

# Santa Ana River Wasteload Allocation Model Update

May 13, 2020



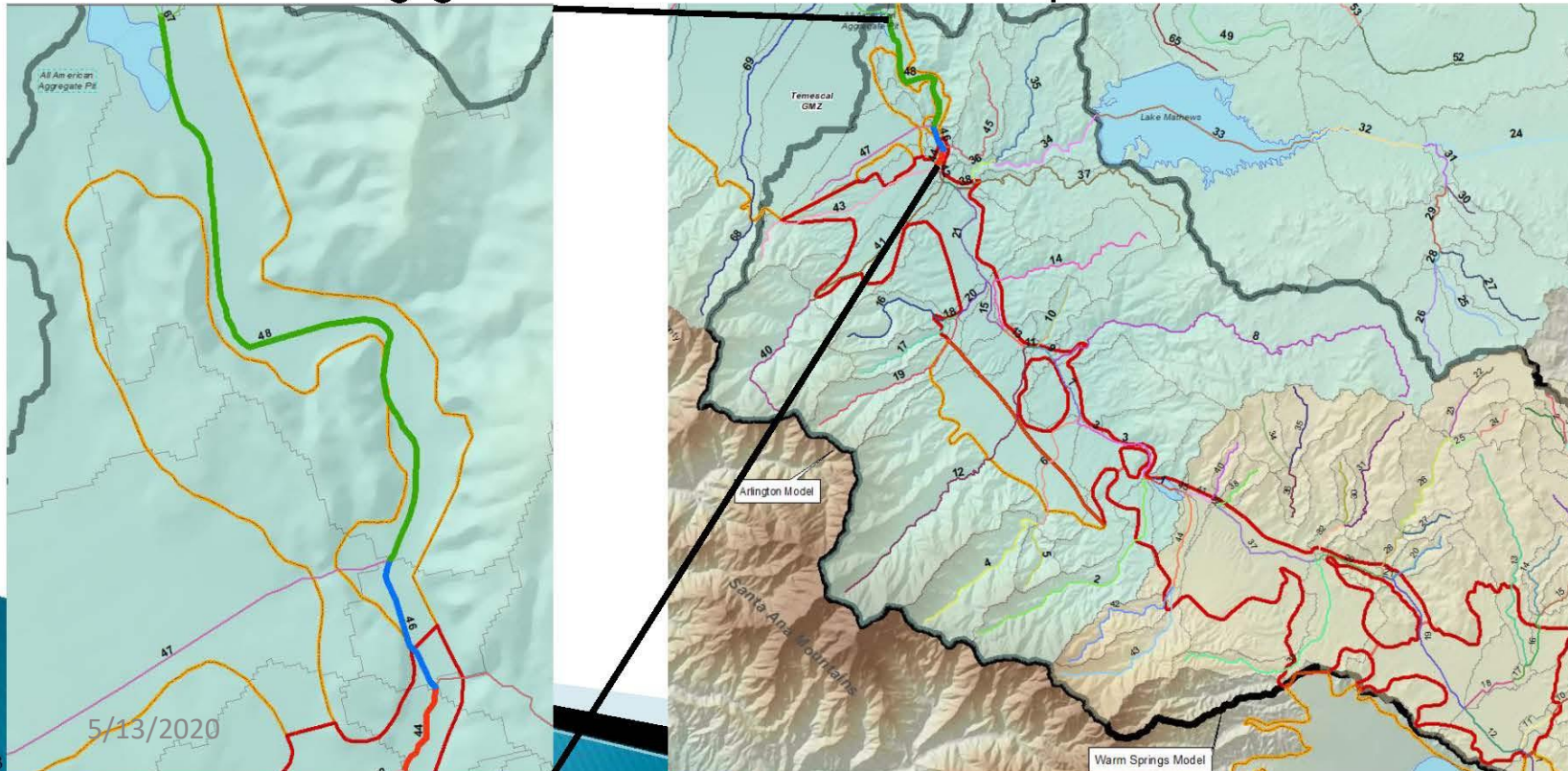
5/13/2020



# WEI Comment (WEI Slide No. 8)

## MODEL PARAMETERS

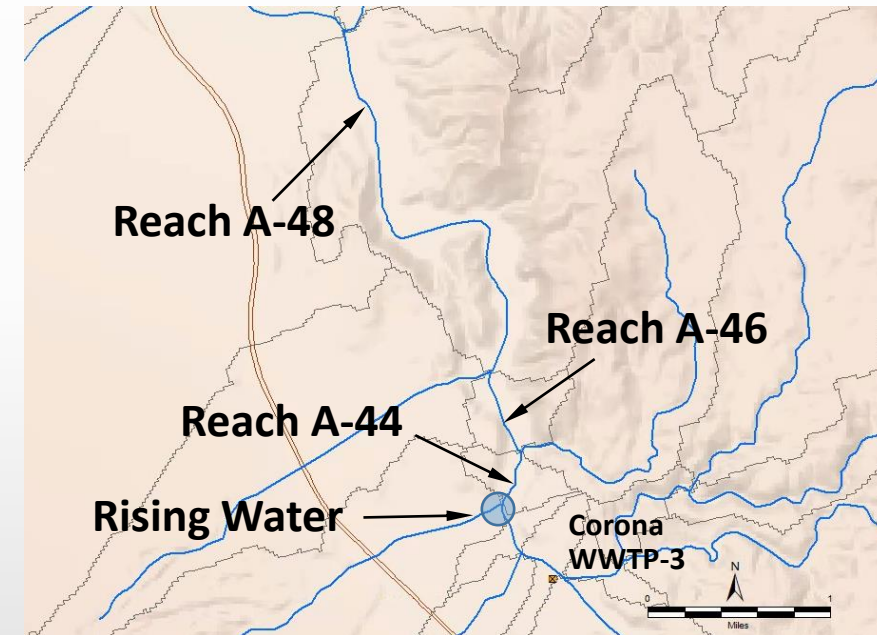
Reach 44 (location of rising groundwater), 46, and 48 → The infiltration rate was increased in Reaches 44 and 46, which are within a bedrock narrows where it is not likely that (1) the infiltration rates are higher than other areas of the Temescal Wash or (2) there is the capacity in the underlying alluvium to accept the recharge. The volume of infiltration is nearly always greater than the rising groundwater volume that is input into Reach 44.



