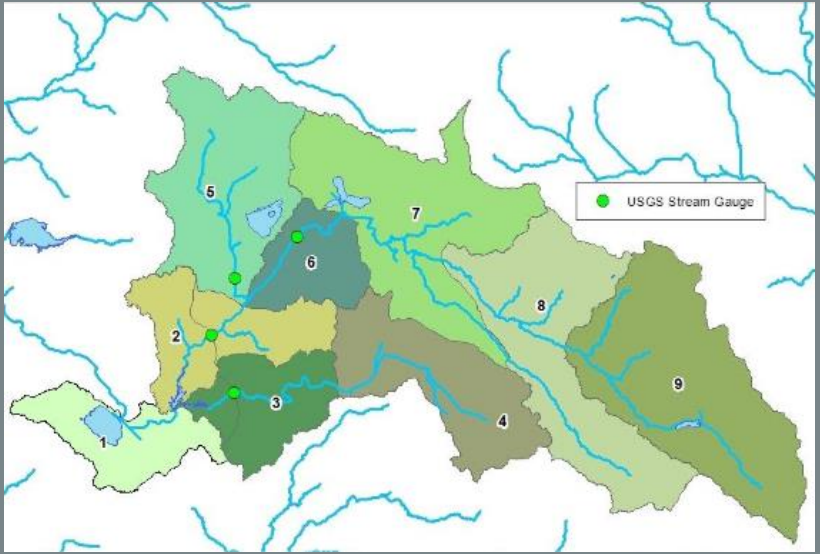
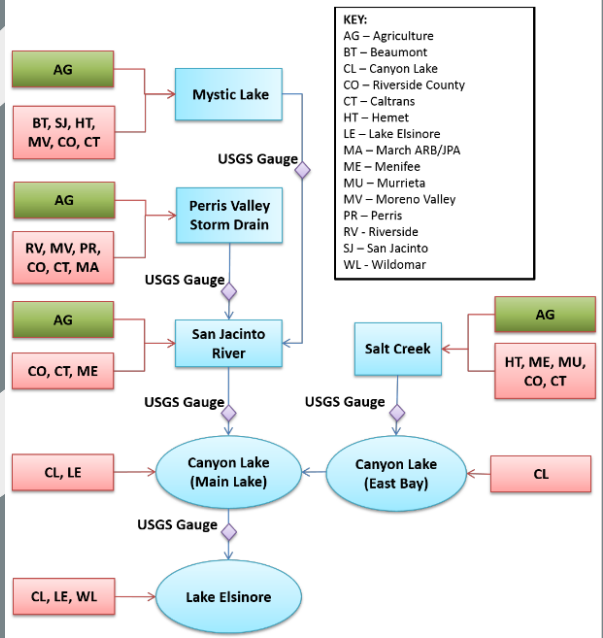
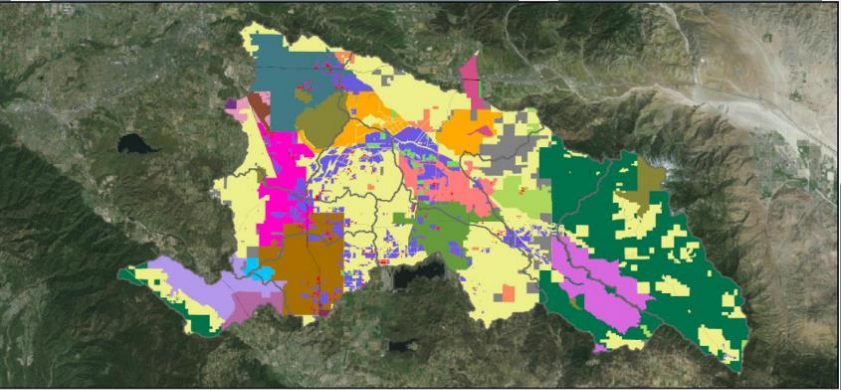


LECL TMDL Task Force Update to TMDL Revision

Presentation by Steve Wolosoff, Paul Senker,
and Richard Meyerhoff, GEI Consultants

March 28, 2023



Agenda

- Allocations for updated jurisdictions
- Source assessment – watershed model update
- Implementation

