

Total Dissolved Solids in San Diego County – A Need for Action?

Presented to
Headwaters to Oceans (H2O) Conference

Presented by
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Presentation Objectives

- Why do we care about TDS?
 - Beneficial Uses
 - 303(d) listings
- What is the distribution of TDS in San Diego County?
- What's in the future?
- What can we do about it?

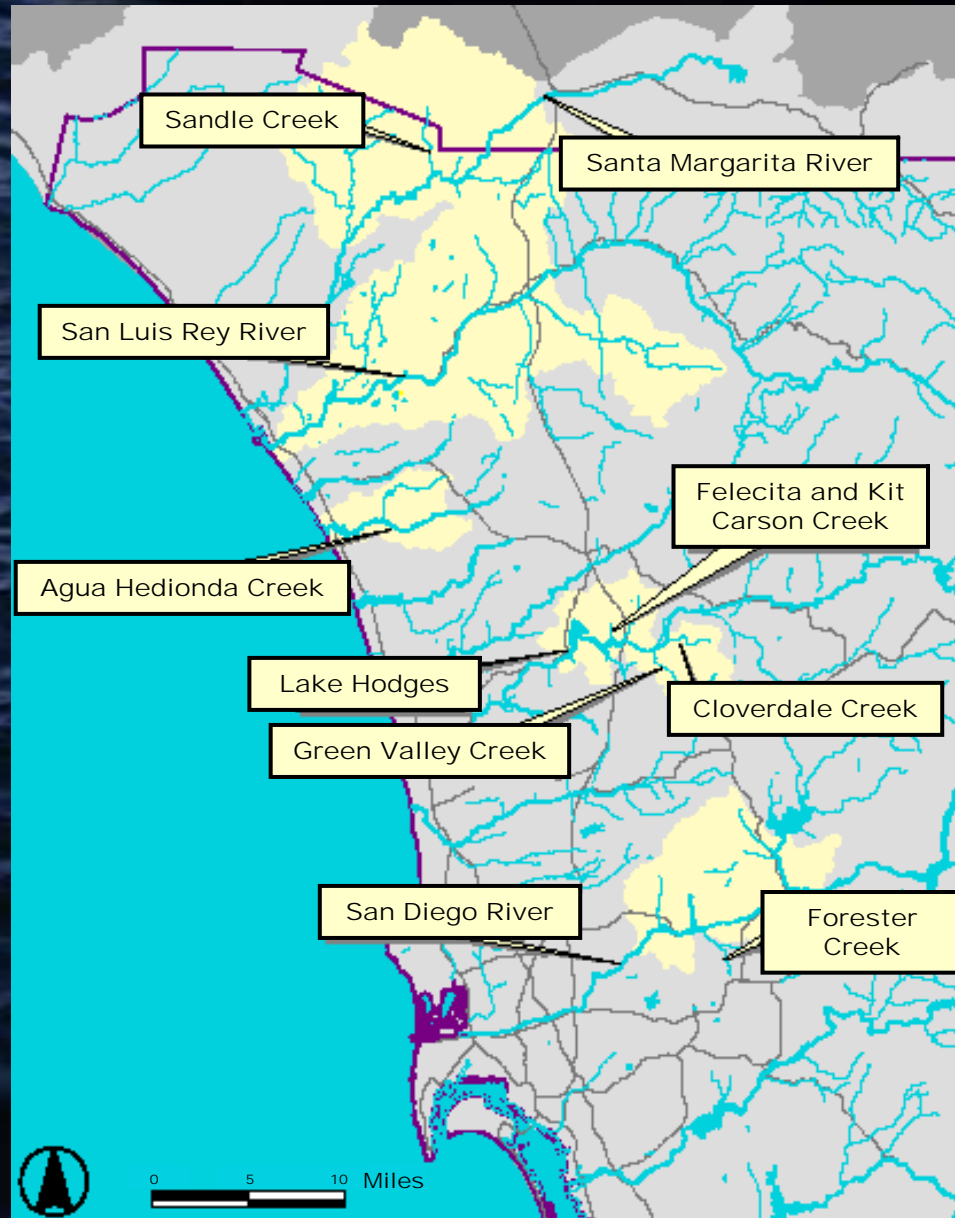
Protection of Beneficial Uses

- Drinking water
- Agricultural irrigation

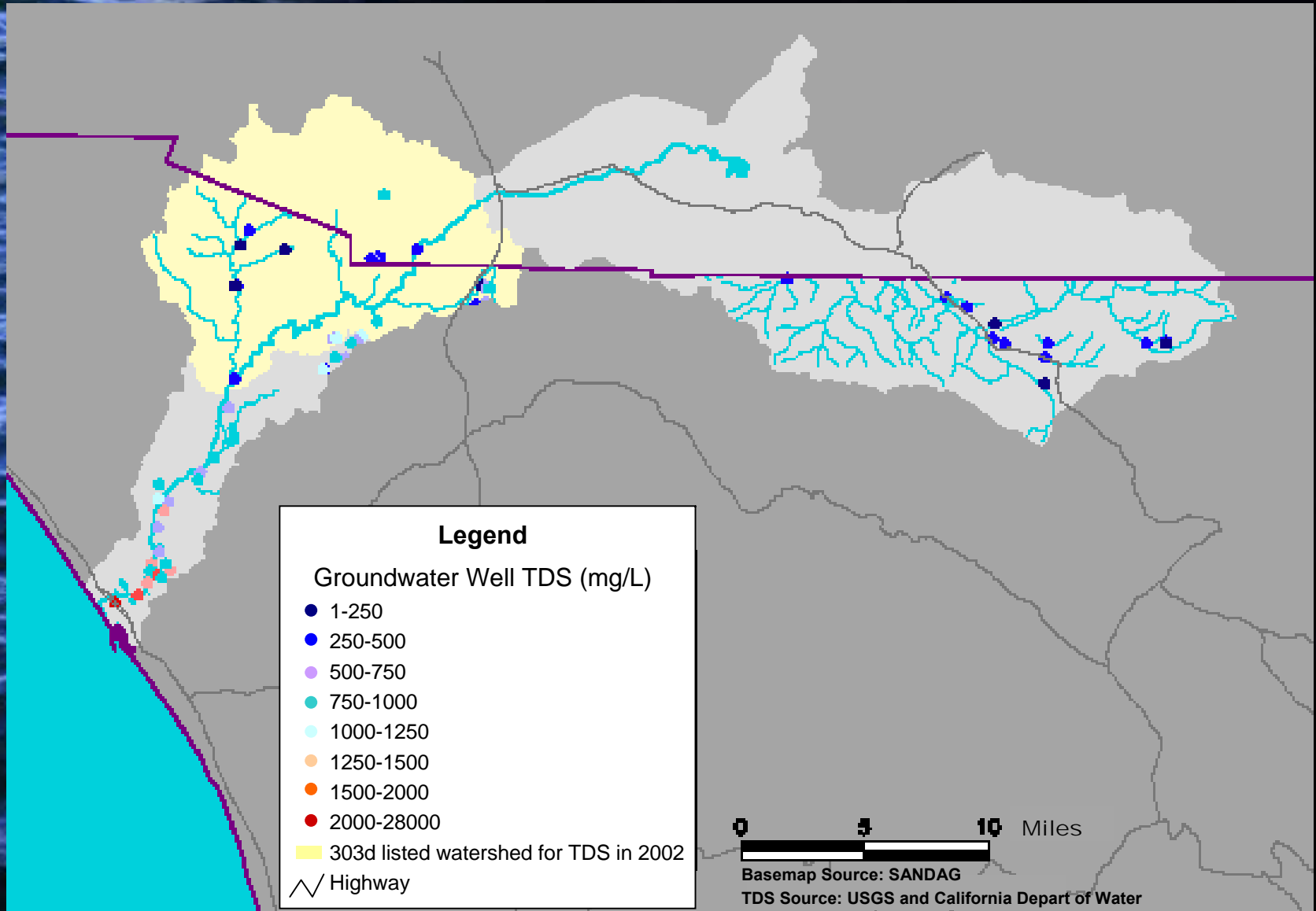


Principal Aquifers in Western San Diego County