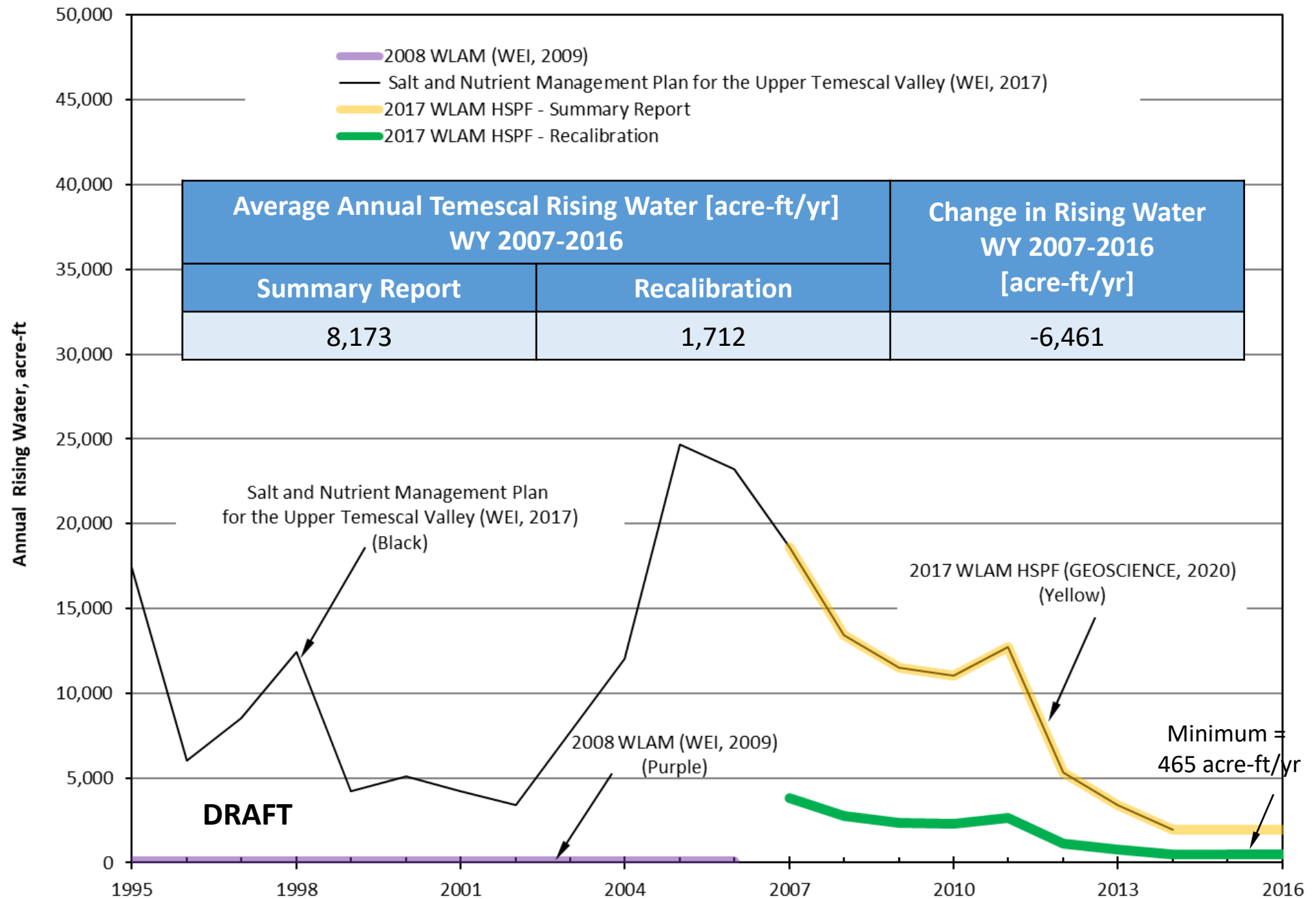
Water Year	Rising Groundwater Entering Reach 44 (afy)	Streambed Infiltration in Reaches 44, 46, 48 (afy)
2005	5,020	7,741
2006	4,805	4,151
2007	3,943	3,144
2008	2,802	3,062
2009	2,432	2,546
2010	2,144	3,090
2011	2,840	3,789
2012	1,188	1,268
2013	801	1,013
2014	464	671
2015	464	904
2016	463	719
Average (1995-2016)	2,012	2,449

# Geoscience Response: Infiltration Rate of Reaches A-44, A-46, and A-48

- Increased flow in reaches below the location of rising water supports higher infiltration rates because fines in the streambed surface would be removed.
- Higher infiltration rates are supported by model calibration.