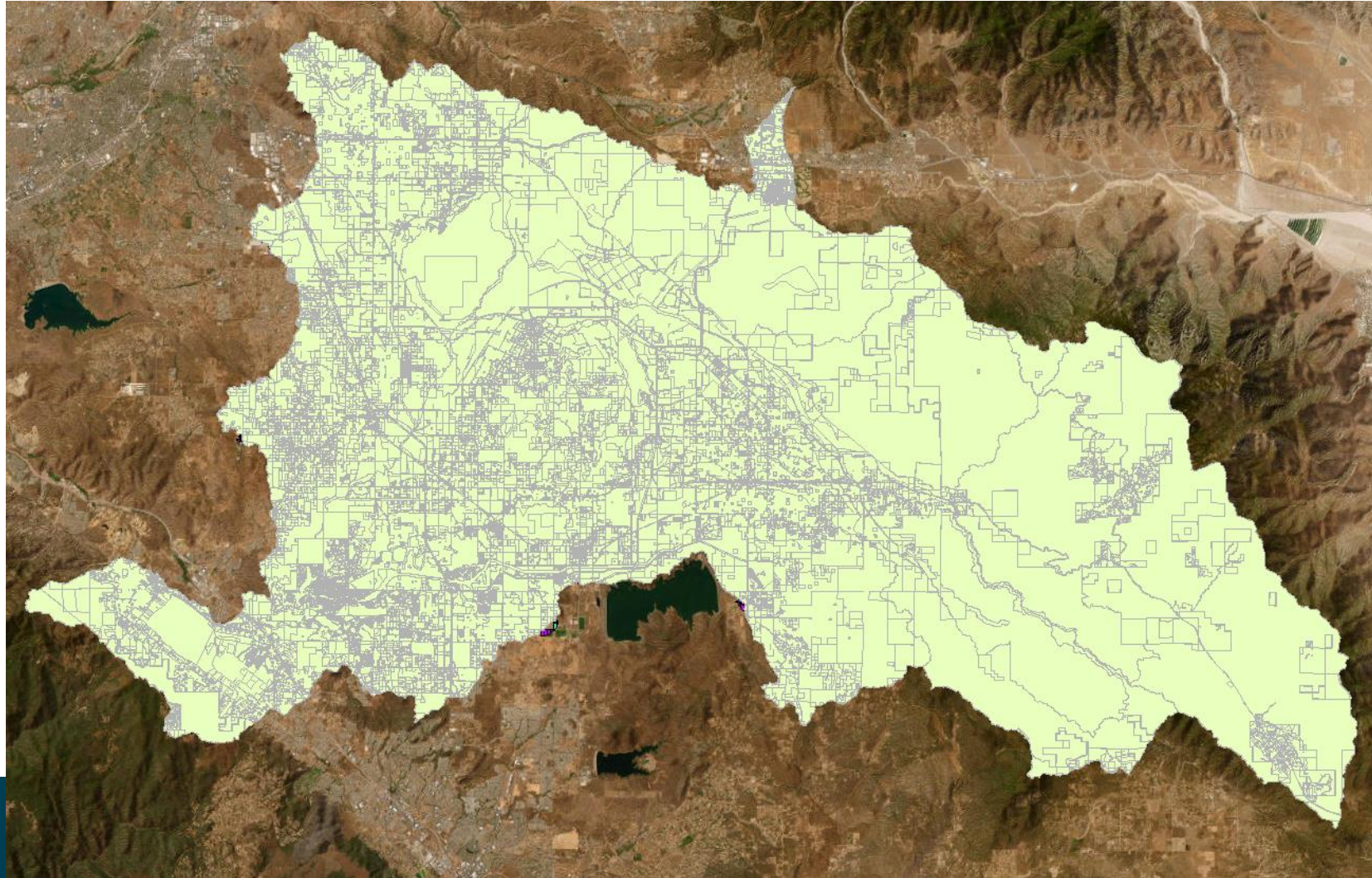


Watershed Model Update



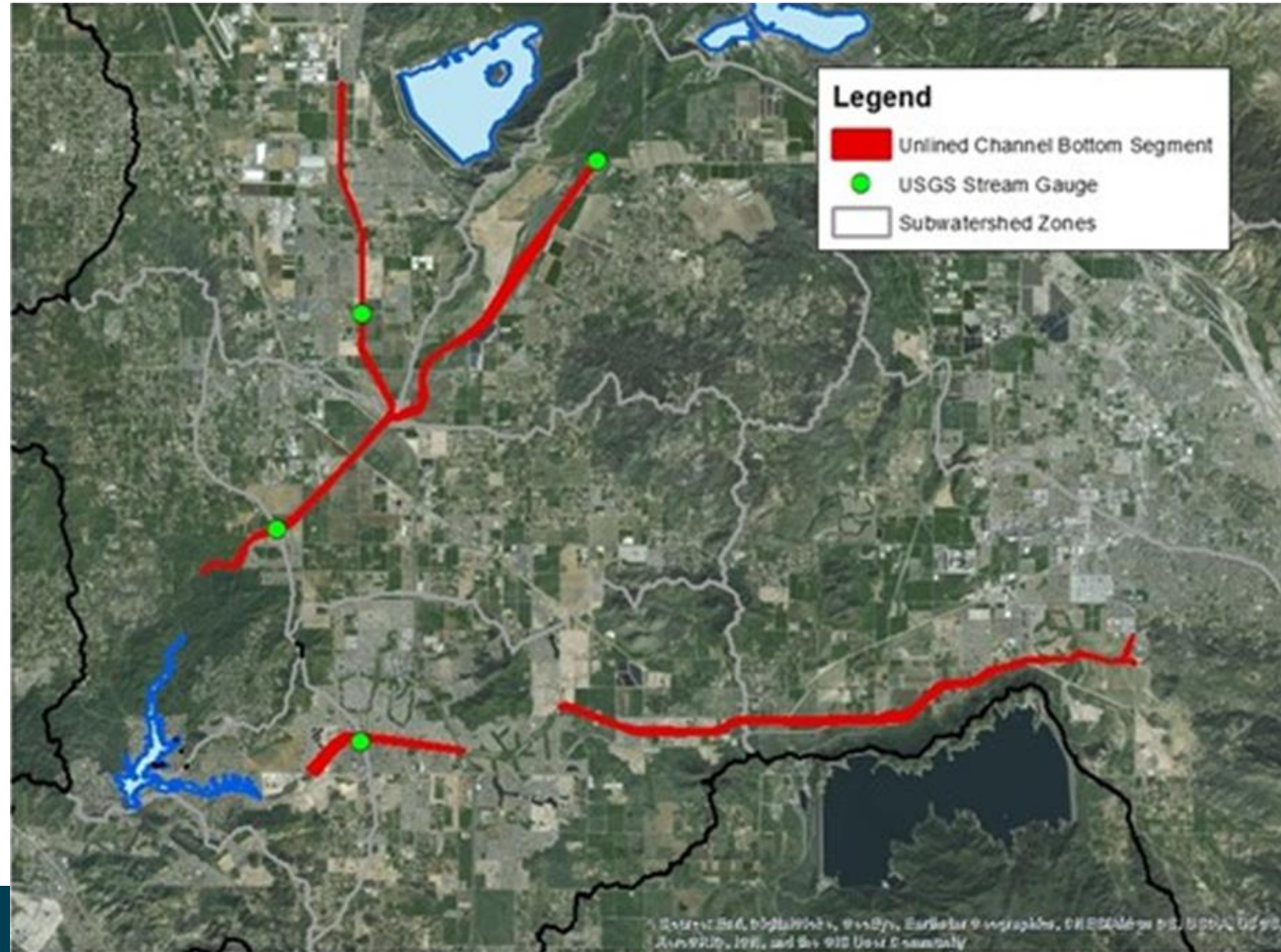
Mapping for Watershed Model

- Runoff based on long-term annual rainfall for unique combinations
- Jurisdiction, subwatershed zone, land use