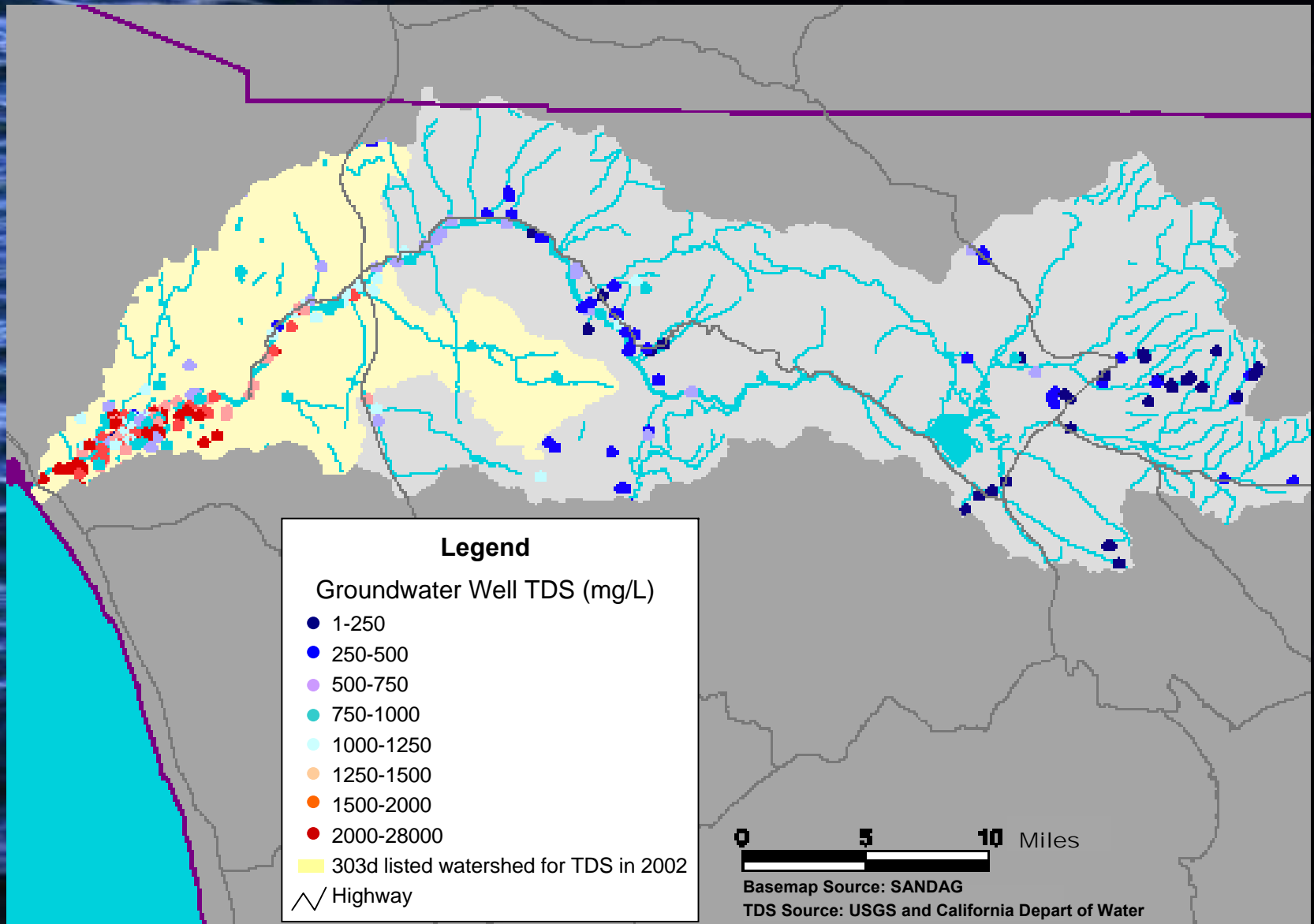
303(d) Listings



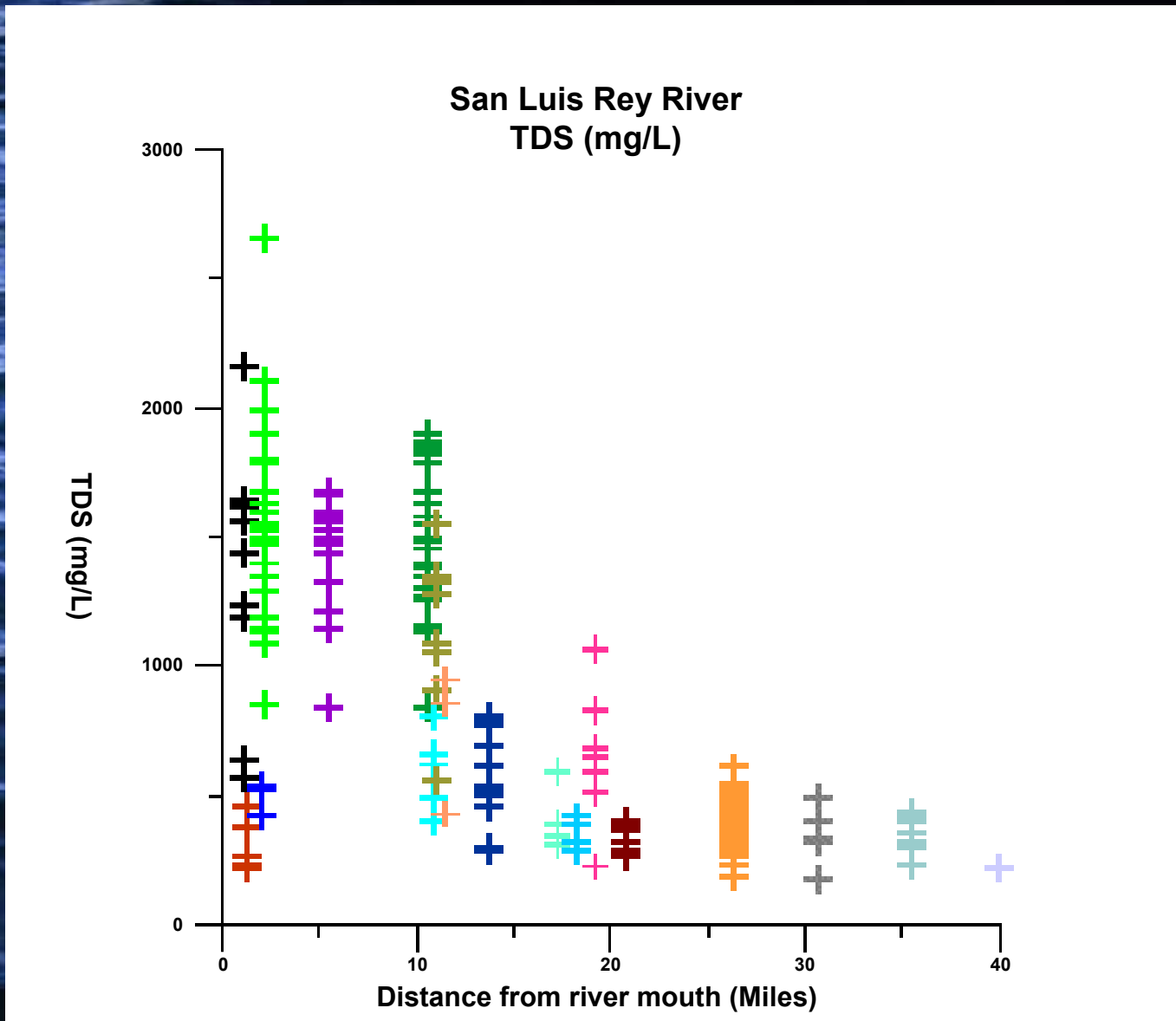
Santa Margarita River Watershed



San Luis Rey River Watershed



Variation of TDS in Surface Water



TDS Data Source: a) California Water Resources Control Board b) City of Oceanside