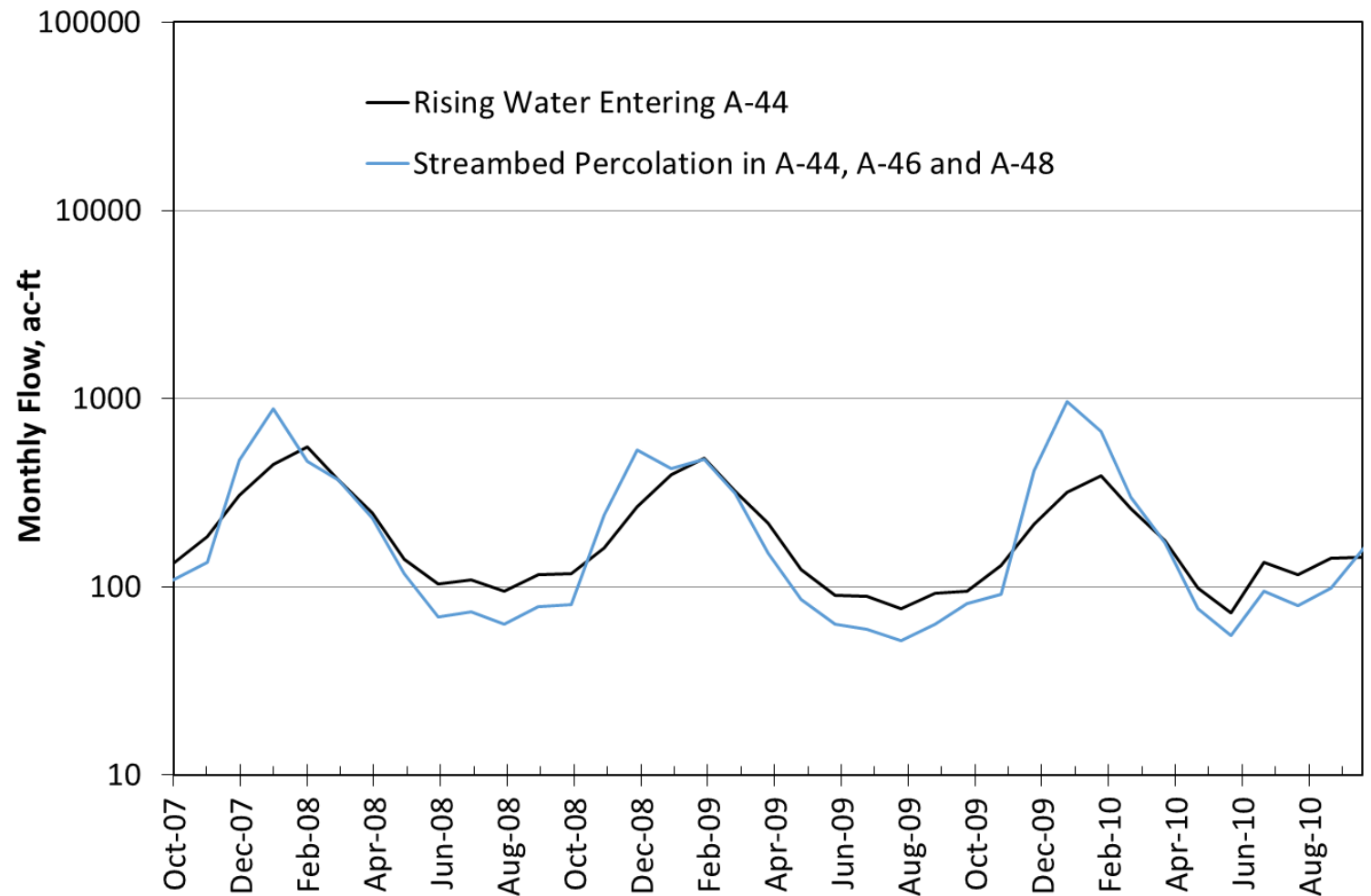
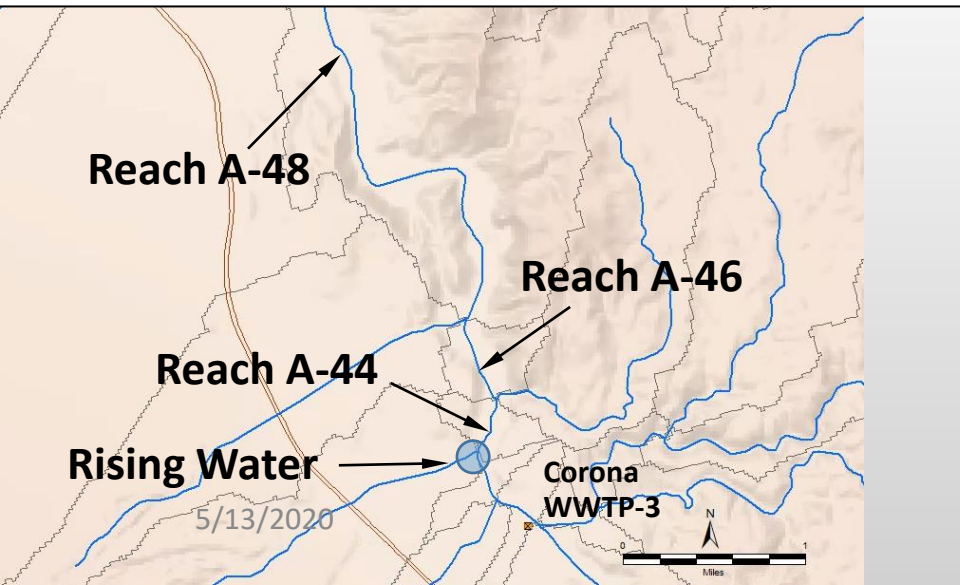
# Annual Rising Water from Upper Temescal Valley to Temescal Creek



