MSAR Triennial Report Update

August 2022 Update: Cucamonga Creek Synoptic Surveys

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08/29/22

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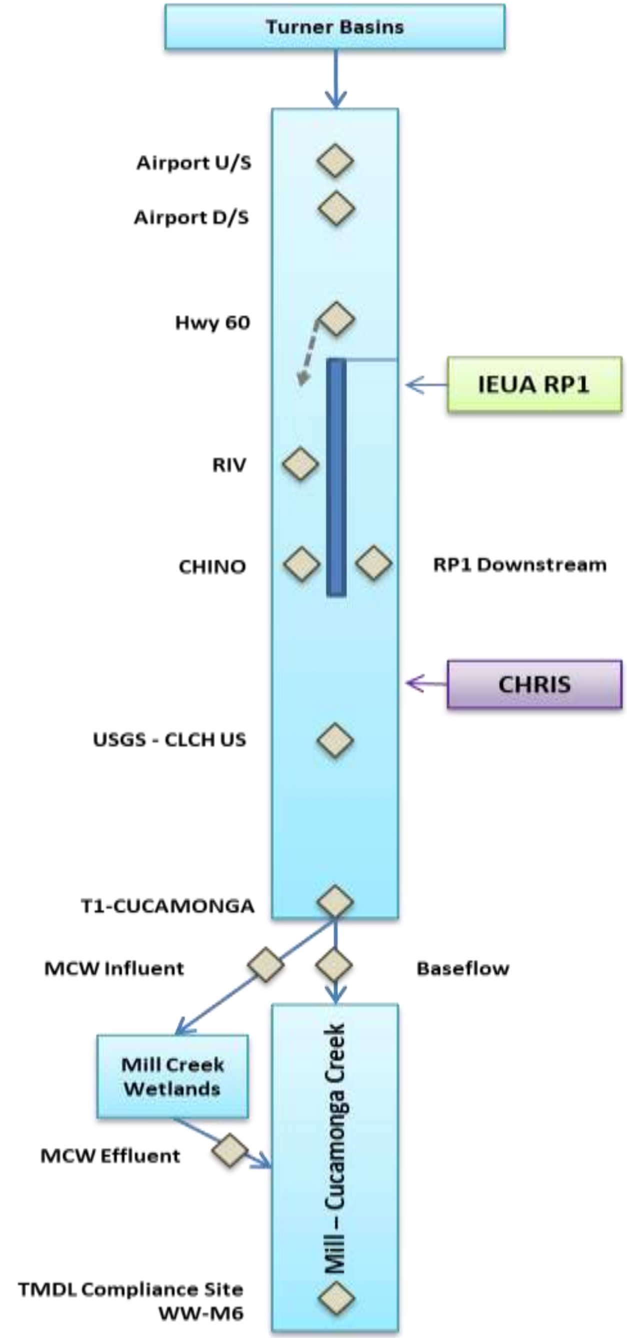
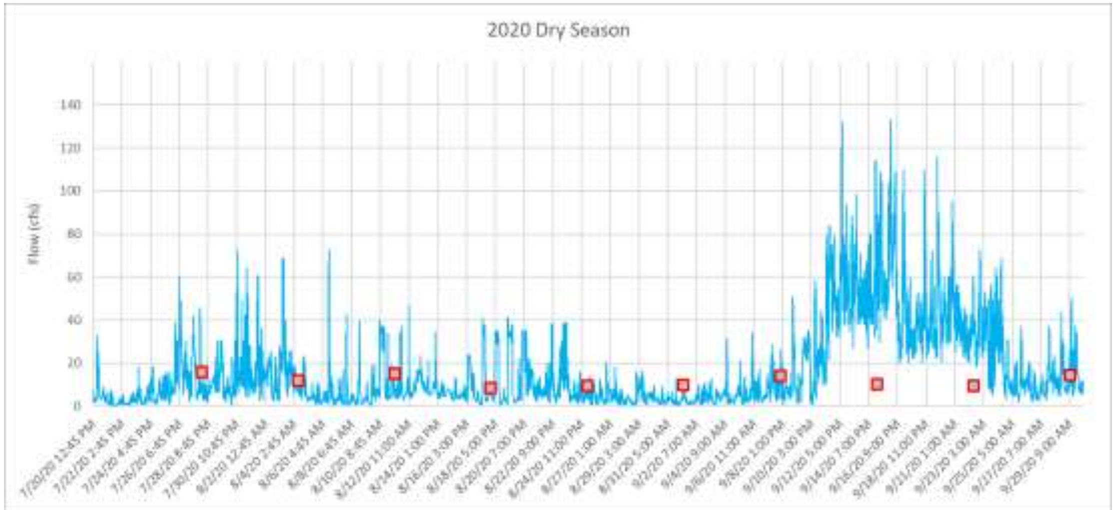
Cucamonga Creek 10-week Assessment Stations