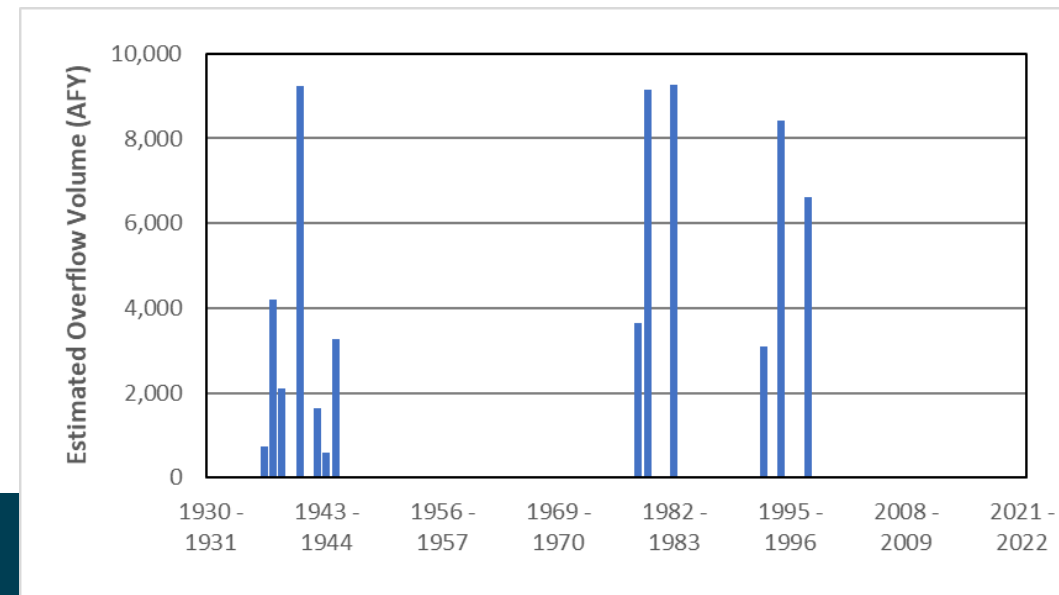
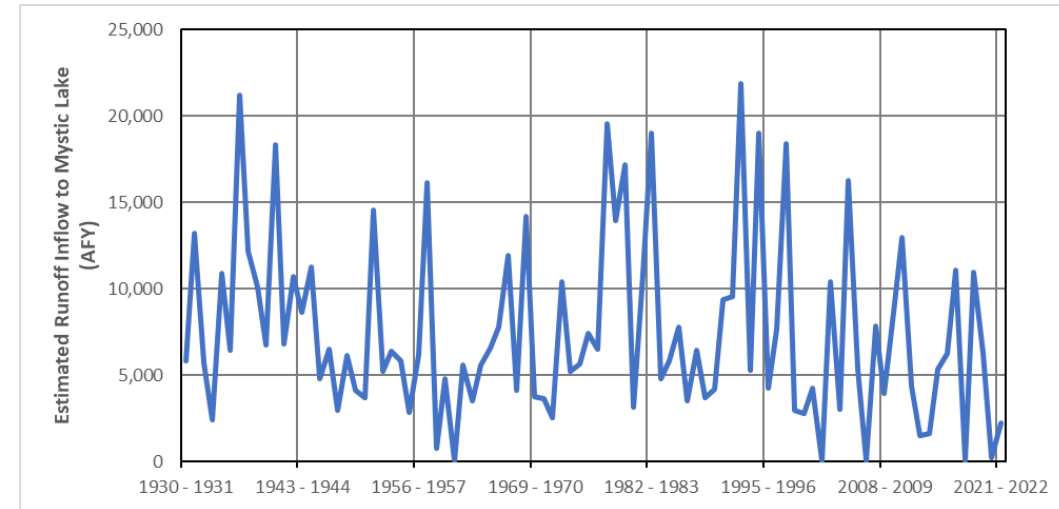
Watershed Retention Factors

- Channel bottom recharge based on surface area and estimated percolation rate
- Salt Creek retention 65%
- San Jacinto River/Perris Valley Channel retention 9%



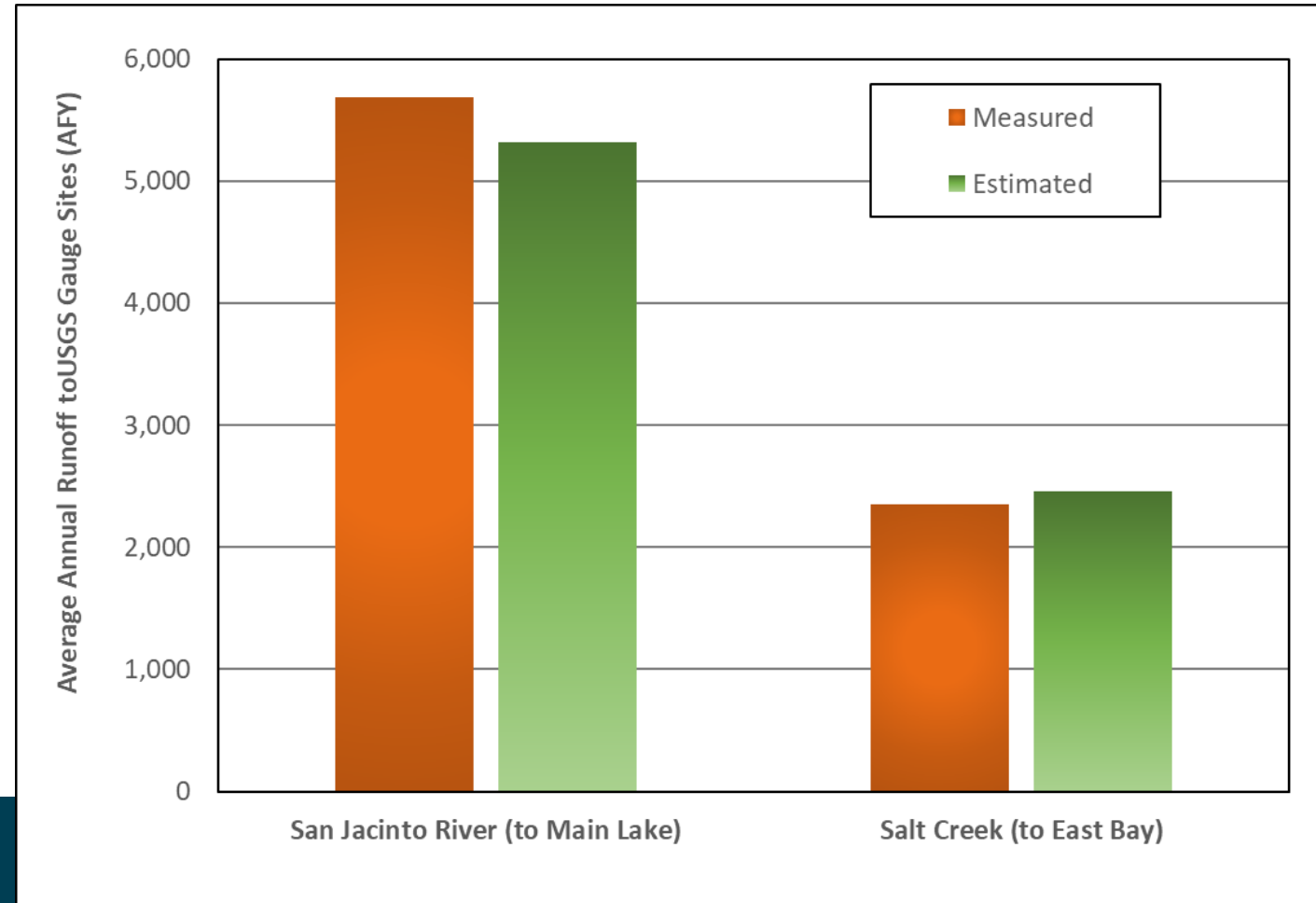
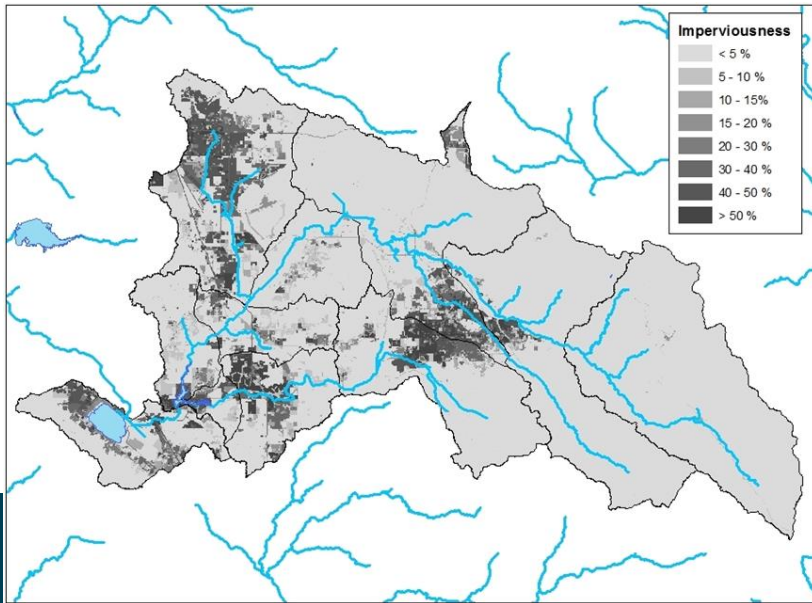
Watershed Retention Factors

