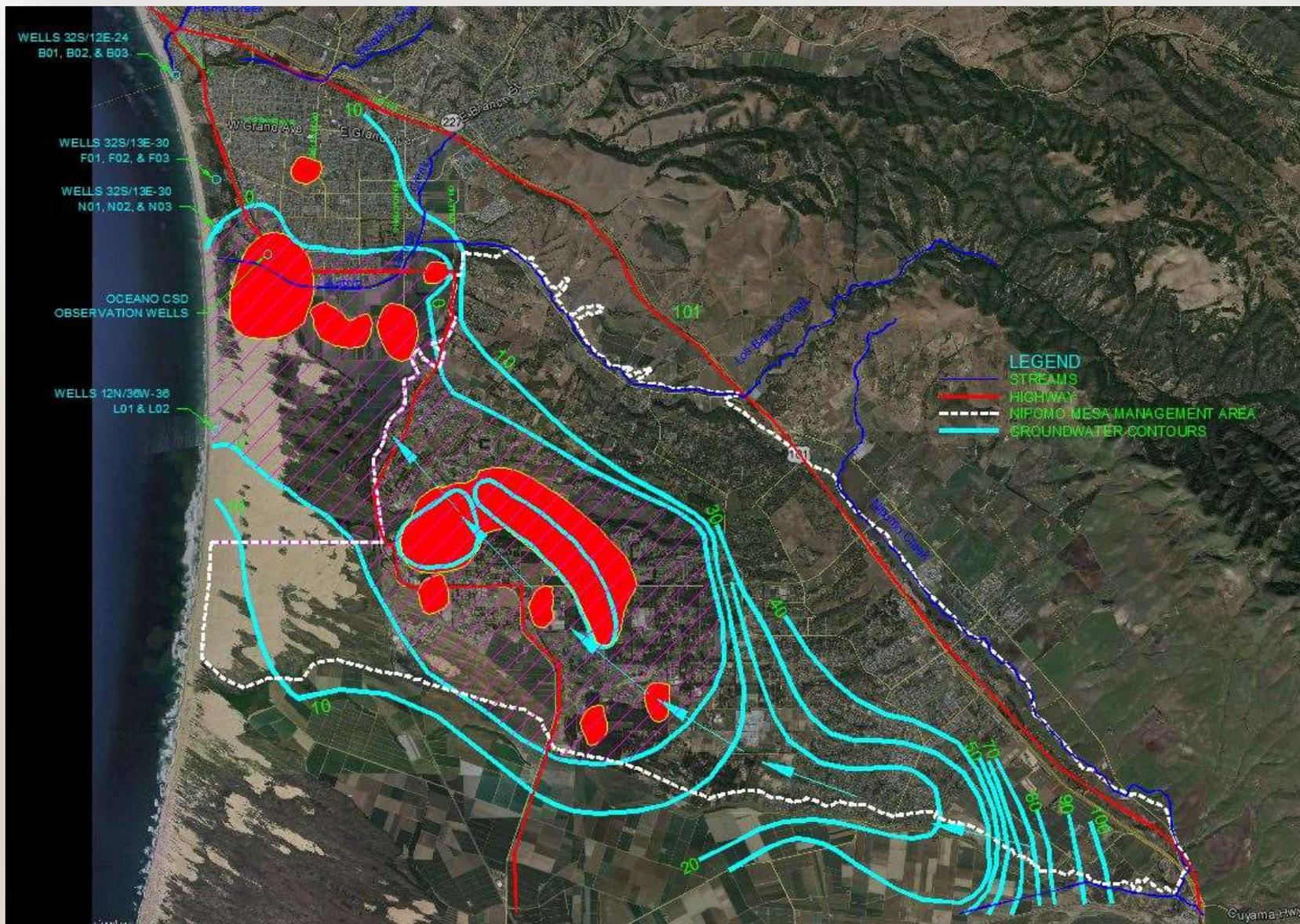
**DEPTHS OF SENTRY WELLS, APRIL 2015 WATER LEVEL DATA**  
 Northern Cities Management Area  
 San Luis Obispo County, California



**AVERAGE DEEP SENTRY WELL GROUNDWATER ELEVATION, PERIOD OF RECORD**

Northern Cities Management Area  
 San Luis Obispo County, California

# Effects of Drought and Pumping



FALL 2014 GROUNDWATER CONTOURS

# State Water

## SLO County State Water Entitlement:

25,000 ac-ft (in Central Valley Aqueduct)