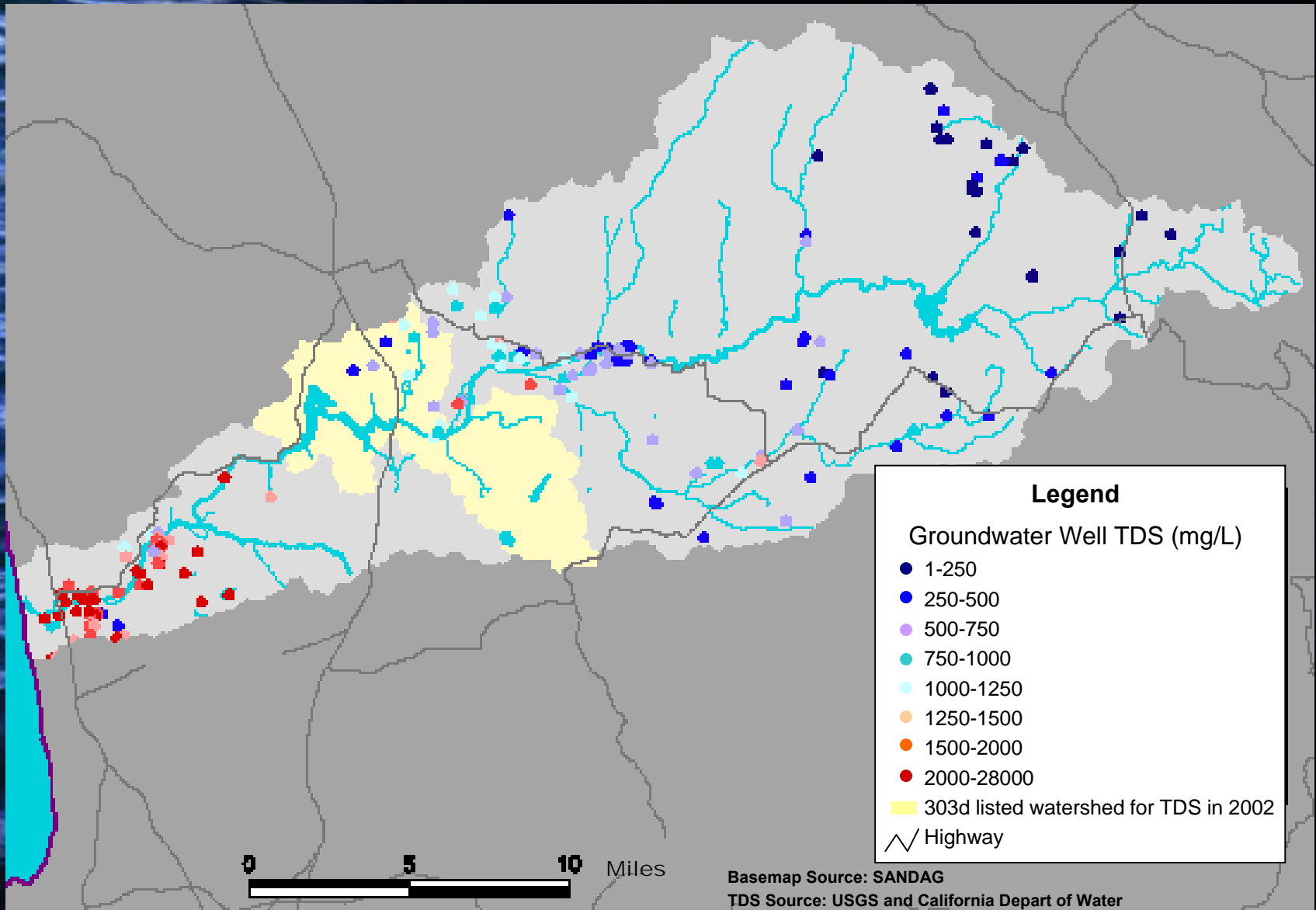
Seasonal Variation

Streamflow (cfs)	Mean Streamflow TDS Concentration (mg/L)	
	San Luis Rey River at Oceanside ¹	Santa Margarita River at Fallbrook ²
> 300	620	620
100 – 300	940	690
50 – 100	1200	790
10 – 50	1400	800
0 – 10	1700	850

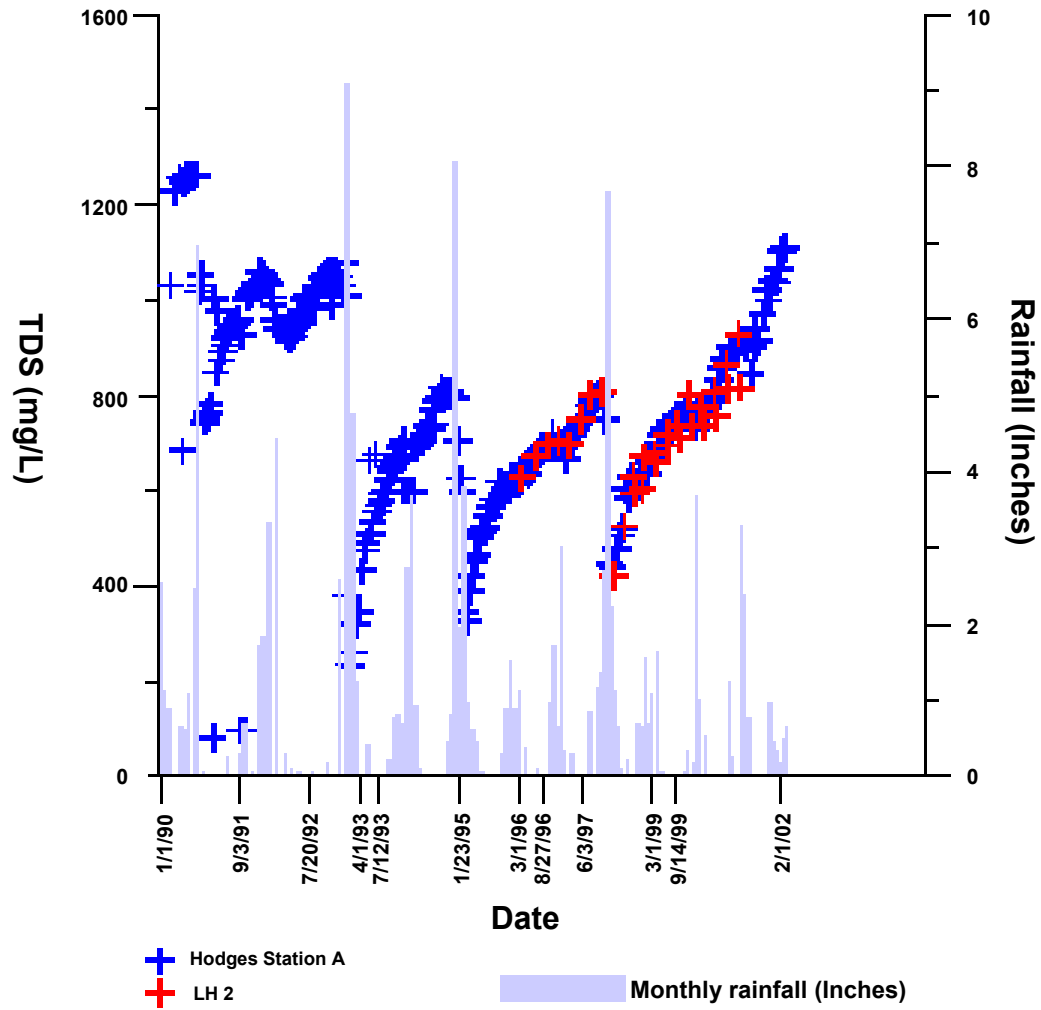
1 Water quality data for San Luis Rey River at Oceanside, 1973-1992, U.S. Geological Survey. Values rounded to two significant figures.

