

MSS Modeling Assumptions

December 9, 2022

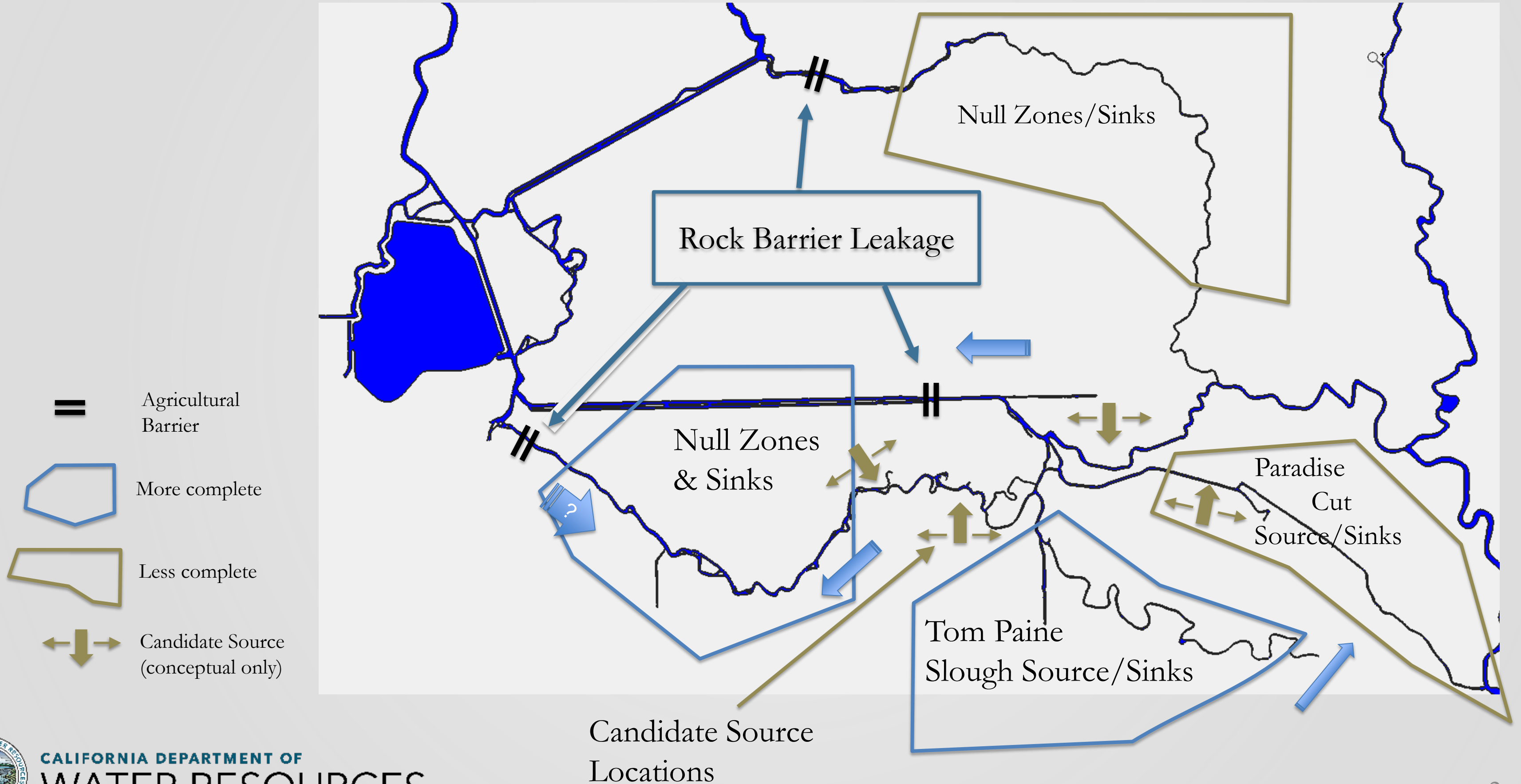


Assumption Template

- Issue:
 - Need for assumption, underlying concepts
- Assumption and basis
- Caveats/contradictions
- Limits on precision, brackets
- Expected/possible improvement