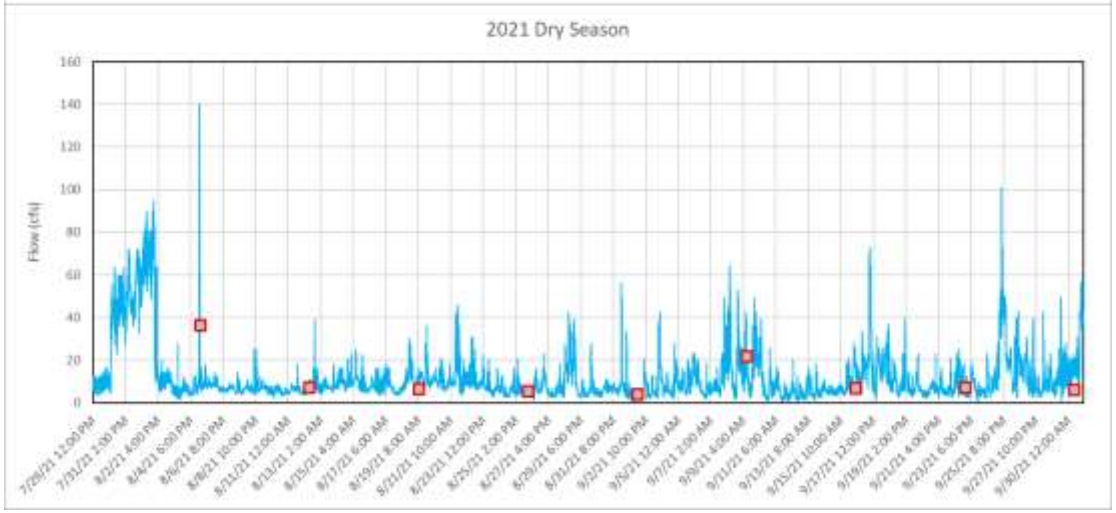
- Mainstem samples collected at
  - Airport Upstream
  - Airport Downstream
  - Highway 60
  - Riverside Drive
  - Chino Avenue
  - County Line
  - Hellman Avenue
  - Mill Creek Wetland
- Samples of key tributaries
  - RP1 effluent at Chino Avenue
  - Chris Basin
  - Mill Creek Wetland Return



Cucamonga Creek 10-week Assessment Schedule

- Weekly sampling over ten consecutive weeks during dry seasons (2016-2022)
- Sub-hourly flow data from Cucamonga Creek USGS gauge





Dry Weather Flow in Cucamonga Creek

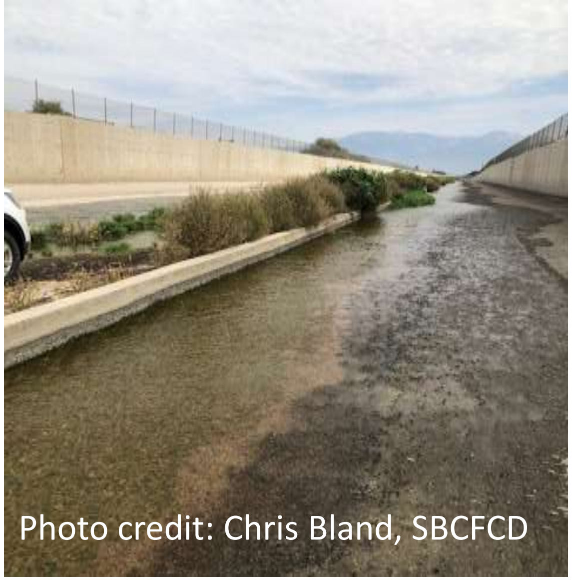
- Extremely variable RP1 discharge
- MS4 dry weather flow with or without Turner Basins bypass
- Occasional dewatering of stored water from Turner Basins
- Synoptic surveys (n=50) are not on same playing field



