



West San Jacinto Groundwater Sustainability Agency (GSA) Development of the West San Jacinto Groundwater Sustainability Plan (GSP) – October 14, 2020

Rachel Gray

October 14, 2020

Introduction

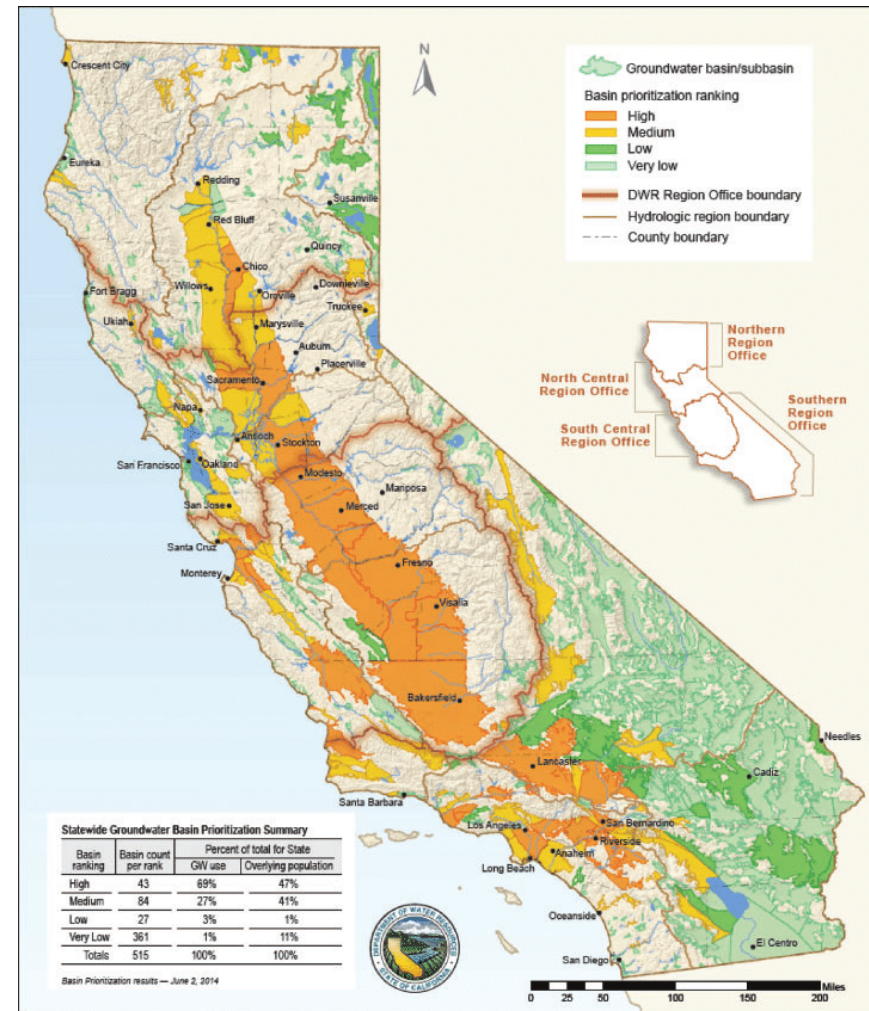
- Project Overview
 - What is the Sustainable Groundwater Management Act?
 - What is a Groundwater Sustainability Plan?
- Update on the Groundwater Sustainability Plan Development
 - Historical, Current, and Projected Baseline Water Budgets for the West San Jacinto GSA Area
 - Minimum Thresholds and Measurable Objectives for Groundwater Quality
 - Undesirable Results
 - Projects and Management Actions
- Timeline and Next Steps
- SGMA Webpage
- Feedback
- Questions and Answers



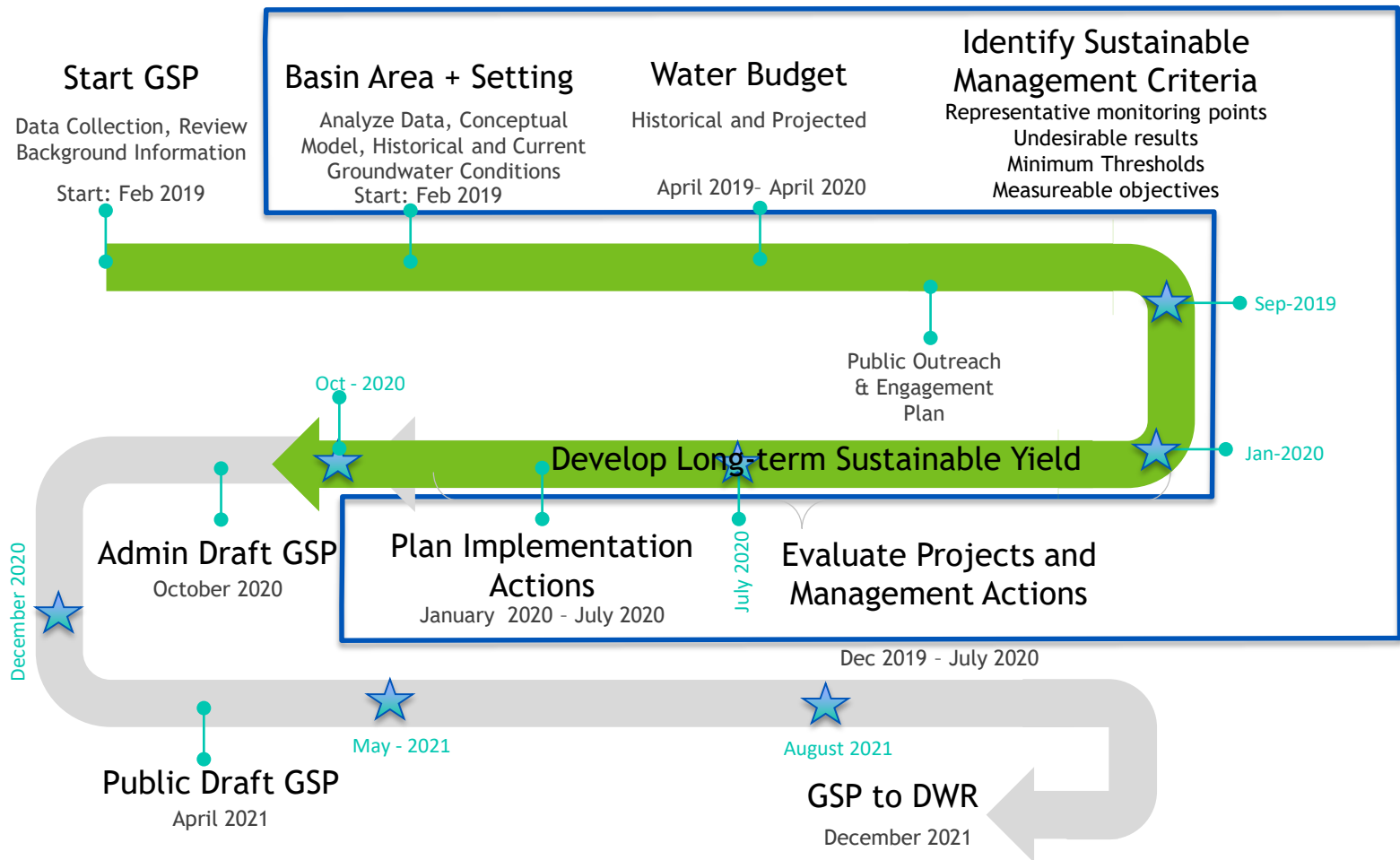
Project Overview

What is the Sustainable Groundwater Management Act?

- Signed September 16, 2014
- Effective January 1, 2015
- Requires:
 - Formation of groundwater sustainability agencies (GSAs) for high and medium priority groundwater basins
 - Preparation of groundwater sustainability plans (GSPs) by 2022
 - Achieve sustainability within 20 years of plan adoption
- “A central tenet of these bills is the recognition that groundwater management is best accomplished locally.”
 - Governor Edmund G. Brown Jr.



GSP Development Process





San Jacinto Groundwater Basin

Water Budgets for GSP Development

Ali Taghavi, Ph.D., P.E.
Project Manager

Agenda

- Water Budget Background
- Water Budget Development for:
 - Historical Conditions
 - Current Conditions
 - Projected Baseline Conditions

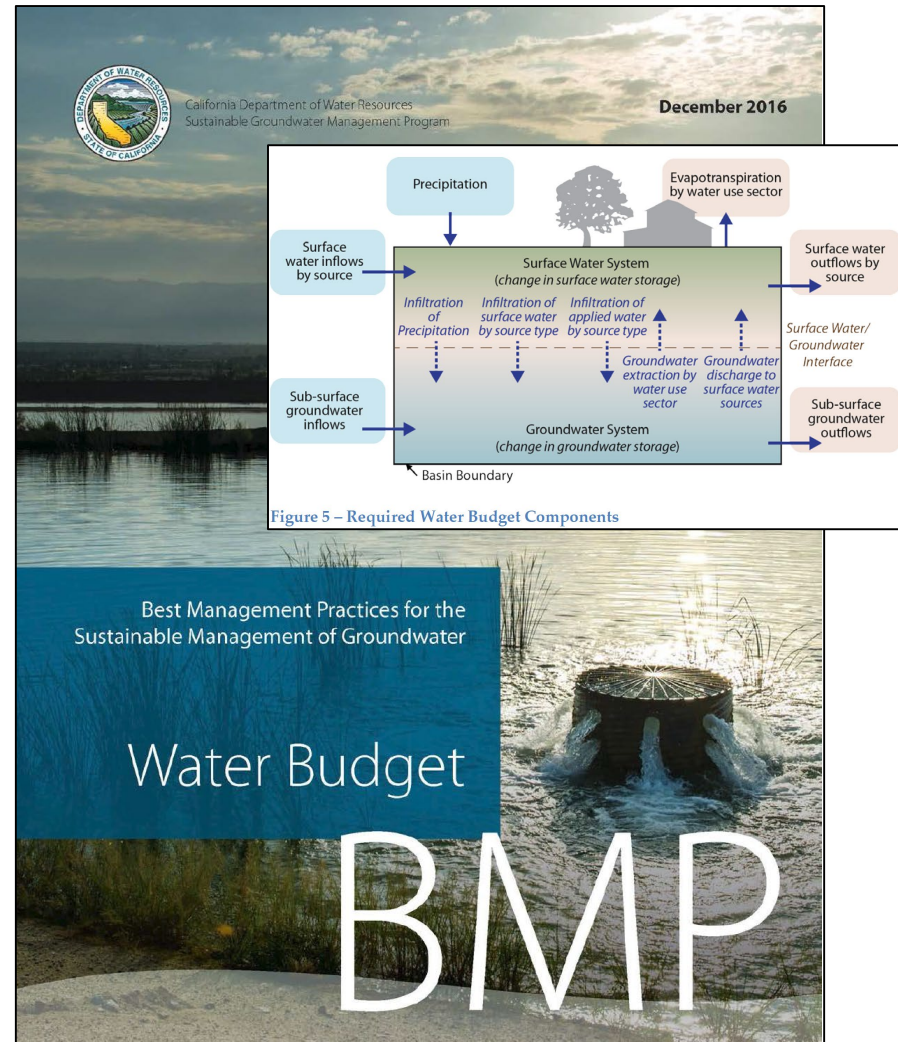


Water Budgets Background



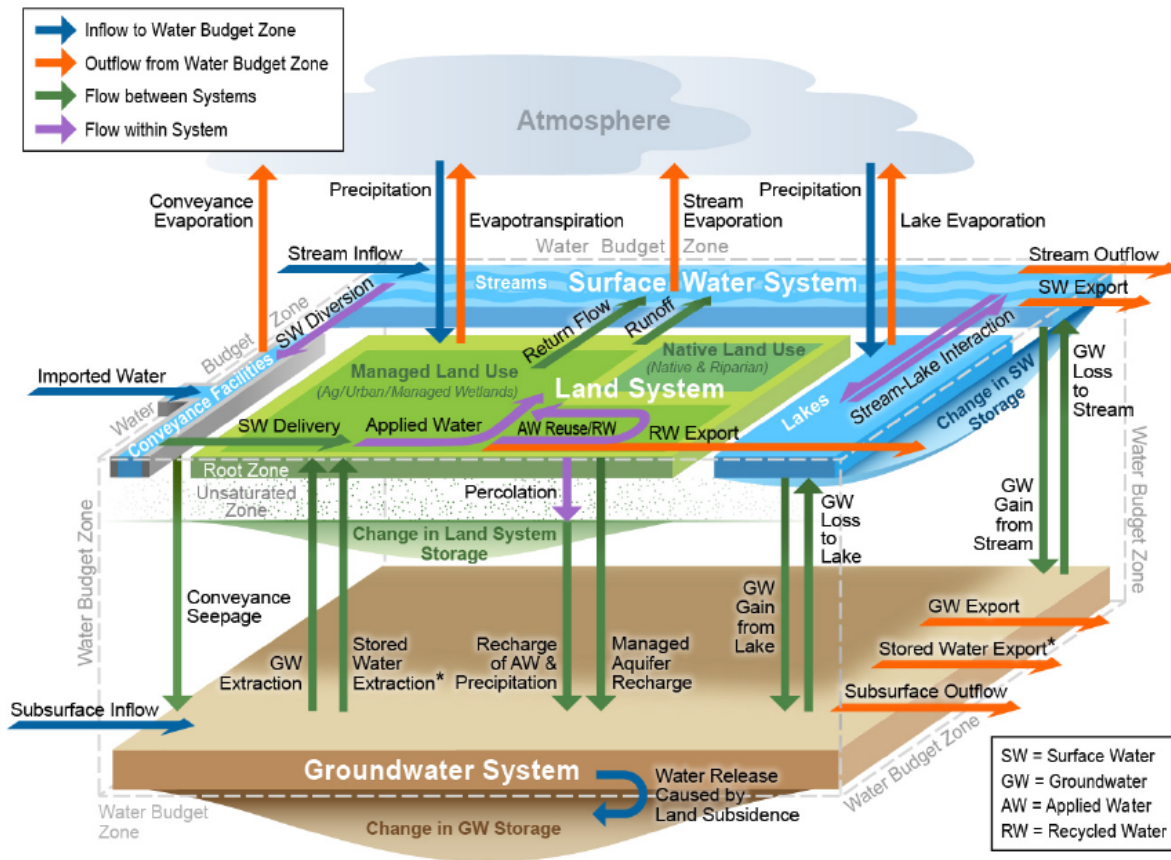
DWR's Water Budget Best Management Practices

- Water Budgets provide an accounting and assessment of the total annual volume of groundwater and surface water entering and leaving the basin.
- Water budget information shall be reported in tabular and graphical form.
- Water Budgets should provide an understanding of historical and projected:
 - hydrology
 - water demand
 - water supply
 - land use
 - population
 - climate change
 - groundwater and surface water interaction
 - subsurface groundwater flow



DWR's Water Budget Handbook

Figure 1-1 Total Water Budget Schematic



- The Water Budget Handbook is not prescriptive in what methods an agency should apply and does not impose requirements as to how water budgets should be developed for any compliance purposes.
- It serves as a technical resource that provides information on a suite of methods and data sources.