Major Assumptions



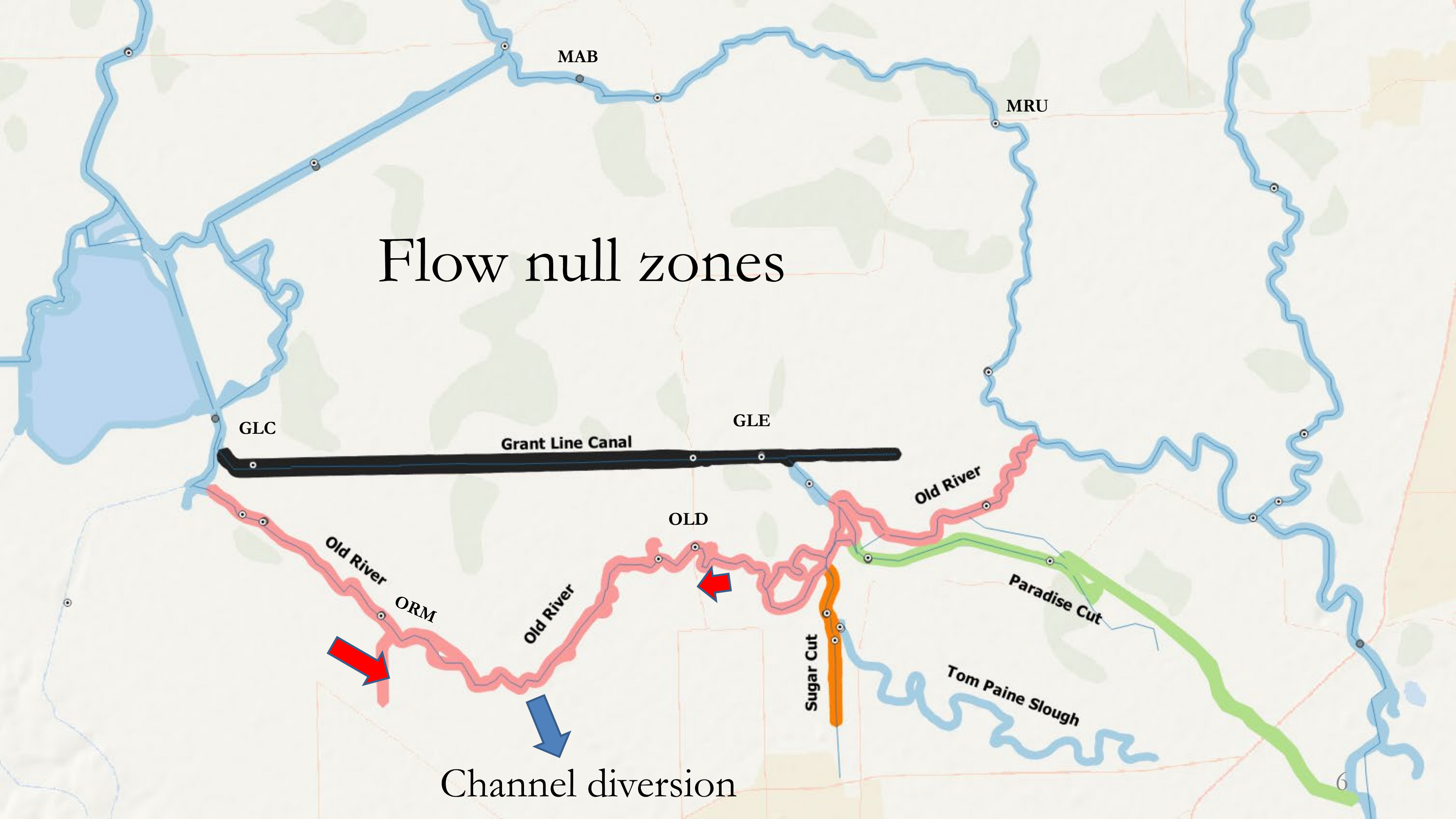
Products of the Assumption Phase

- Modified channel depletions for SCHISM and DSM2
 - Some reassignment of diversions and return locations
 - Small local changes in total volume
- Leakage parameterization for rock barrier
- Target for report: 2023 Annual Report (mid-year)