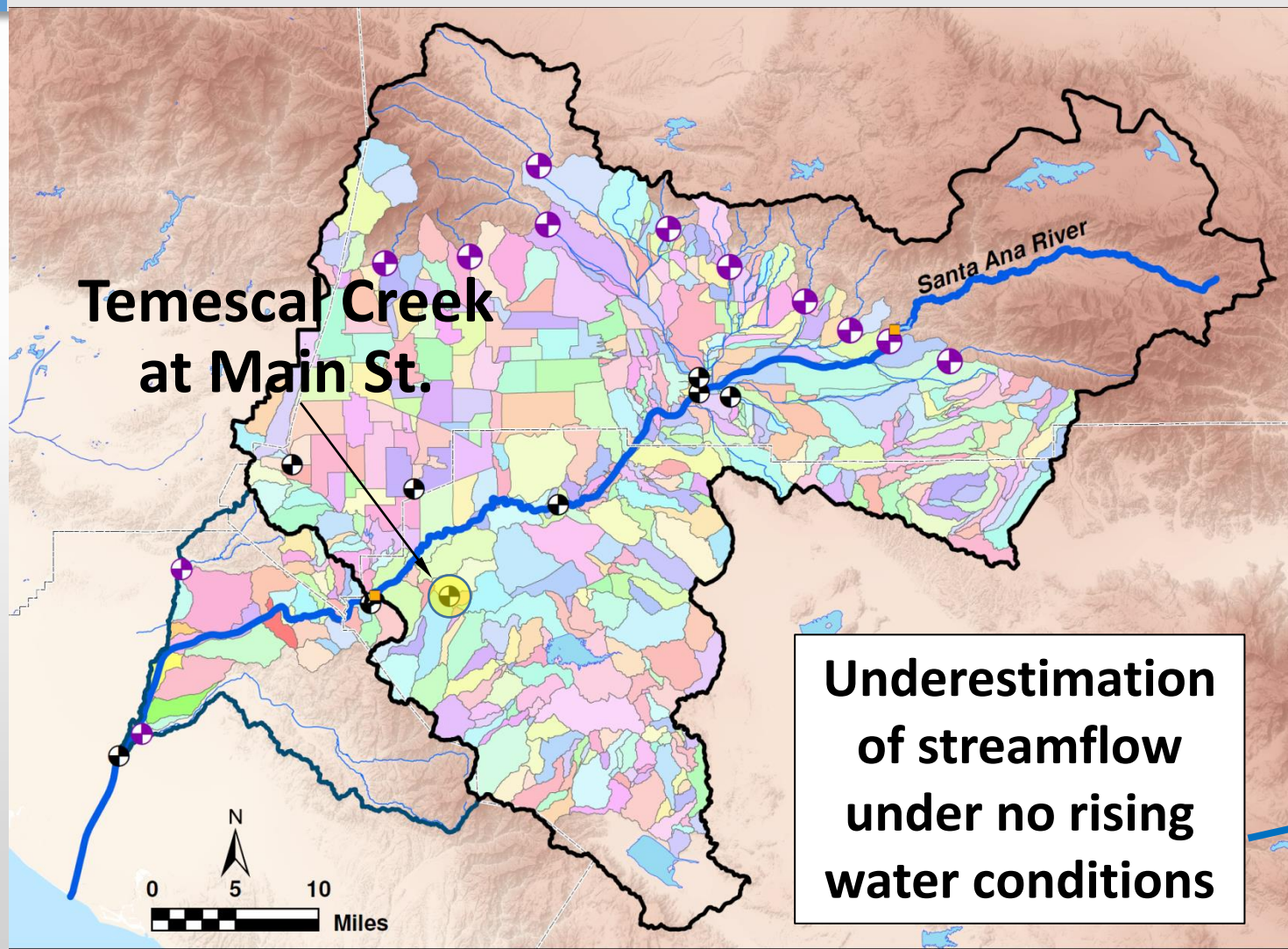


# Geoscience Response: Rising Water Exceeds Streambed Percolation During Summer Months

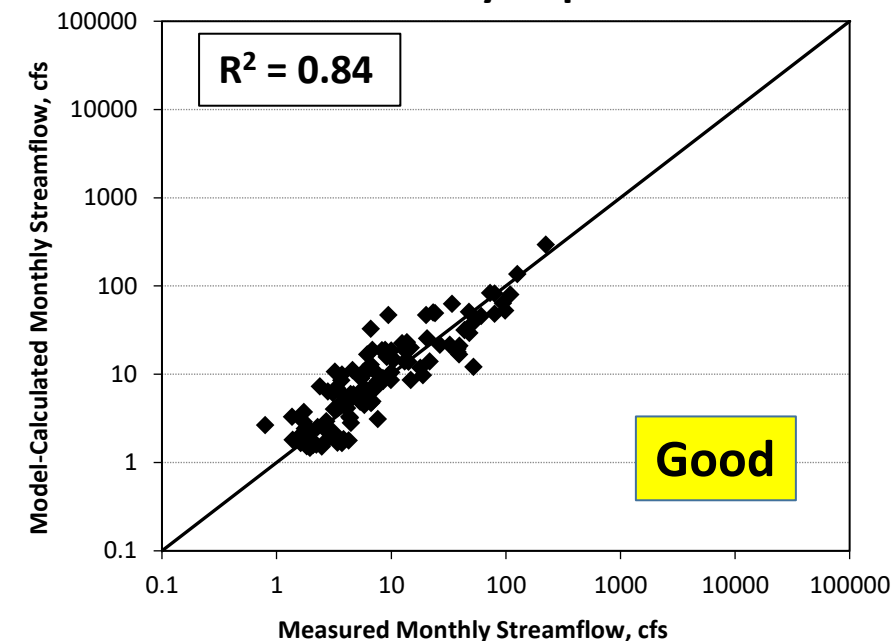
- Streambed percolation includes rising water, stormflow/runoff, and wastewater discharge.
- Additional flow from rising water in summer months helps improve model undersimulation at Main St. Gage.