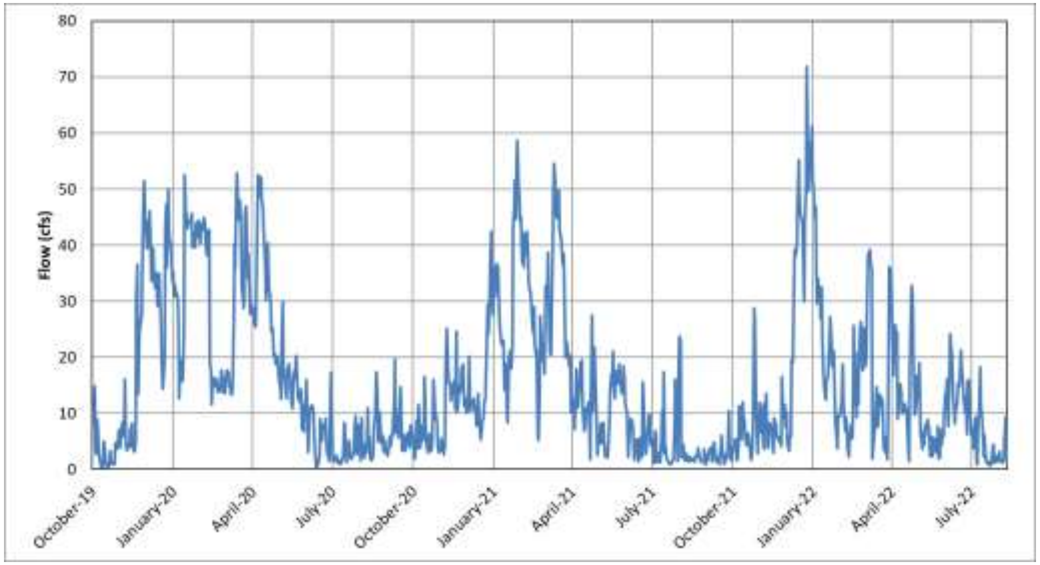

Photos credit: Chris Bland, SBCFCD

RP1 Effluent

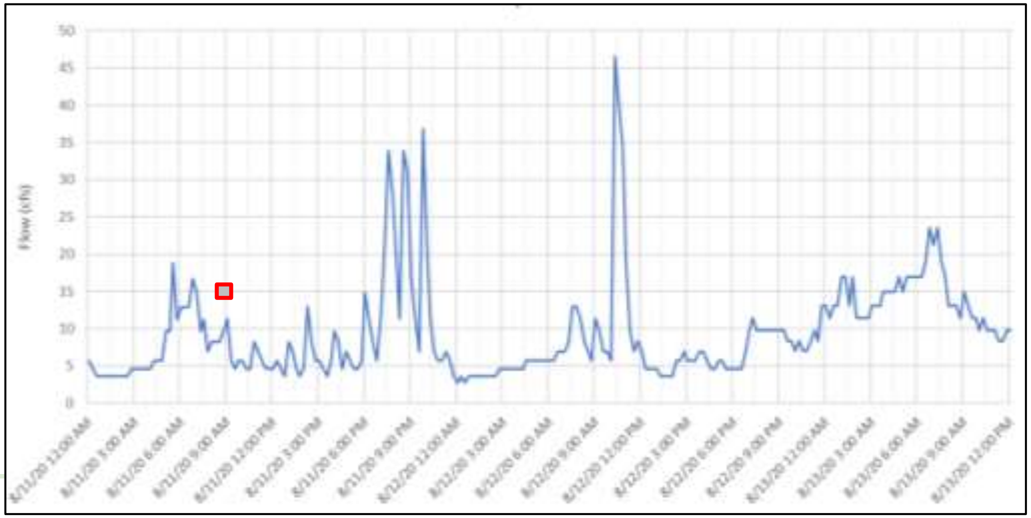
- Isolated by curb from discharge to Chino Avenue (~1 mile)
- Extreme sub-hourly temporal variability



Daily RP1 Effluent (2019-2022)