OLD RIVER FLOW AND NULL ZONES

Flow null zones



MAB

MRU

GLC

GLE

Grant Line Canal

Old River

OLD

Old River

ORM

Old River

Sugar Cut

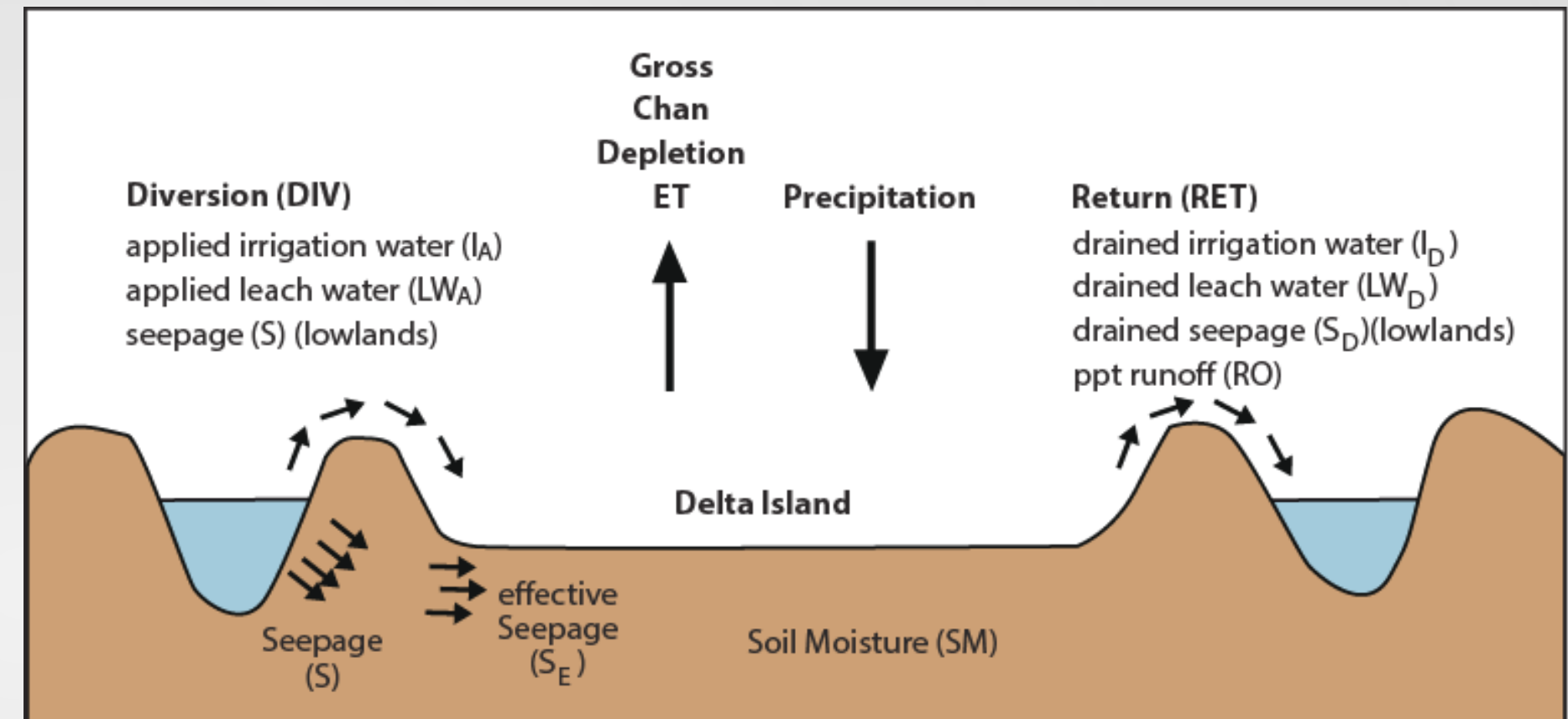
Paradise Cut

Tom Paine Slough

Channel diversion

Estimating Channel Depletions: DETAW, DCD Model and EWRIMS

- DETAW: Estimates applied water based on evapotranspiration (ET)
- DCD: Distributes diversions, seepage and returns to DSM2 nodes (even for SCHISM)
- EWRIMS: Public Water Rights Database of diversions