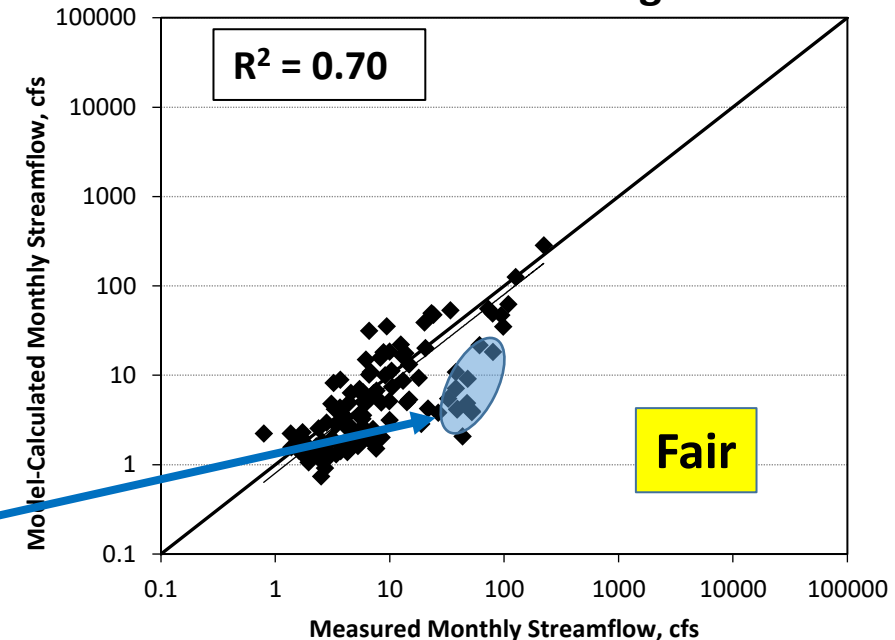
# 2017 WLAM HSPF Summary Report (Nov, 2019) vs. Recalibration Scenario 1 - No Temescal Rising Water Monthly Streamflow