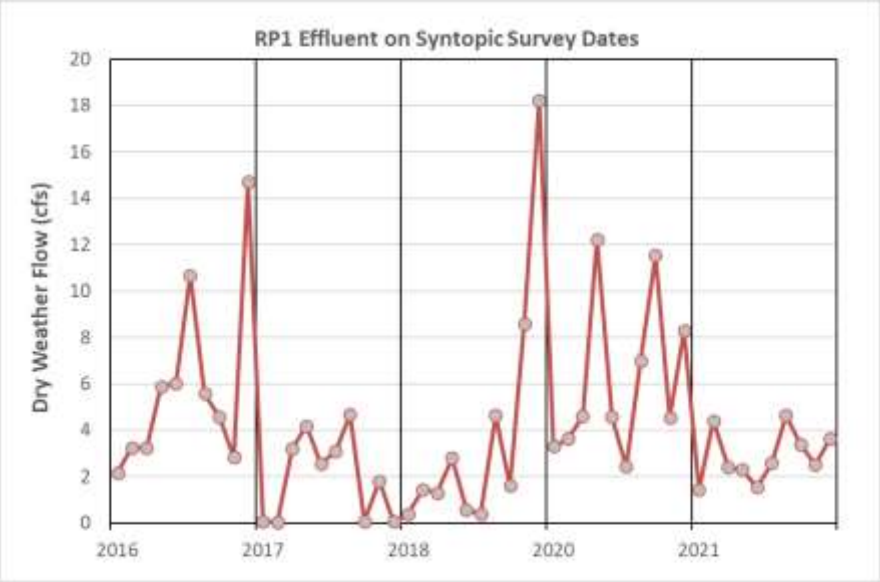


USGS Gauge Downstream of RP1 (3 days in August 2020)

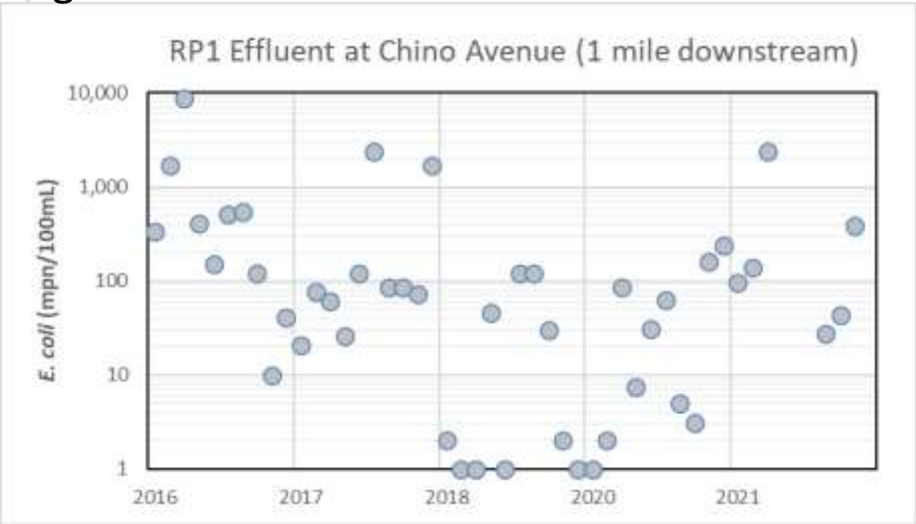


RP1 Effluent

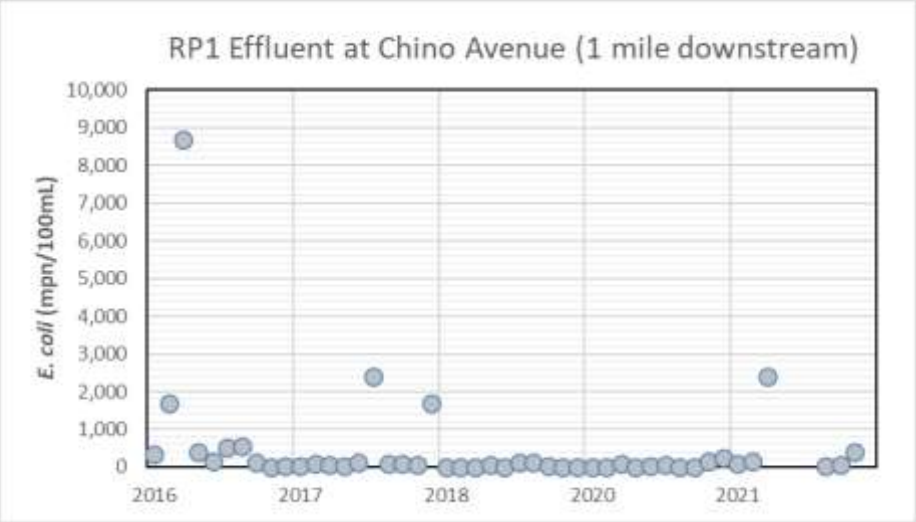
- Is there an increase in fecal bacteria from clean discharge from in-stream sources (e.g. scour from channel bottom colonies) ?