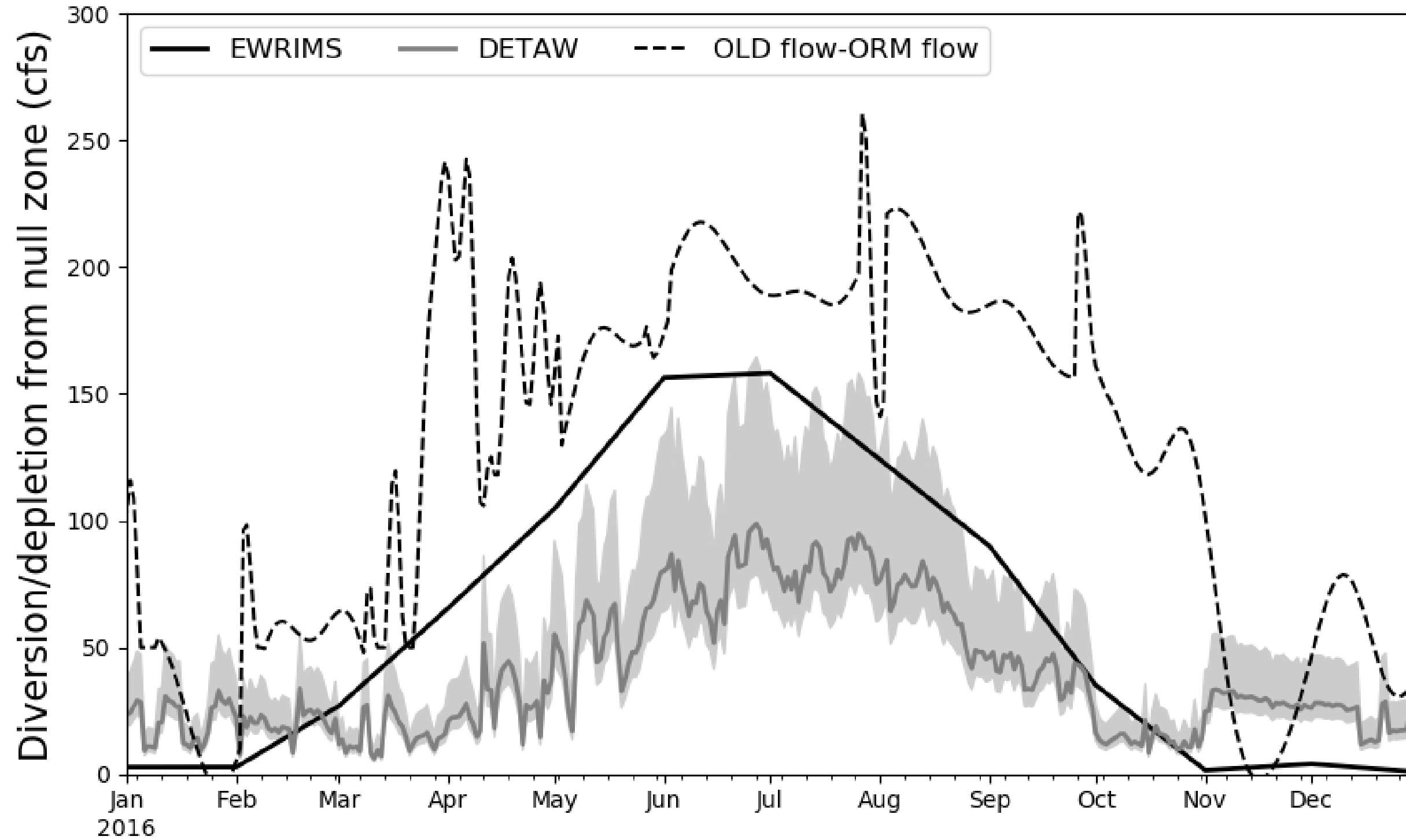


DETAW: Delta Evapotranspiration of Applied Water

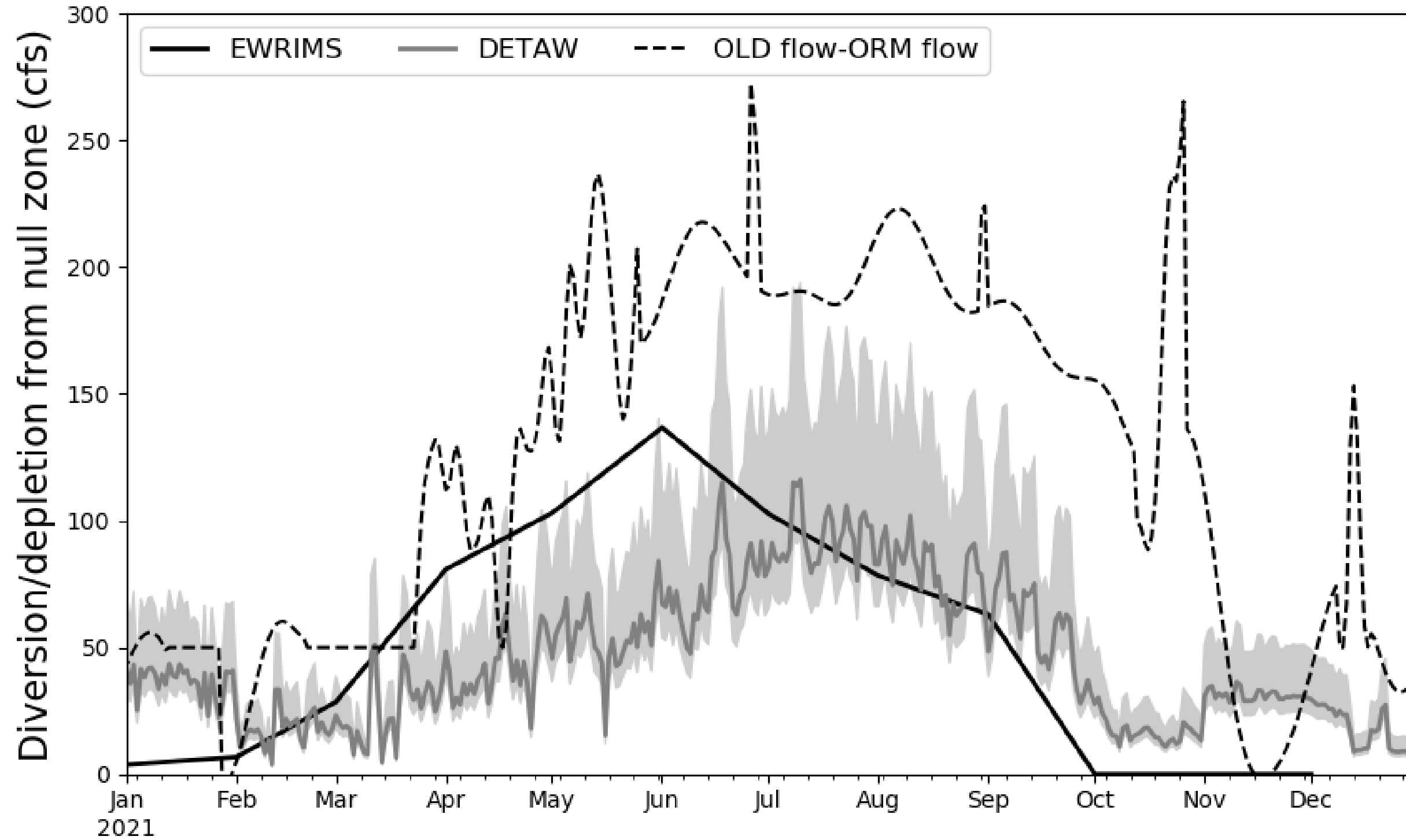