2 Water quality data for Santa Margarita River at Fallbrook, 1963-1993, U.S. Geological Survey. Values rounded to two significant figures.

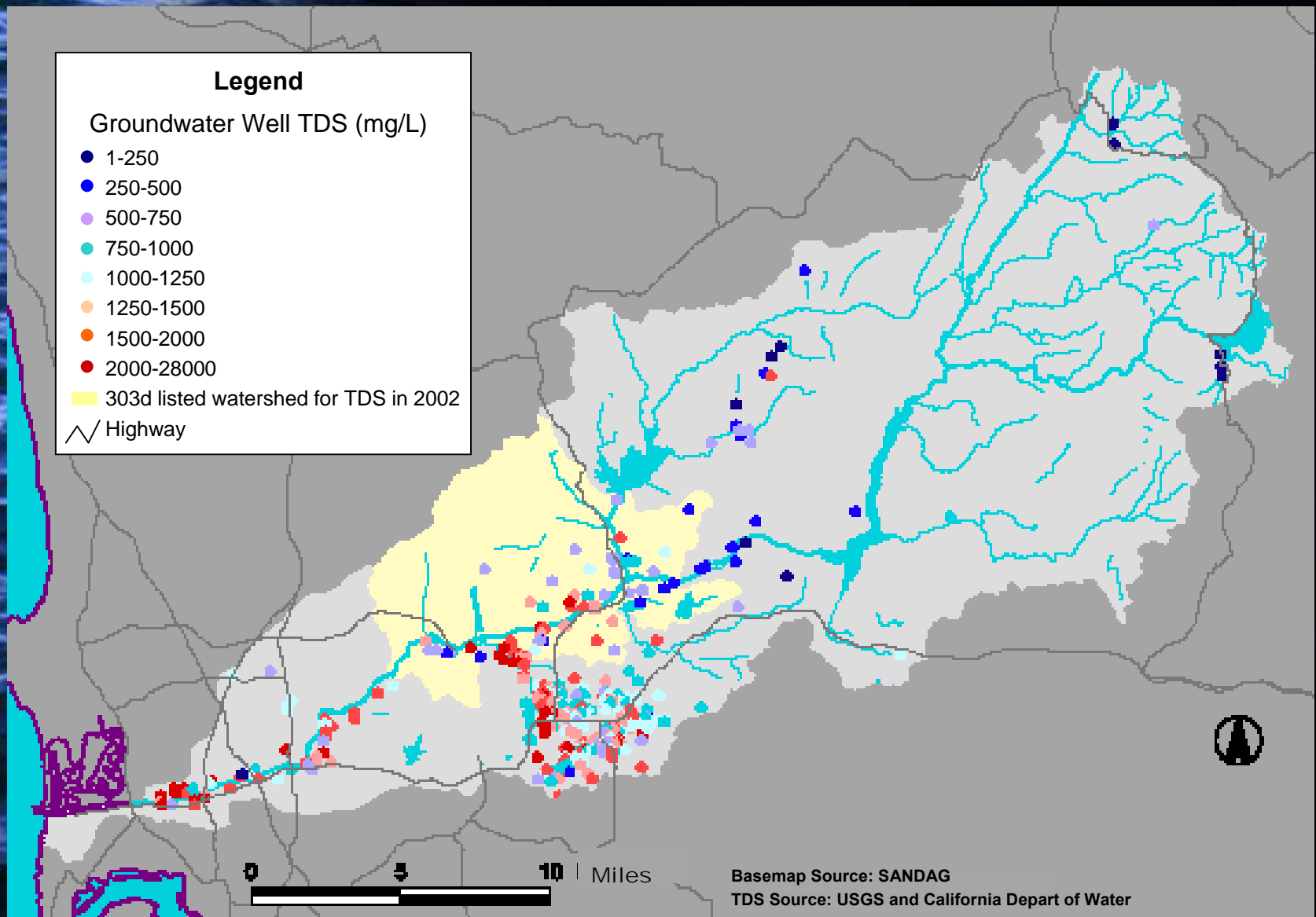
San Dieguito River Watershed



Lake Hodges TDS (mg/L)