Log scale

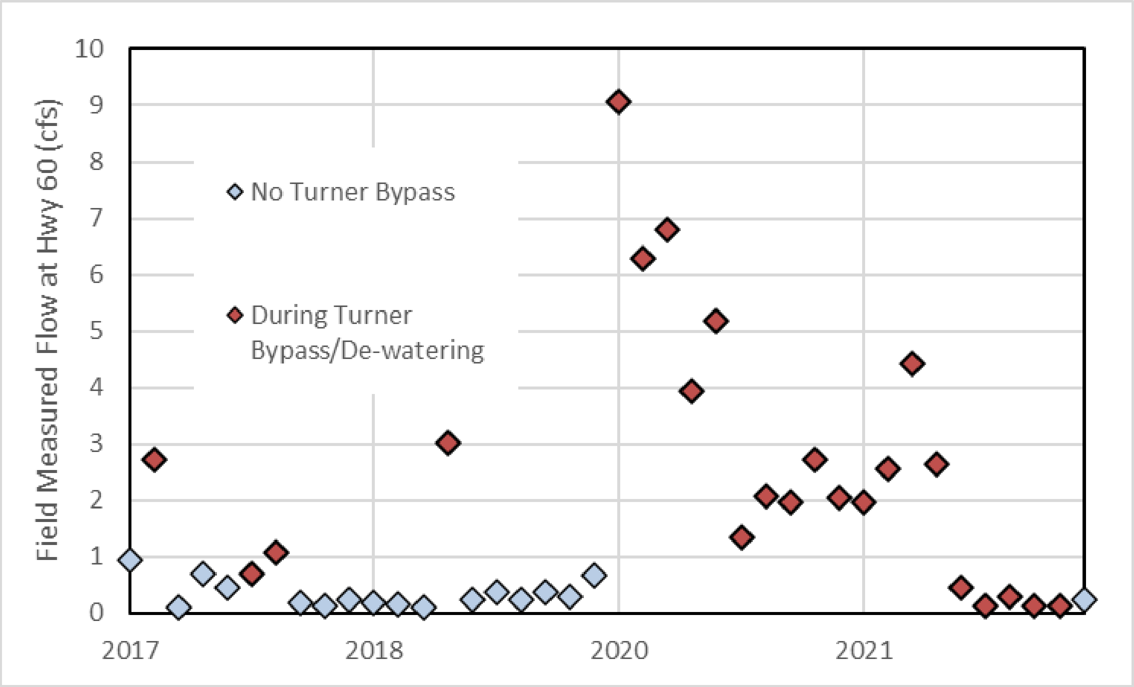


Linear scale



Turner Basins

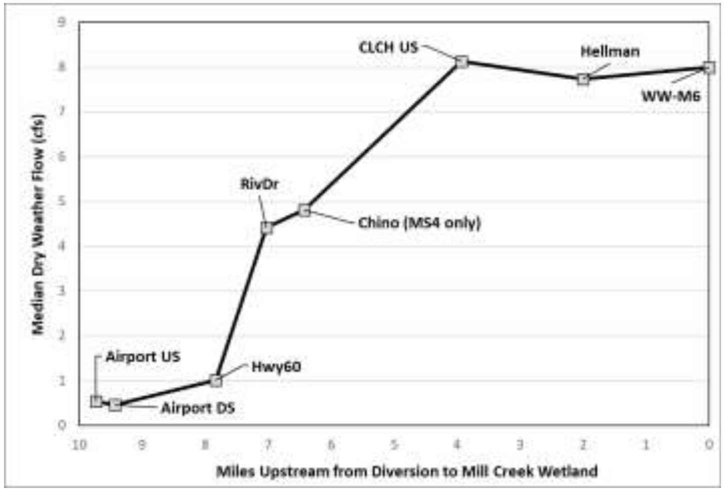
- MS4 flow in Cucamonga Creek above RP1 inflow is dependent upon operations at Turner Basin
- Average flow of 0.3 cfs when Turner Basins are online and 2.7 cfs when offline