## Summary Report

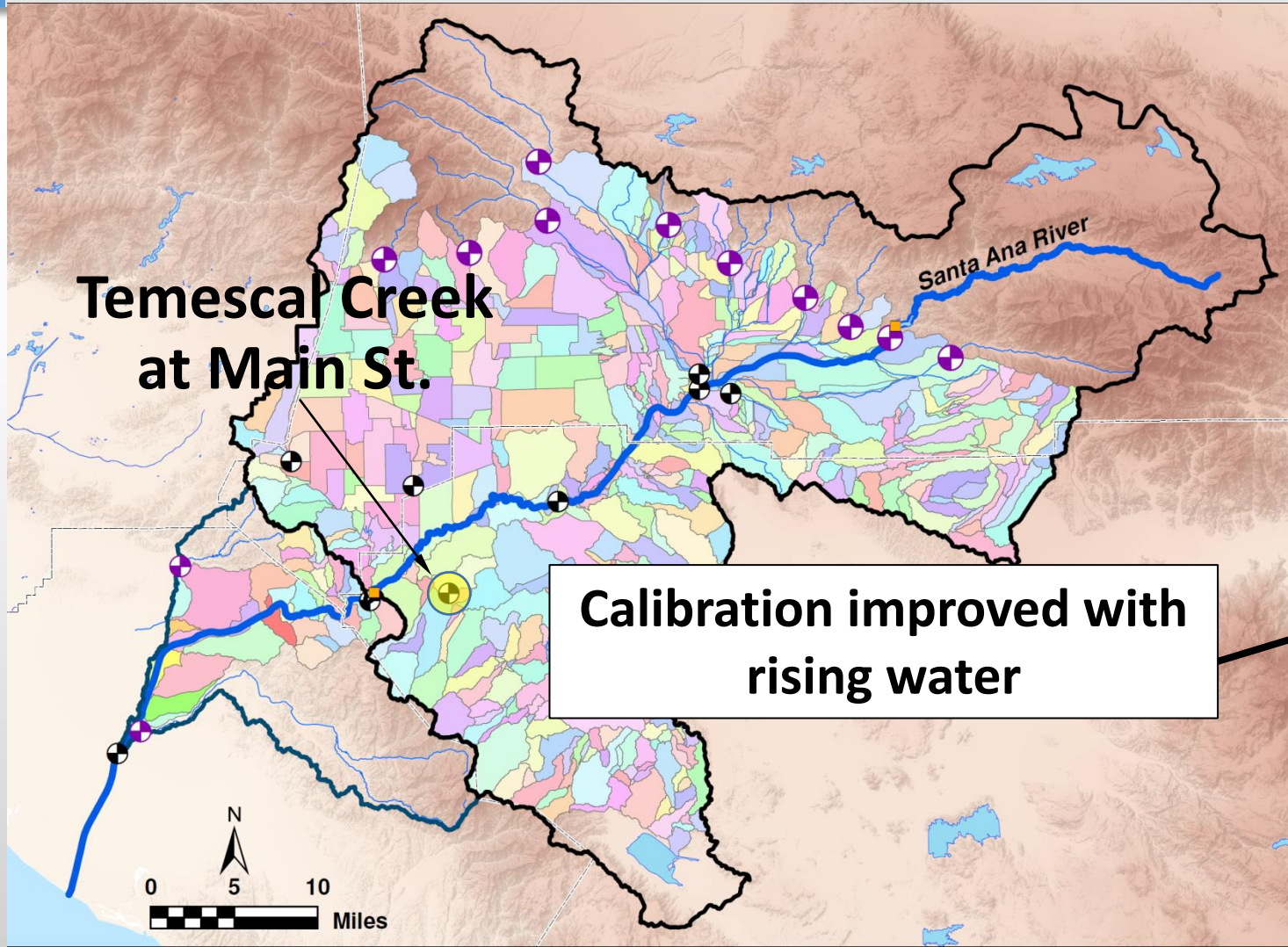


## Recalibration –No Rising Water

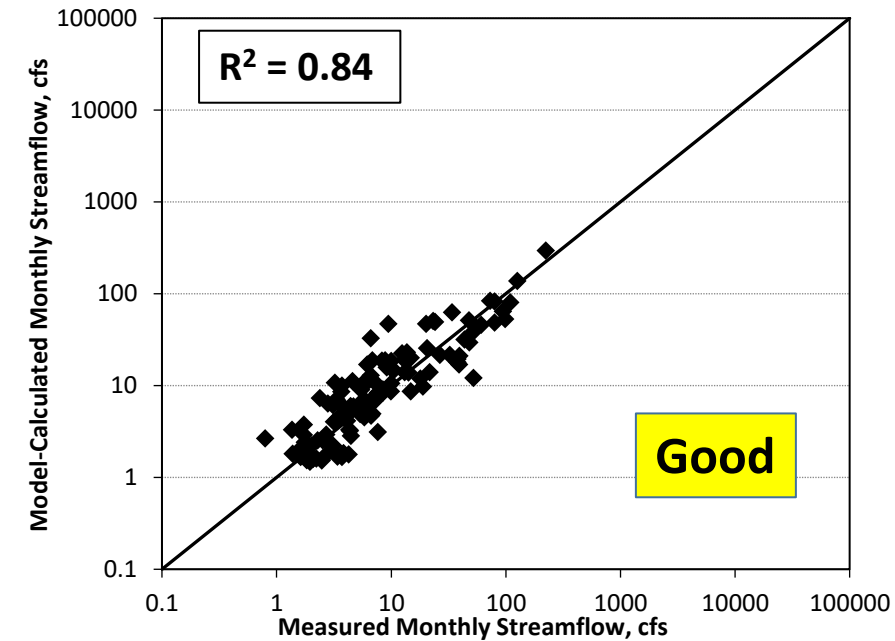




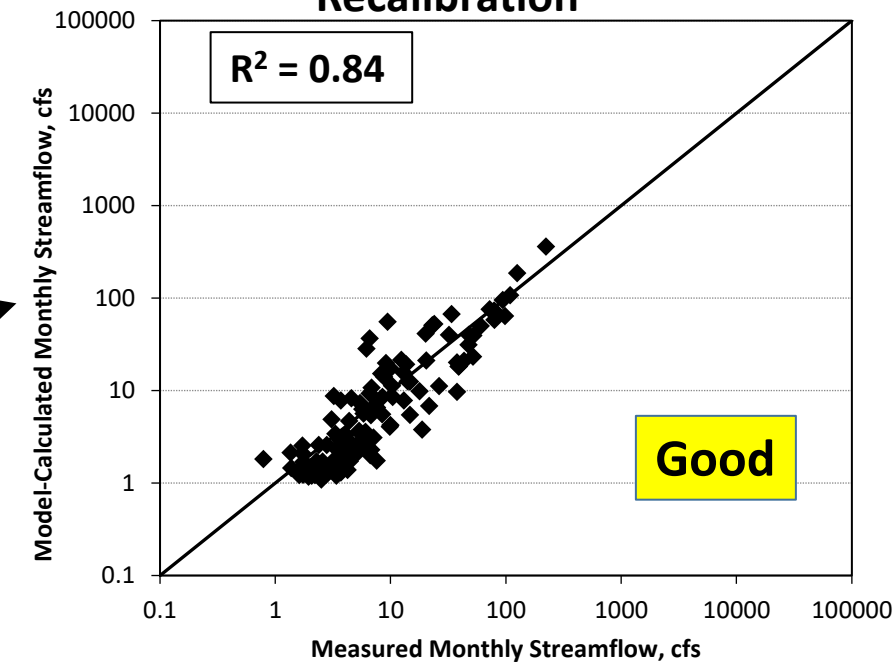
# XY Scatter Plot of Monthly Streamflow –WY 2007-2016 Temescal Creek at Main St.