Water Budget: Defining Time Frames

Historical

Uses historical information for hydrology, precipitation, water supply and demand, and land use during a minimum of 10 years.

Current Conditions

Holds constant the most recent or “current” data on population, land use, year type, water supply and demand, and hydrologic conditions.

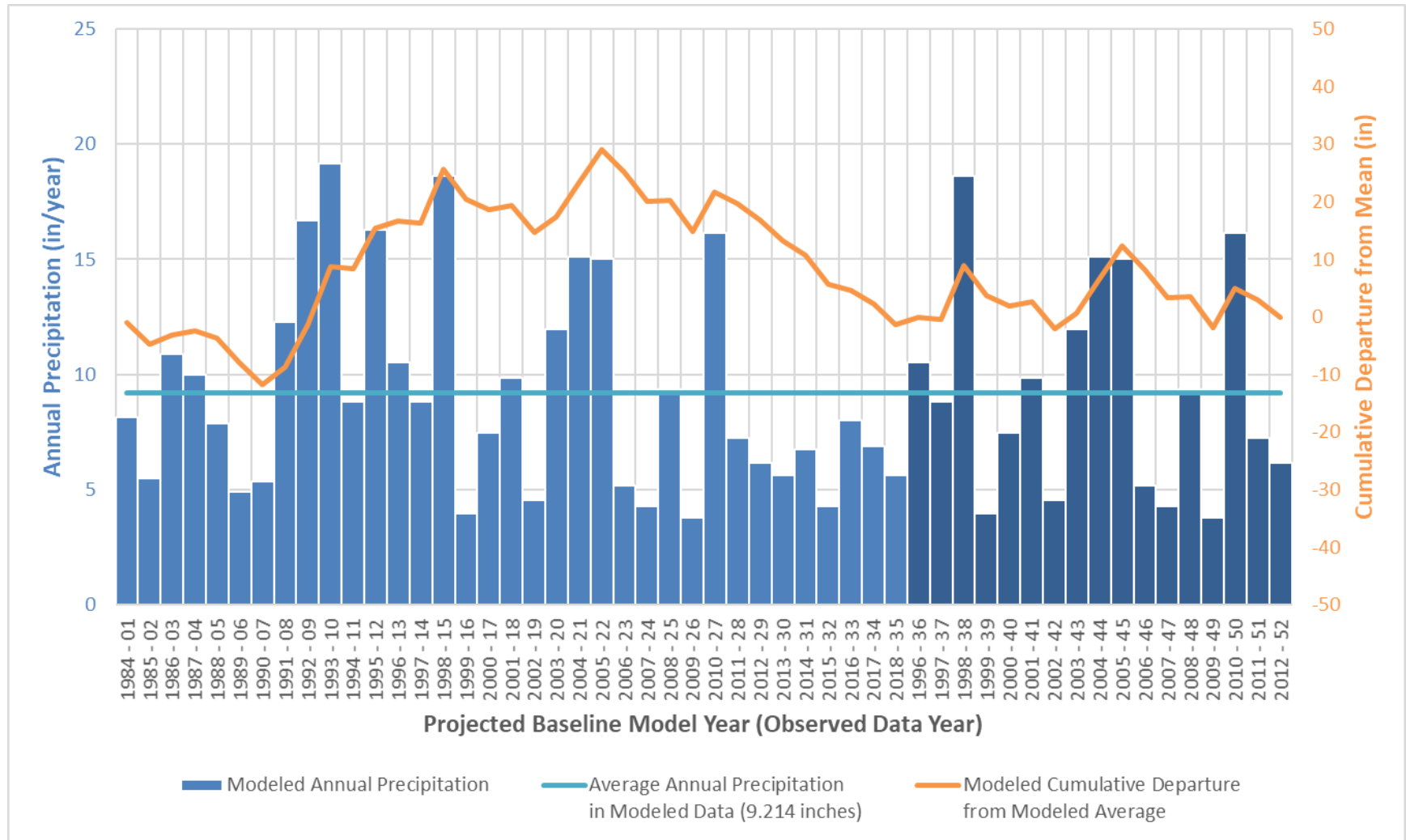
Projected Conditions

Uses a 50-year projected planning horizon to estimate population growth, land use changes, water supply conditions, climate change, etc.

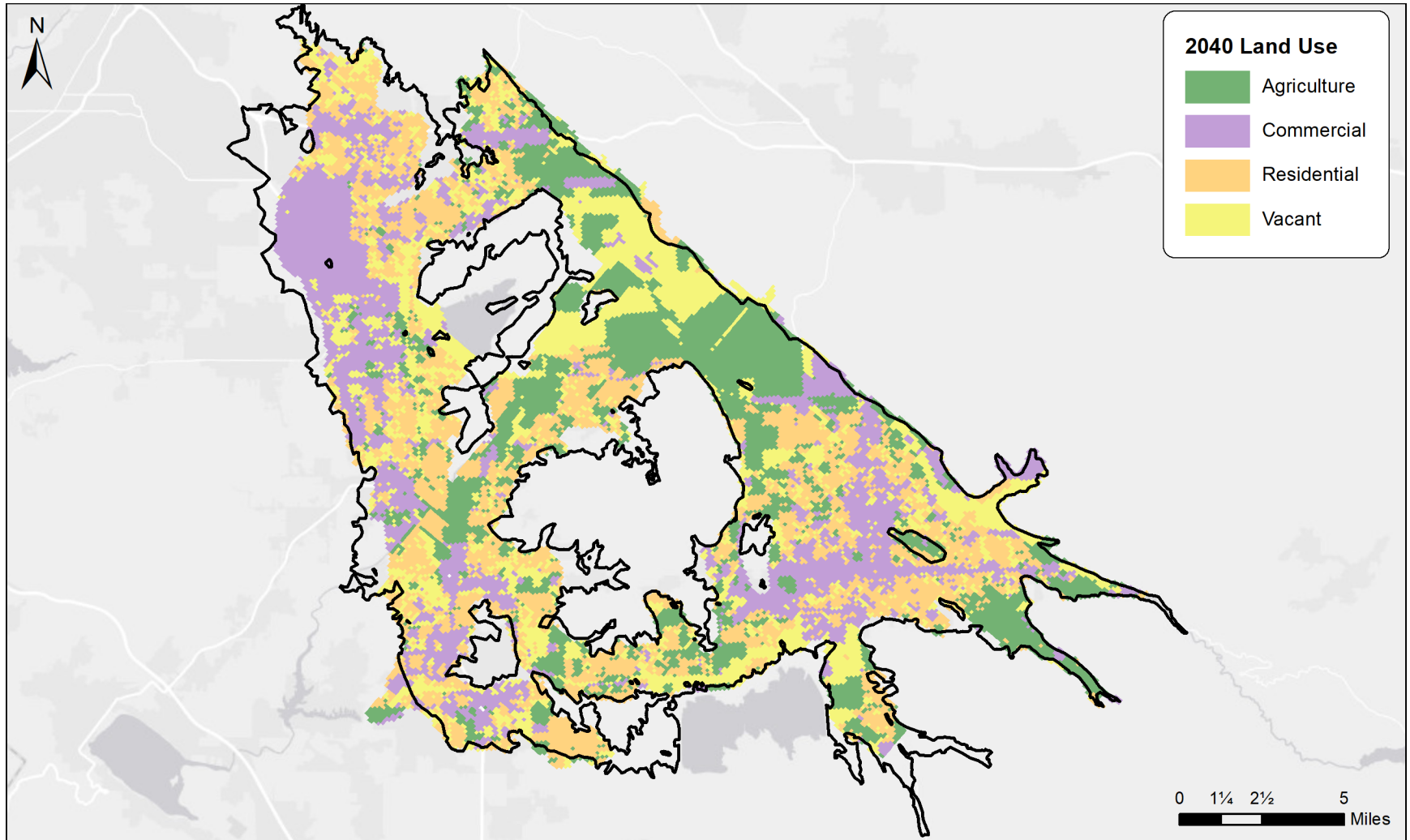
Water Budget Assumptions

- Period of Analysis
 - Historical Conditions: WY 1984 – 2012
 - Current Conditions: WY 2013-2018
 - Projected Conditions: WY 2019-2072
- Land Use Conditions
- Recharge Sources
 - Precipitation
 - Irrigation
 - EMWD water sales
 - Sub-agency water sales
 - Reclaimed Water facilities
 - Recycled water sales
- Groundwater Productions
- Projected Baseline Conditions Include Additional Planned Projects:
 - Perris North Contamination Remediation Program
 - Perris South Desalter II
 - DWR’s Lake Perris Seepage Recovery

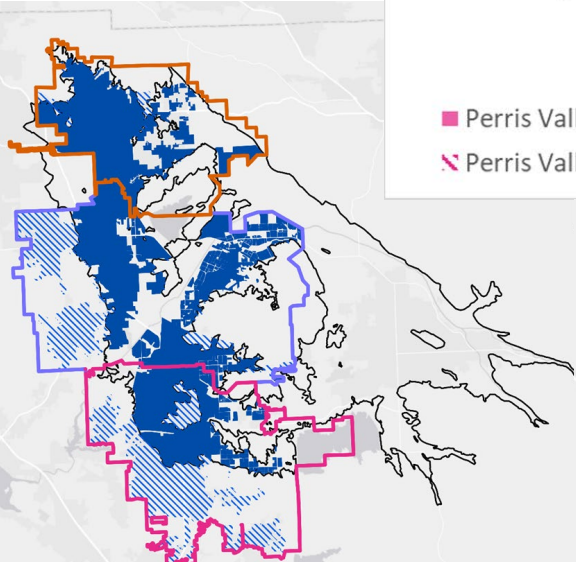
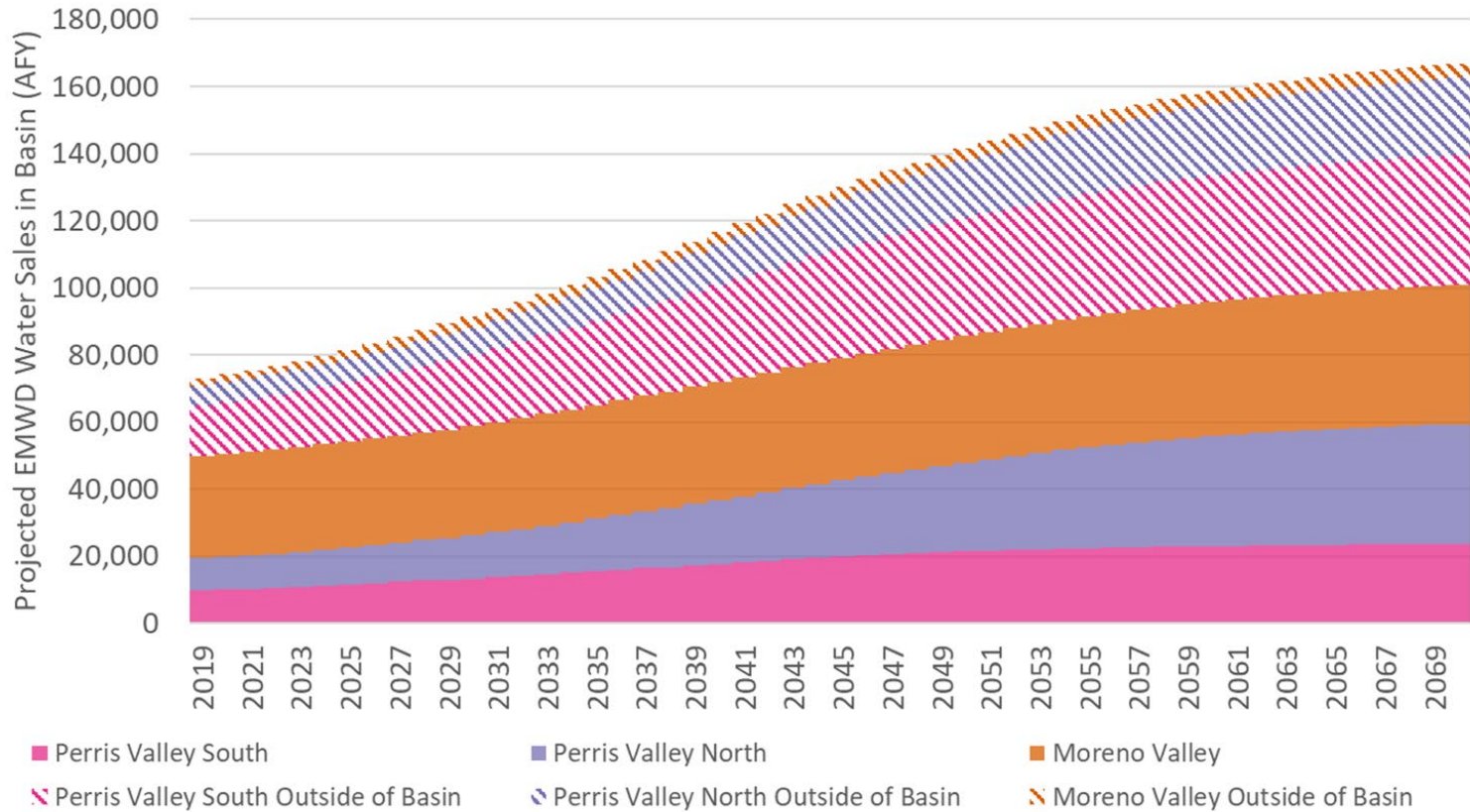
Precipitation Conditions



