

Case 2: Post-Fire Putah Creek WQ Monitoring

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Solano County Water Agency



Location

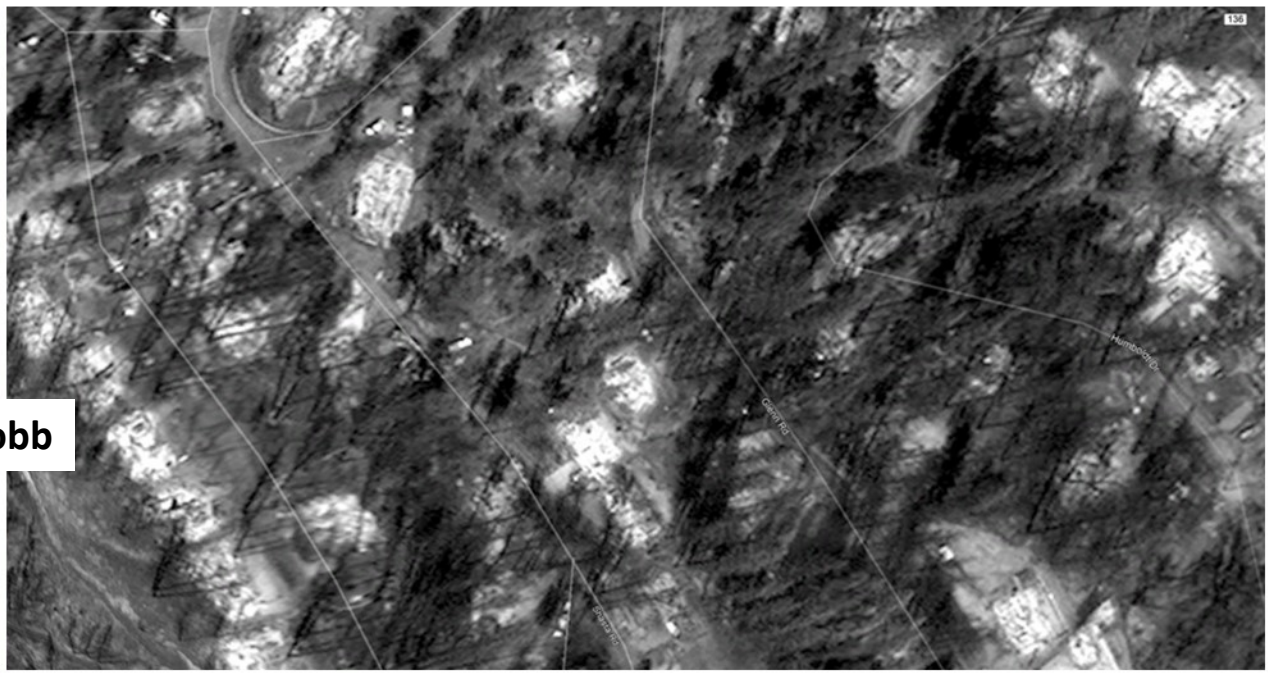




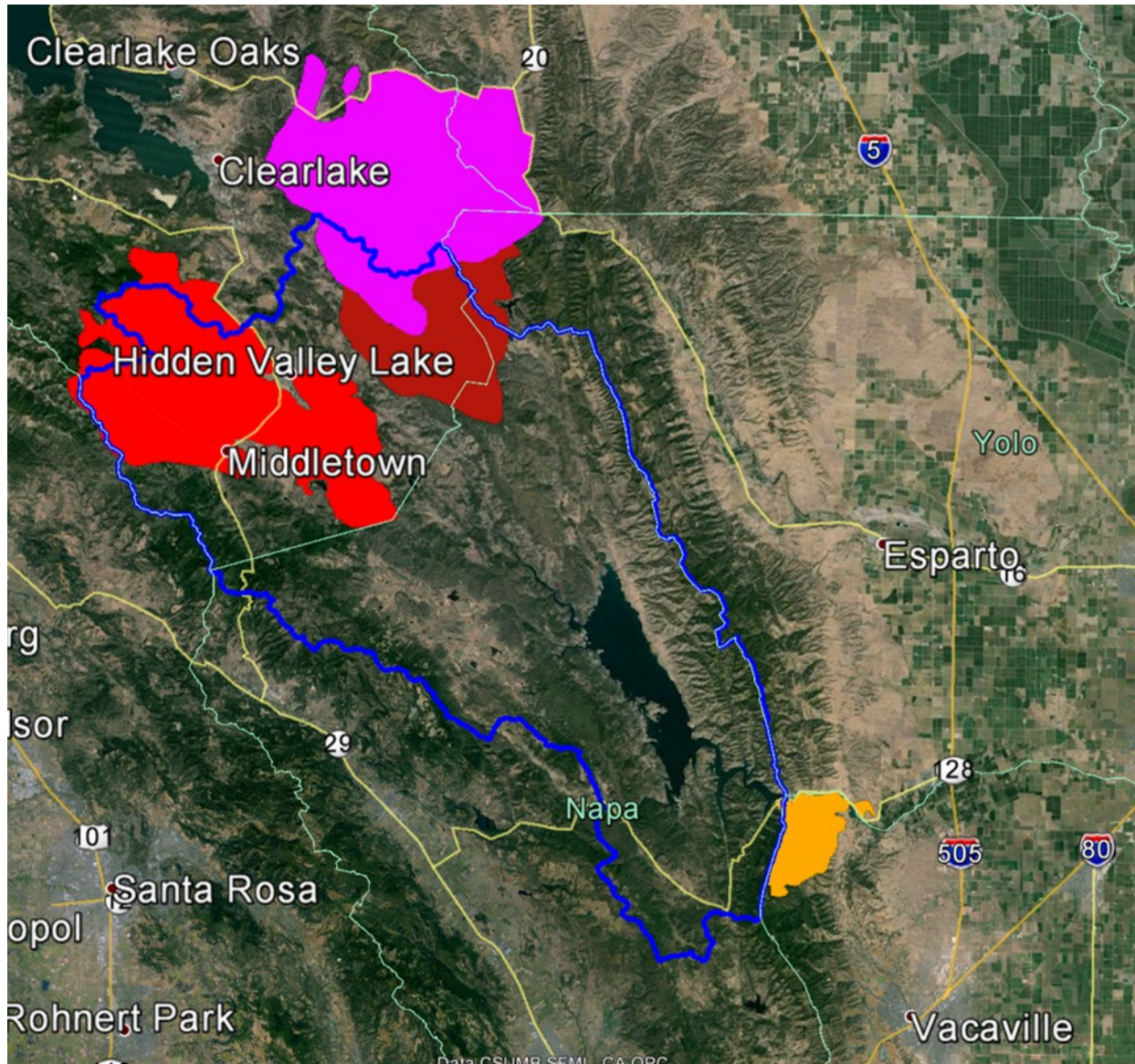
Middletown



Cobb



Wildfires in 2015

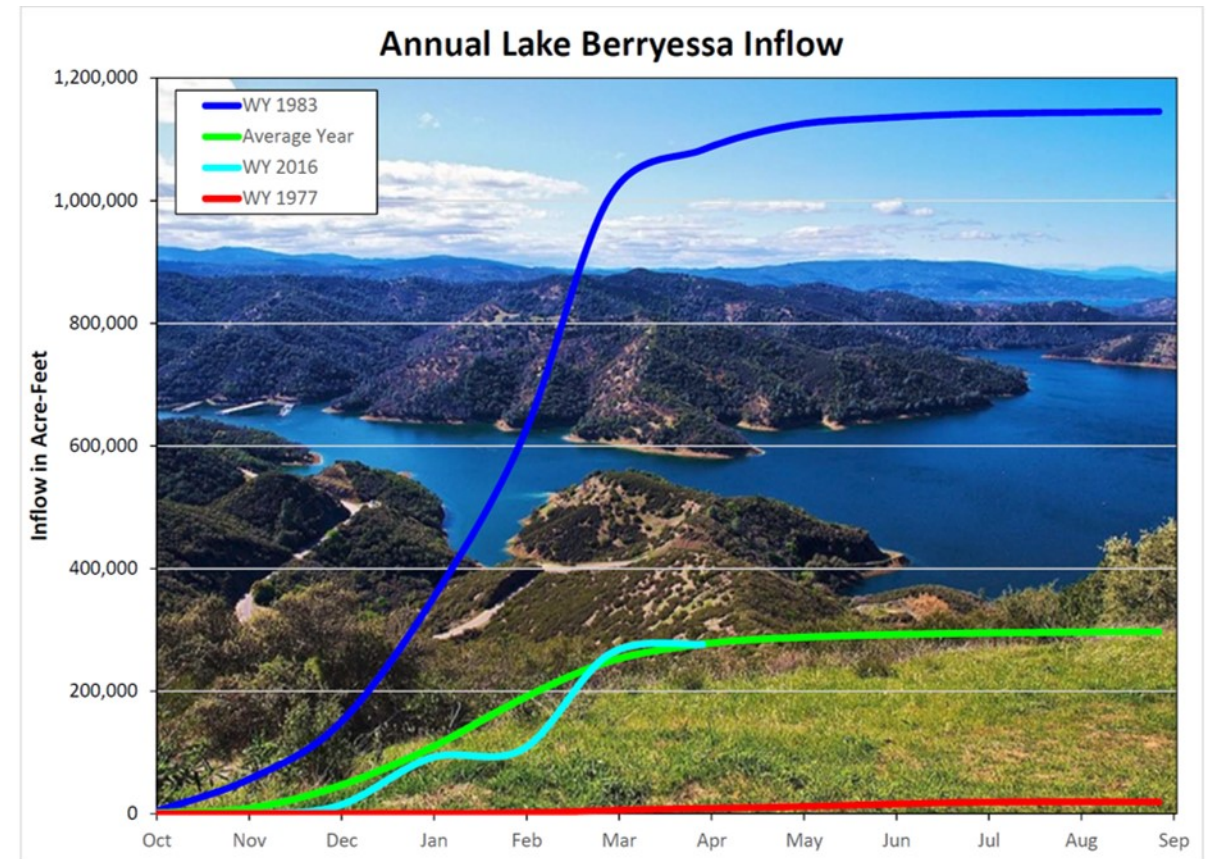


Fire	Area (acres)
Wragg Fire (Solano)	8,000
Rocky Fire (Lake)	70,000
Jerusalem Fire (Lake)	25,000
Valley Fire (Napa-Lake) - 1,955 Structures - 1,281 Homes - 4 th Most-Destructive Fire	76,000

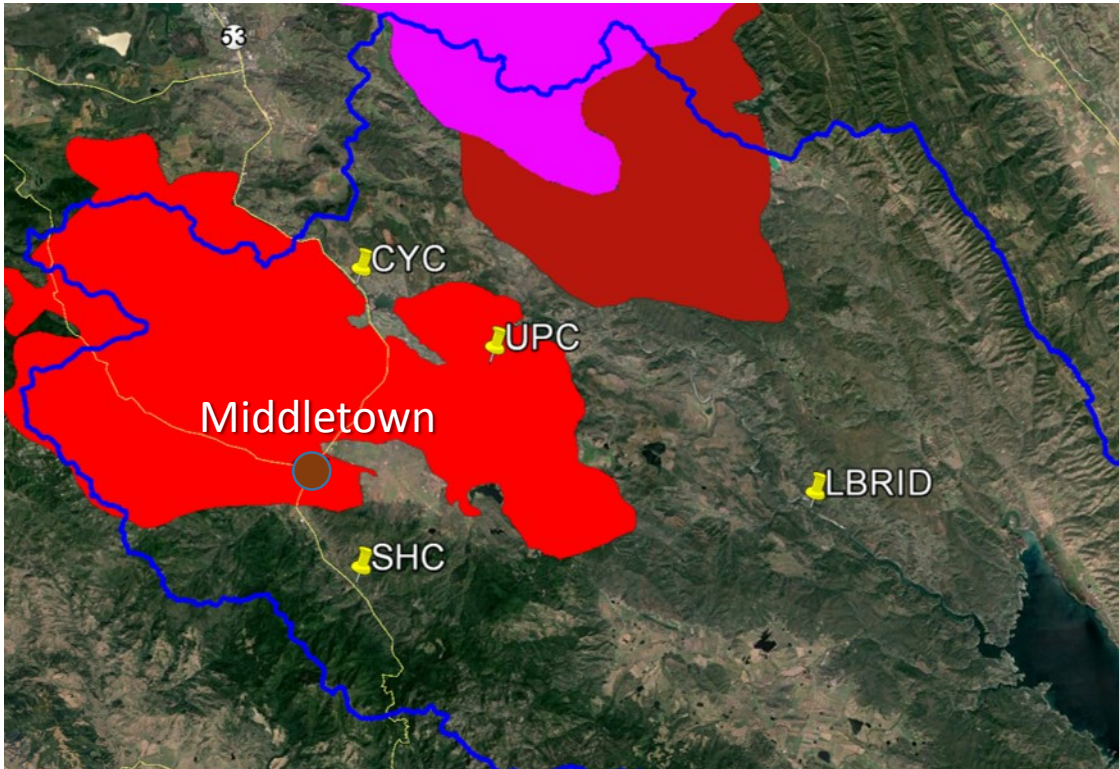
Total = 180,000 acres (333 mi²)
(10 x Lake Berryessa)