## Summary Report



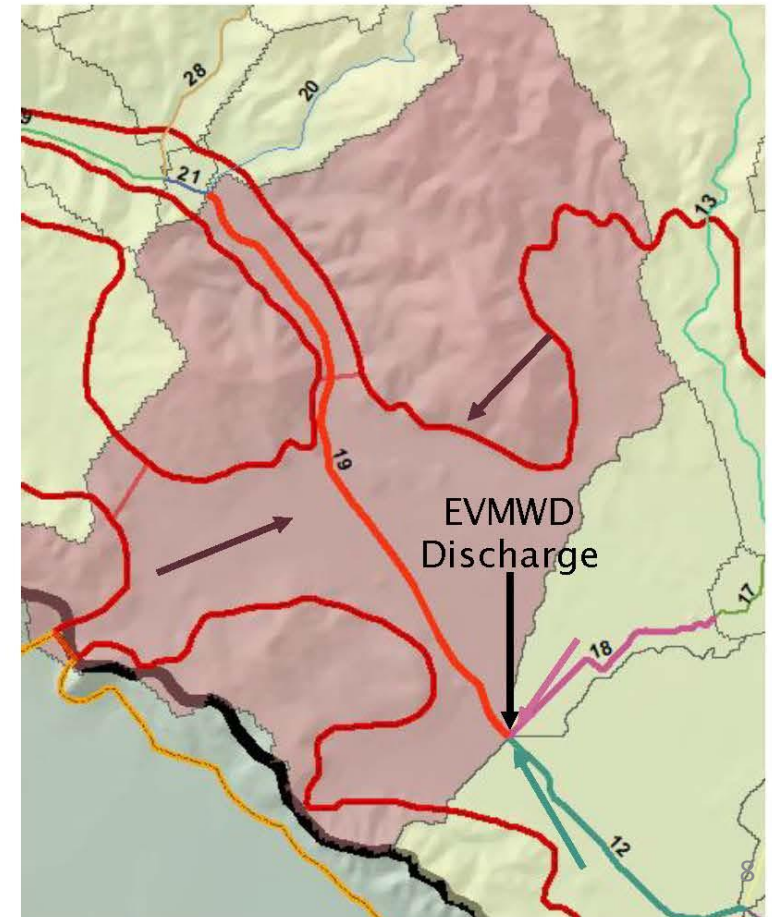
## Recalibration



## WEI Comment (WEI Slide No. 9)

### STREAMBED INFILTRATION TDS ESTIMATES

- ▶ We do not agree with the proposed methodology used to assign TDS concentration to the streambed infiltration when reaches “dry up” and the model assumes a zero TDS concentration.
- ▶ Recommended methodology →  
Use the volume-weighted TDS concentration of the inputs to the surface flow of each reach that’s drying up for that specific day. For example, for Reach 19 use:
  - Inflow from Reaches 12 and 18
  - Runoff from Watershed 19
  - EVMWD discharge





# **Geoscience Response: Streambed Infiltration TDS/TIN Estimates**

- Geoscience will use WEI's proposed methodology to update estimates of TDS/TIN in streambed percolation.

# 2017 WLAM HSPF Model Updates

- Updated Model Code

2004/2008 WLAM	2017 WLAM HSPF
<ul style="list-style-type: none"><li>• RUNOFF and ROUTER (proprietary software)</li></ul>	<ul style="list-style-type: none"><li>• Hydrologic Simulation Program – Fortran (HSPF)<ul style="list-style-type: none"><li>• Supported and maintained by USEPA and USGS</li><li>• Heavily peer reviewed and industry standard</li><li>• Established standard and guideline for model calibration</li><li>• Publicly available</li></ul></li></ul>

# 2017 WLAM HSPF Model Updates (continued)

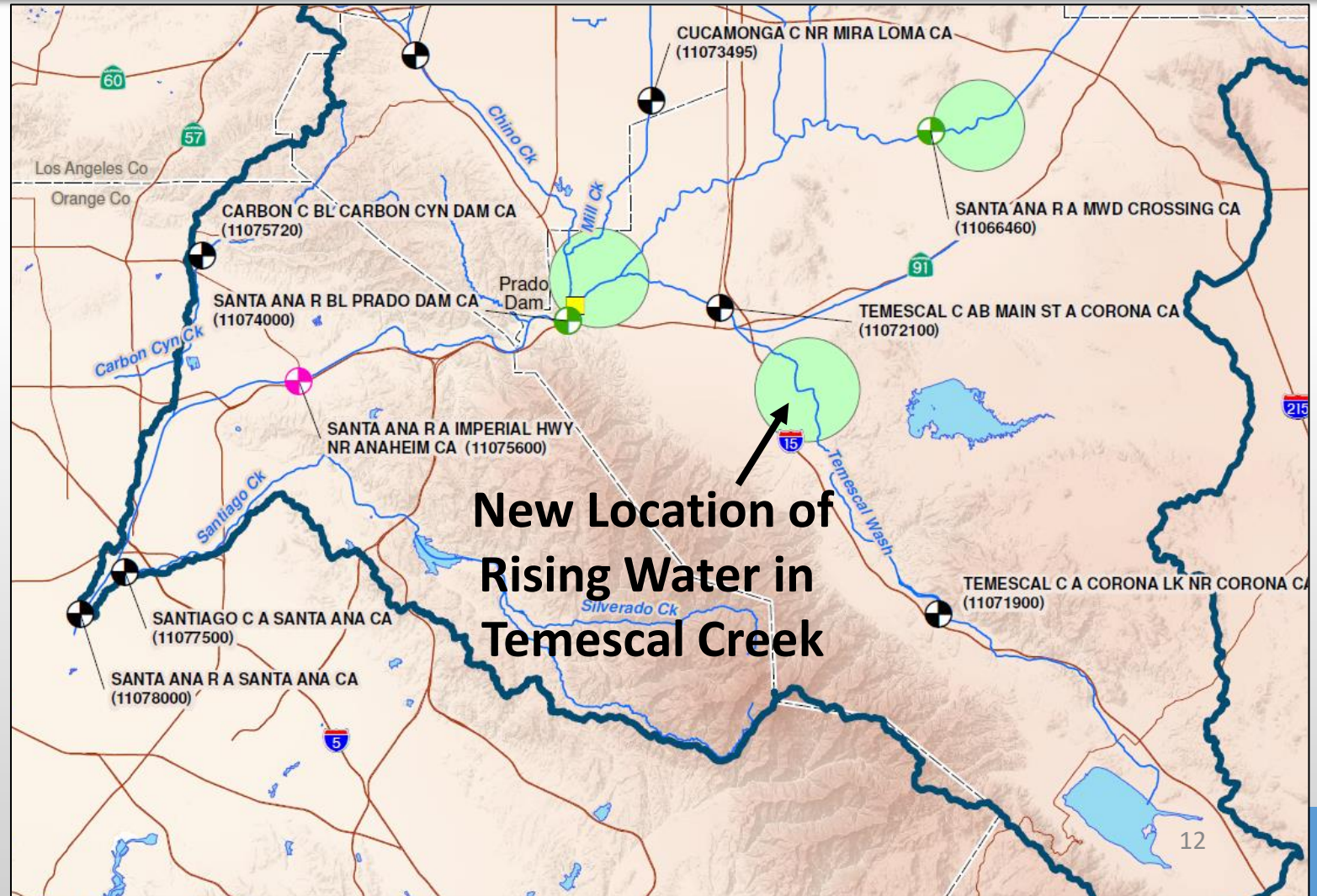
- Quantitative TDS/TIN and Flow Calibration Criteria