- Hydrology analysis to meet condition of 1998 as last overflow
- Overflow/Inflow = 0.089
- Retention 91%



Hydrologic Fitting

- Annual runoff coefficient model as a function of imperviousness
- Accounting for channel bottom recharge losses upstream of the USGS gauges



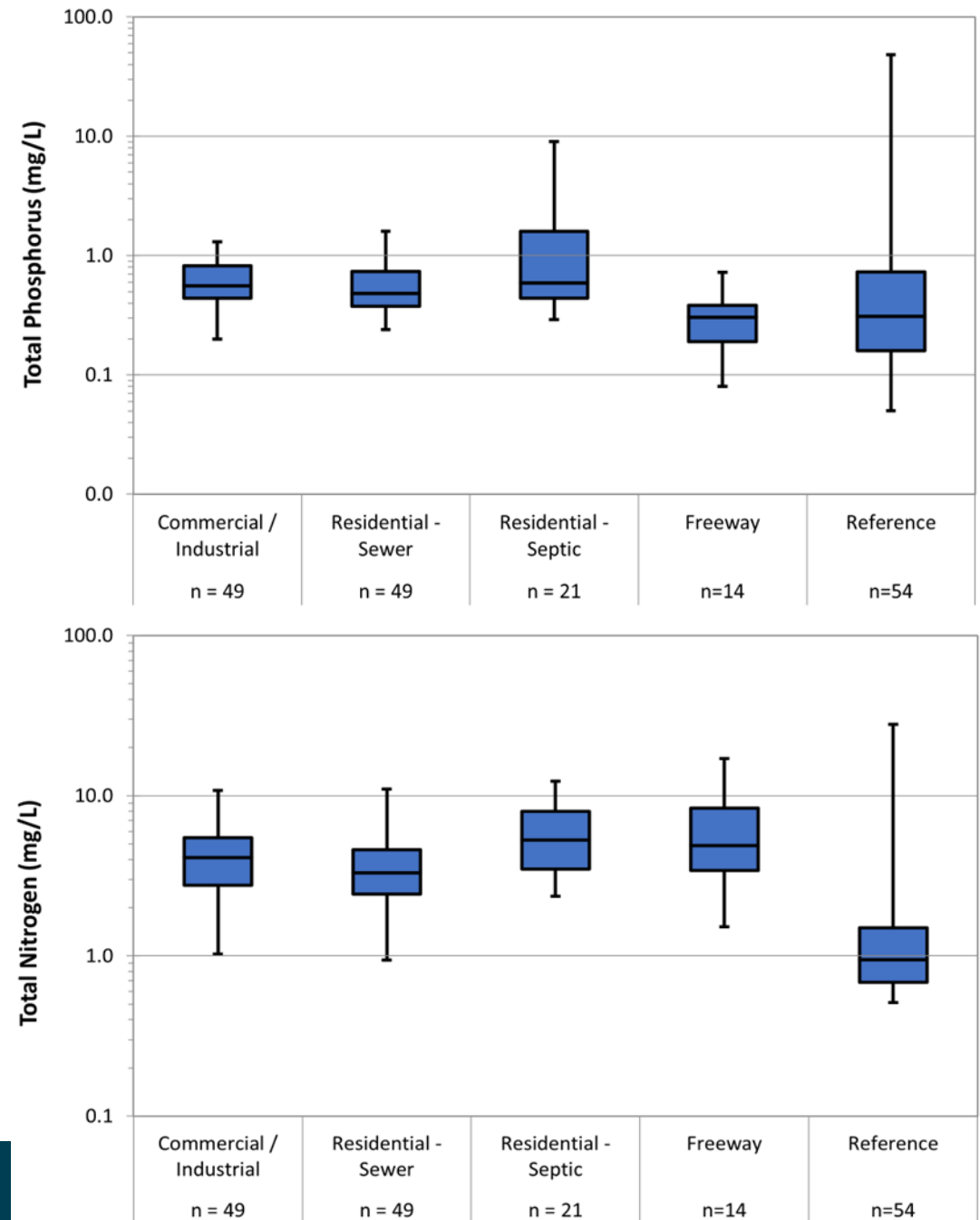
Nutrient EMCs by Landuse

- Washoff concentrations based on measured data, literature values

Table 4.8. Estimate of Nutrient Concentrations in Runoff from Agricultural Fields in the San Jacinto River Watershed (kg/ac/yr = kilograms/acre/year)

Land Use	Pervious Land Runoff (in/yr) ¹	SED (tons/ac/yr)	Sediment Delivery Ratio	P in Soils (ppm)	TP Export (kg/ac/yr)	TP (mg/L)	TKN in Soils (ppm)	TN Export (kg/ac/yr)	TN (mg/L)
Irrigated	0.43	0.5	8%	1,400	0.05	1.18	1,300	0.05	1.09
Non-irrigated	0.43	2.1	8%	1,100	0.17	3.89	1,400	0.21	4.95
Orchards	0.43	0.5	8%	800	0.03	0.67	550	0.02	0.46
Pasture/Hay	0.43	2.1	8%	1,400	0.21	4.95	1,300	0.20	4.59

¹ Pervious land runoff estimated from RC = 0.036 and average annual rainfall of 11.8 in/yr (RCFC&WCD Station 186 San Jacinto)



Existing Watershed Nutrient Loads

- Load for jurisdictions (not accounting for downstream retention)

Table 4-2. Rainfall Station Summary Statistics and Linkage to Model Subwatersheds

Station	Period of Record	Period of Record Average Rainfall (in/yr)	1948-2022 Average ¹ Rainfall (in/yr)	2000-2022 Average ² Rainfall (in/yr)	Subwatershed Zone
San Jacinto Station 186	1903 – Present	12.6	11.8	10.1	6, 7, 8
Elsinore NWS Station 67	1896 - Present	11.9	11.0	9.4	1, 2
Perris CDF Station 152	1910 – Present	10.3	10.0	8.5	5
Winchester Station 248	1940 - Present	10.5	10.5	9.0	3, 4
Idyllwild NWS Station 90	1929 – Present	26.2	25.0	21.4	9