Post-Fire WQ Monitoring

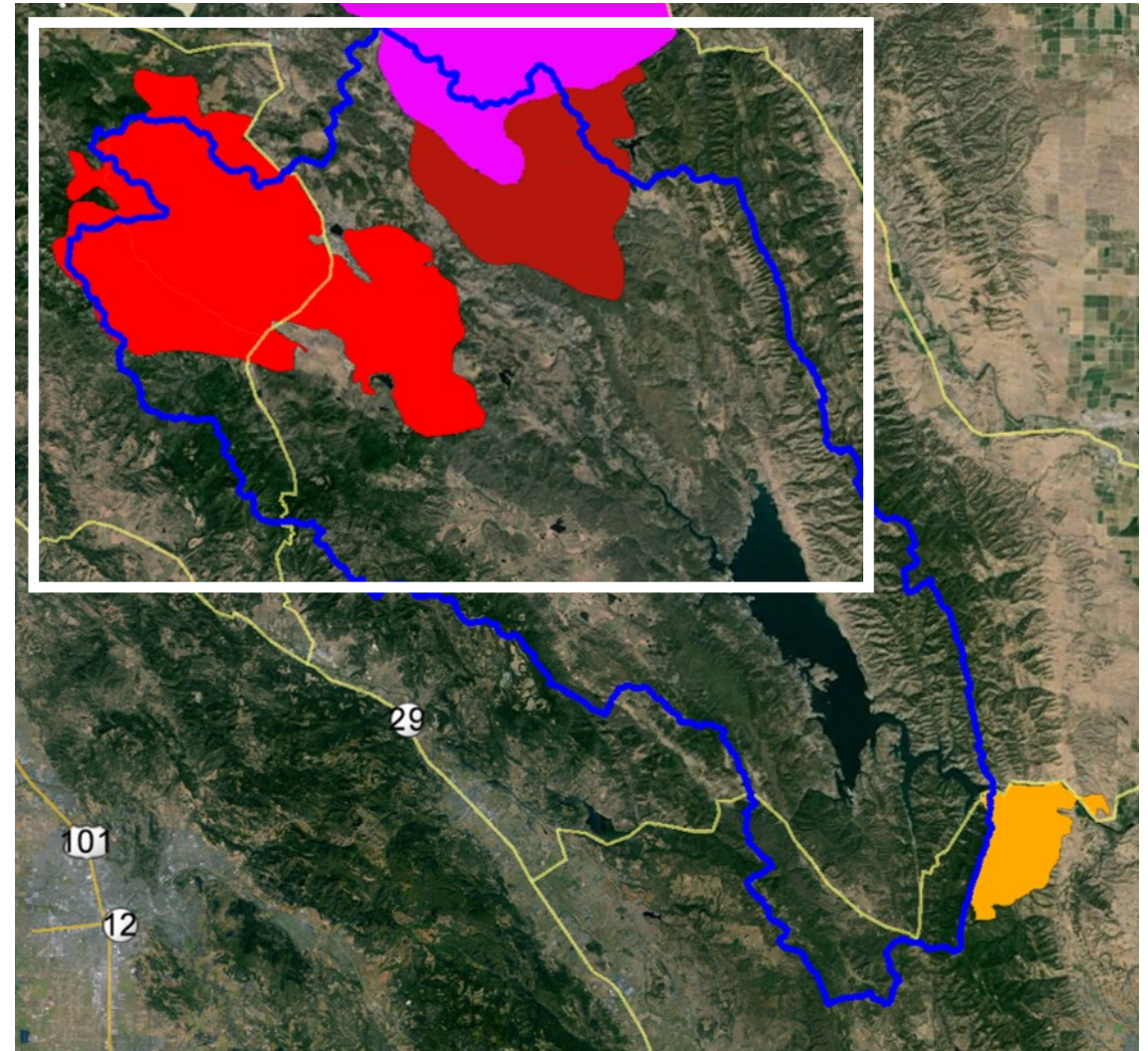
- Water Quality concerns to Lake, Napa, and Solano Counties
- Lake Berryessa provides huge dilution but...“Godzilla El Nino”
- Partnered with Hidden Valley Lake CSD & Napa County for WQ monitoring



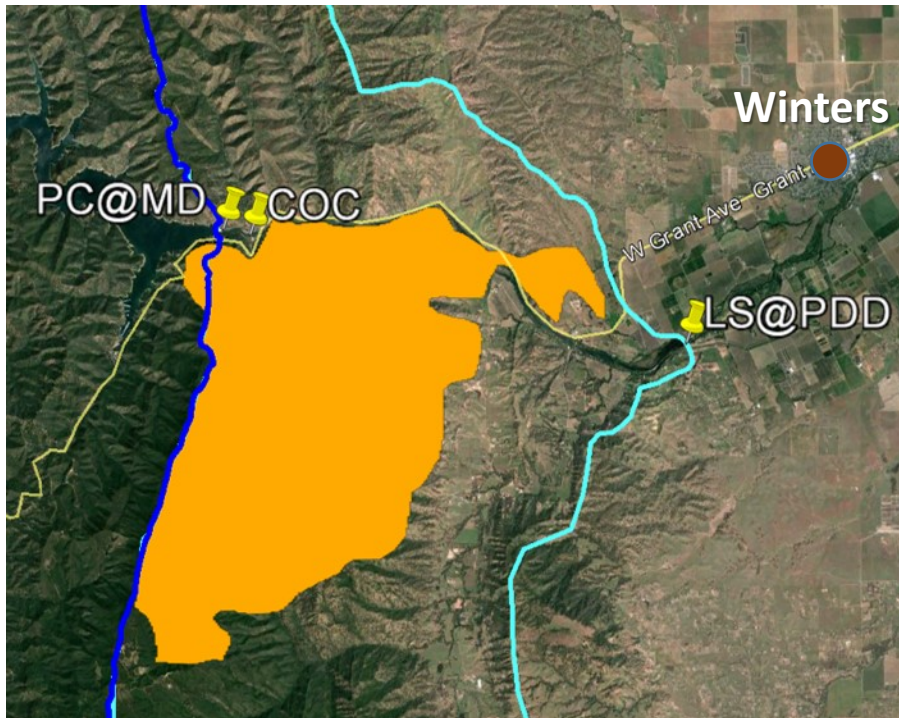
Sample Locations



Name	Description
SHC	St Helena Ck (Control)
CYC	Coyote Ck (Partial, Small Trib)
UPC	Putah Ck (Upper, Sig Burn Impact)
LBRID	Putah Ck (Middle, U/S L. Berryessa)

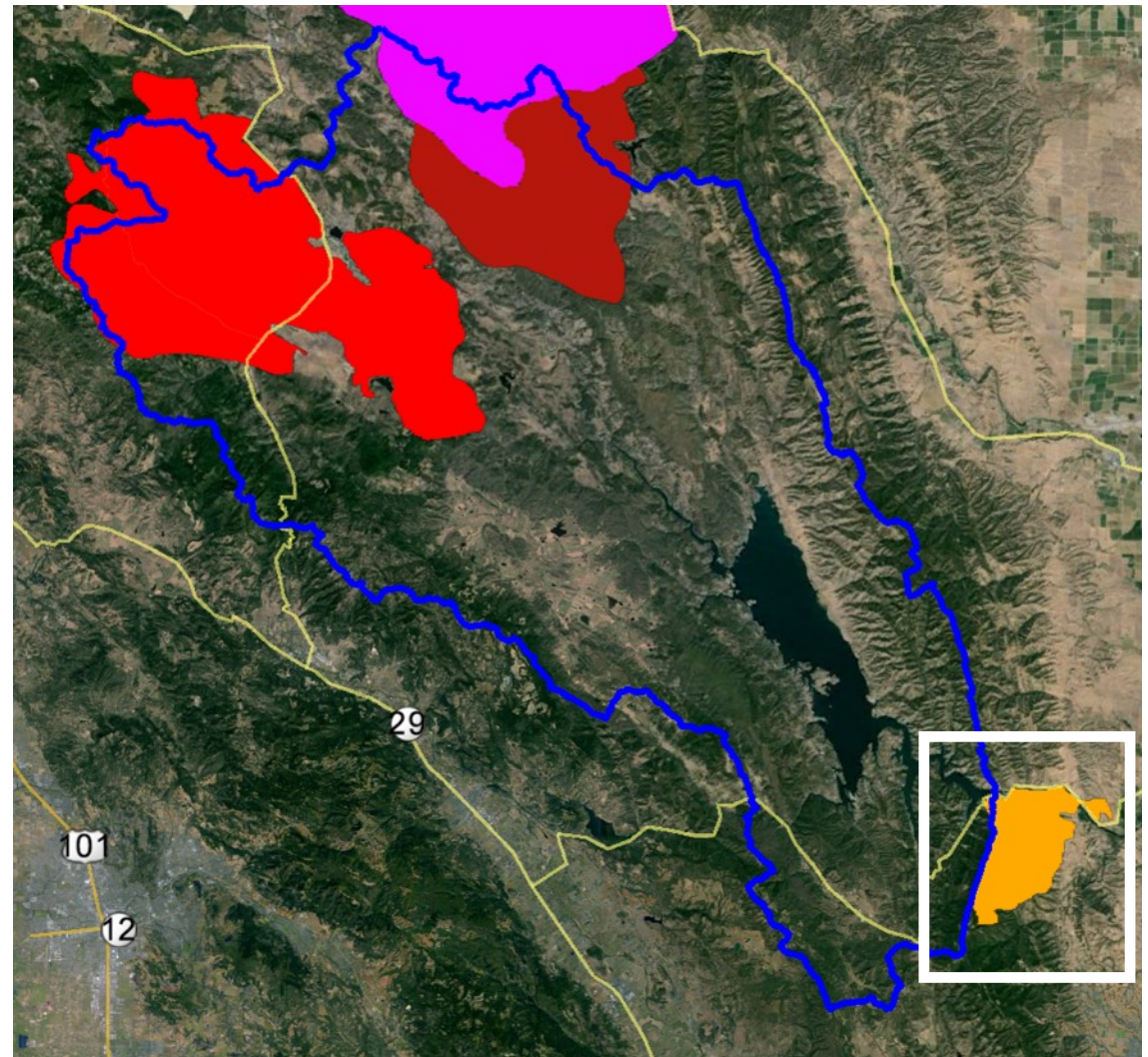


Sample Locations



Name	Description
PC@MD	Putah Ck (Lower D/S L. Berryessa)
COC	Cold Canyon Ck (U/S of Putah Ck)
LS@PDD	Lake Solano @ Div Dam (Intake)

**Most significant post-fire WQ impacts*



Constituents

Tier III (Interdam Reach only)

Trihalomethane Formation Potential (TTHMFP)

Tier II (All except Coyote Ck)

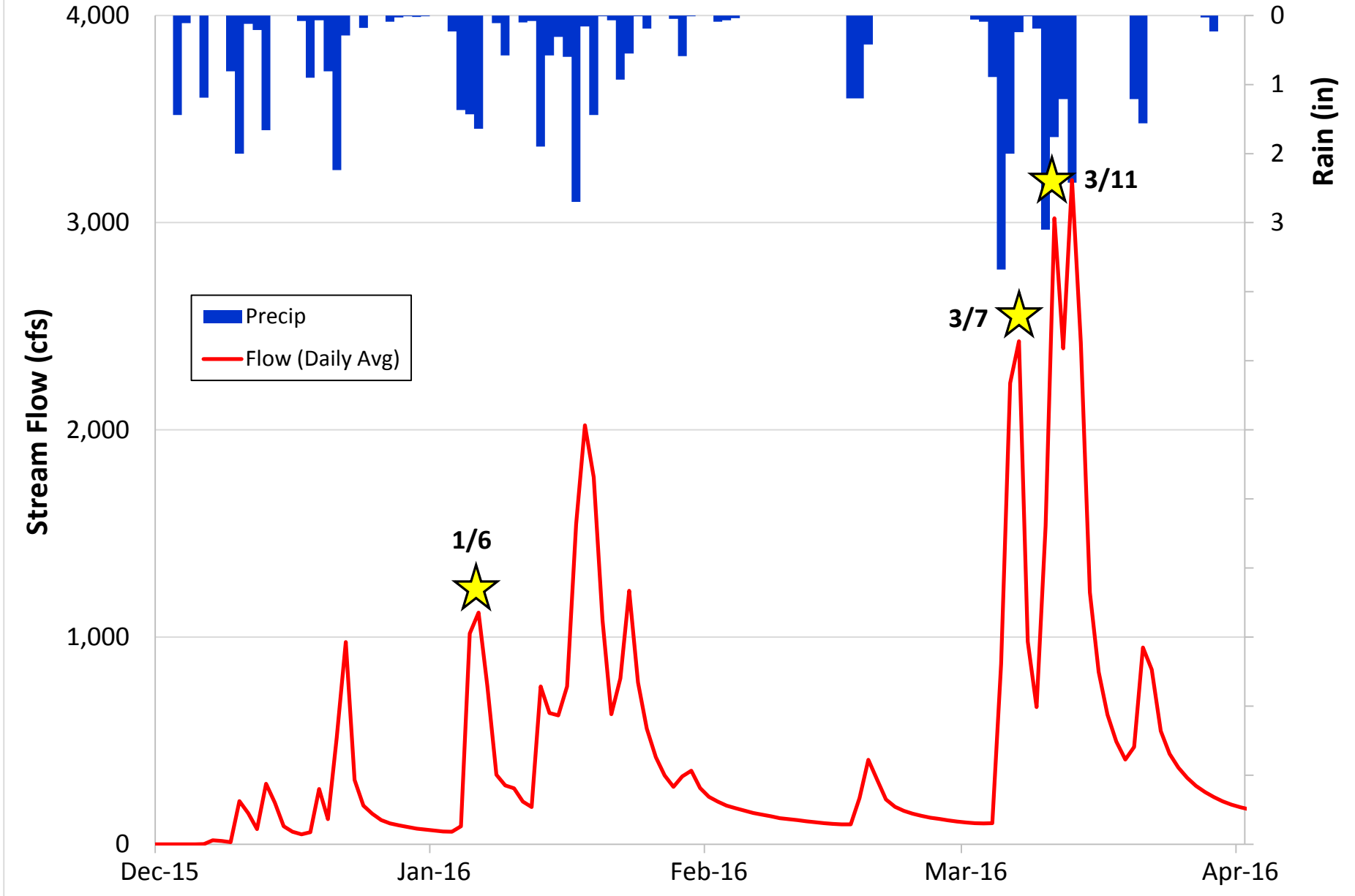
Polycyclic Aromatic Hydrocarbons (PAHs)