Land Use Conditions



EMWD Water Sales Deliveries



Urban Area

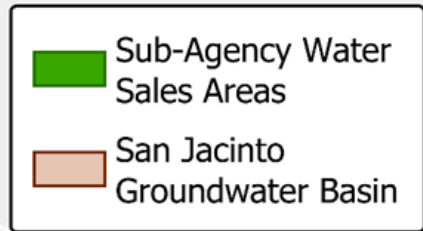
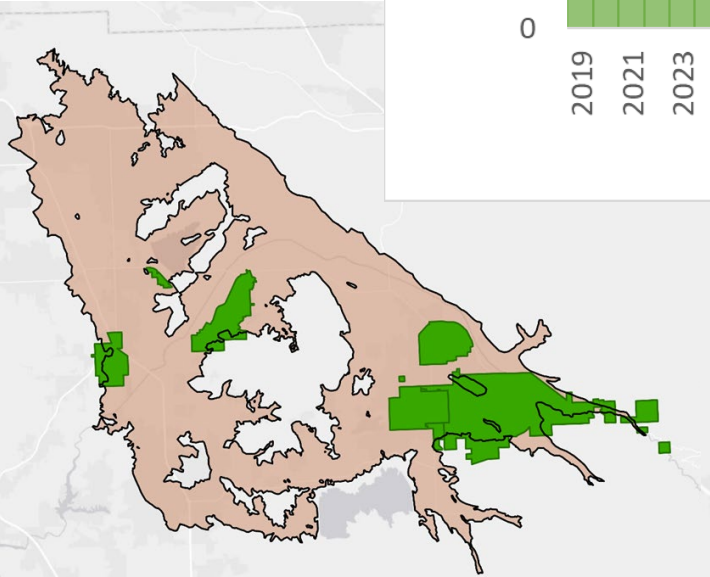
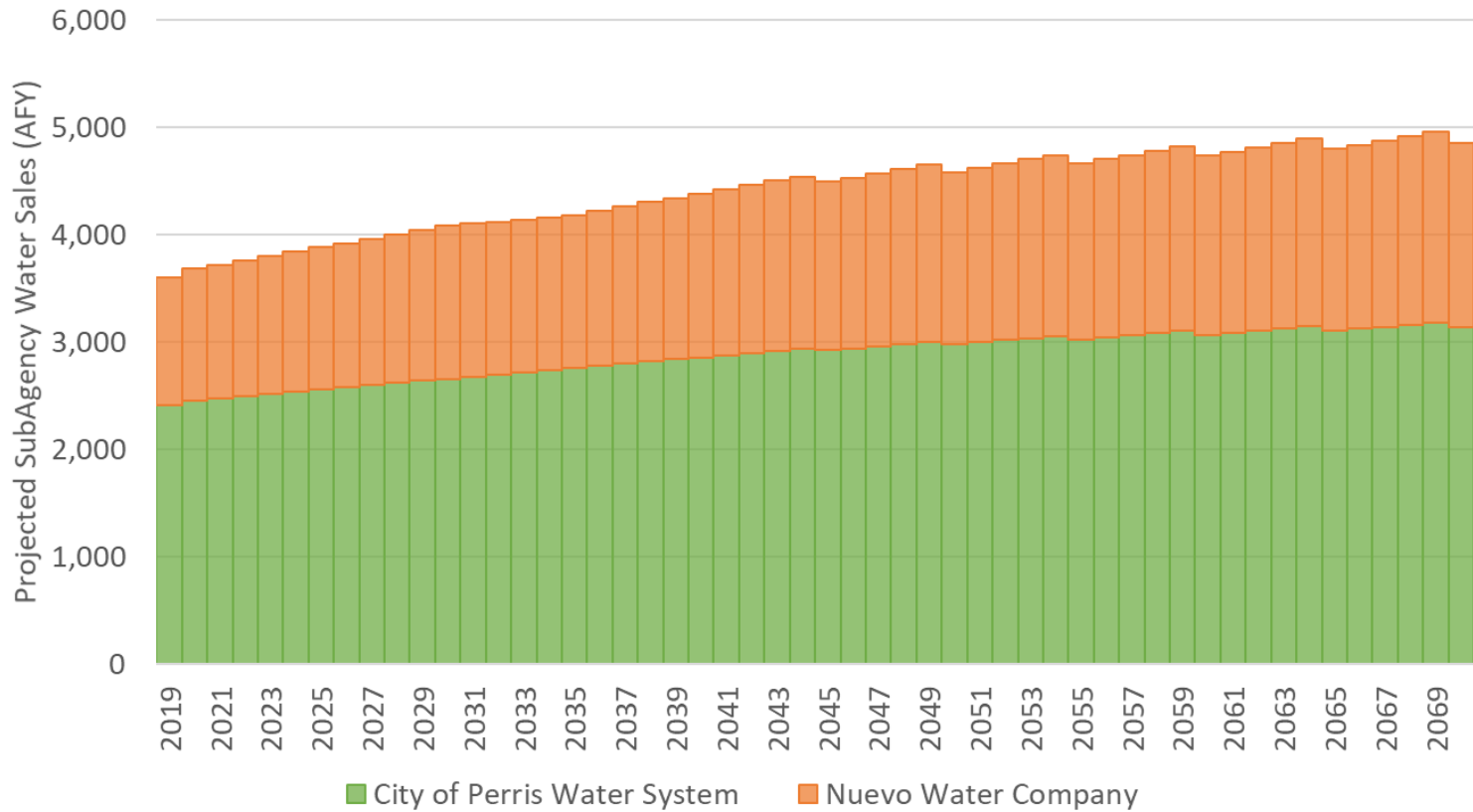
- Outside Basin
- Inside Basin

EMWD Sales Projection Area

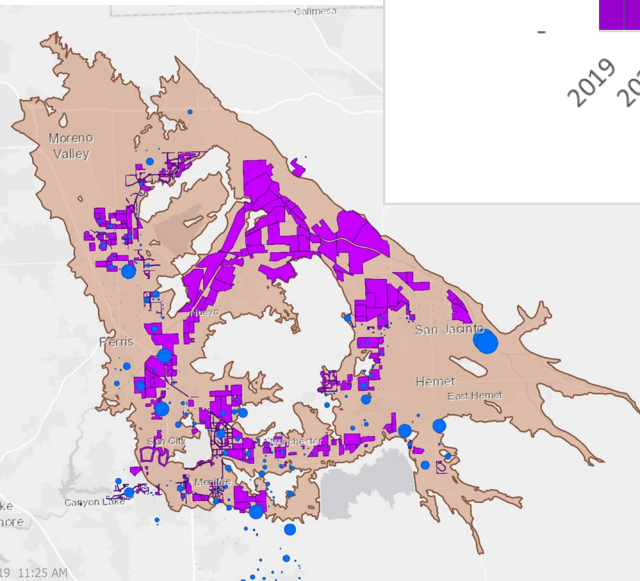
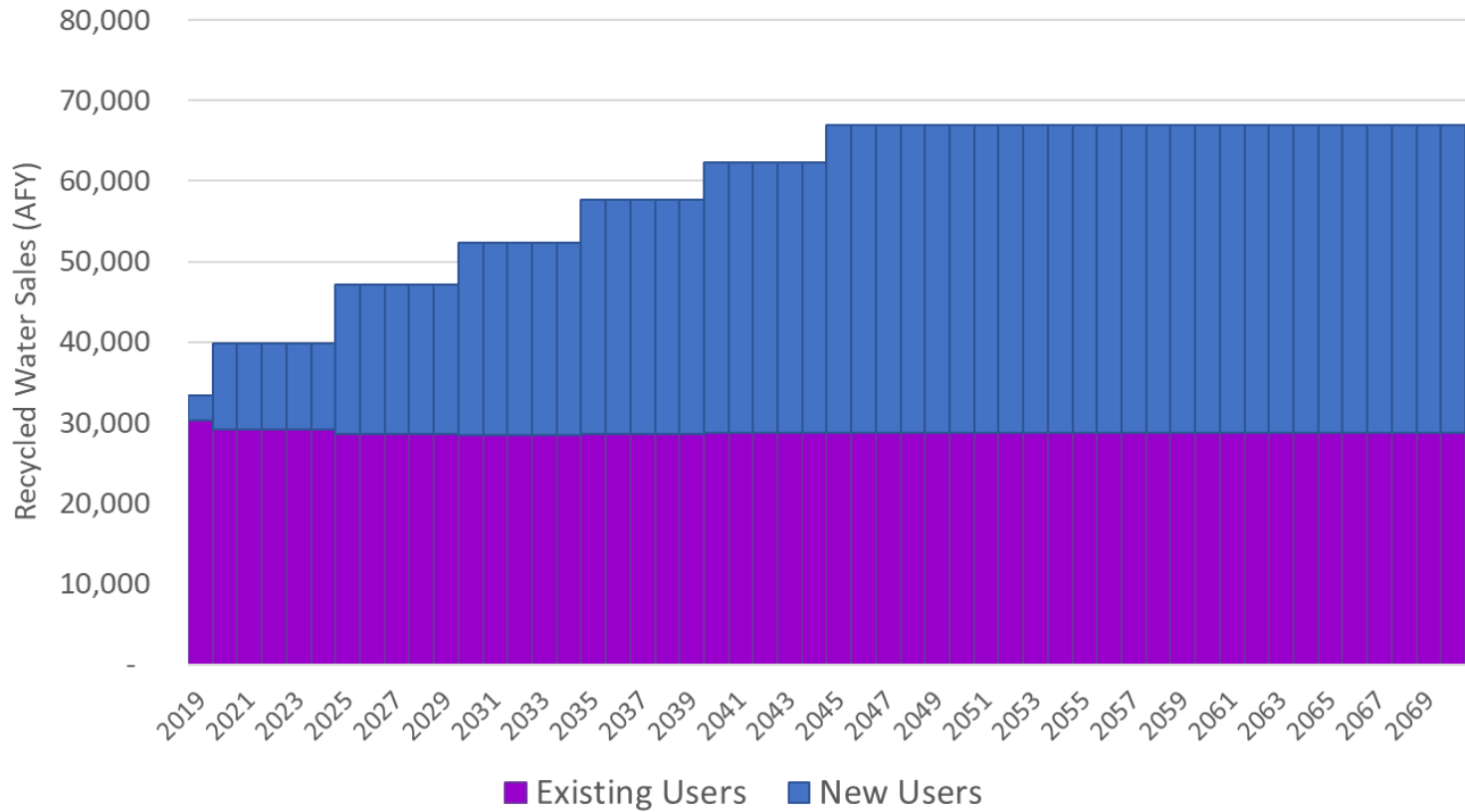
- Moreno Valley
- Perris Valley North
- Perris Valley South