DCD: Delta Channel Depletion model

EWRIMS: Electronic Water Rights Information Management System

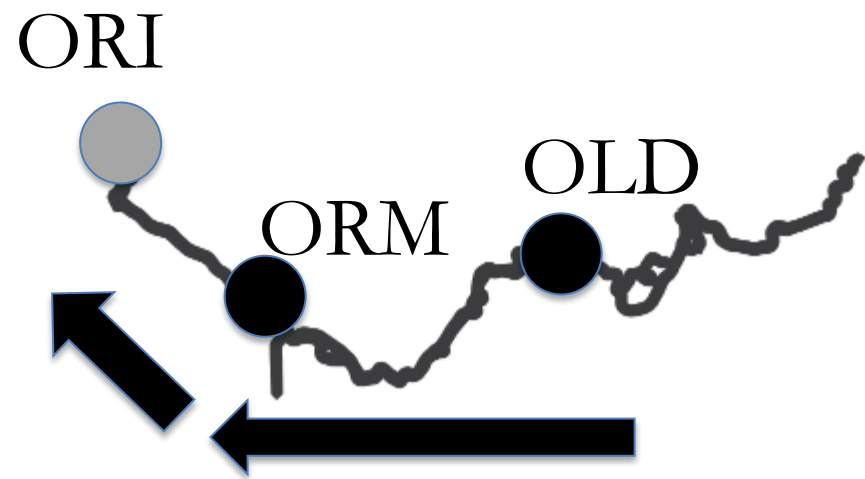
2016



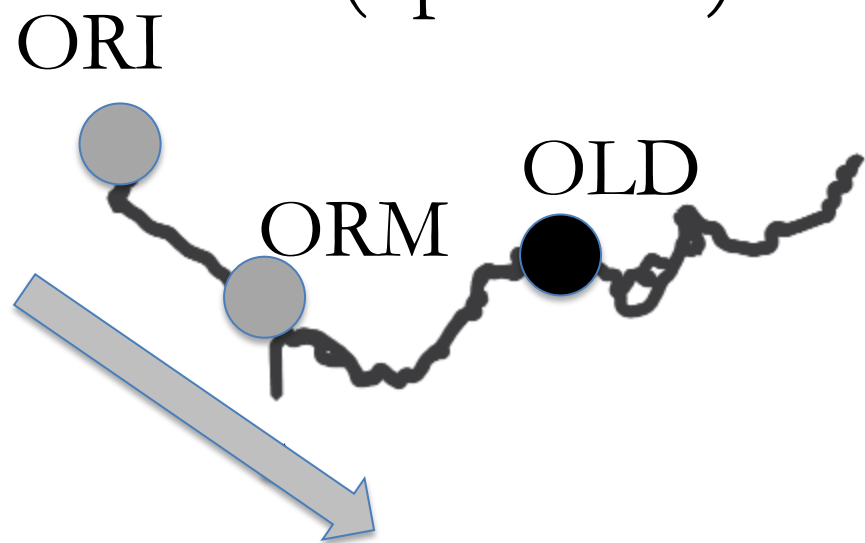
2021



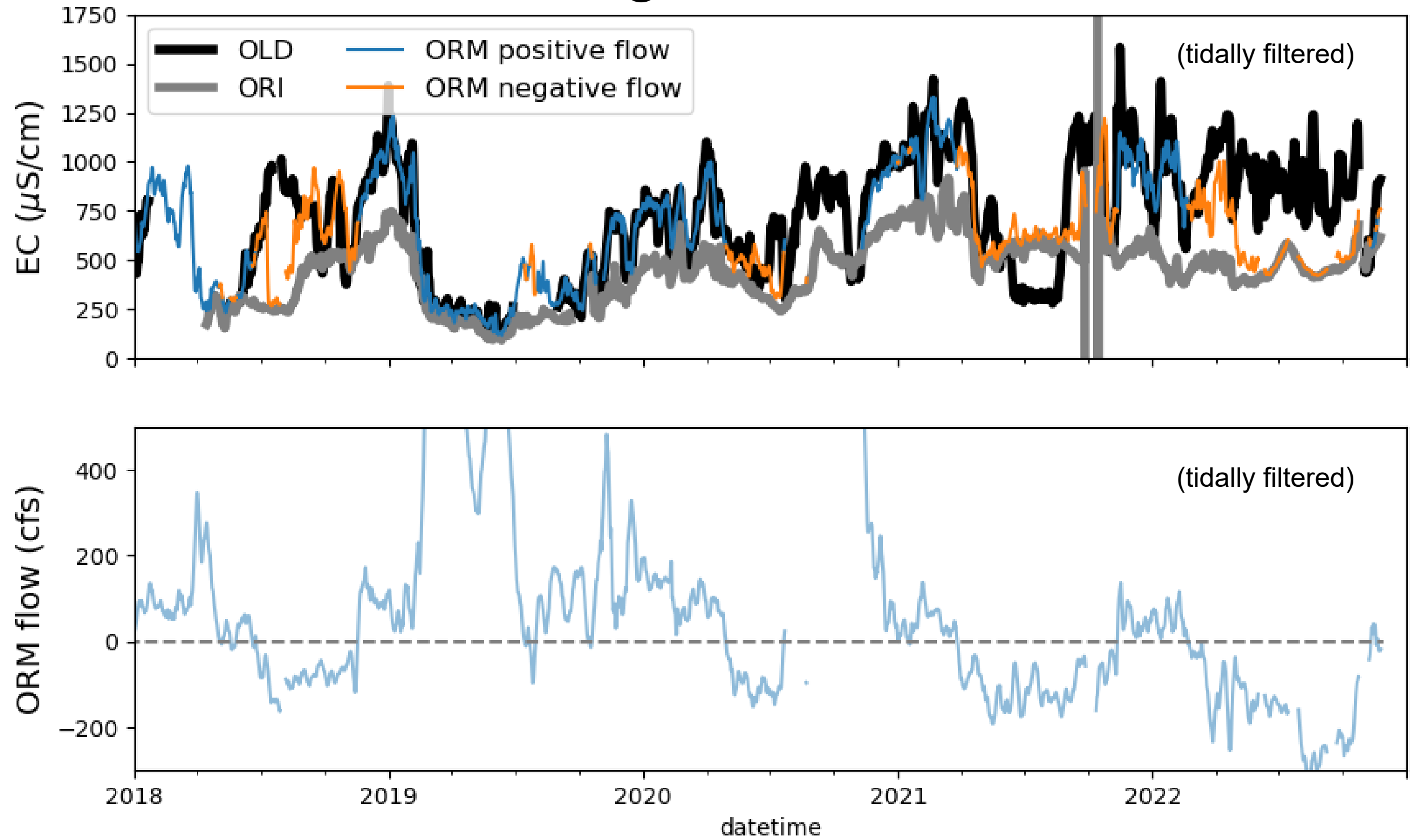