San Diego River Watershed

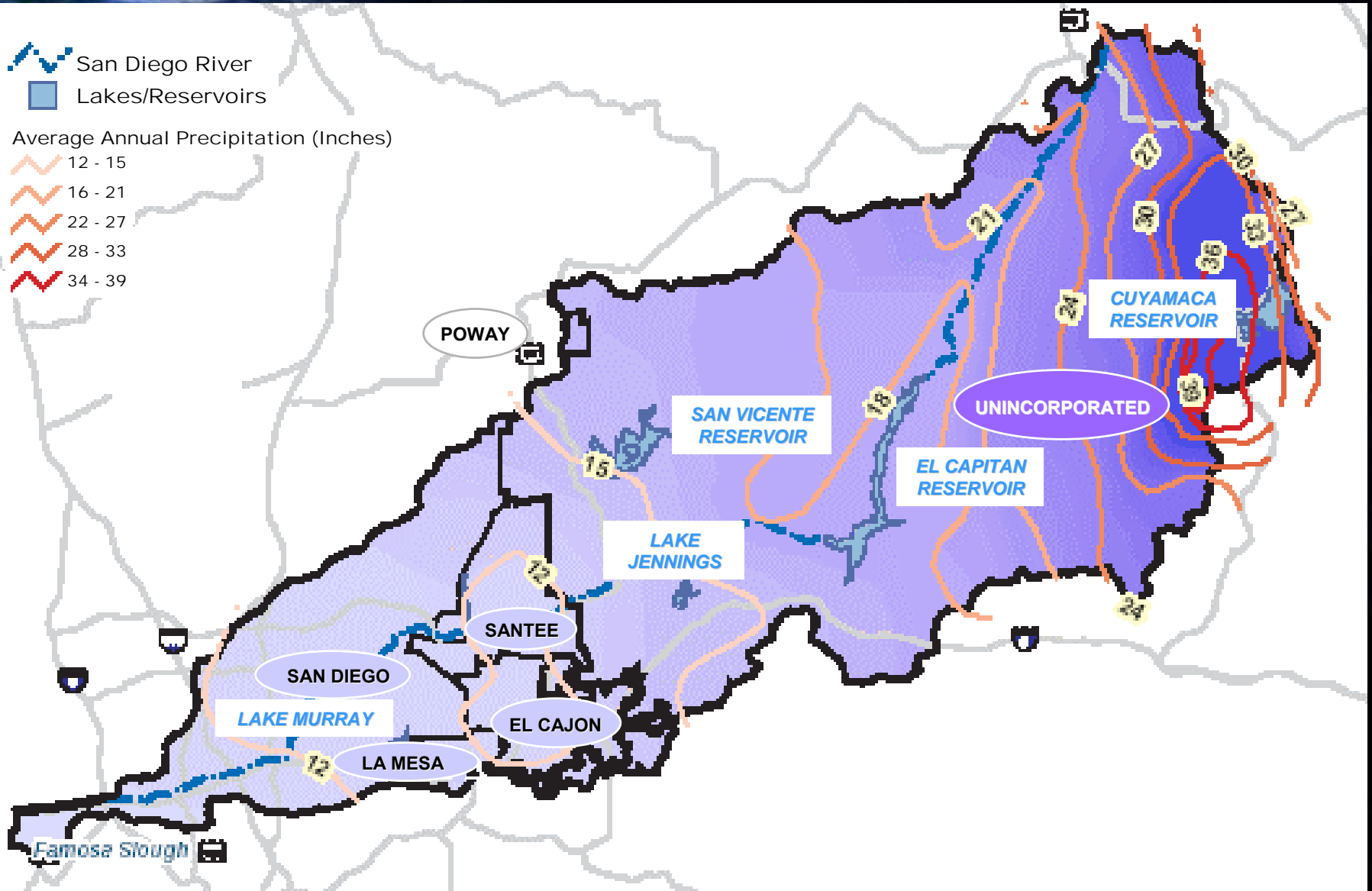


Effect of Precipitation

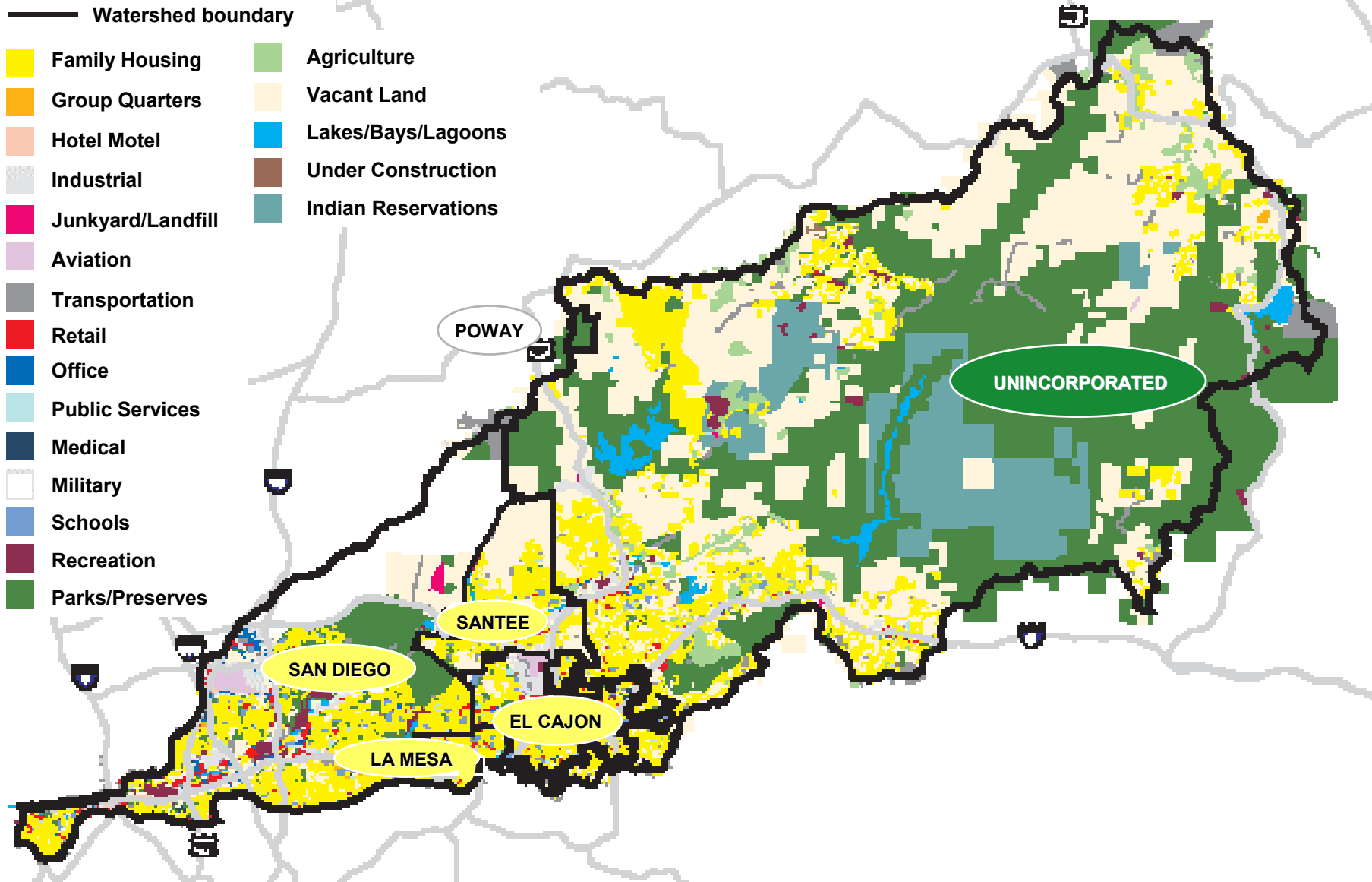
San Diego River