Sub-Agency Water Sales



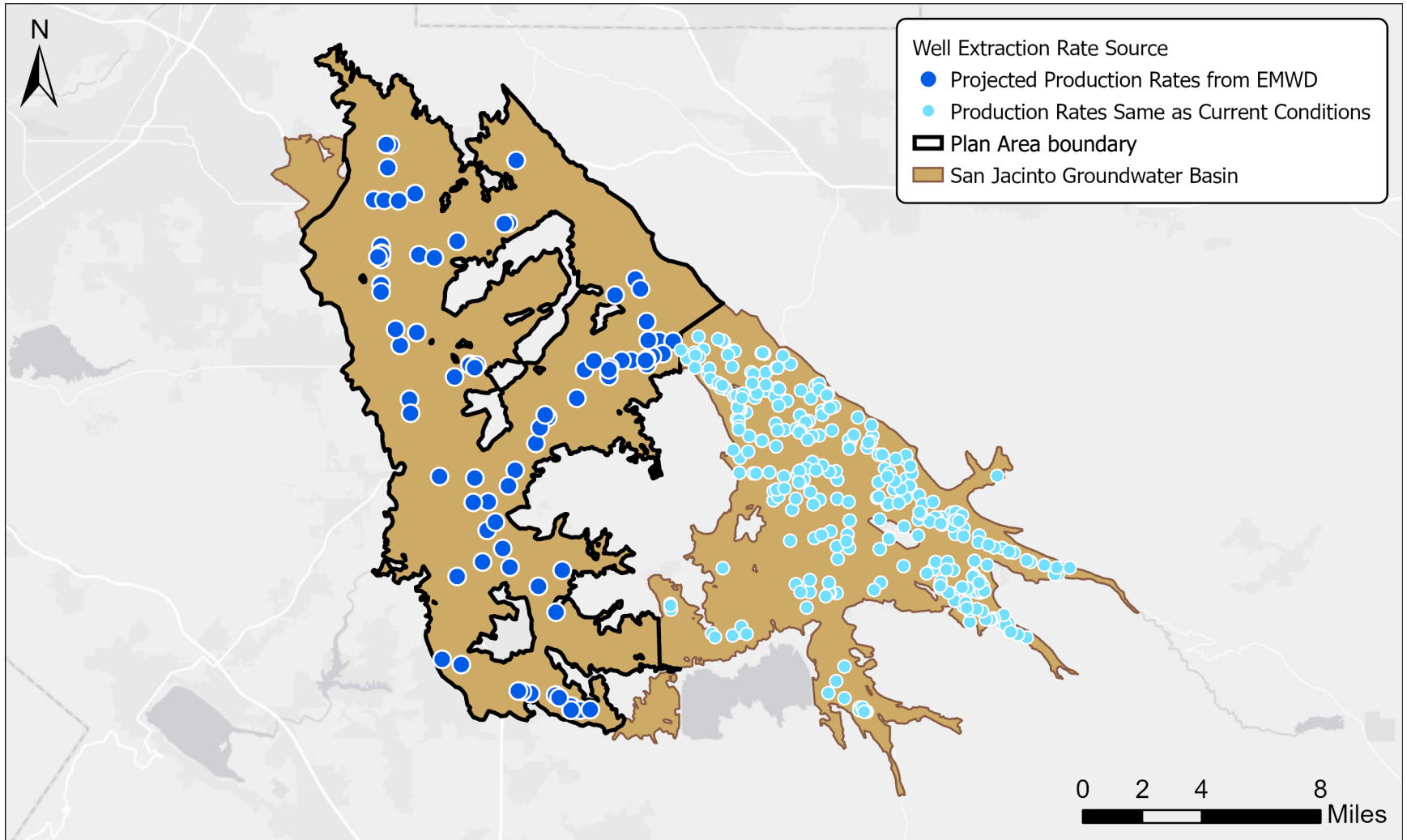
Recycled Water Sales Deliveries



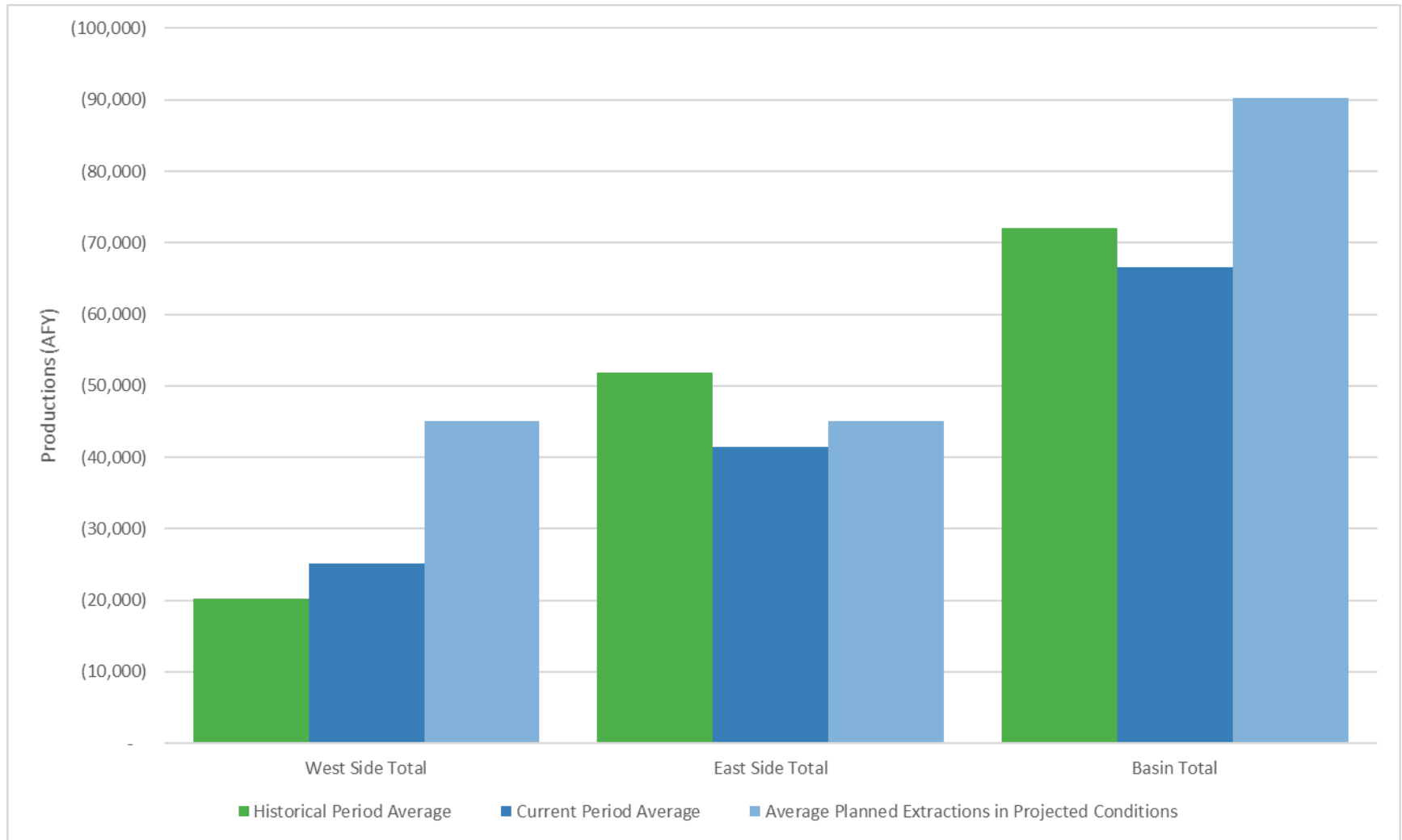
- New User Application Areas
- Existing User Application Areas
- San Jacinto Groundwater Basin



Groundwater Production Locations



Groundwater Production in the Basin

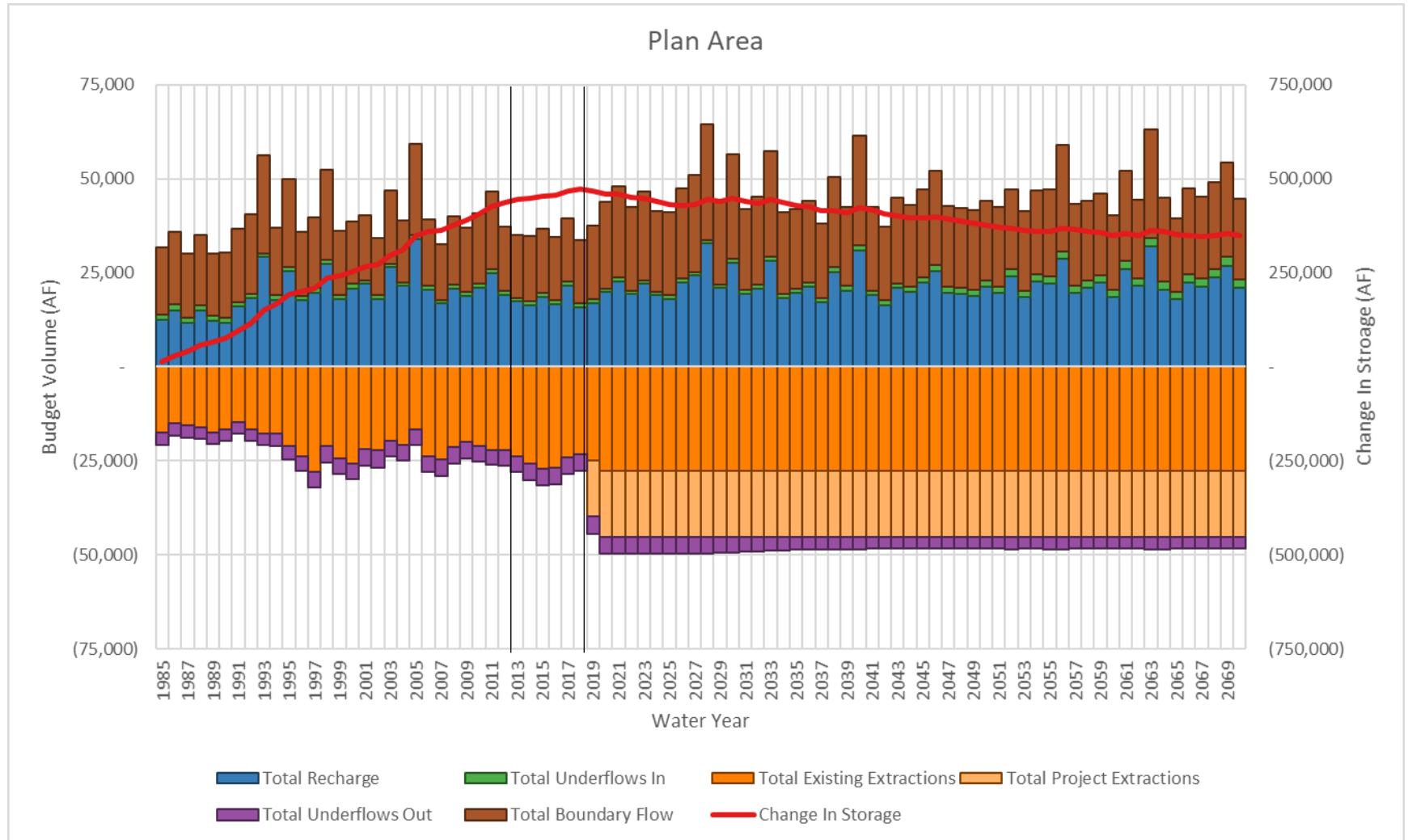




Plan Area Water Budgets



Plan Area Summary



Plan Area Summary

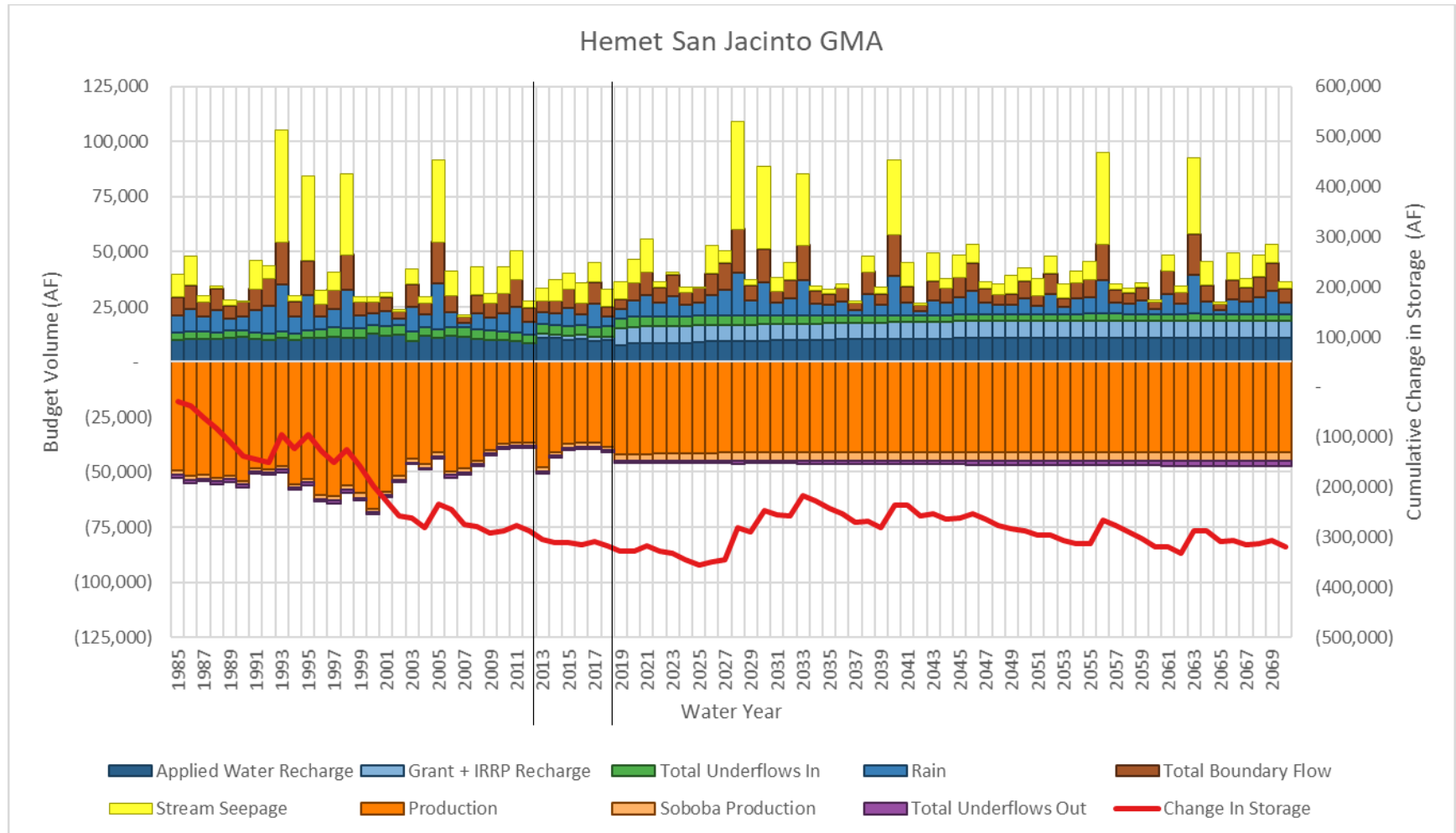
Flow		Historical Period Average WY 1985-2012 (AFY)		Current Condition Average WY 2013-2018 (AFY)		Updated Projected Baseline Average WY 2019-2070 (AFY)	
Recharge	EMWD Sales	3,169		2,539		4,472	
	Irrigation	1,504		577		436	
	Rain	8,718	19,397	5,462	17,365	7,090	21,603
	Reclaimed Ponds	4,822		7,623		8,177	
	Recycled Water Sales	1,032		954		1,164	
	Subagency Sales	152		210		264	
Stream Seepage	307	307	300	300	306	306	
Underflows In	From Hemet North	657		577		858	
	From Hemet South	253	1,128	247	1,015	501	1,515
	From Upper Pressure	219		191		157	
Boundary Flows	From Sun City Area	889		1,098		1,160	
	Lake Perris Right Dam Seepage	585		585		585	
	Lake Perris Right Dam Seepage	3,400	18,760	3,400	16,932	7,500	22,876
	Lake Perris Native Underflow	3,201		3,201		3,201	
	Mountain Front Recharge	10,685		8,647		10,429	
Total Average Annual Inflow		39,593		35,612		46,299	
Underflows Out	To Hemet North	103		0		1	
	To Hemet South	3	3,823	2	4,370	6	3,554
	To Upper Pressure	3,717		4,368		3,547	
Productions	Toe Drain	3,400		3,400		0	
	LPSRW	0		0		7,500	
	EGETS Wells	0	20,235	0	25,144	241	45,096
	Perris North Project	0		0		6,717	
	Perris South Desal Project	0		0		2,985	
	Existing Wells	16,835		21,744		27,652	
Total Average Annual Outflow		24,058		29,514		48,650	
Average Annual Change in GW Storage		15,535		6,098		(2,351)	