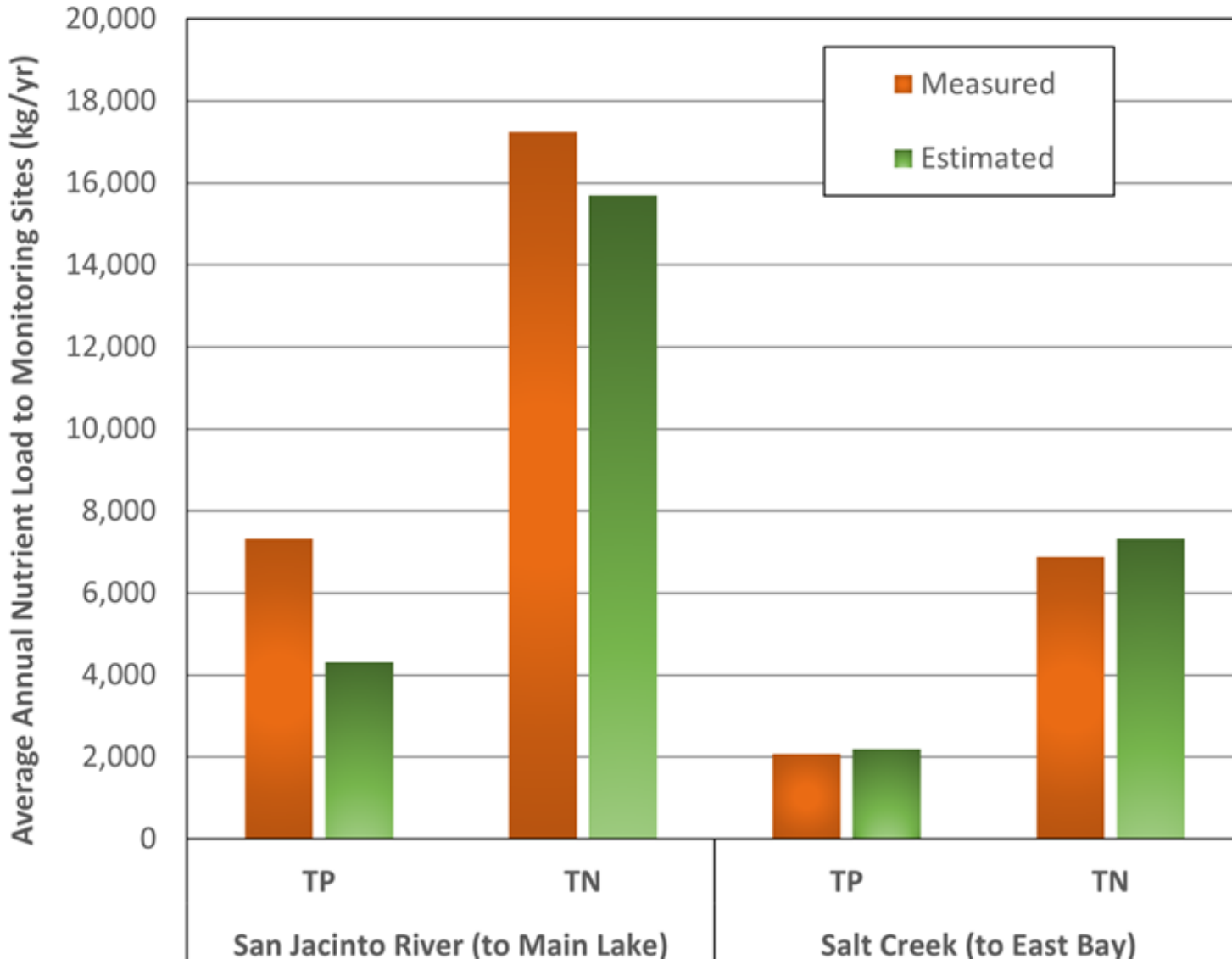
¹ Average annual rainfall used to estimate runoff volume for determining existing and allowable loads for TMDLs

² Average annual rainfall used to fit watershed runoff model to measured data at USGS gauging stations

Responsible Agency	TP (kg/yr)	TN (kg/yr)
Banning	23	118
Beaumont	214	1,030
CAFO	67	86
Caltrans	162	1,015
Canyon Lake	144	797
Federal - DOD	88	588
Hemet	1,229	5,533
Lake Elsinore	624	3,066
March Joint Powers Authority	87	382
Menifee	1,538	6,916
Moreno Valley	1,625	8,142
Murrieta	28	138
Perris	1,155	3,971
Riverside County	6,793	19,269
San Jacinto	697	2,830
Wildomar	155	846
Irrigated	789	718
Non-irrigated	854	1,087
California Department of Fish and Wildlife	257	728
Federal - BLM	248	698
Federal - National Forest	2,168	6,212
Federal - Native American Land	146	355
Federal - Wilderness	407	1,169
Non-Dairy CAFO	433	711
State Land	266	747
Western Riverside County RCA	67	146
TOTAL	20,260	67,297