Tier I (All Samples)

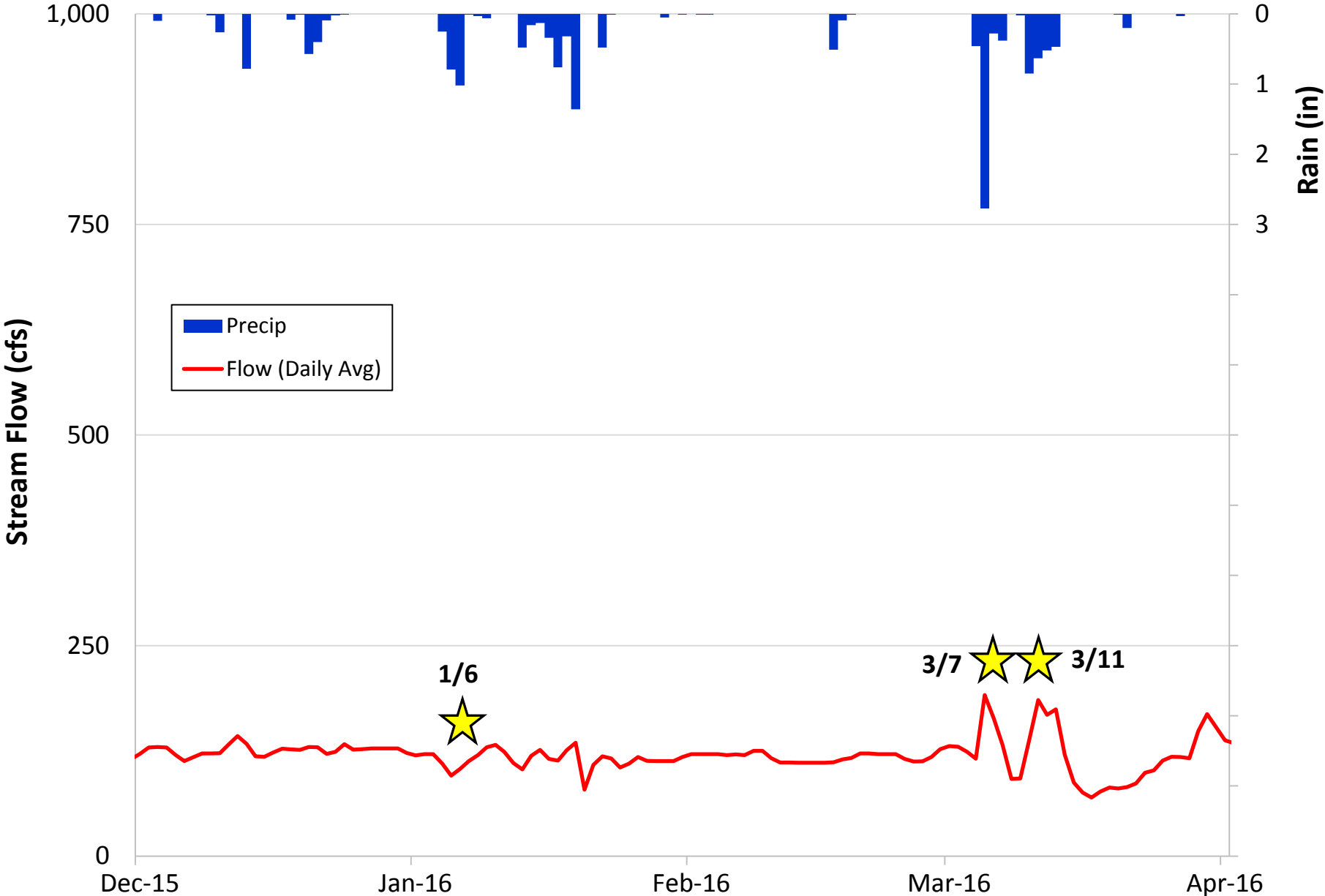
Title 22 (Mineral, Physical, Inorganics) + TOC/DOC + Nutrients



Upper Putah Creek - Rain & Runoff



Lower Putah Creek - Rain & Runoff



Results

What did we see?

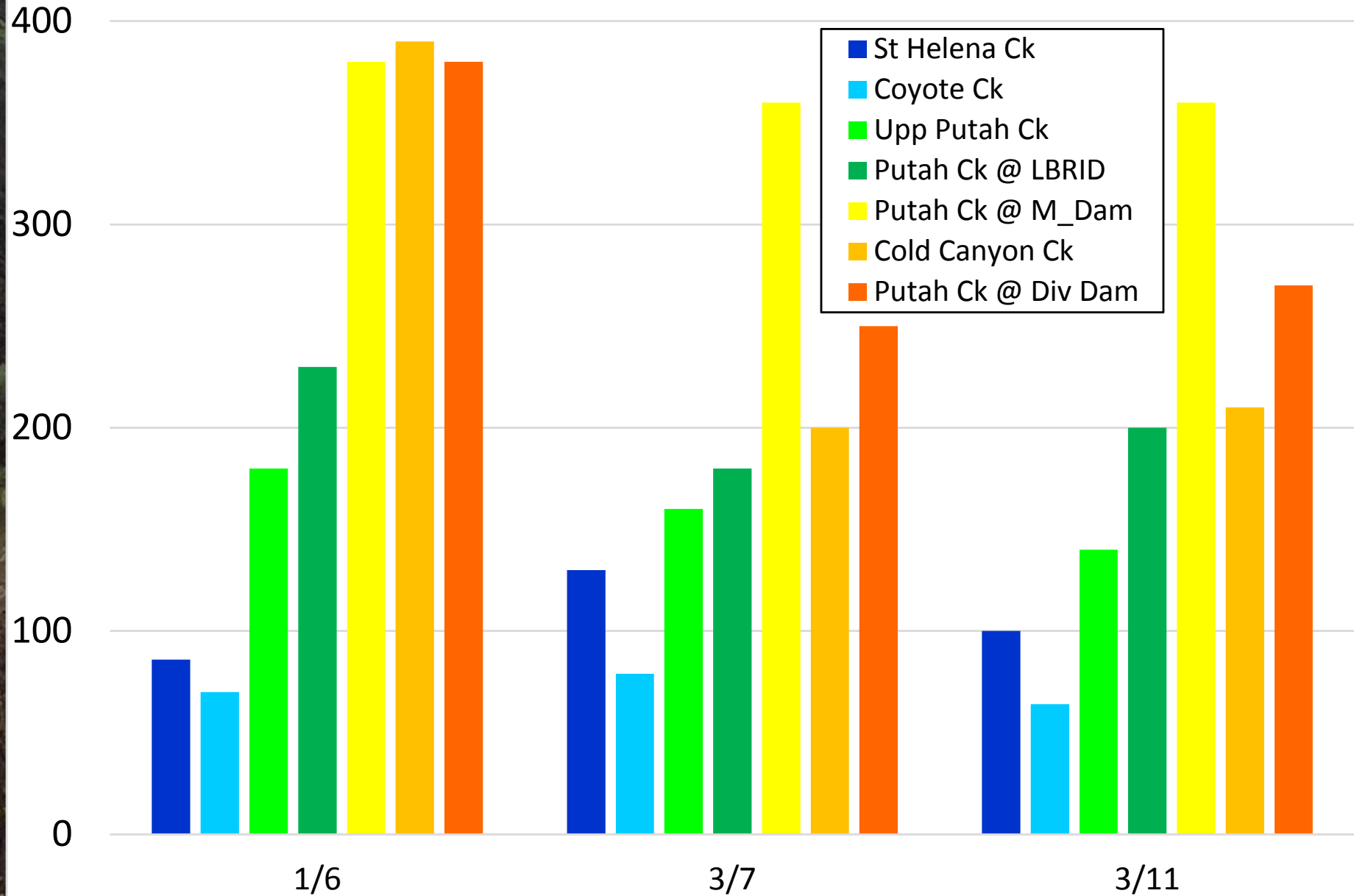
- Cold Canyon Creek (Interdam Reach) had the worst WQ
- No significant WQ degradation in Upper Putah Creek
- Upper Putah Creek has excellent WQ!
- Godzilla El Nino → Average Water Year for Putah Creek



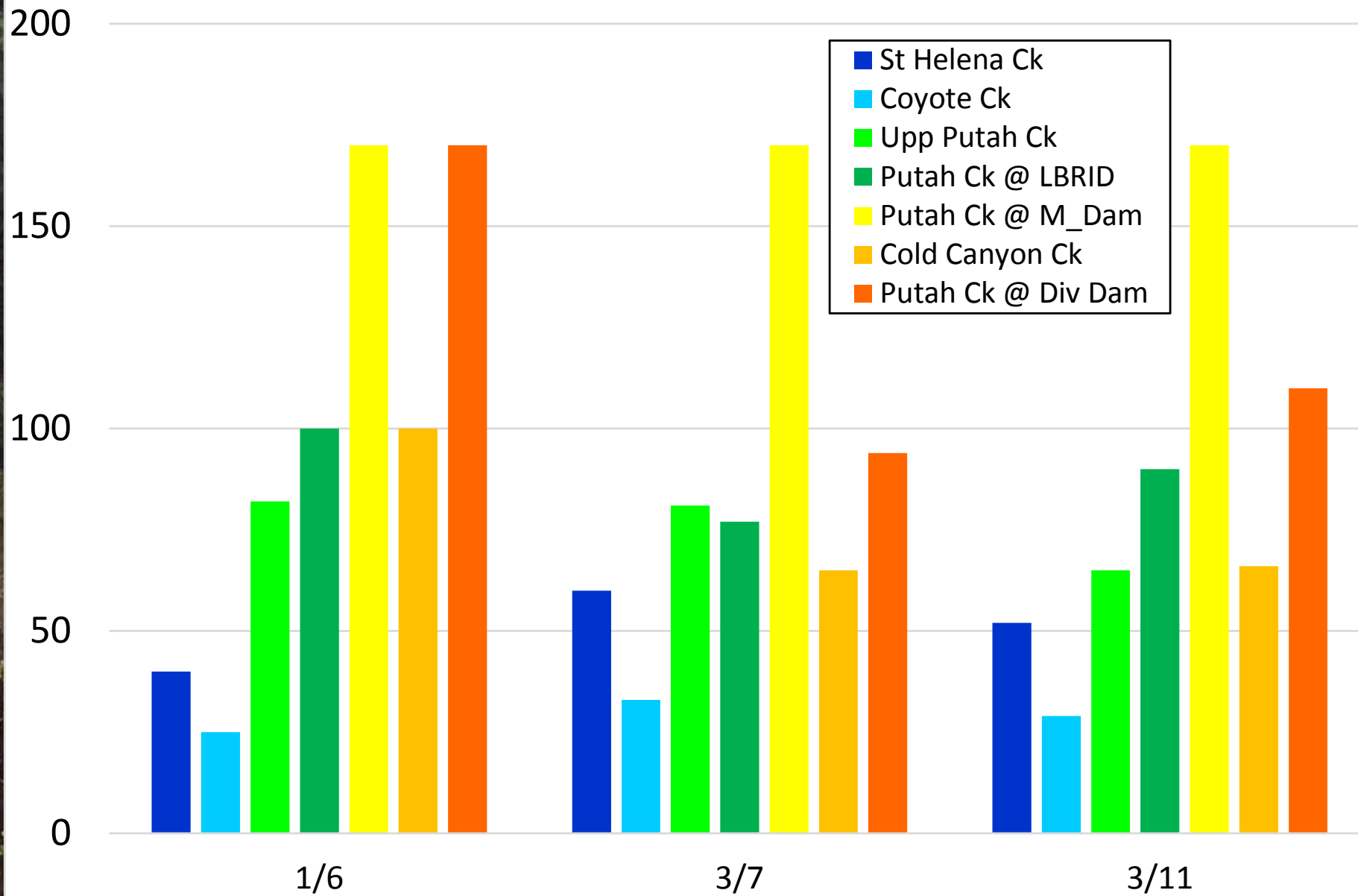
Physical Properties



Specific Conductance (uS/cm)



Alkalinity (mg/L)