Hemet-San Jacinto Water Management Area Water Budgets



Hemet-San Jacinto Water Management Area



Hemet-San Jacinto Water Management Area

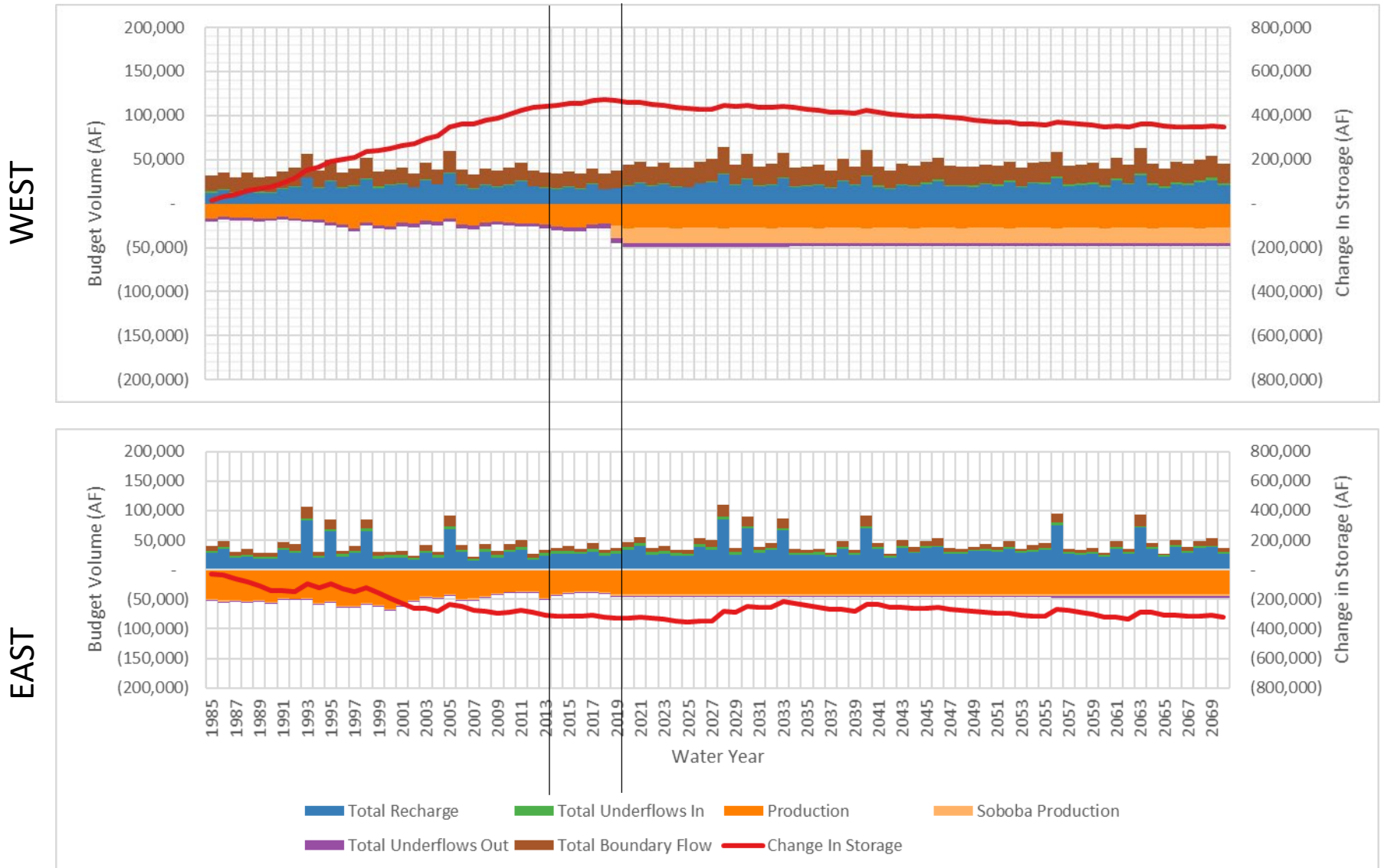
Flow		Historical Period Average WY 1985-2012 (AFY)		Current Condition Average WY 2013-2018 (AFY)		Updated Projected Baseline Average WY 2019-2070 (AFY)	
Recharge	<i>Applied Water Recharge</i>	10,677		10,305		10,326	
	<i>Rain</i>	8,962	19,639	6,548	18,579	7,451	25,276
	<i>Grant + IRRP Recharge</i>	0		1,727		7,500	
Steam Seepage		10,833	10,833	7,915	7,915	9,489	9,489
Underflows In	<i>From Menifee</i>	3		2		6	
	<i>From Lower Pressure</i>	3,717	3,823	4,368	4,370	3,547	3,554
	<i>From Lakeview</i>	103		0		1	
Boundary Flows	<i>Mountain Front Recharge</i>	8,992	8,992	6,570	6,570	8,258	8,258
Total Average Annual Inflow		43,287		37,435		46,578	
Underflows Out	<i>To Perris South</i>	253		247		501	
	<i>To Lower Pressure</i>	219	1,128	191	1,015	157	1,515
	<i>To Lakeview</i>	657		577		858	
Extractions	<i>EMWD</i>	13,740		7,199		7,303	
	<i>LHWMD</i>	9,524		9,355		7,434	
	<i>City of Hemet</i>	4,344		3,672		4,542	
	<i>City of San Jacinto</i>	2,976		2,637		3,004	
	<i>Soboba (From Natural Recharge)</i>	1,469	51,834	1,491	41,387	1,500	45,083
	<i>Soboba</i>	224		167		2,435	
	<i>Agency Unused Soboba</i>	0		4,287		5,065	
<i>Private Production</i>	19,559		12,581		13,800		
Total Average Annual Outflow		52,962		42,403		46,598	
Average Annual Change in GW Storage		(9,675)		(4,968)		(21)	