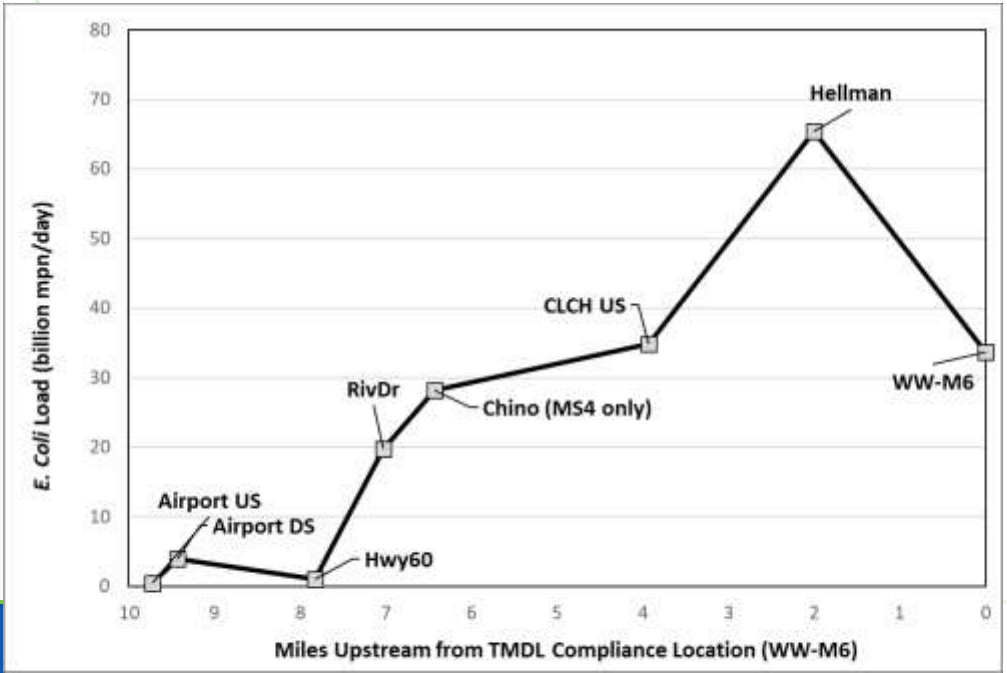
Bacteria Loads in Cucamonga Creek Mainstem

- Estimation of bacteria loads along mainstem of Cucamonga Creek based on median of flow measurements and geomean of *E. coli* concentration

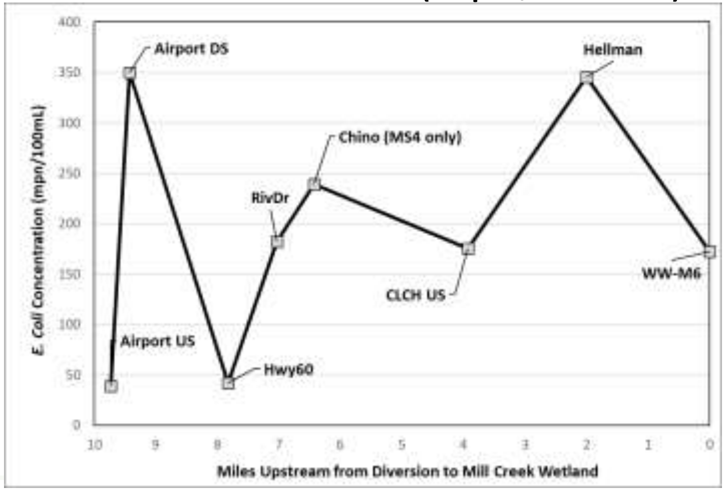
Flow (cfs)