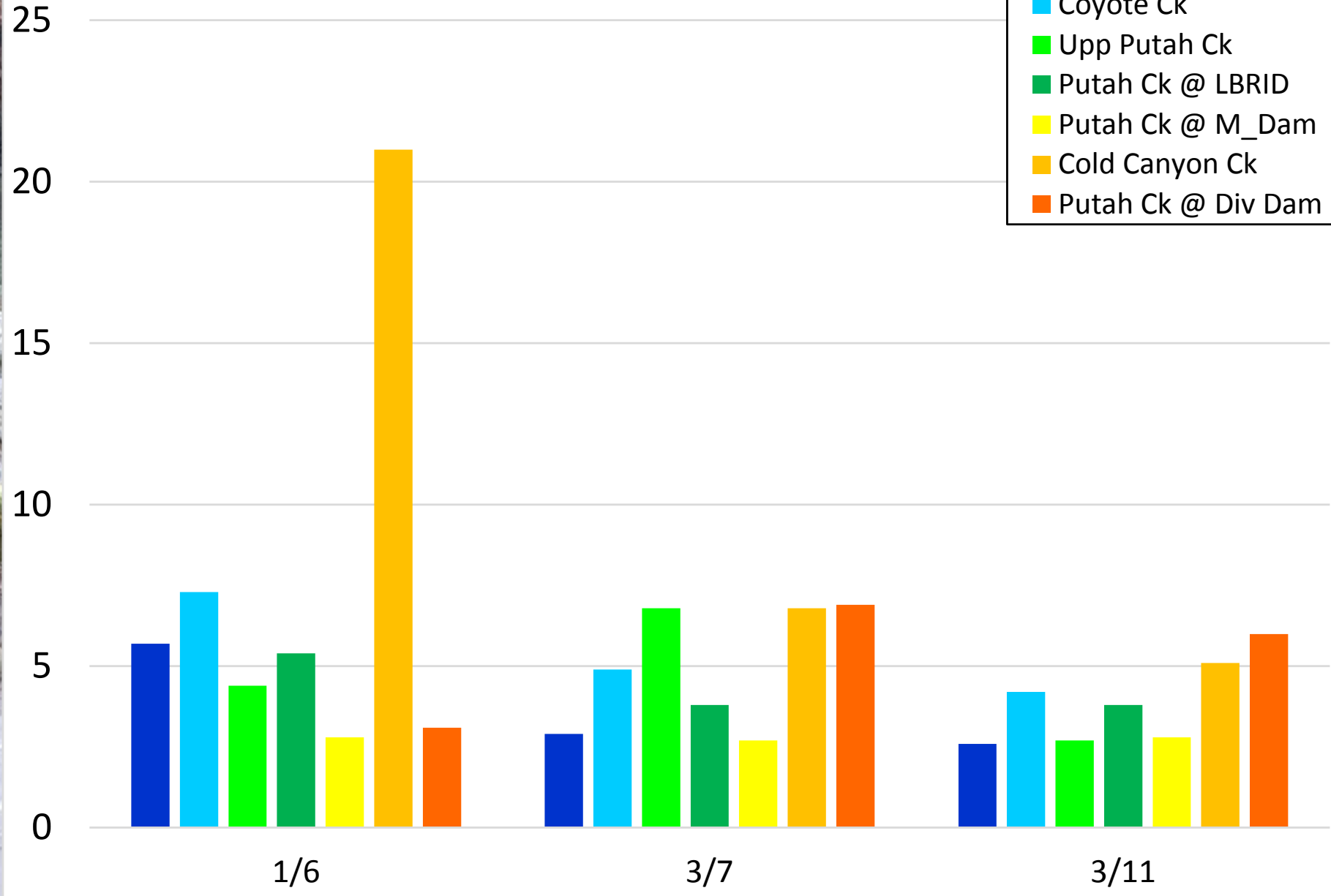


Organics



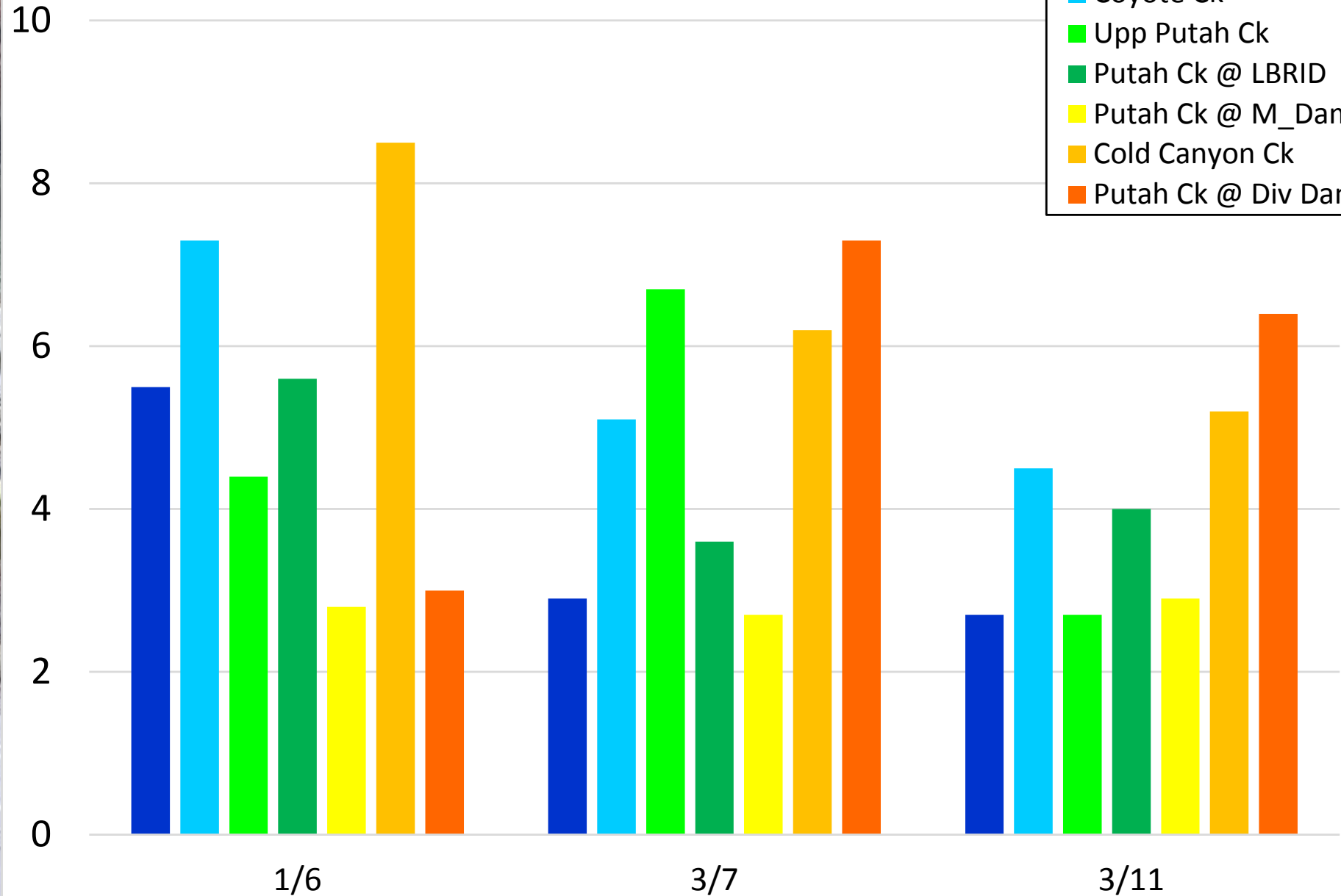
Total Organic Carbon (mg/L)

- St Helena Ck
- Coyote Ck
- Upp Putah Ck
- Putah Ck @ LBRID
- Putah Ck @ M_Dam
- Cold Canyon Ck
- Putah Ck @ Div Dam



Dissolved Organic Carbon (mg/L)

- St Helena Ck
- Coyote Ck
- Upp Putah Ck
- Putah Ck @ LBRID
- Putah Ck @ M_Dam
- Cold Canyon Ck
- Putah Ck @ Div Dam



TTHMFP (ug/L)

- Putah Ck @ M_Dam
- Cold Canyon Ck
- Putah Ck @ Div Dam

1000

800

600

400

200

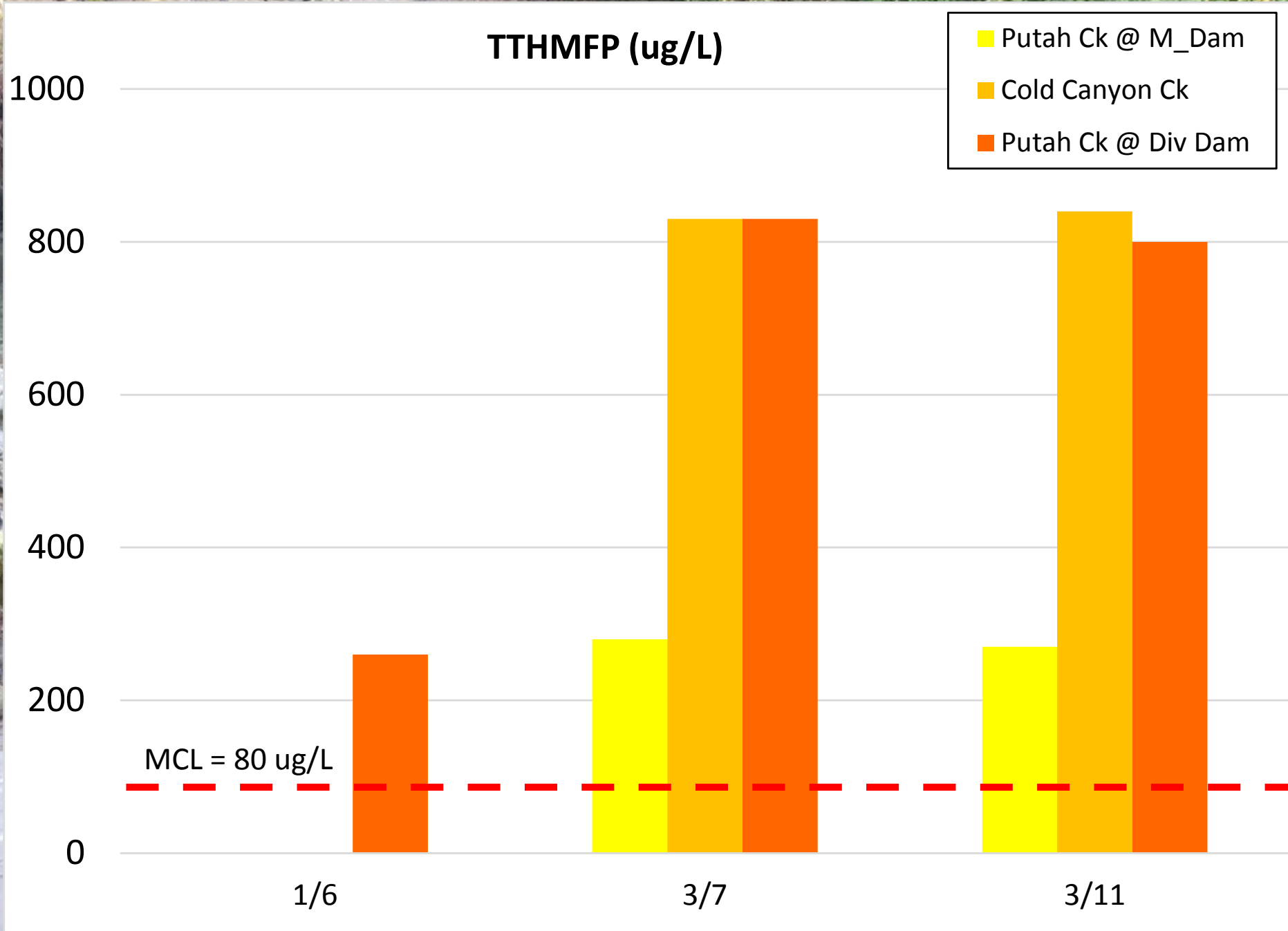
0

MCL = 80 ug/L

1/6

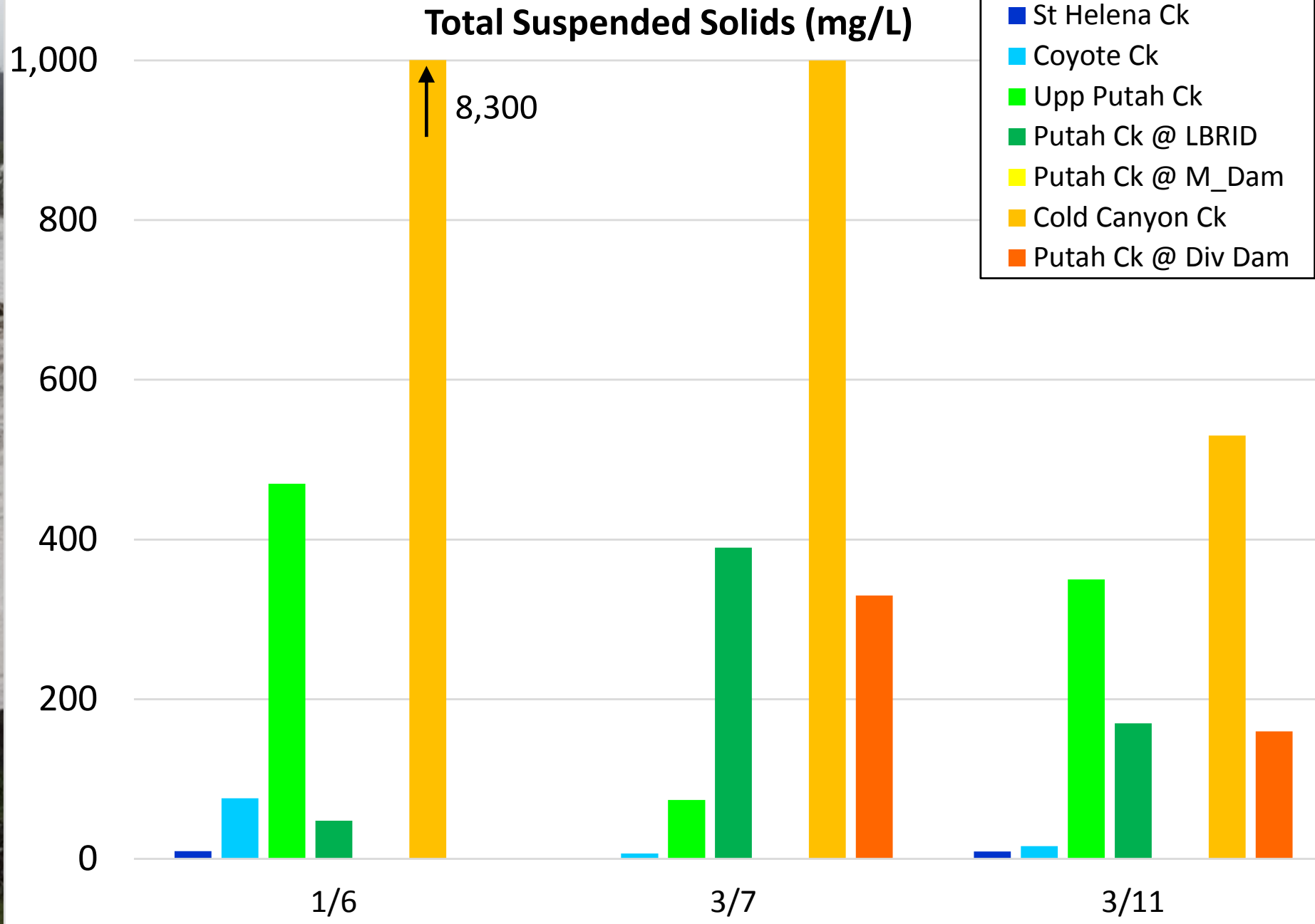
3/7

3/11



Sediment





Total Dissolved Solids (mg/L)