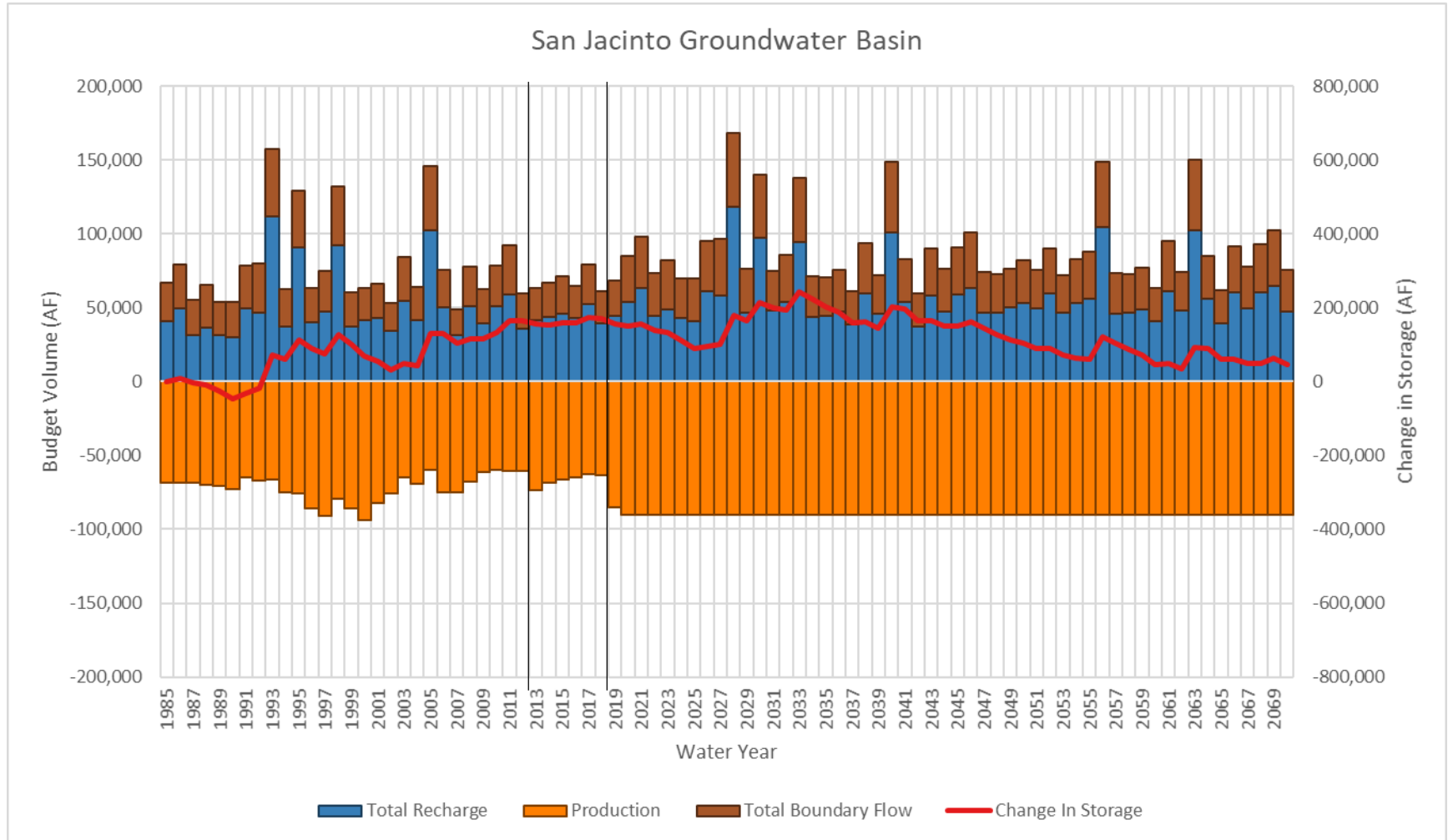
Total Water Budget



Total Water Budget – Parts of the Whole



Total Water Budget

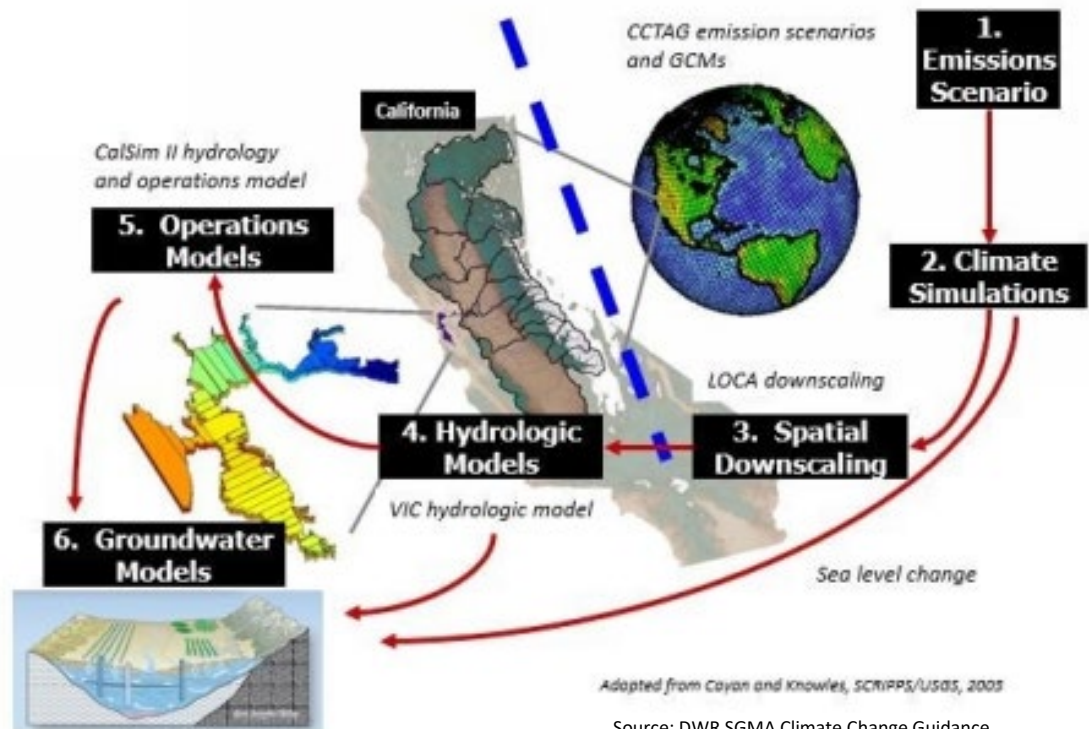


Total Water Budget

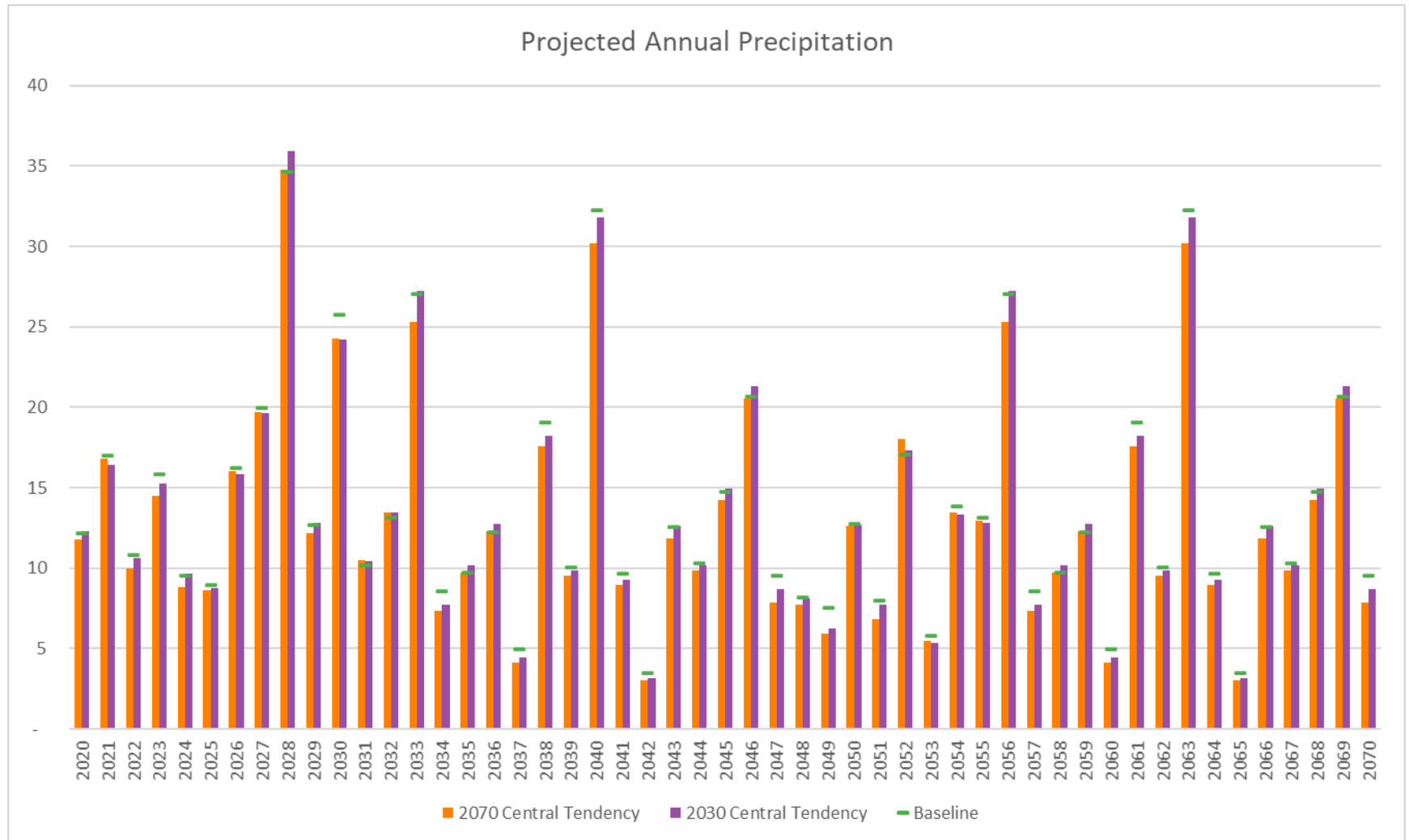
Flow		Historical Period Average WY 1985-2012 (AFY)		Current Condition Average WY 2013-2018 (AFY)		Updated Projected Baseline Average WY 2019-2070 (AFY)	
Recharge	<i>Sales</i>	9,729	39,037	11,408	35,944	13,669	46,879
	<i>Irrigation</i>	5,121		2,583		2,398	
	<i>Rain</i>	17,680		12,010		14,540	
	<i>Artificial</i>	6,506		9,943		16,271	
Stream Seepage		11,140	11,140	8,215	8,215	9,795	9,795
Boundary Flows	<i>From Sun City Area</i>	889	27,752	1,098	23,502	1,160	31,134
	<i>Lake Perris Right Dam Seepage</i>	585		585		585	
	<i>Lake Perris Right Dam Seepage</i>	3,400		3,400		7,500	
	<i>Lake Perris Native Underflow</i>	3,201		3,201		3,201	
	<i>Mountain Front Recharge</i>	19,678		15,218		18,688	
Total Average Annual Inflow		77,929		67,661		87,807	
Production	<i>Toe Drain</i>	3,400	72,069	3,400	66,531	0	90,179
	<i>LPSRW</i>	0		0		7,500	
	<i>EGETS Wells</i>	0		0		241	
	<i>Perris North Project</i>	0		0		6,717	
	<i>Perris South Desal Project</i>	0		0		2,985	
	<i>Soboba</i>	1,692		1,657		3,935	
	<i>HSJ Mgmt Area Production</i>	50,142		39,730		41,148	
	<i>West Side Basin Production</i>	16,835		21,744		27,652	
Total Average Annual Outflow		72,069		66,531		90,179	
Average Annual Change in GW Storage		5,860		1,130		(2,371)	

Climate Change Data Downscaling to Groundwater Model Applications

- Data from Global Climate Models (GCMs) are downscaled to a regional planning scale
- Downscaled data is available in pre-existing datasets



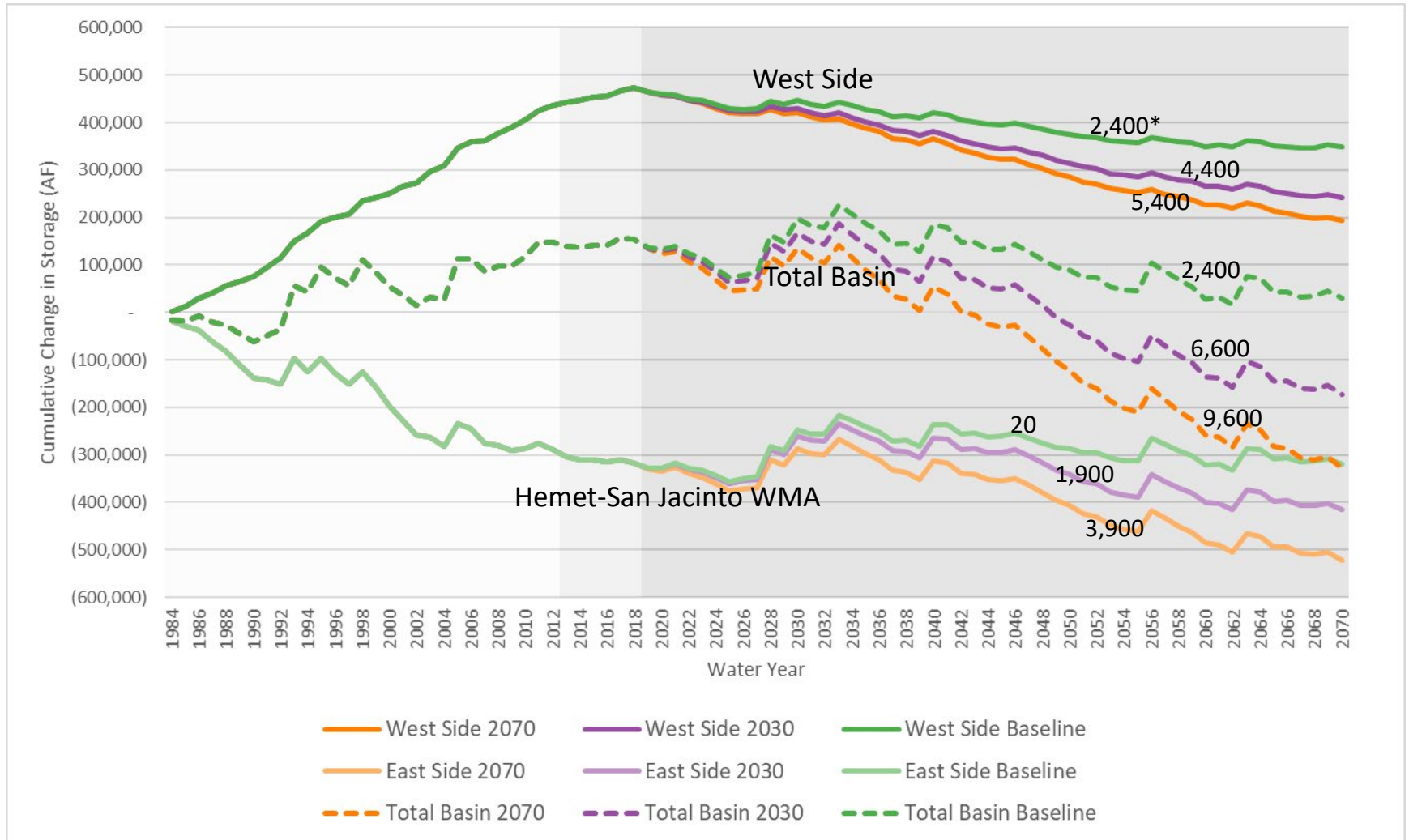
Changes to Precipitation



Changes to Precipitation (West San Jacinto Basin)

Category	Projected Baseline	2030 Central Tendency	2070 Central Tendency
% of Baseline Precipitation	100%	98%	95%
Average Annual Modeled Precipitation	9.17"	8.99"	8.71"
Difference in Annual Modeled Precipitation	-	-0.18"	-0.46"

Projected Change in GW Storage – Baseline and Climate Change Scenarios



* Numbers show the long-term projected annual rate of decline in GW Storage (AF/Yr)



Minimum Thresholds and Measurable Objectives for Groundwater Quality



Minimum Thresholds Under SGMA

- From the SGMA Emergency Regulations:
 - “Each Agency in its Plan shall establish minimum thresholds that quantify groundwater conditions for each applicable sustainability indicator at each monitoring site or representative monitoring site established pursuant to Section 354.36 (Representative Monitoring)” (23 CCR § 354.28. Minimum Thresholds)
 - “An Agency may establish a representative minimum threshold for groundwater elevation to serve as the value for multiple sustainability indicators where the Agency can demonstrate that the value is a reasonable proxy.” (23 CCR § 354.28(d))