E. Coli load (mpn/day)

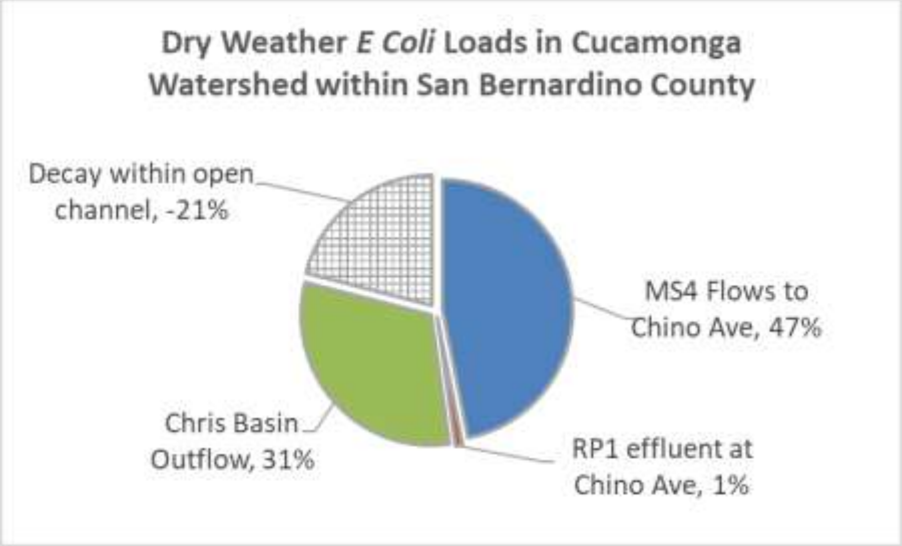


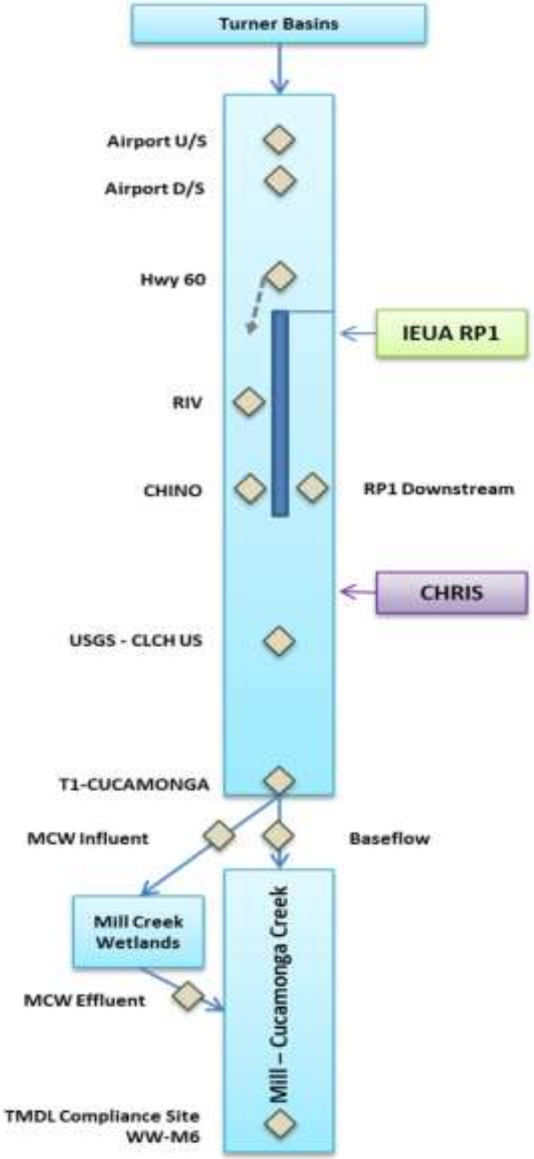
E. Coli concentration (mpn/100mL)



Bacteria Loads in San Bernardino County

- Mass Balance to estimate net in-stream growth/decay
- CHRIS + RP1 DS + CHINO +/- Instream = CLCH US
- Consider recent rehab of Chris Basin for water quality treatment