- St Helena Ck
- Coyote Ck
- Upp Putah Ck
- Putah Ck @ LBRID
- Putah Ck @ M_Dam
- Cold Canyon Ck
- Putah Ck @ Div Dam

1,000
800
600
400
200
0

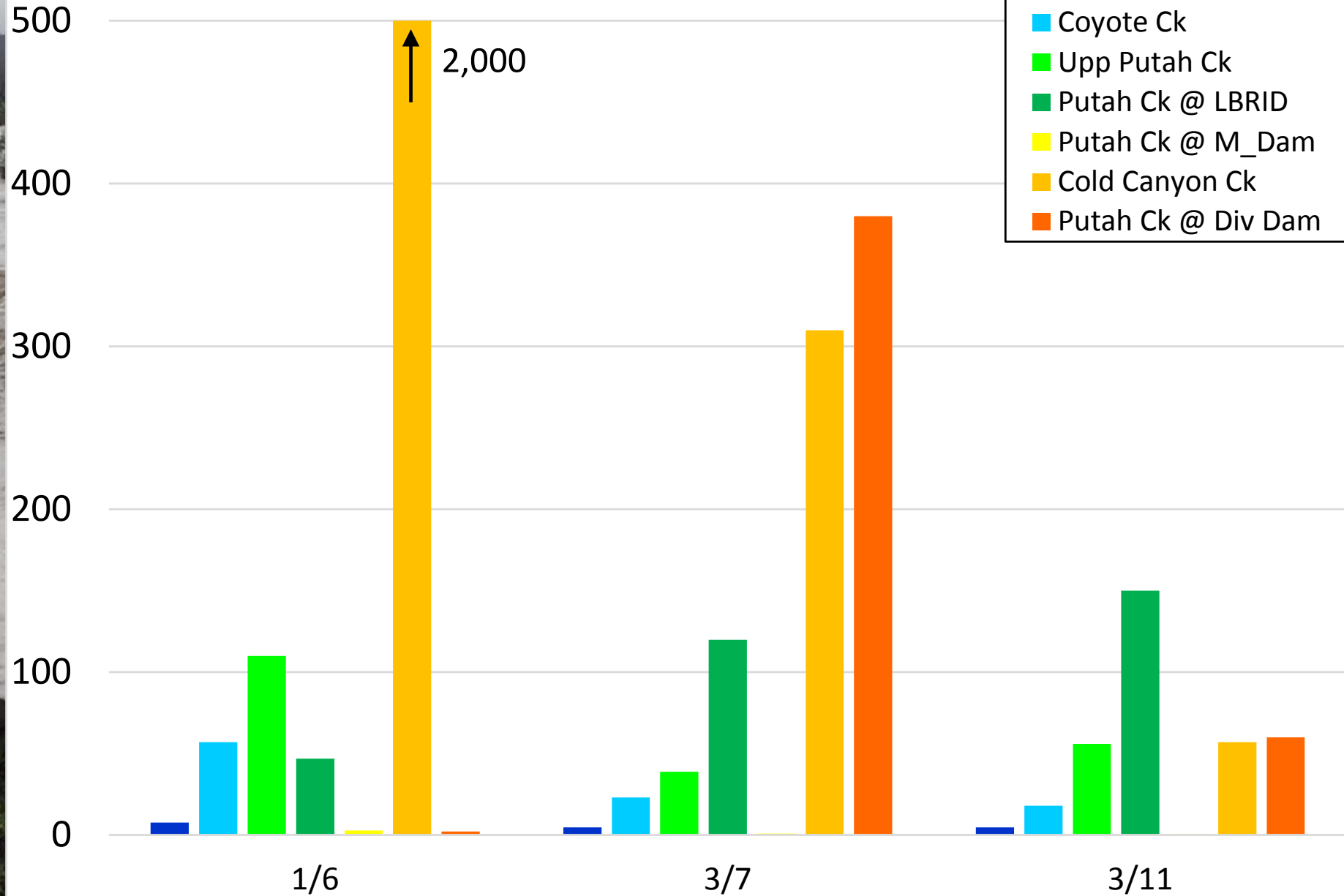
1/6

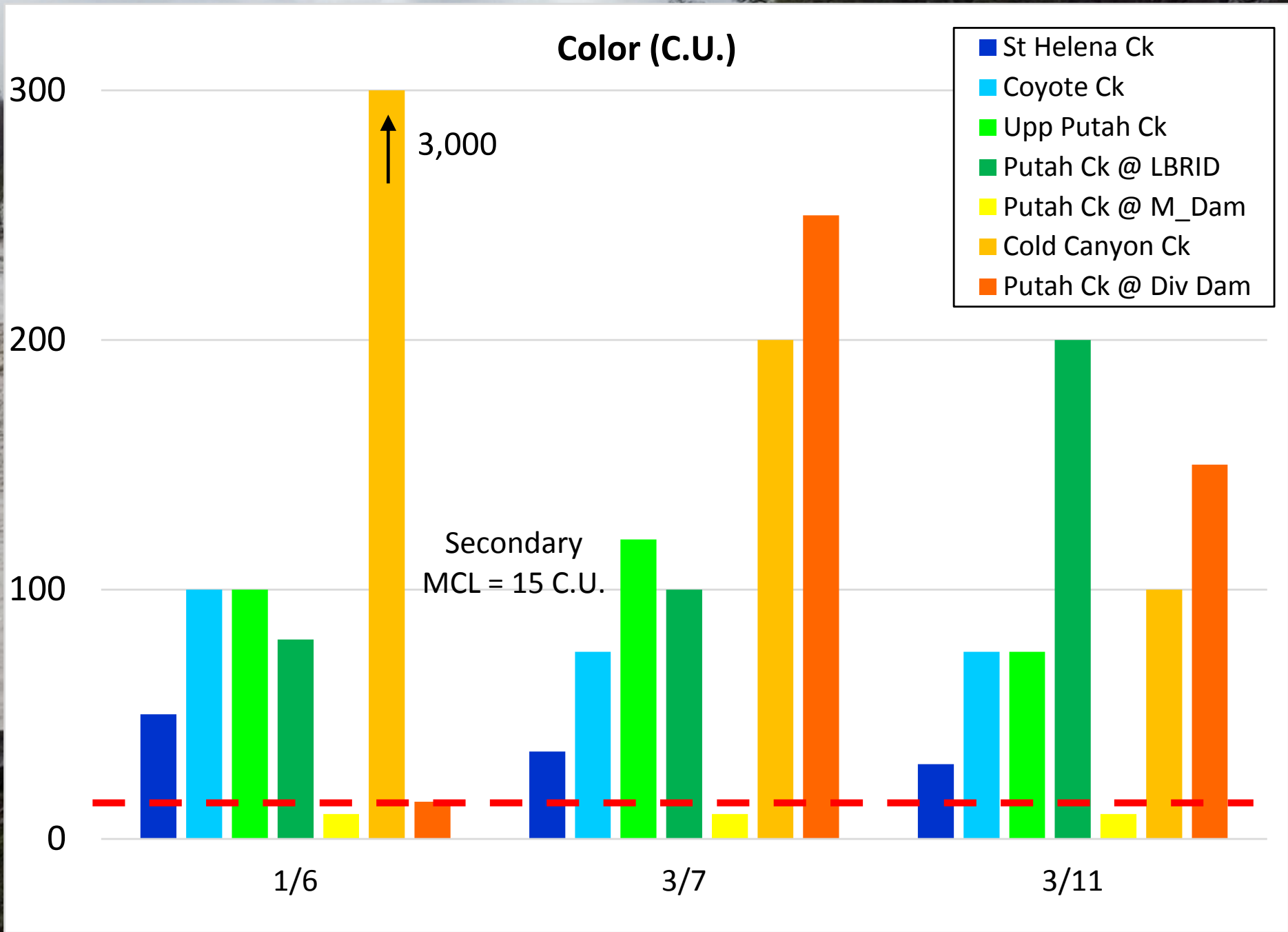
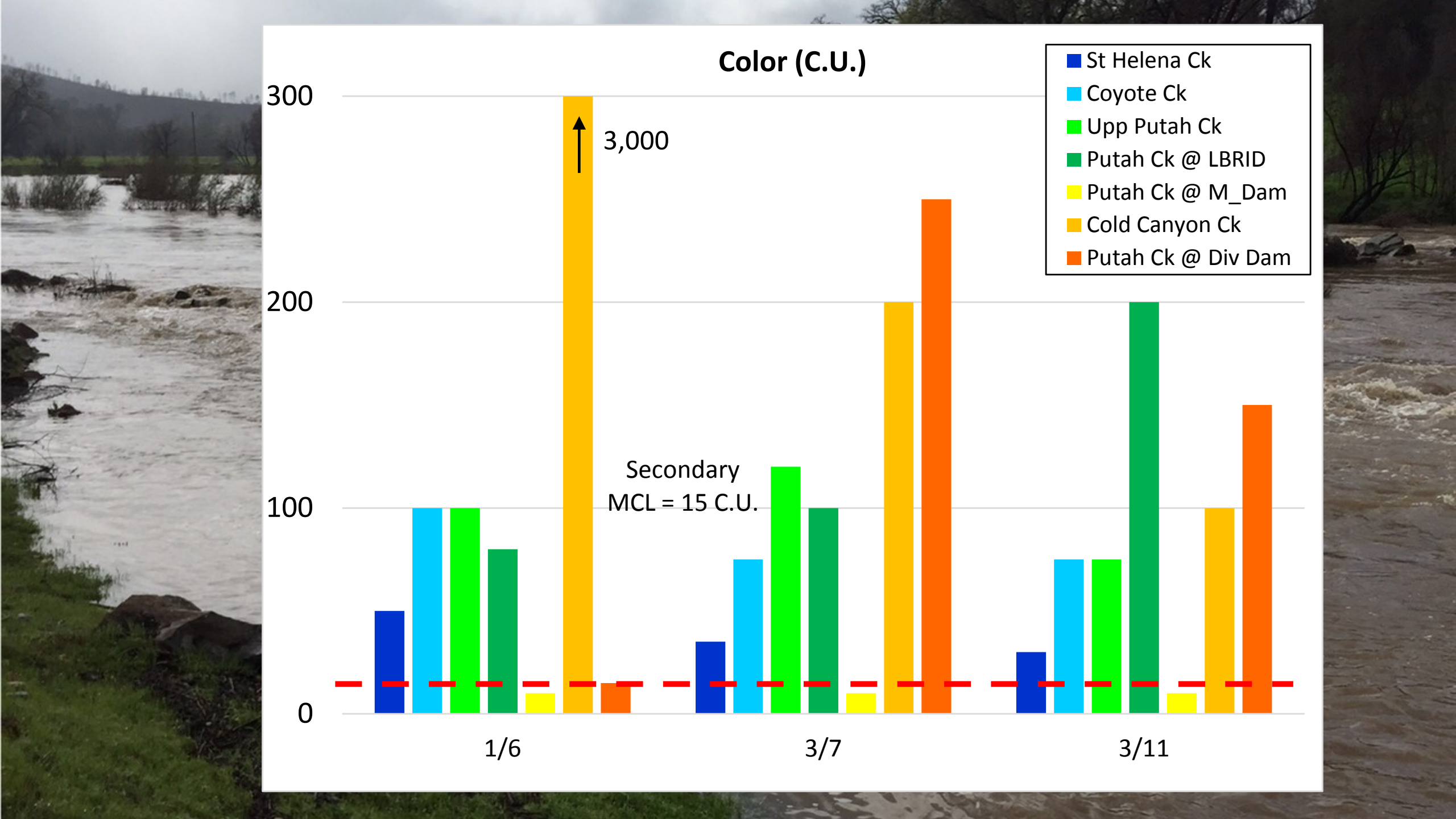
3/7

3/11



Turbidity (NTU)