SUSTAINABILITY INDICATORS



Groundwater elevation
MT = Water Level



Groundwater in storage
MT = Water Level



Land Subsidence
MT = Water Level



Interconnected surface water and groundwater – Not applicable



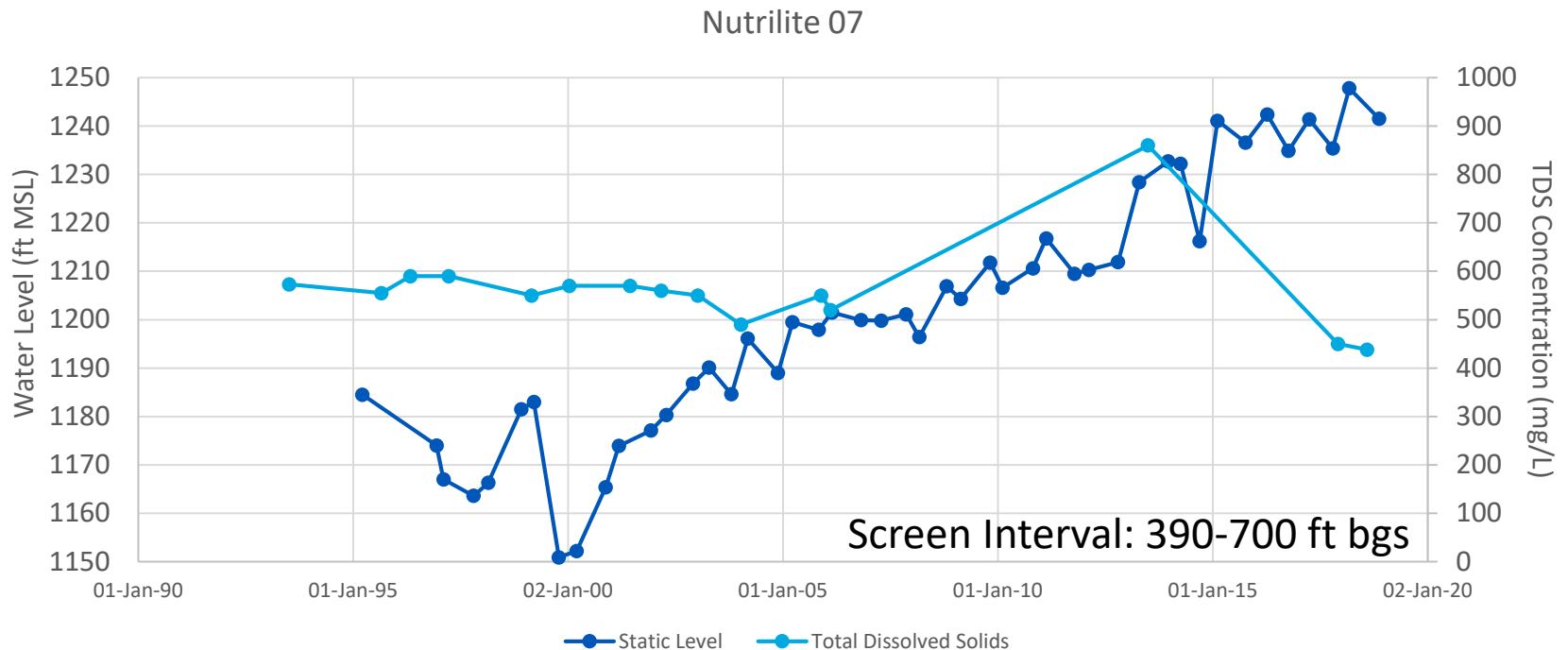
Water Quality
MT = TDS Concentration



Seawater Intrusion – Not applicable

Water Levels Not Appropriate Proxy

- Water level does not correlate with concentration



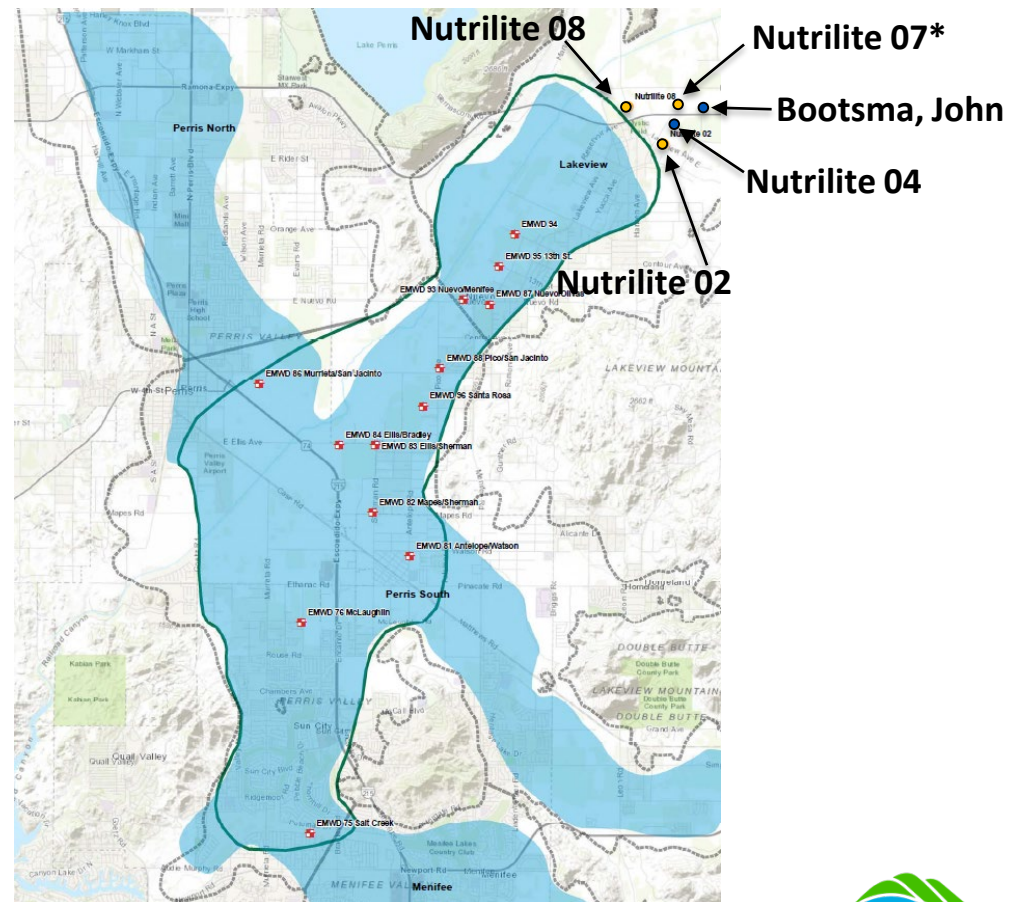
Water Quality General Undesirable Result

- Ongoing northeast migration of brackish water in the Lakeview GMZ would be an undesirable result
 - Use 1000 mg/L TDS plume as indicator of extent of brackish water

- Sentinel Well – Perris II ROTF MRP

- Proposed Additional GSP Representative Monitoring Point – Water Quality ONLY

- * Nutrilite 7 is also a representative monitoring point for water levels



Water Quality Representative Monitoring Points

- Use Perris II Sentinel Wells: Nutrilite 02, 07*, and 08 as representative monitoring points for water quality
 - Already incorporated into existing water quality monitoring plan
- Also include wells: John Bootsma, and Nutrilite 04 as additional representative monitoring points for water quality
 - Wells screened across representative aquifer
 - Provide additional understanding of water quality trends

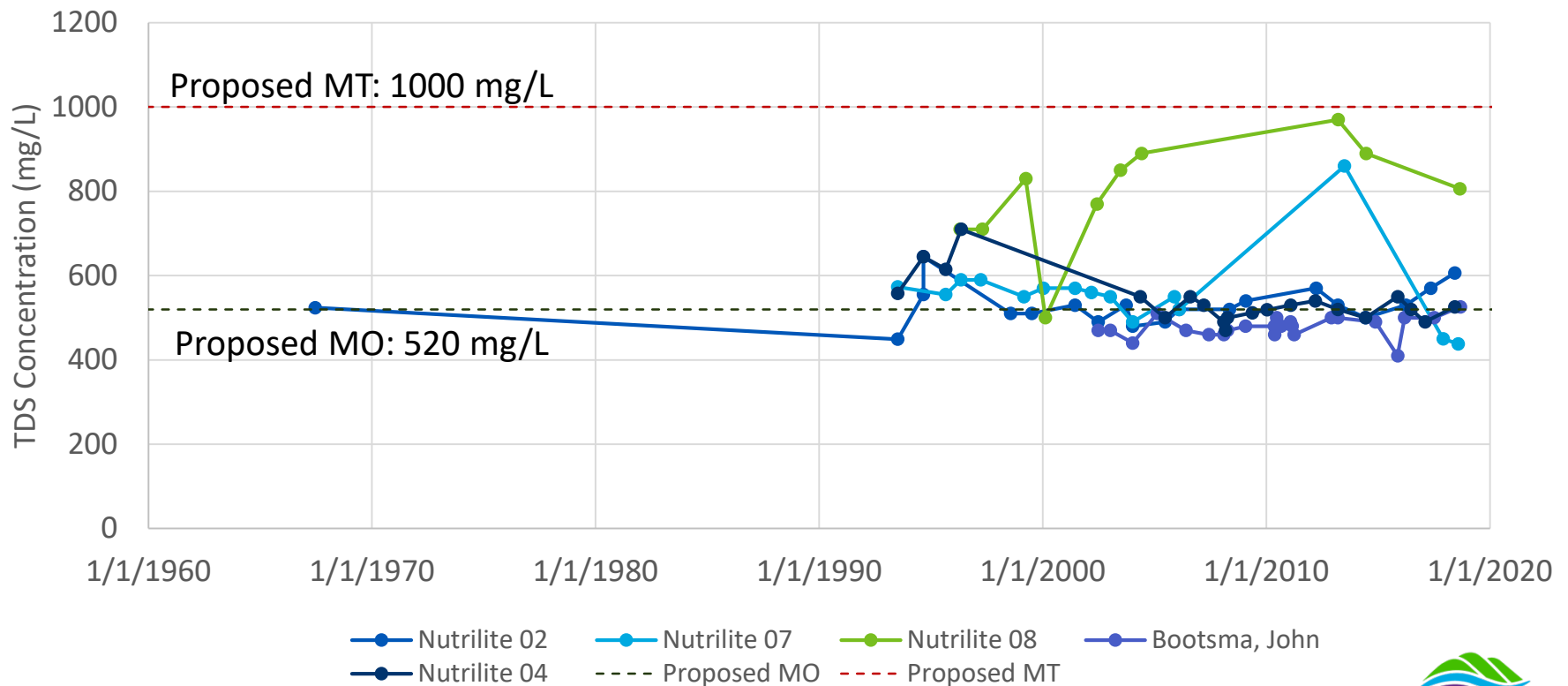
RMP	Top of Screen (ft bgs)	Bottom of Screen (ft bgs)	Maximum TDS Concentration (mg/L)	Maximum TDS Concentration YEAR	Mann-Kendall Trend
Nutrilite 07*	390	700	860	2013	Decreasing
Nutrilite 02	-	-	645	1994	No Trend
Nutrilite 04	170	480	710	1996	Decreasing
Nutrilite 08	-	-	970	2013	Increasing
Bootsma, John	350	650	526	2018	Increasing

* Nutrilite 7 is also a representative monitoring point for water levels

Water Quality Minimum Threshold/ Measurable Objective

- Propose 1000 mg/L TDS as the MT for these wells
- Propose 520 mg/L TDS as the MO
 - This corresponds with the basin plan objective for Lakeview/ Hemet North

Proposed Representative Monitoring Point TDS Concentrations



Minimum Thresholds

- Followed DWR guidance to propose *water level, groundwater in storage, and land subsidence* minimum thresholds at each representative monitoring point
- Need to define minimum threshold for groundwater quality

RMP	Proposed MT Water Levels (ft MSL)	Proposed MT Groundwater In Storage (ft MSL)	Proposed MT Land Subsidence (ft MSL)	Proposed MT Groundwater / Surface Water Interaction	Proposed MT Seawater Intrusion	Proposed MT Water Quality (TDS – mg/L)
EMWD 74	1200	1200	1200	NA	NA	NA
EMWD A1	1200	1200	1200	NA	NA	NA
EMWD Skiland 05	1200	1200	1200	NA	NA	NA
EMWD 94	1200	1200	1200	NA	NA	NA
Nutrilitte 07	1100	1100	1100	NA	NA	1000
EMWD 52	1200	1200	1200	NA	NA	NA
UCR Scott	1300	1300	1300	NA	NA	NA
Nutrilitte 02	NA	NA	NA	NA	NA	1000
Nutrilitte 04	NA	NA	NA	NA	NA	1000
Nutrilitte 08	NA	NA	NA	NA	NA	1000
Bootsma, John	NA	NA	NA	NA	NA	1000

Measurable Objectives

- Followed DWR guidance to propose *water level, groundwater in storage, and land subsidence* measurable objectives at each representative monitoring point
- Need to define measurable objective for groundwater quality

RMP	Proposed MO Water Levels (ft MSL)	Proposed MO Groundwater In Storage (ft MSL)	Proposed MO Land Subsidence (ft MSL)	Proposed MO Groundwater / Surface Water Interaction	Proposed MO Seawater Intrusion	Proposed MO Water Quality (TDS – mg/L)
EMWD 74	1250	1250	1250	NA	NA	NA
EMWD A1	1250	1250	1250	NA	NA	NA
EMWD Skiland 05	1250	1250	1250	NA	NA	NA
EMWD 94	1250	1250	1250	NA	NA	NA
Nutriline 07	1150	1150	1150	NA	NA	520
EMWD 52	1250	1250	1250	NA	NA	NA
UCR Scott	1350	1350	1350	NA	NA	NA
Nutriline 02	NA	NA	NA	NA	NA	520
Nutriline 04	NA	NA	NA	NA	NA	520
Nutriline 08	NA	NA	NA	NA	NA	520
Bootsma, John	NA	NA	NA	NA	NA	520