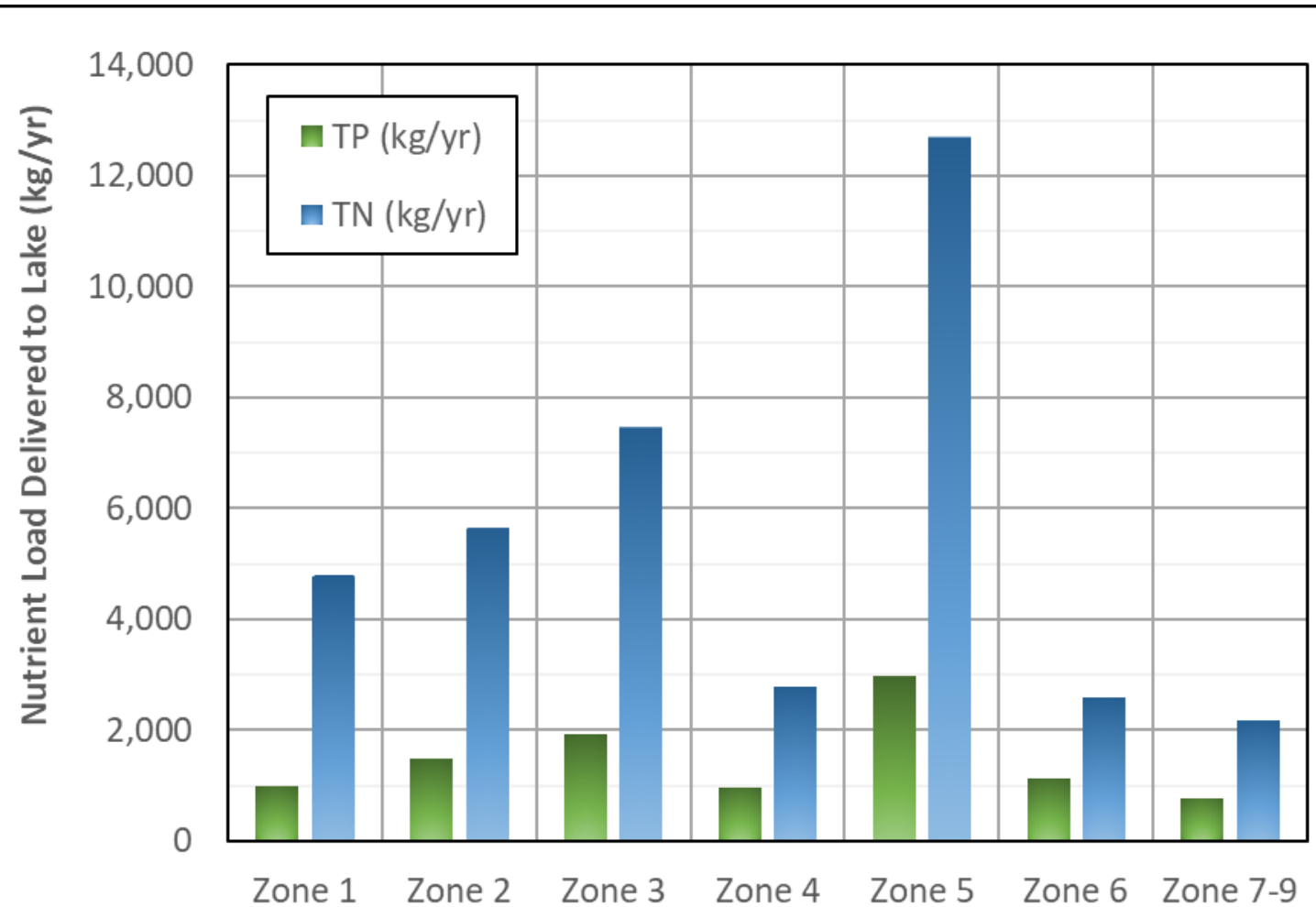


Watershed Model Fitting Results



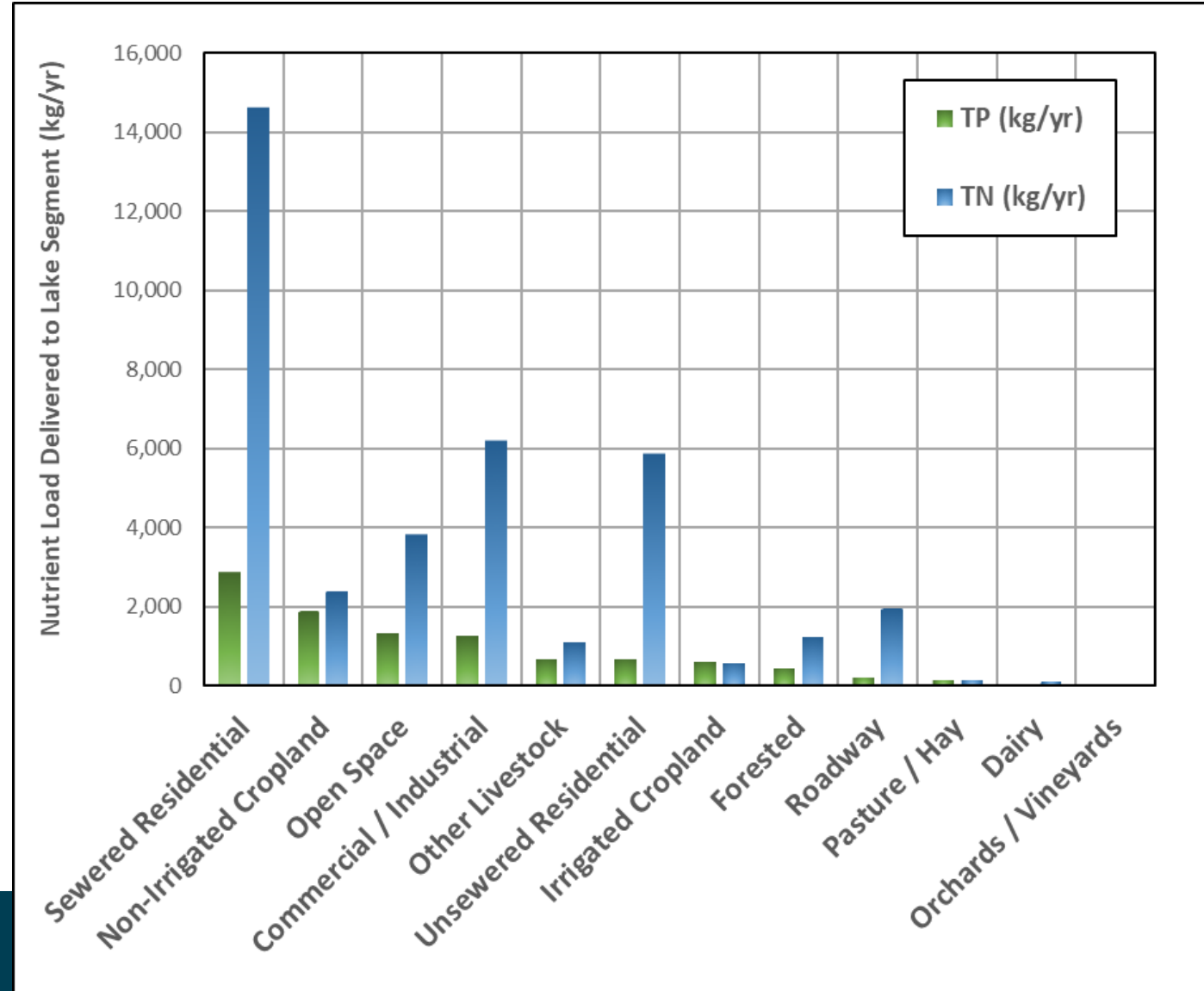
Existing Watershed Nutrient Loads

- Load by subwatershed zone (accounting for downstream retention)