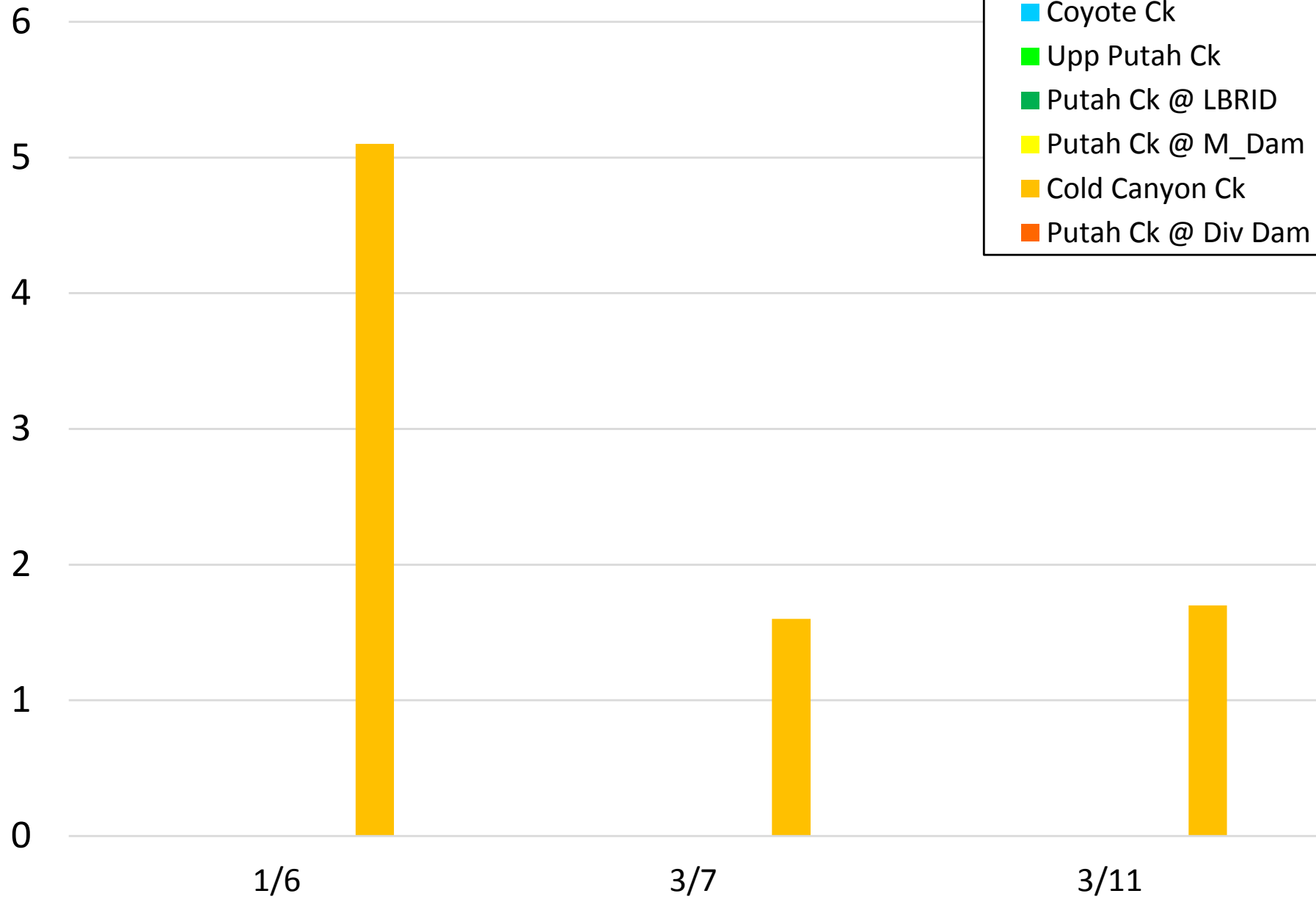


Nutrients



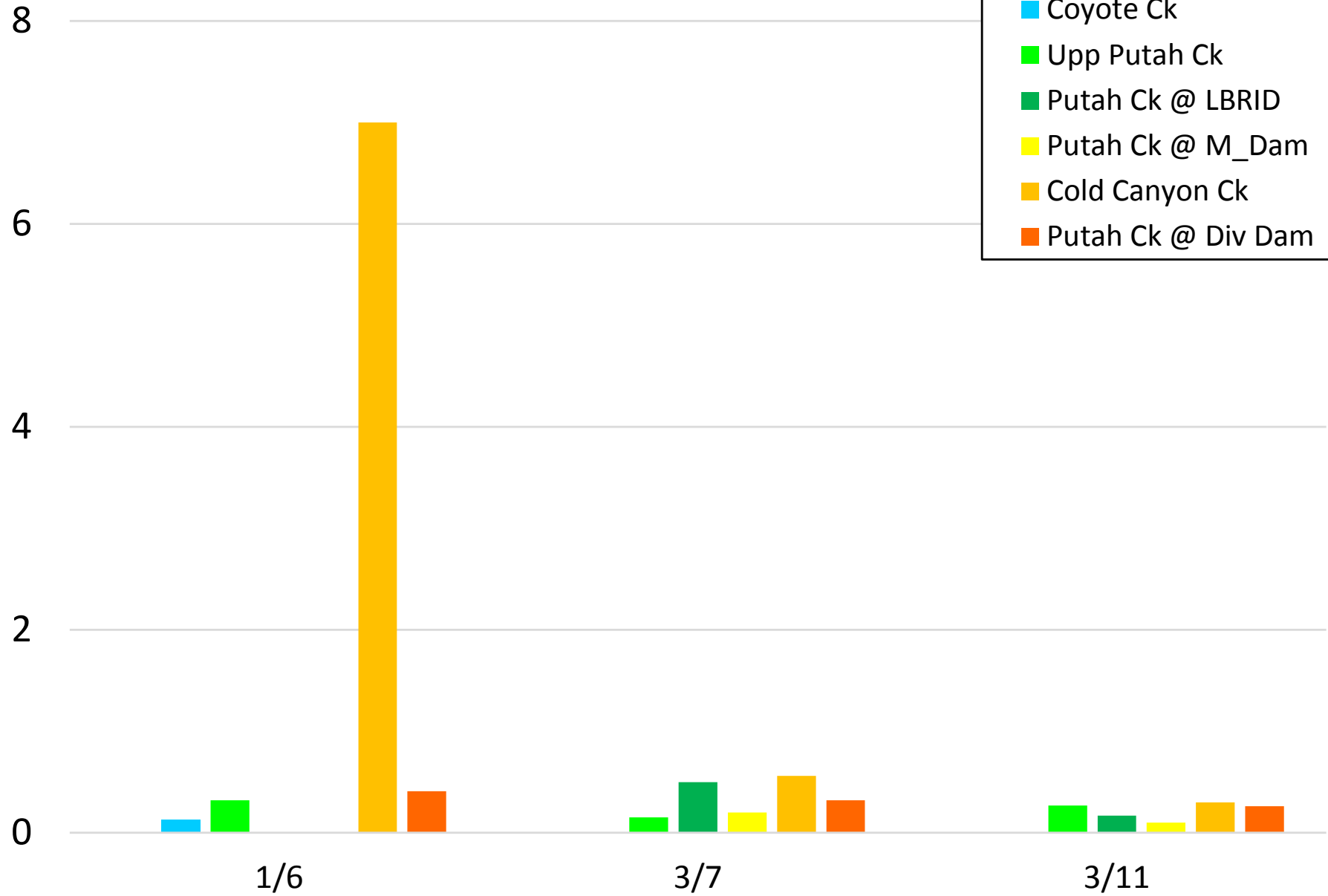
Total Nitrogen (mg/L)

- St Helena Ck
- Coyote Ck
- Upp Putah Ck
- Putah Ck @ LBRID
- Putah Ck @ M_Dam
- Cold Canyon Ck
- Putah Ck @ Div Dam

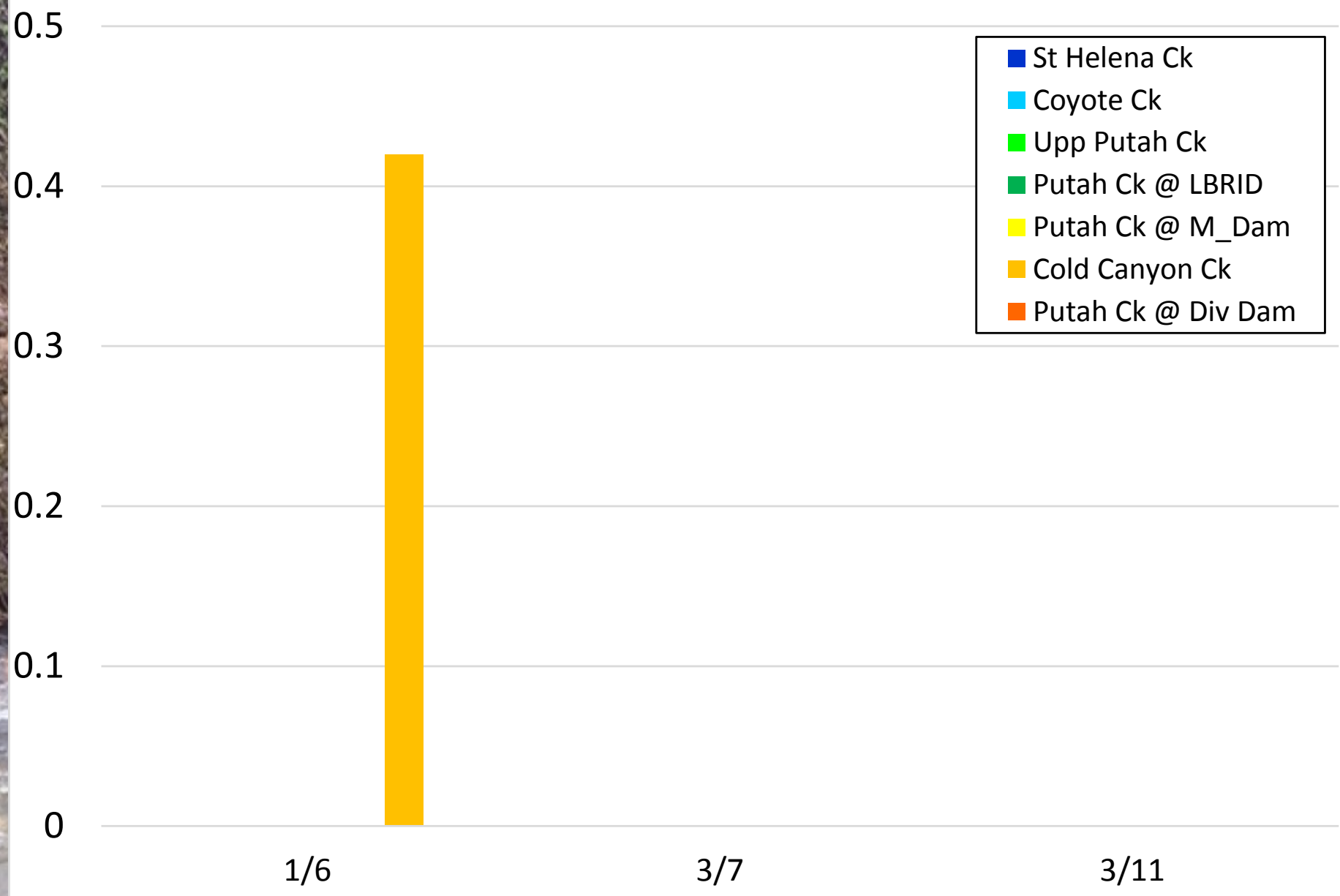


Phosphorus (mg/L)

- St Helena Ck
- Coyote Ck
- Upp Putah Ck
- Putah Ck @ LBRID
- Putah Ck @ M_Dam
- Cold Canyon Ck
- Putah Ck @ Div Dam



Ortho Phosphate (mg/L)