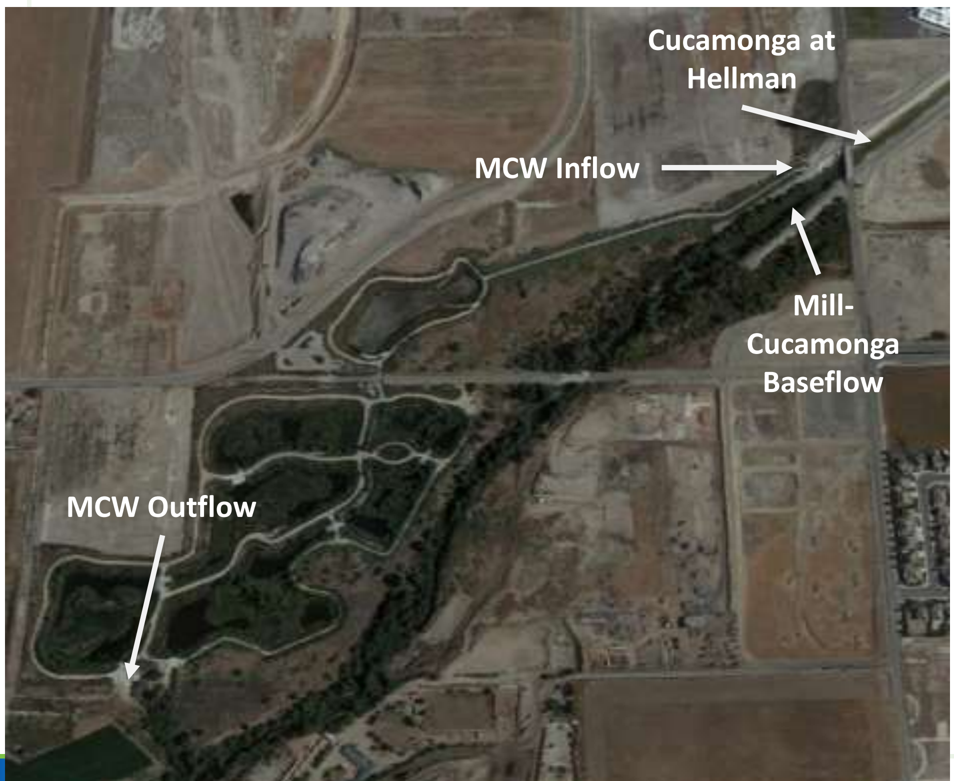


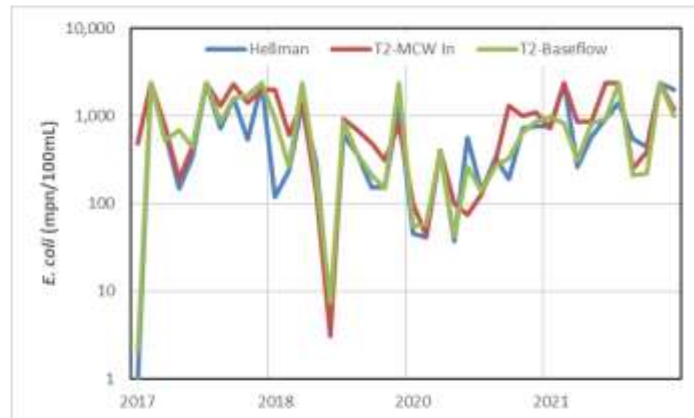


Removal in Mill Creek Wetlands

Photo credit: Chris Bland, SBCFCD

- Less than 50 percent of flow in Cucamonga Creek diverted to MCW for treatment





Mill Creek Wetlands	Dry Weather Flow (cfs)	E.coli (mpn/100 mL)	E.coli (billion mpn/day)
Inflow	3.30	463	37
Outflow	0.83	94	2
Estimated Removal	75%	80%	95%

Optimizing Removal in Mill Creek Wetlands

- Potential effective strategy to meet MSAR bacteria TMDL in Mill-Cucamonga Creek during dry weather
- Extend curb from Chino Ave to MCW diversion (~4 miles) to increase treatment of MS4 flows
- Modify diversion structure to maximize the flow going to the wetland while maintaining environmental flows in the creek (consider smart system with real time decisions based on IEUA facility operation)


Photo credit: Chris Bland, SBCFCD

Next Steps

- Incorporate data from 2022 synoptic surveys on Cucamonga Creek
- Data analysis for Chino Creek synoptic surveys
- Update SAR Reach 3 source contribution analysis
- Analyze full set of data from Pig2Bac sampling in 2022
- Begin to assemble draft Triennial Review Report