Existing Watershed Nutrient Loads

- Load by land use

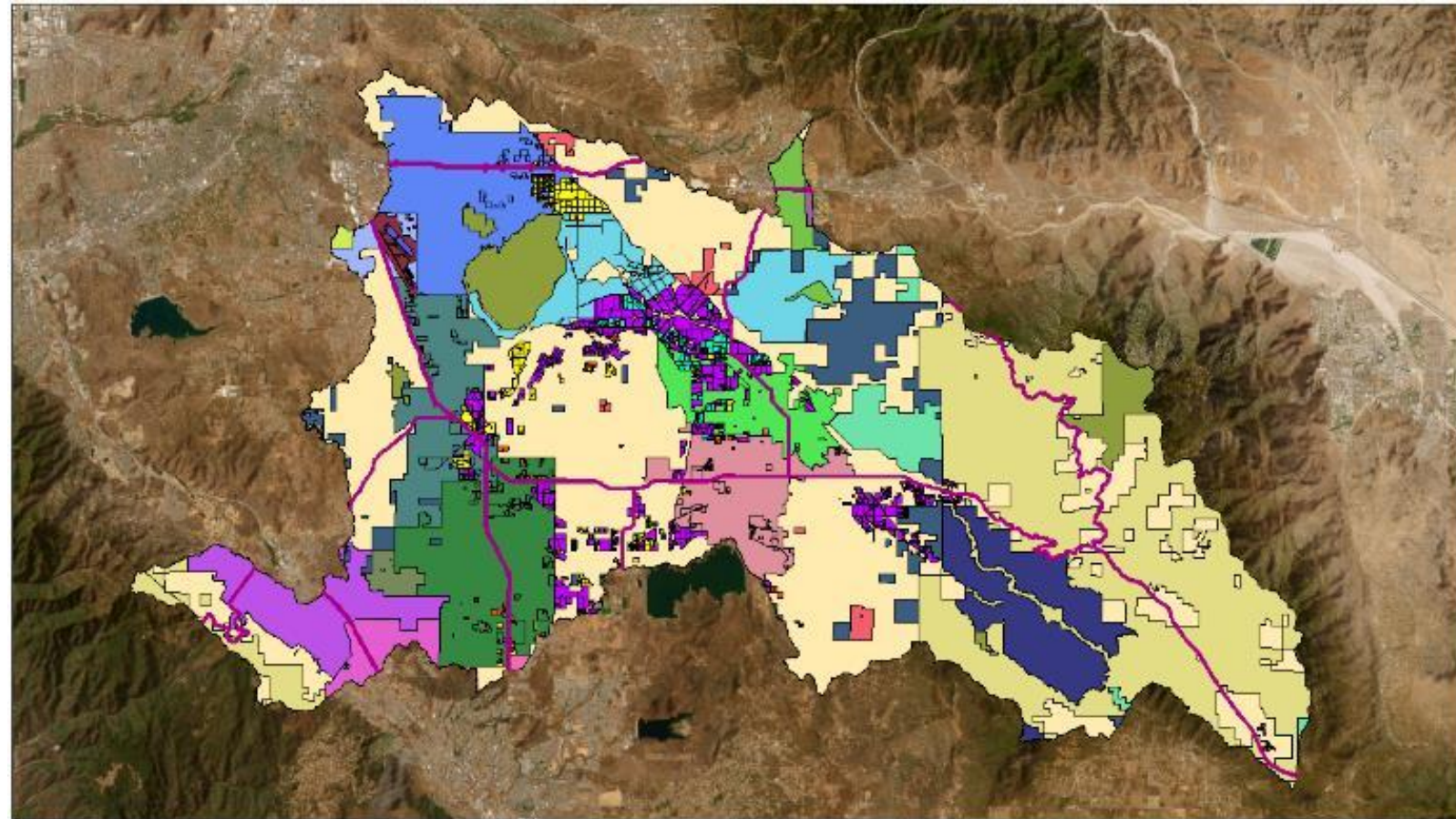


Allocations Update



2023 Jurisdictional Boundaries

- Allocation based on jurisdictional runoff (not accounting for downstream retention)
- Watershed model for current imperviousness applied for all land areas at open space nutrient concentration



2023 Jurisdictions		Federal - BLM		Federal - National Forest		Federal - Wilderness		Lake Elsinore		Perris		Western Riverside County Regional Conservation Authority	
Imigated Cropland (WRCAC)	Caltrans	Federal - March Air Reserve Base	Federal - National Forest	March Joint Powers Authority	Federal - Wilderness	Lake Elsinore	Perris	Western Riverside County Regional Conservation Authority	Imigated Cropland (WRCAC)	March Joint Powers Authority	Riverside (City)	County Regional Conservation Authority	
Non-irrigated Cropland	Banning	Federal - March Air Reserve Base - Airfield	Federal - Native American Land	Menifee	Wilderness	March Joint Powers Authority	Riverside (City)	County Regional Conservation Authority	Non-irrigated Cropland	Menifee	Riverside County	Wildomar	
CAFO	Beaumont		Federal - American Land	Moreno Valley	Wilderness	Menifee	Riverside County	Wildomar	CAFO	Moreno Valley	San Jacinto		
Non-Dairy CAFO	California Department of Fish and Wildlife		Hemet	Murrieta	Wilderness	Murrieta	San Jacinto		Non-Dairy CAFO	Murrieta	State Land		
	Canyon Lake						State Land				Unincorporated		

Watershed Runoff Allocations

- Interim based on median of Cranston Guard dataset (0.32 mg/L TP; 0.92 mg/L TN)
- Final based on 25th percentile of Cranston Guard dataset (0.16 mg/L TP; 0.68 mg/L TN)

Table 6-1. Allocations for Watershed Runoff in Lake Elsinore and Canyon Lake Nutrient TMDLs

Responsible Agency or Jurisdiction	Interim Milestone		Final Milestone	
	TP (kg/yr)	TN (kg/yr)	TP (kg/yr)	TN (kg/yr)
Wasteload Allocations				
Banning	15	44	8	33
Beaumont	154	442	77	327
CAFO	3	10	2	7
Caltrans	124	357	62	264
Canyon Lake	98	282	49	208
Federal - DOD	63	180	31	133
Hemet	758	2,178	379	1,610
Lake Elsinore	444	1,275	222	943
March Joint Powers Authority	60	174	30	128
Menifee	919	2,642	460	1,953
Moreno Valley	1,040	2,990	520	2,210
Murrieta	19	54	9	40
Perris	583	1,676	291	1,239
Riverside County	2,623	7,541	1,312	5,574
San Jacinto	408	1,174	204	868
Wildomar	106	306	53	226
Load Allocations				
Agriculture: Irrigated	234	672	117	496
Agriculture: Non-irrigated	70	202	35	149
California DFW	251	722	126	534
Federal - BLM	239	688	120	508
Federal - National Forest	2,147	6,172	1,073	4,562
Federal - Native American Land	118	340	59	252
Federal - Wilderness	407	1,169	203	864
Non-Dairy CAFO	16	45	8	34
State Land	253	728	127	538
WRCRCA	39	113	20	84
Total Allowable Watershed Load (WLAs and LAs)	11,192	32,177	5,596	23,783

¹ Allocations are for watershed runoff at the jurisdictional boundary. Losses not accounted associated with reductions occurring downstream of subwatersheds 7-9 at Mystic Lake and downstream of subwatershed 4,5,6 in unlined channel bottoms. These losses are accounted for in estimation of offset credit demands for jurisdictions in zones 4-9.