Lakes/Reservoirs

Average Annual Precipitation (Inches)

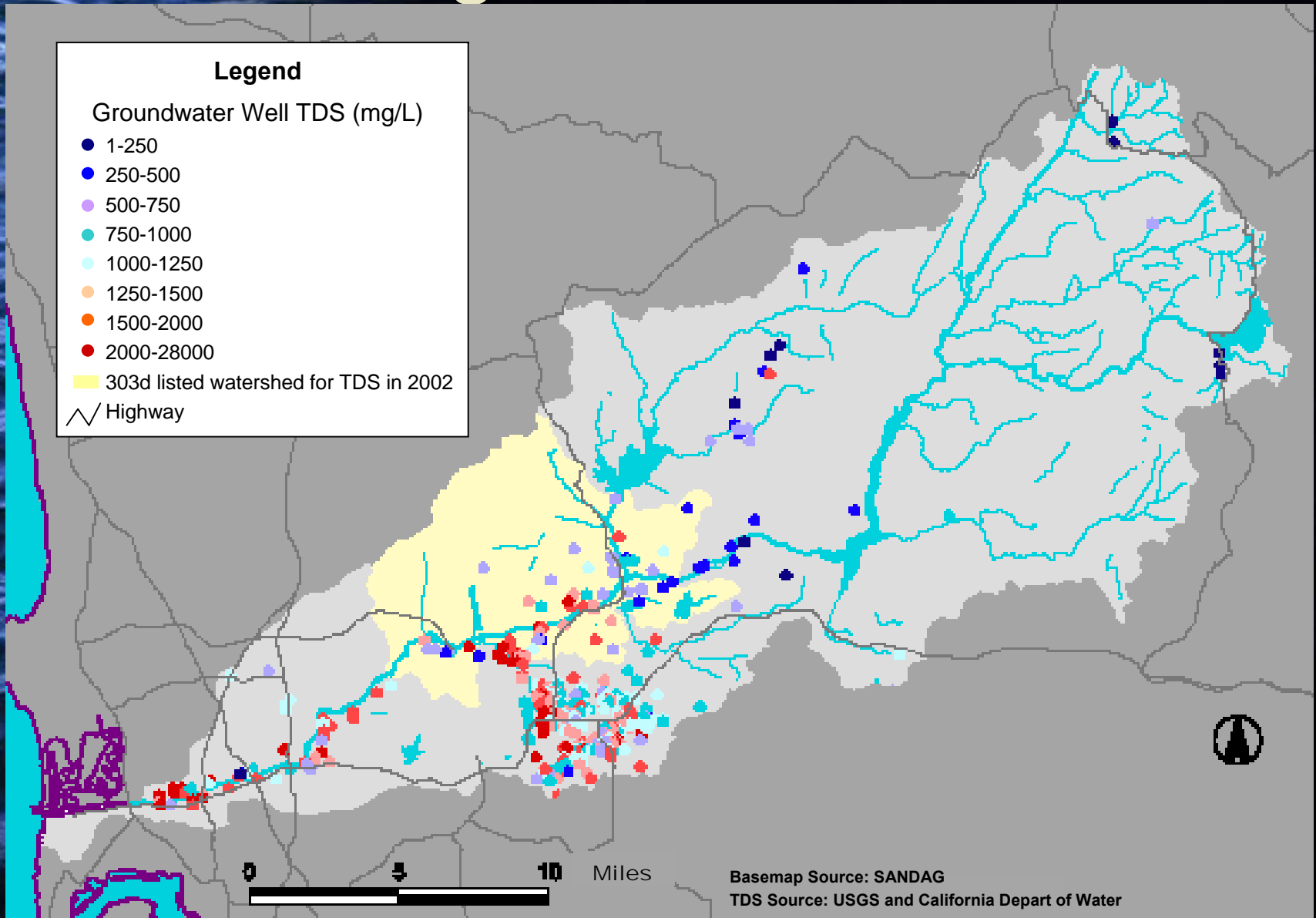
- 12 - 15
- 16 - 21
- 22 - 27
- 28 - 33
- 34 - 39