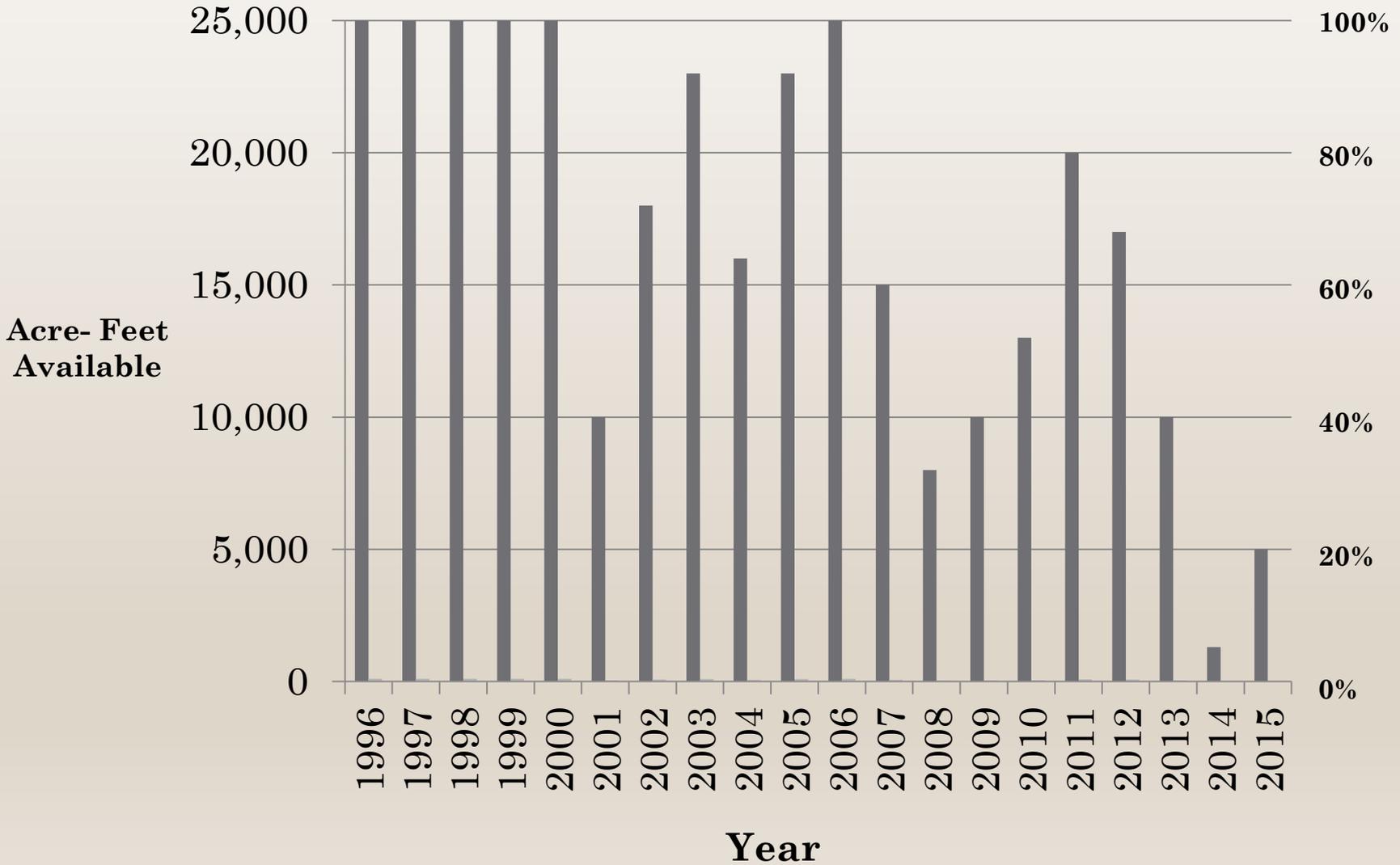
## SLO County Capacity in Coastal Branch of State Water Project:

4,750 ac-ft

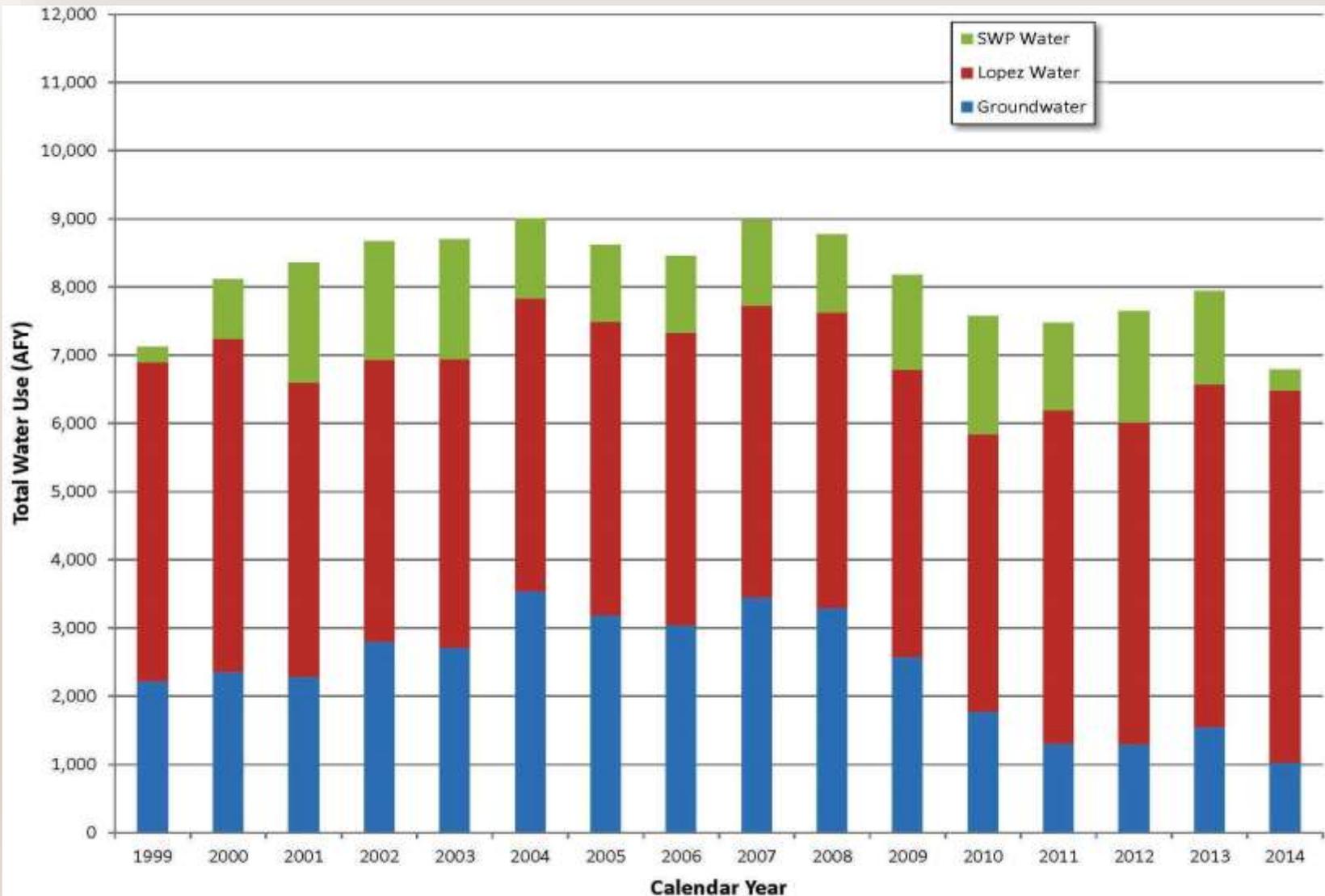
## Northern Cities Entitlements to State Water:

Pismo Beach	1,240 ac-ft
Oceano CSD	750 ac-ft

# State Water Availability



# Total Water Use by Source



# Summary

- Lopez Lake and Groundwater Elevations are at historically low levels while State Water deliveries are at historically low levels.
- Conservation will dramatically extend the availability of these critical water resources.
- Predicted El Nino Conditions may bring a wet winter, but there is no guarantee that this will occur.
- If dry conditions continue, even more restrictive conservation measures will be necessary.