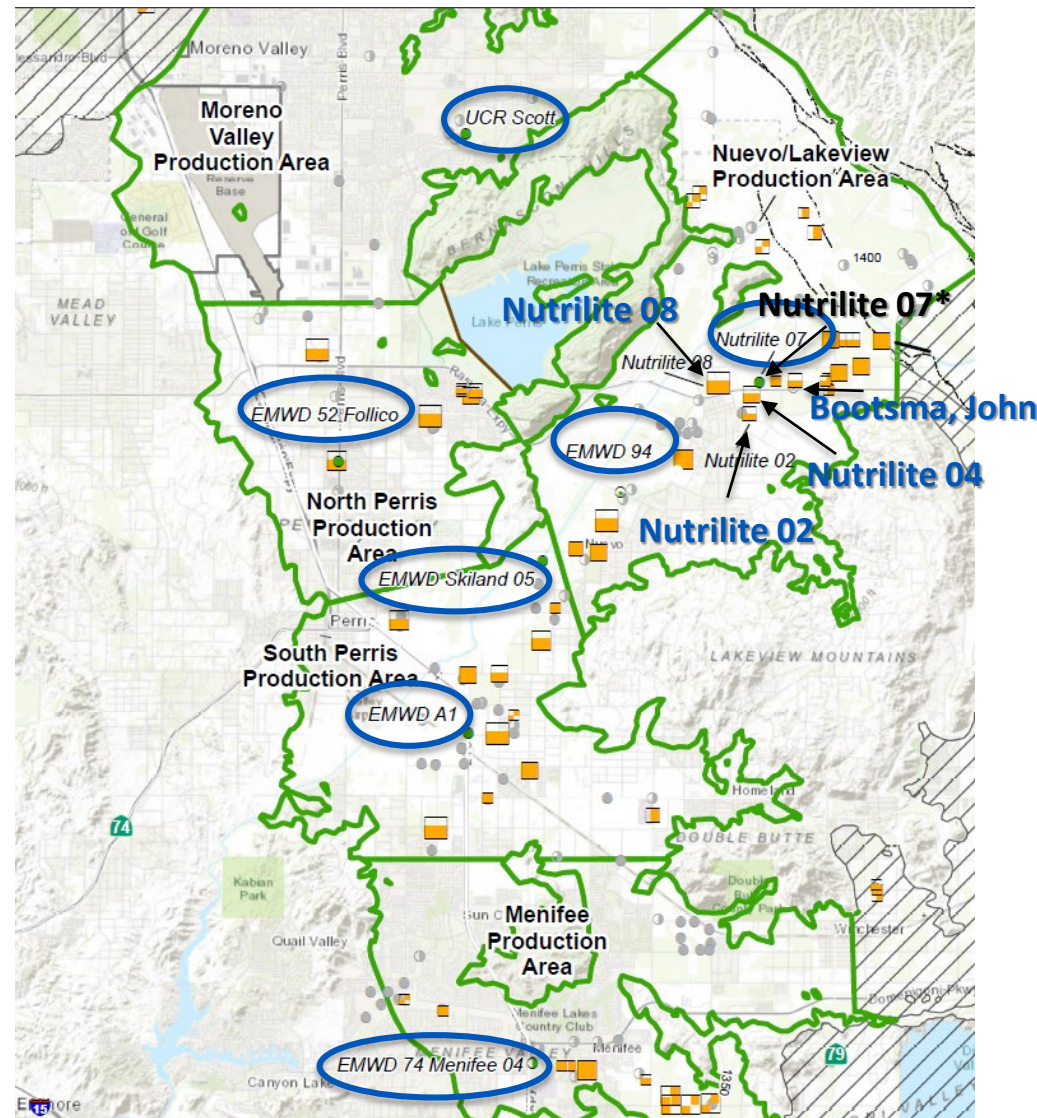


Undesirable Results



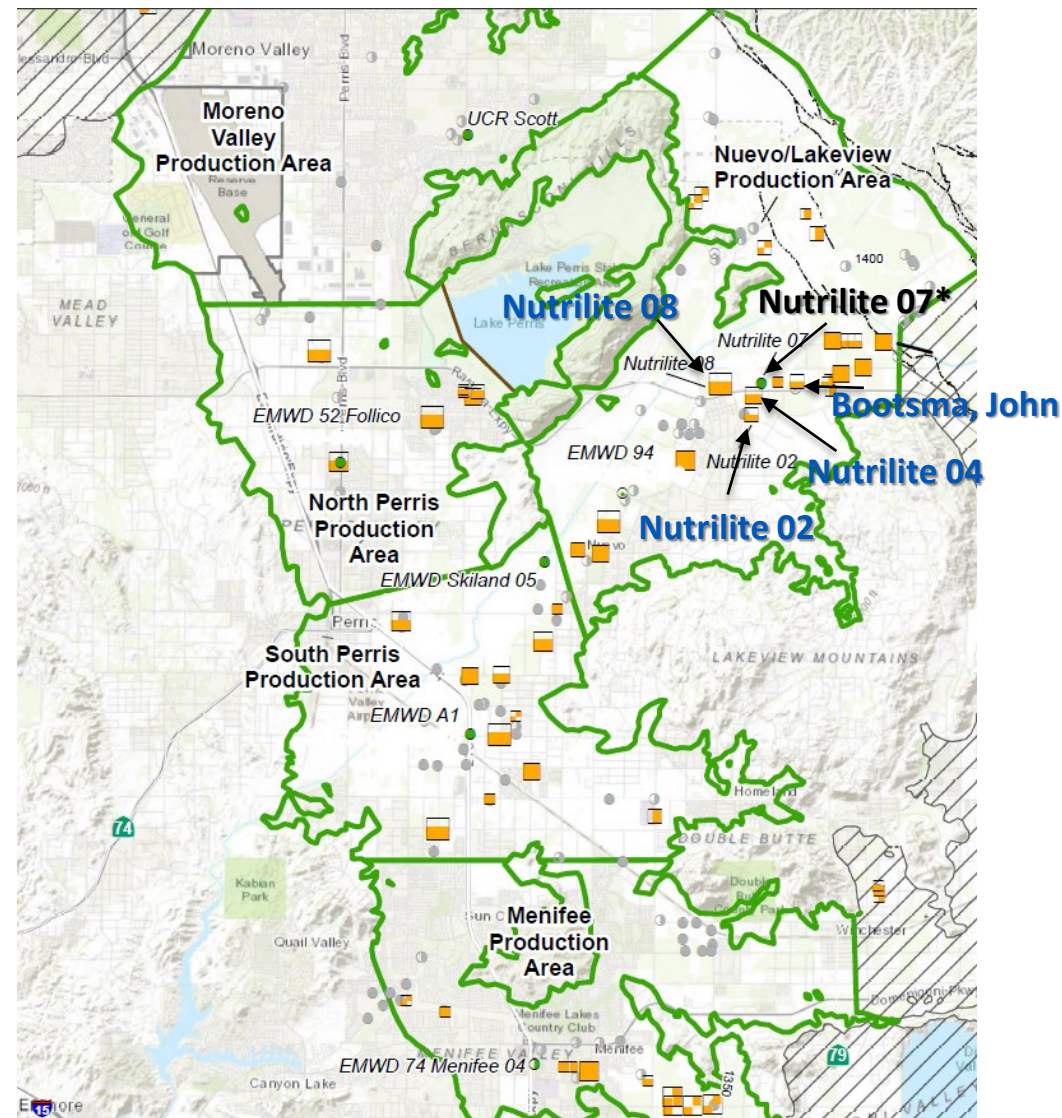
Undesirable Results

- From the SGMA Emergency Regulations:
 - “Undesirable results occur when significant and unreasonable effects for any of the sustainability indicators are caused by groundwater conditions occurring throughout the basin.”
 - The criteria used to define undesirable results “shall be based on a quantitative description of the *combination* of minimum threshold exceedances that cause significant and unreasonable effects in the basin” (emphasis added).



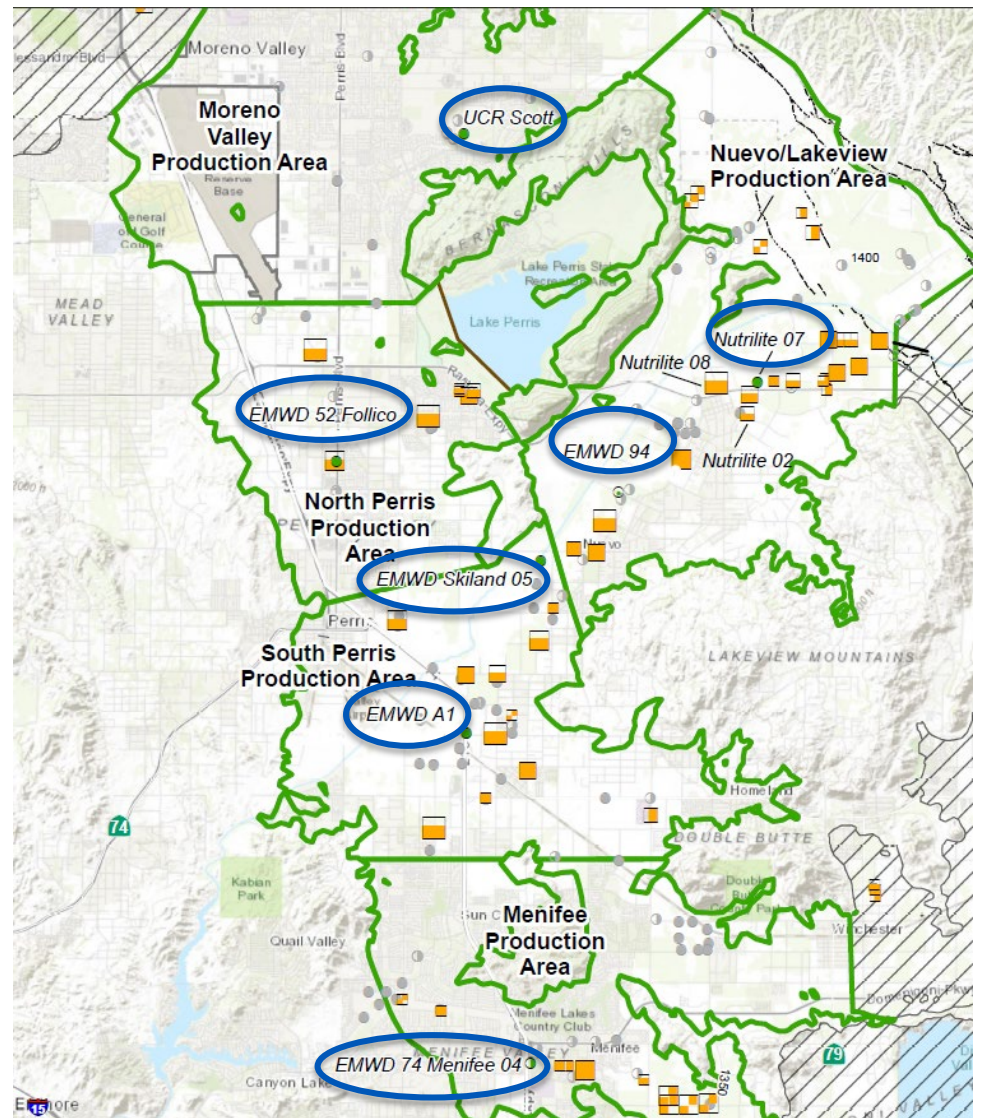
Undesirable Results: Water Quality

- Proposed quantification of undesirable results for water quality:
 - 3 of 5 wells have concentrations >1000 mg/L for 2 consecutive annual water quality sampling events



Undesirable Results: Water Levels

- Proposed quantification of undesirable results for water levels:
 - >30% of RMPs (for WL) have water levels below the minimum threshold for 2 consecutive spring monitoring events





Projects and Management Actions

Projects and Management Actions

- Projects and management actions shall be commensurate with the level of understanding of the basin setting, based on the level of uncertainty and data gaps ((23 CCR § 350.4(d))
- Each Plan shall include a description of the projects and management actions the Agency has determined will achieve the sustainability goal for the basin, including projects and management actions to respond to changing conditions in the basin. ((23 CCR § 354.44(a))
- Funded projects already included in baseline understanding of basin and incorporated in groundwater model of future conditions
- What projects and/ or management actions would be undertaken to address “changing conditions in the basin” or unanticipated declines in groundwater elevation and storage?

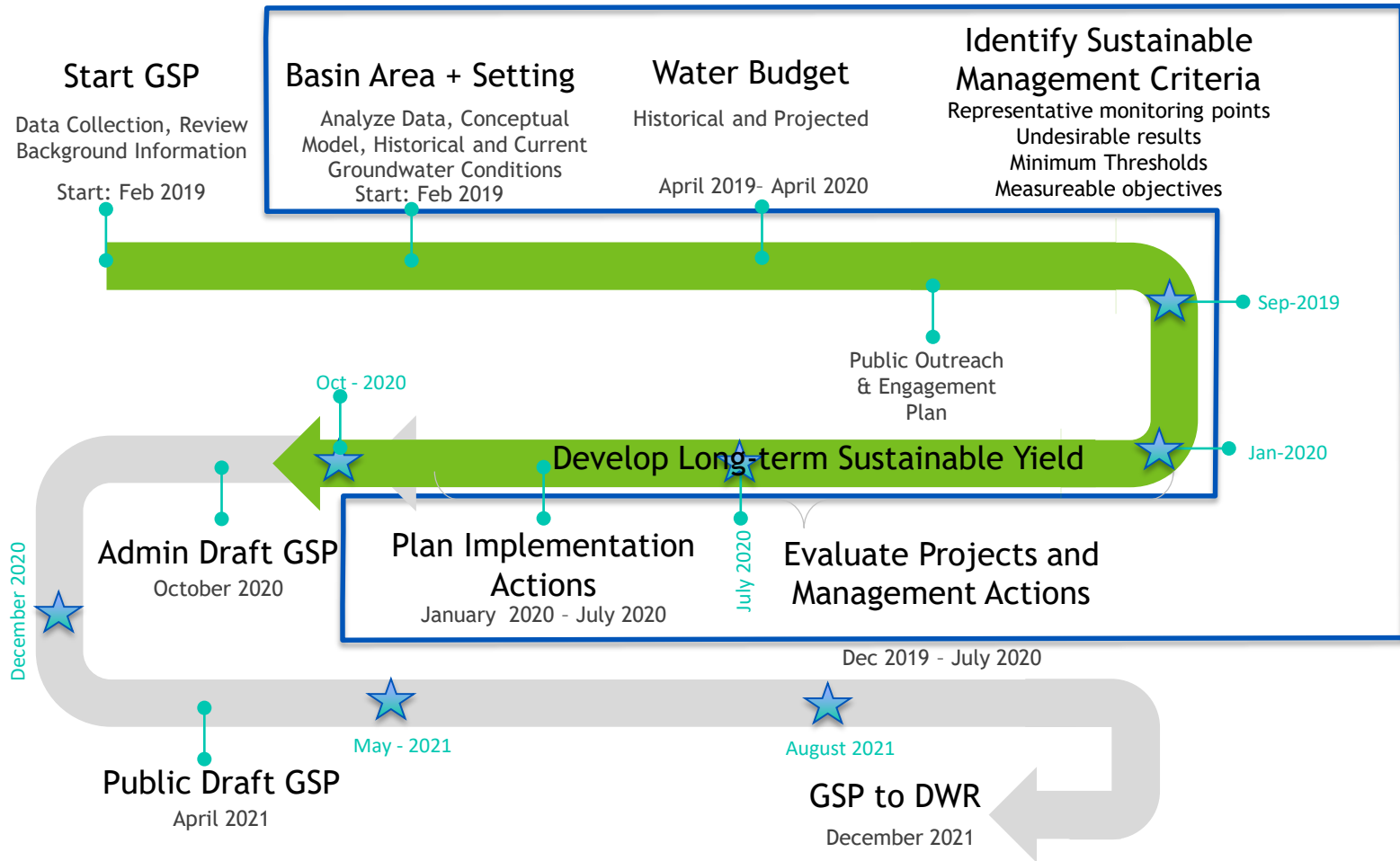
Projects and Management Actions

- Adjust pumping as needed to meet water level and/ or water quality objectives
 - Increase pumping in select areas to influence groundwater gradient to better control migration of non-point sources of contamination
 - Shift production away from localized areas that are experiencing over-pumping
 - Review spring water levels relative to minimum thresholds at representative monitoring points to determine if this is necessary
 - Reduce overall production if shifting production is unsuccessful at meeting water level objectives
- Assess feasibility of recycled water delivery to private producers in the Menifee production area to offset their groundwater production
 - Only applies if water levels in Menifee drop below minimum thresholds and shifting production does not result in groundwater elevation recovery
- Conduct additional investigations and/ or technical studies
 - Collect additional data if necessary to support additional studies
 - Refine understanding of the basin hydrogeology
 - Assess controls on water quality or water levels based on revised understanding



Timeline and Next Steps

GSP Development Process



Next Steps

- EMWD and consultant team will continue to work together to:
 - Prepare the public draft GSP
- Next stakeholder advisory group meeting scheduled for April 2021



Questions