Effect of Land Use



San Diego River Watershed



What Can We Do About It?

- Resolve water quality objectives between surface water and groundwater

Surface Versus Groundwater Objectives

Basin No.	Basin Name	TDS Concentration in mg/L		
		Surface Water Quality Objective ¹	Groundwater Quality Objective ¹	Observed Groundwater Quality
902.22	Upper Santa Margarita River (lower 17.5 miles)	500	750	750 – 1200 ^{2,3,4,5}
902.22	Sandia Creek (lower 1.5 miles)	500	750	
903.11	San Luis Rey River (lower 17 miles)	500	1500	500 – 3400 ^{2,4}
904.31	Agua Hedionda Creek (lower 8 miles)	500	1200	
905.21	Lake Hodges Reservoir	500	1000	1000 – 1500 ^{2,4}
905.23	Felicita Creek (lower 2 miles)	500	1000	
905.23	Kit Carson Creek (1 mile)	500	1000	
905.31	Cloverdale Creek (1 mile)	500	1000	
907.12	Forester Creek (lower 1 mile)	1000	1000	1500 - 3000 ^{2,4,6}
907.11 ⁷ 907.12	Lower San Diego River (lower 20 miles)	1500	2000 ⁷	1000 - 3000 ^{2,4}

1 Surface and groundwater quality objectives as designated in the 1994 Basin Plan.

2 From NBS/Lowry (1989a).

3 From NBS/Lowry (1995) and SDCWA (1997b).

4 From Leedshill-Herkenhoff (1988).

5 From California Department of Water Resources (1986).

6 RWQCB lists this subbasin as 907.12, but the lower 20 miles of the Lower San Diego River is predominantly located within HSA 907.11.

7 Groundwater quality objective within 907.11 is 3000 mg/L. Basin Plan groundwater quality objective within alluvial aquifer portion of 907.12 is 2000 mg/L.

What Can We Do About It?

- Resolve water quality objectives between surface water and groundwater
- Be vigilant about blending and quality of water supplies

Water Supply Characteristics

Water Supply	Source	Year 2001 Supply ¹		TDS Concentration (mg/L)	
		AFY	Percent	Year 2001	Historical Average 1975-1999
Imported Supply	Colorado River	437,750	64%	560 ²	700 ⁴
	SWP	159,700	24%	290 ³	250 ⁴
Local Supply	Surface Water	51,400	8%	300 – 1200 ⁵	300 – 1200 ⁵
	Groundwater	12,700	2%	400 – 700 ⁶	400 – 700 ⁶
	Desalted Groundwater	5,500	1%	400 ⁷	400 ⁷
	Recycled Water	12,700	2%	800 – 1100 ⁸	800 – 1100 ⁸

¹ From SDCWA 2001 Annual Report (for water year 2000-2001).

² From Metropolitan Water District of Southern California (MWD) monthly reports for Colorado River supply in San Jacinto Tunnel West Portal for 2001.

³ From MWD monthly reports for SWP East Branch supply in Lake Perris for 2001.

⁴ Long-term (25-year) average TDS concentration. From MWD and U.S. Bureau of Reclamation (1999).

⁵ Surface water quality varies by reservoir and with hydrologic conditions. The listed range of values are typical for major San Diego County reservoirs, including Lake Hodges, Sutherland Reservoir, El Capitan Reservoir, Sweetwater Reservoir, and Otay Reservoir.

⁶ Groundwater quality varies with location and hydrologic conditions. Listed quality is typical for agencies within or near the affected 303(d) areas, including the U.S. Marine Corps Base Camp Pendleton, Lakeside Water District, Riverview Water District, and Helix Water District.

⁷ Typical desalted groundwater TDS quality for Sweetwater Authority and City of Oceanside.

⁸ Water quality supply varies with recycled water agency. Recycled water supplies within the SDCWA service area typically have TDS concentrations from 350 to 450 mg/L higher than the source water TDS. The listed water quality values represent a range of recycled water quality from agencies within the affected 303(d) listed areas, including the City of San Diego, City of Escondido, Fallbrook Public Utility District, Olivenhain Municipal Water District, Otay Water District, and Padre Dam Municipal Water District.

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- Develop and implement best management practices for irrigation

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- Be vigilant about blending and quality of water supplies
- Develop and implement best management practices for irrigation
- Use groundwater basins to store low TDS water and limit evapoconcentration