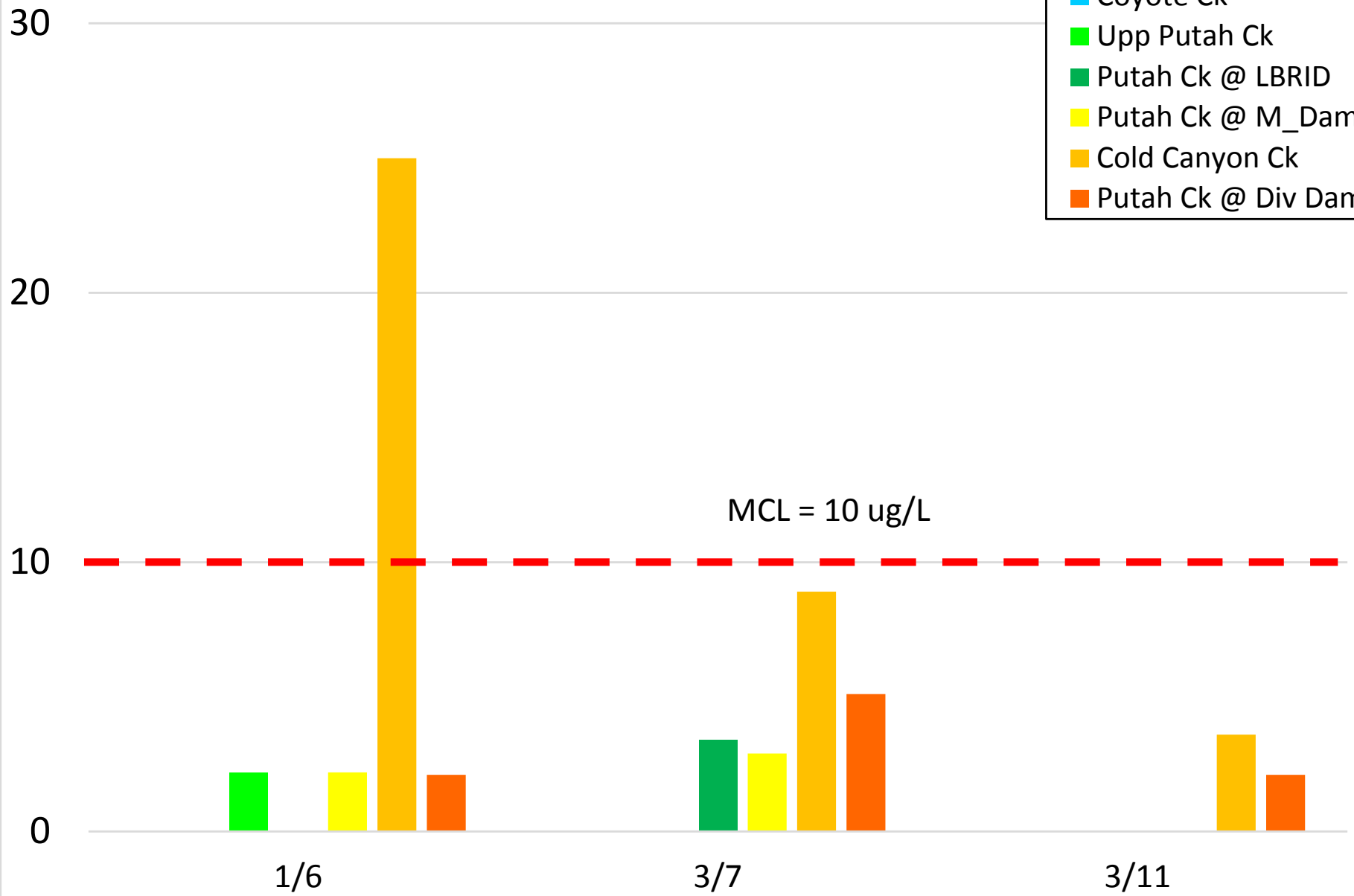


Minerals & Metals

A photograph of a rocky river with rapids, framed by tree branches and trunks. The water is turbulent and white with foam as it flows over dark, jagged rocks. The scene is viewed through a dense network of thin, dark branches in the foreground and several thick tree trunks on the right side. The background shows a lush, green forest.

Arsenic (ug/L)

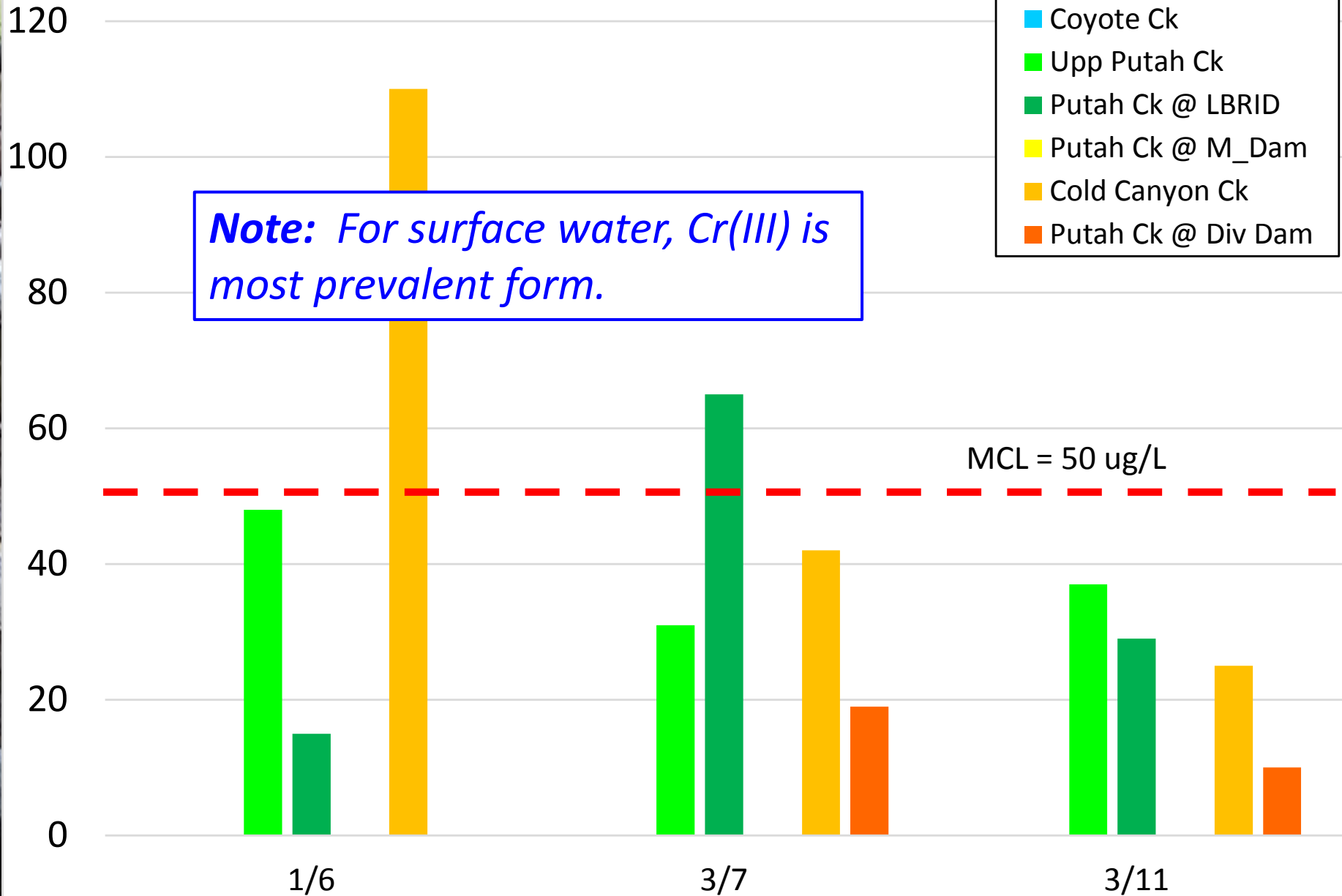
- St Helena Ck
- Coyote Ck
- Upp Putah Ck
- Putah Ck @ LBRID
- Putah Ck @ M_Dam
- Cold Canyon Ck
- Putah Ck @ Div Dam



Total Chromium (ug/L)

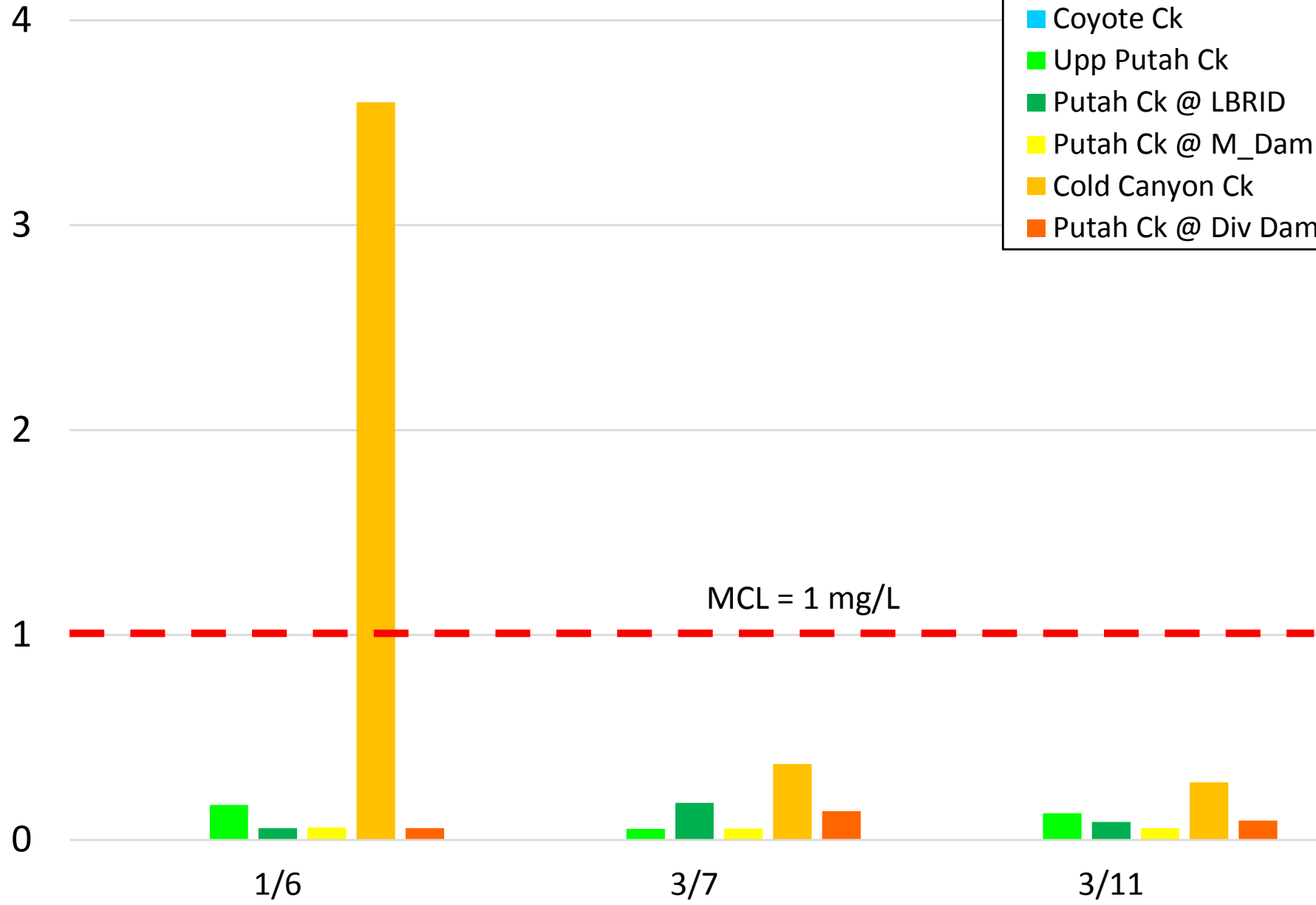
- St Helena Ck
- Coyote Ck
- Upp Putah Ck
- Putah Ck @ LBRID
- Putah Ck @ M_Dam
- Cold Canyon Ck
- Putah Ck @ Div Dam

Note: For surface water, Cr(III) is most prevalent form.



Barium (mg/L)

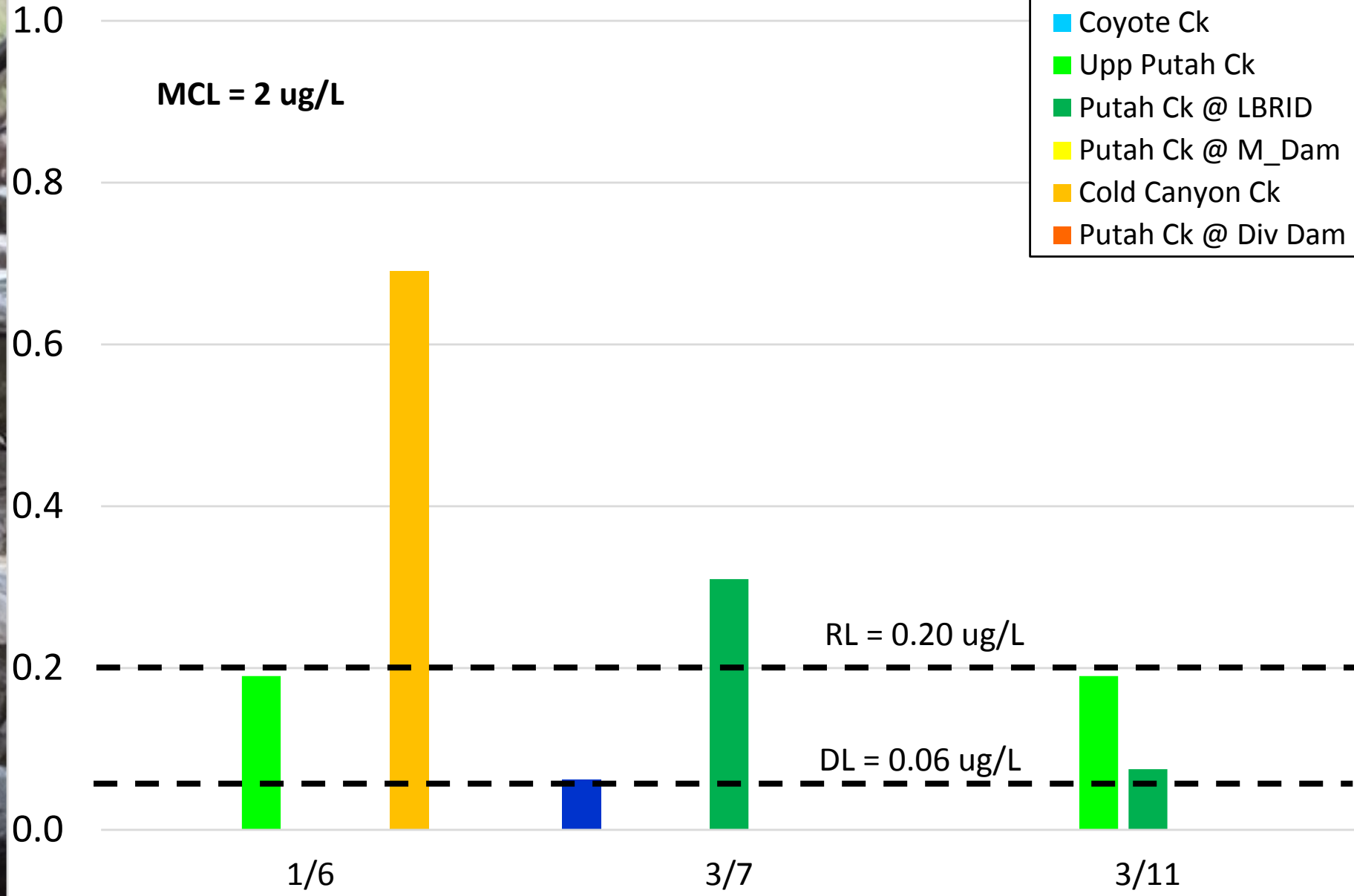
- St Helena Ck
- Coyote Ck
- Upp Putah Ck
- Putah Ck @ LBRID
- Putah Ck @ M_Dam
- Cold Canyon Ck
- Putah Ck @ Div Dam