2008 WLAM	2017 WLAM HSPF
<ul style="list-style-type: none"><li>Qualitative TDS/TIN calibration</li><li>Quantitative monthly flow calibration</li></ul>	<ul style="list-style-type: none"><li>Daily and monthly flow and TDS/TIN calibration evaluated in terms of:<ul style="list-style-type: none"><li>Average Residual</li><li>Average Residual Percentage of Observed</li><li>Standard Deviation</li><li>RMSE</li></ul></li></ul>



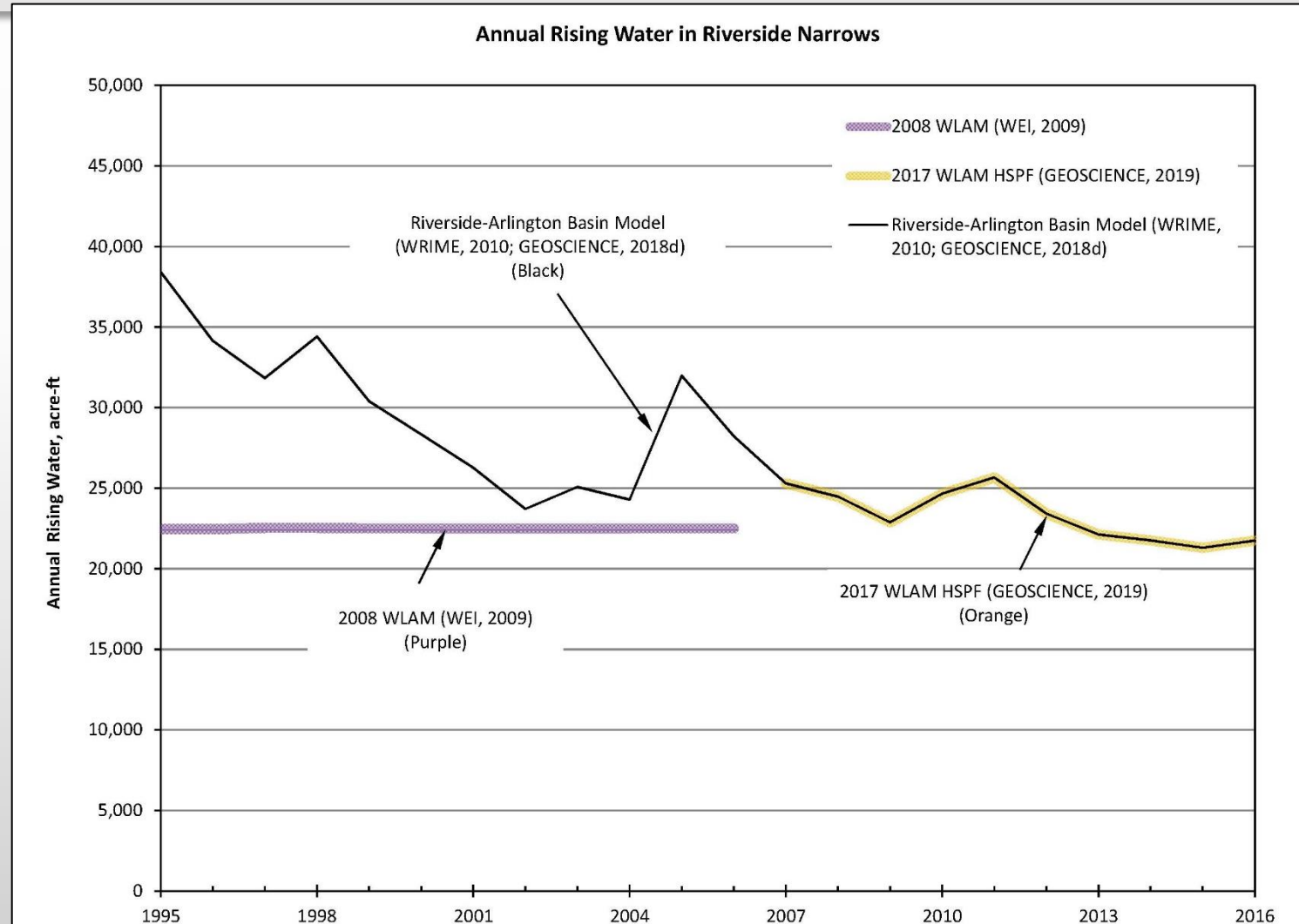
# 2017 WLAM HSPF Model Updates (continued)

- **Rising Water Assumptions**
  - Additional rising water added in Temescal Creek upstream of Main St. Gage, based on recent studies



# 2017 WLAM HSPF Model Updates (continued)

- Rising Water Assumptions (cont.)
  - Rising water volumes varied based on groundwater flow modeling to reflect hydrology





# 2017 WLAM HSPF Model Updates (continued)

- **Corrected location of Corona WWTP #1 discharge**