Watershed Load Reductions

- Existing load minus allocated load for each jurisdiction
- Interim and final milestones
- No longer parsed by lake segment

Table 6-2. Nutrient Load Reduction Required for Watershed Jurisdictions to Comply with Lake Elsinore and Canyon Lake Nutrient TMDLs

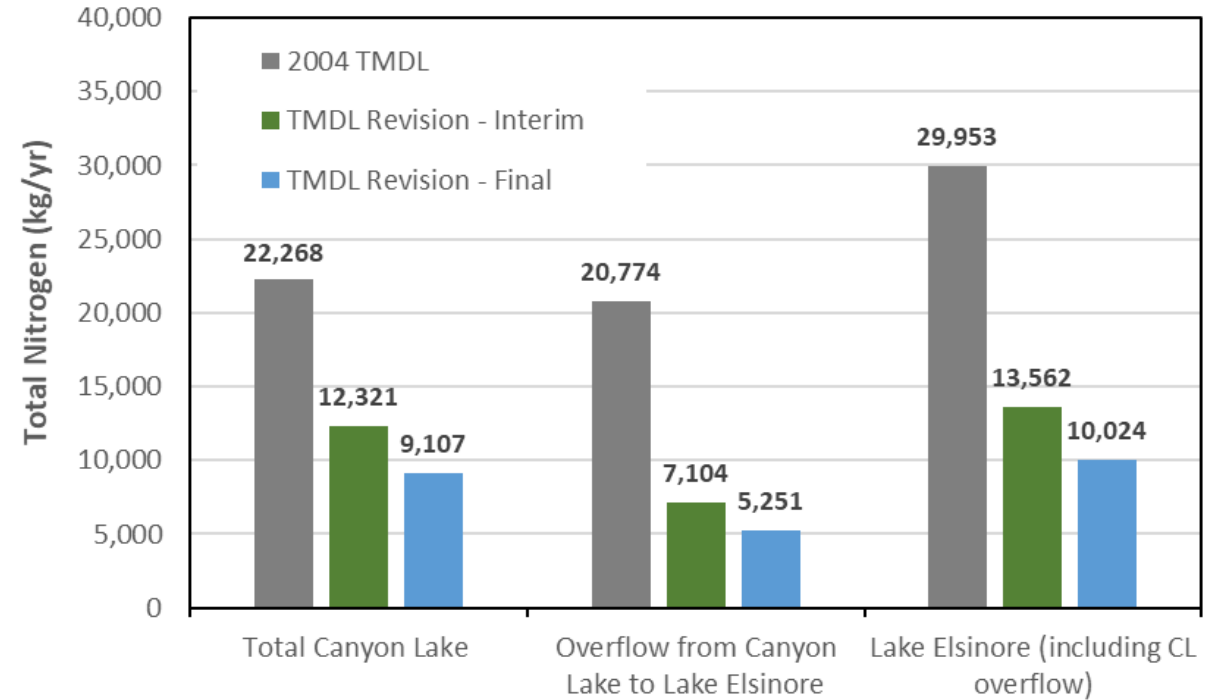
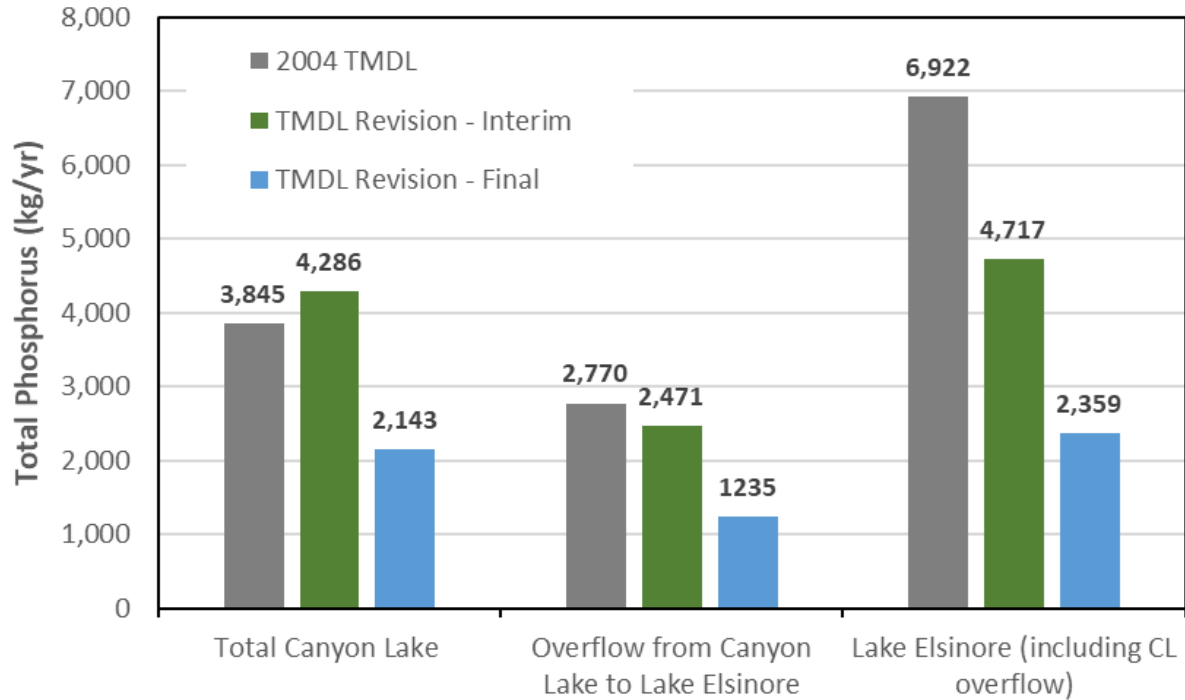
Responsible Agency or Jurisdiction	Interim Milestone		Final Milestone	
	TP (kg/yr)	TN (kg/yr)	TP (kg/yr)	TN (kg/yr)
Wasteload Allocations				
Banning	7	73	15	85
Beaumont	60	589	137	704
CAFO	64	78	68	79
Caltrans	38	658	100	751
Canyon Lake	48	515	95	589
Federal - DOD	28	408	57	455
Hemet	471	3,354	850	3,923
Lake Elsinore	180	1,791	402	2,124
March Joint Powers Authority	27	208	57	254
Menifee	619	4,274	1,078	4,963
Moreno Valley	585	5,152	1,105	5,932
Murietta	9	85	19	99
Perris	572	2,295	863	2,732
Riverside County	4,170	11,727	5,481	13,695
San Jacinto	288	1,655	493	1,961
Wildomar	49	540	102	619
Load Allocations				
Agriculture: Irrigated	555	46	672	222
Agriculture: Non-irrigated	783	884	818	937
California DFW	5	6	131	194
Federal - BLM	9	10	128	190
Federal - National Forest	21	40	1,094	1,850
Federal - Native American Land	27	14	87	103
Federal - Wilderness	-	-	203	305
Non-Dairy CAFO	417	668	425	677
State Land	13	20	140	209
WRCRCA	27	33	47	63
Total Allowable Watershed Load (WLAs and LAs)	9,068	35,120	14,664	43,514

¹ Existing load (Attachment A) – Allocation (Table 6-1) = Watershed load Reduction (Table 6-2)



Changes to TMDL

- Sum of WLAs and LAs for external sources



Other Project Updates



Comments and Other Coordination

- Information received from WRCAC for inclusion in the implementation program involving future agricultural water quality index application
- Working with RB staff to address outstanding peer review comments and make appropriate changes in draft sections accordingly
- Seeking Task Force input on compliance demonstration by on-site retention (ex. CAFOs, new urban development)



Currently Active Tasks

- Allocations – draft completed to be sent to Task Force for comment this week
- Source Assessment - draft completed to be sent to Task Force for comment this week
- Implementation – draft to be sent to Task Force for comment 4/7
- Update to Linkage Analysis chapter under development
- Remainder of document updates involve limited new technical analysis
- Collaboration with MS4 permittees and RB staff on how revised TMDL would be incorporated into permits in the future