Mercury (ug/L)

- St Helena Ck
- Coyote Ck
- Upp Putah Ck
- Putah Ck @ LBRID
- Putah Ck @ M_Dam
- Cold Canyon Ck
- Putah Ck @ Div Dam

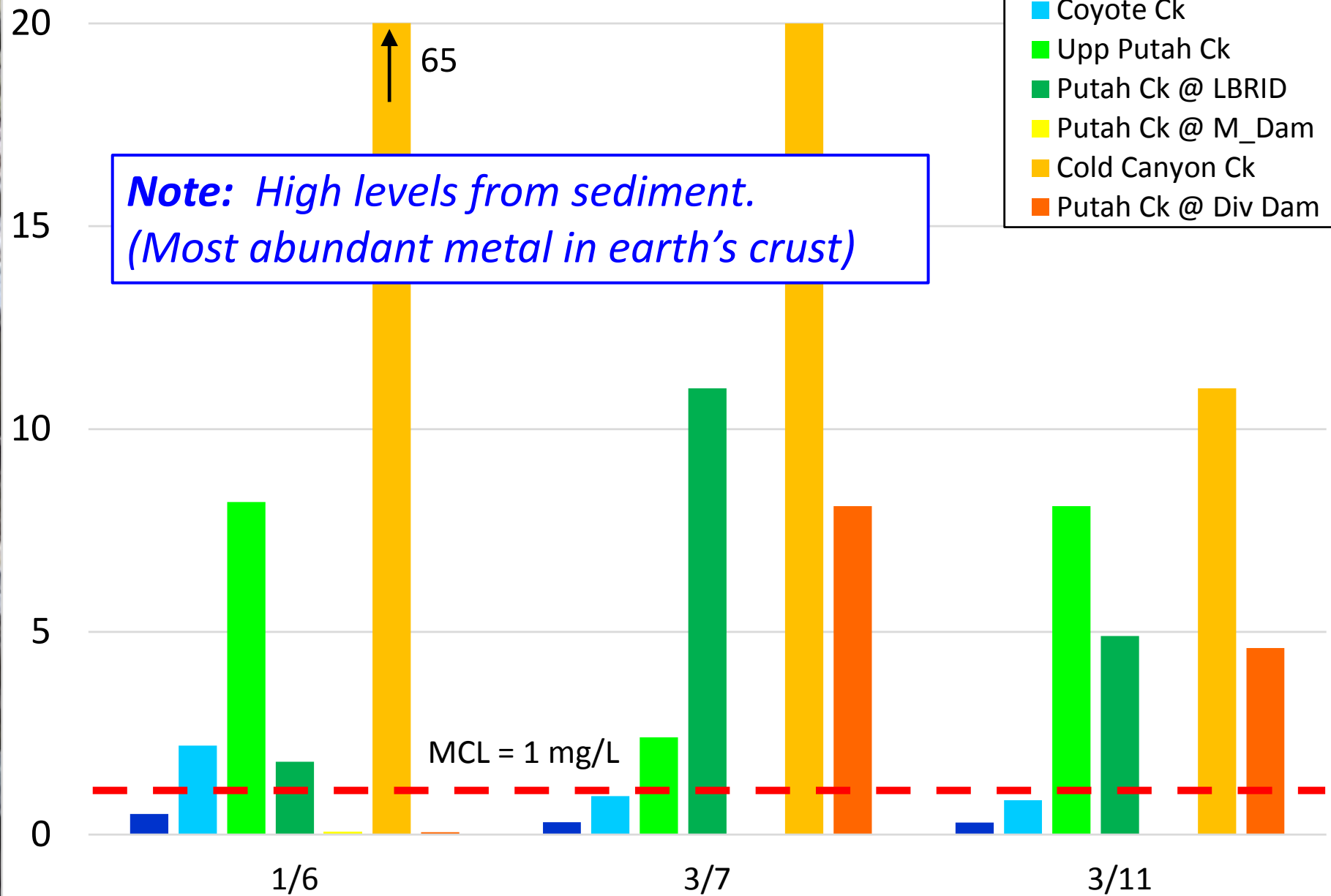
MCL = 2 ug/L



Aluminum (mg/L)

- St Helena Ck
- Coyote Ck
- Upp Putah Ck
- Putah Ck @ LBRID
- Putah Ck @ M_Dam
- Cold Canyon Ck
- Putah Ck @ Div Dam

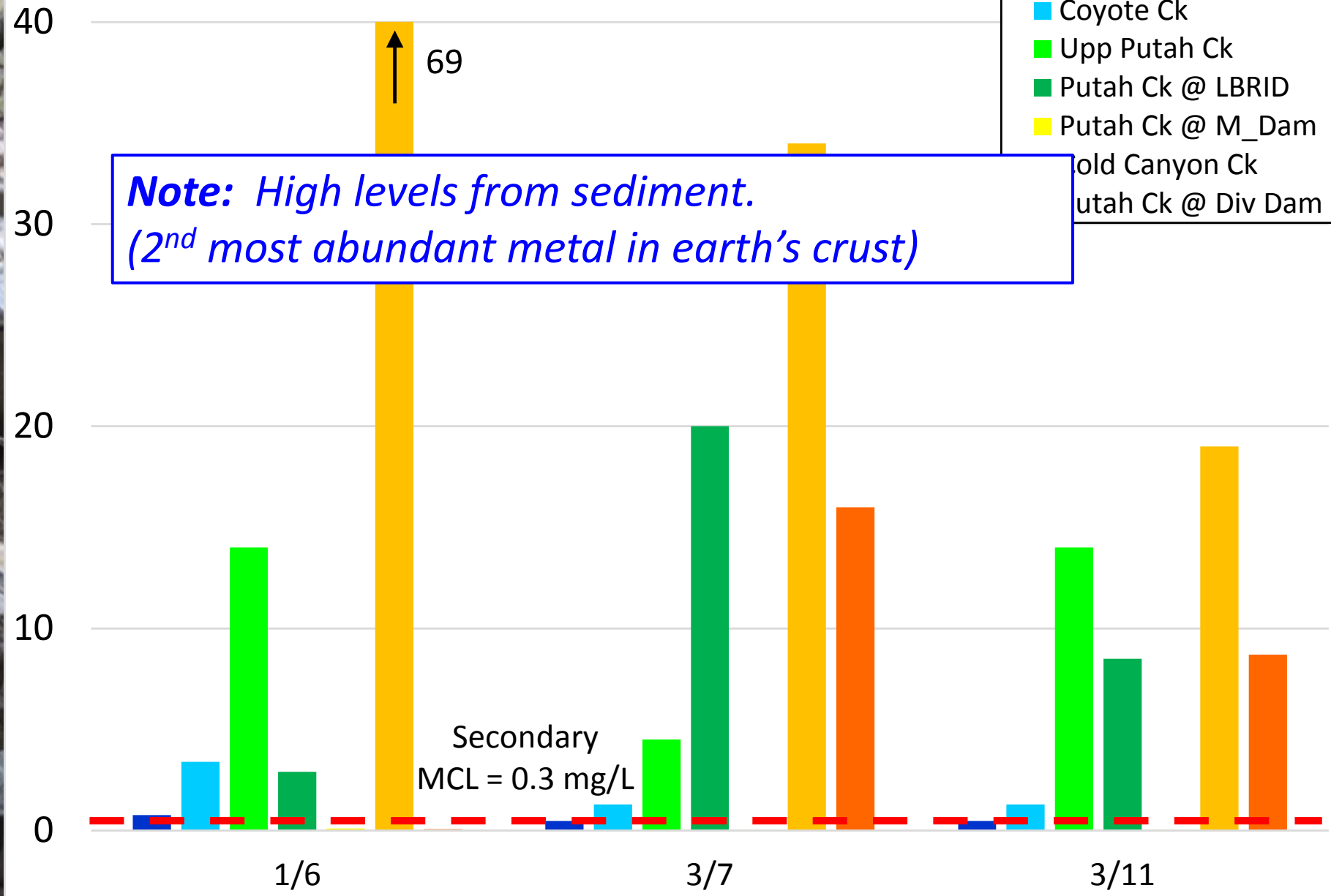
*Note: High levels from sediment.
(Most abundant metal in earth's crust)*



Iron (mg/L)

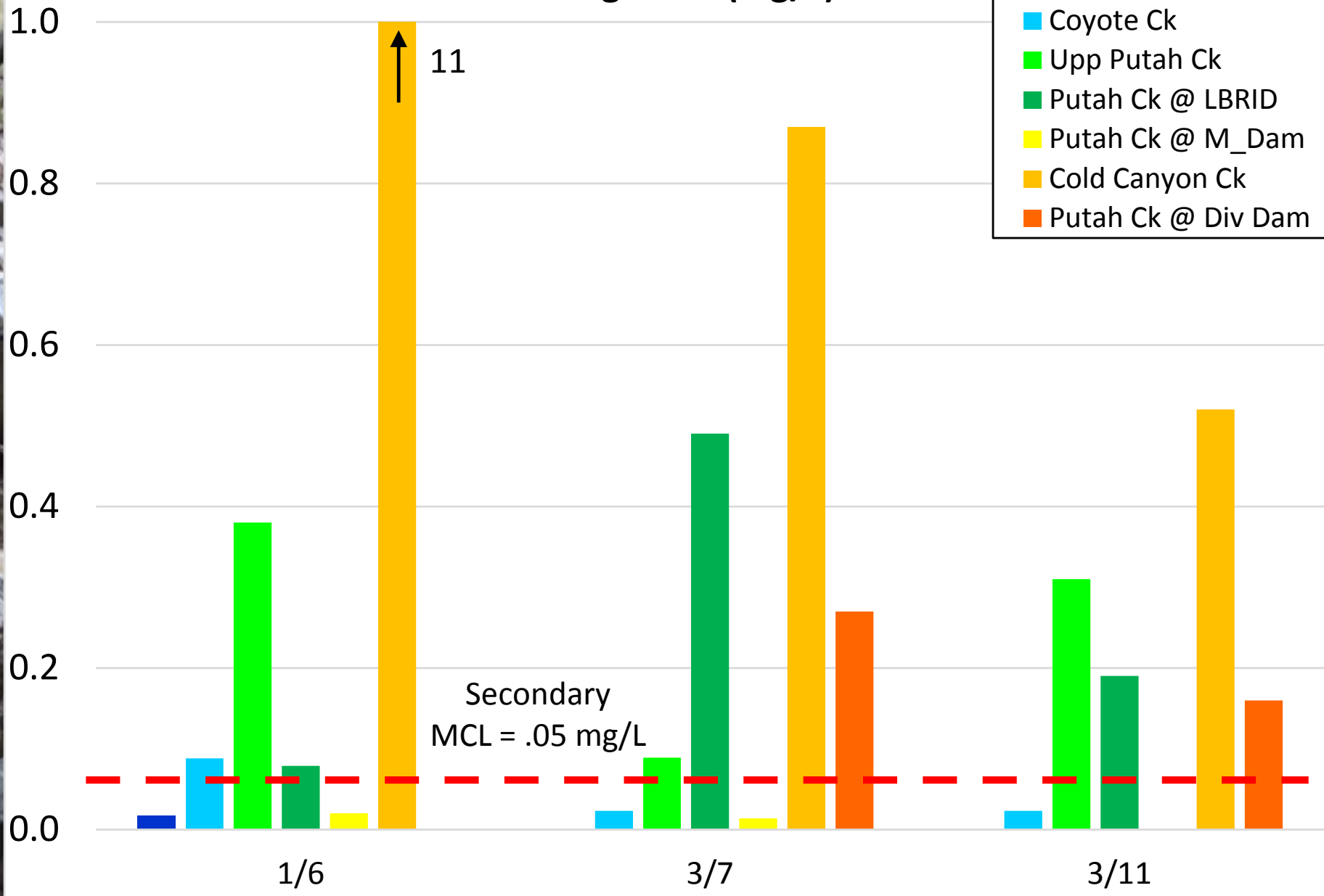
- St Helena Ck
- Coyote Ck
- Upp Putah Ck
- Putah Ck @ LBRID
- Putah Ck @ M_Dam
- Old Canyon Ck
- Putah Ck @ Div Dam

*Note: High levels from sediment.
(2nd most abundant metal in earth's crust)*



Manganese (mg/L)

- St Helena Ck
- Coyote Ck
- Upp Putah Ck
- Putah Ck @ LBRID
- Putah Ck @ M_Dam
- Cold Canyon Ck
- Putah Ck @ Div Dam



Conclusion

- Cold Canyon Creek (Interdam Reach) had the worst WQ
- Primarily in suspended sediment [TSS = 8,300 mg/L; TDS = 270 mg/L]
- No significant WQ degradation in Upper Putah Creek
- Upper Putah Creek has excellent WQ!



Where in the Watershed?