Net Positive Flow
(downstream)



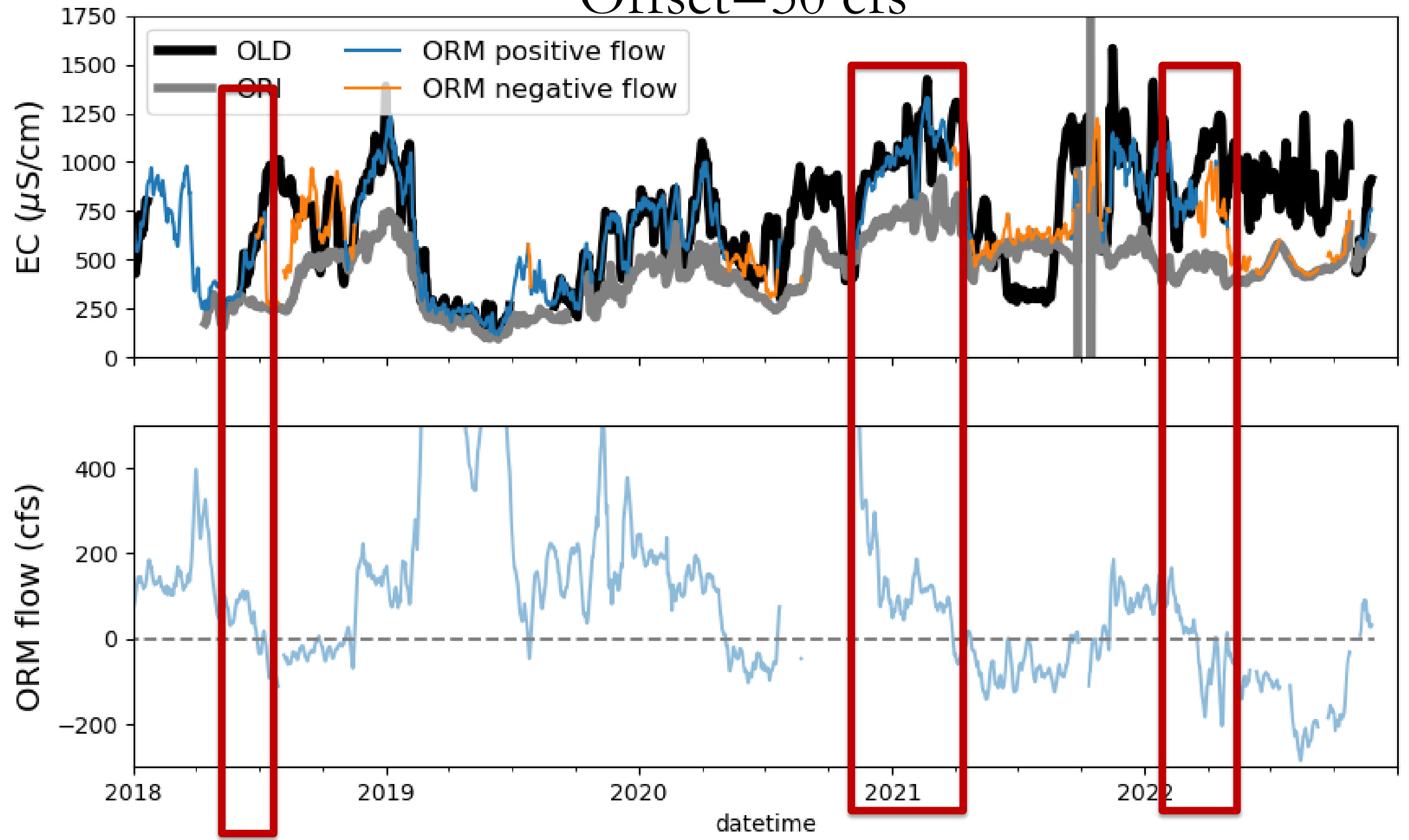
Net Negative Flow
(upstream)

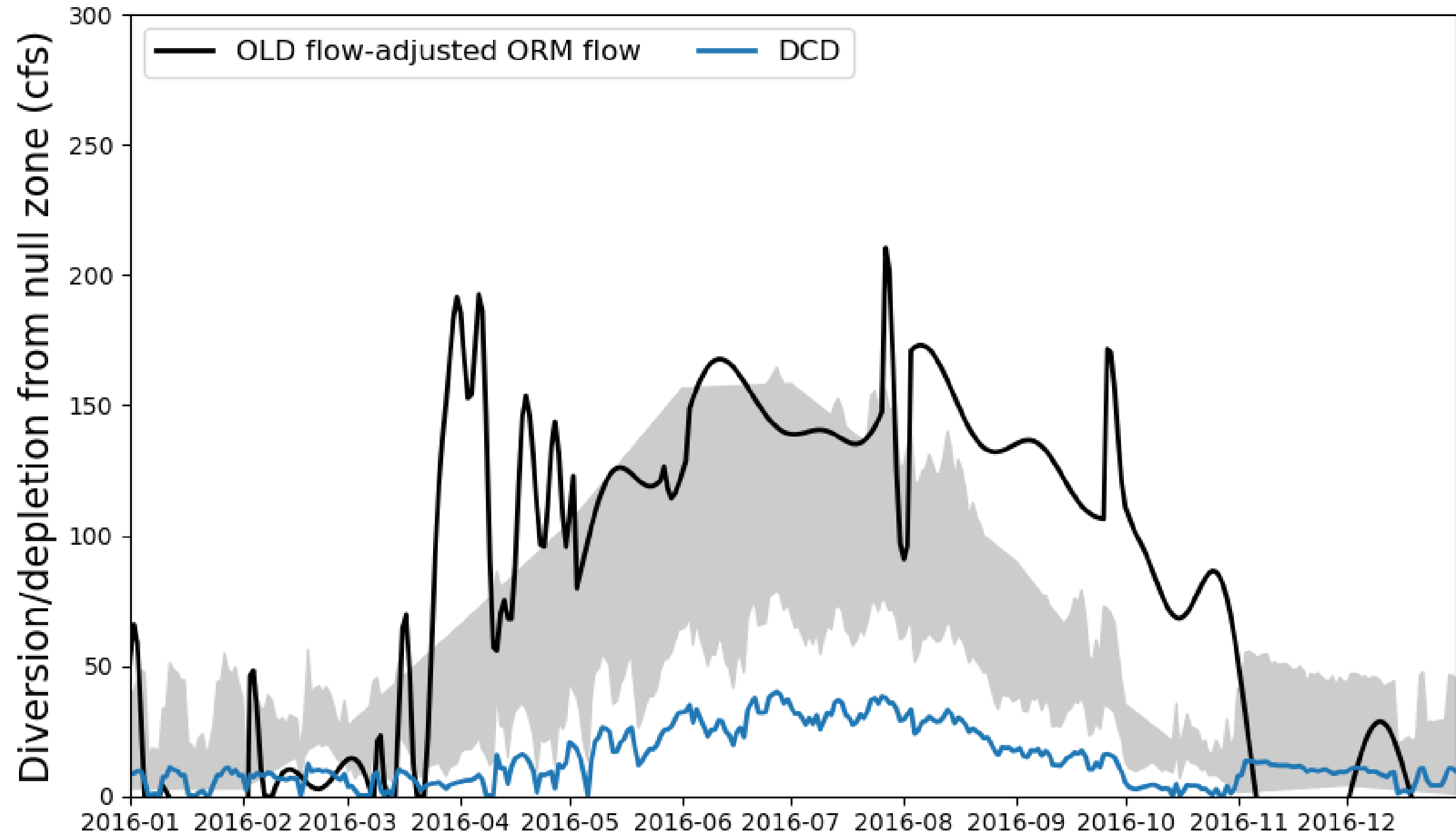


“Tidal Plug Flow”

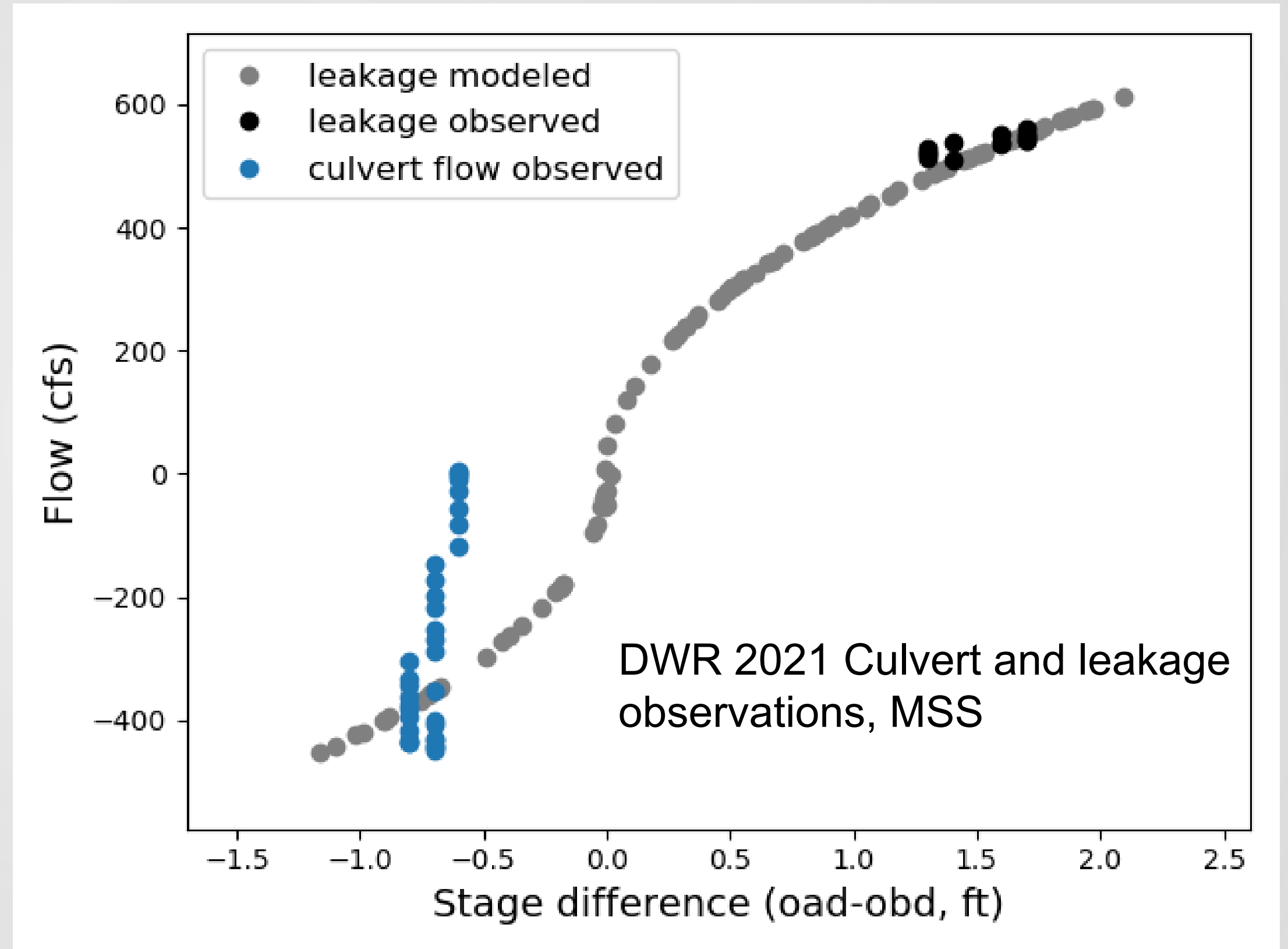
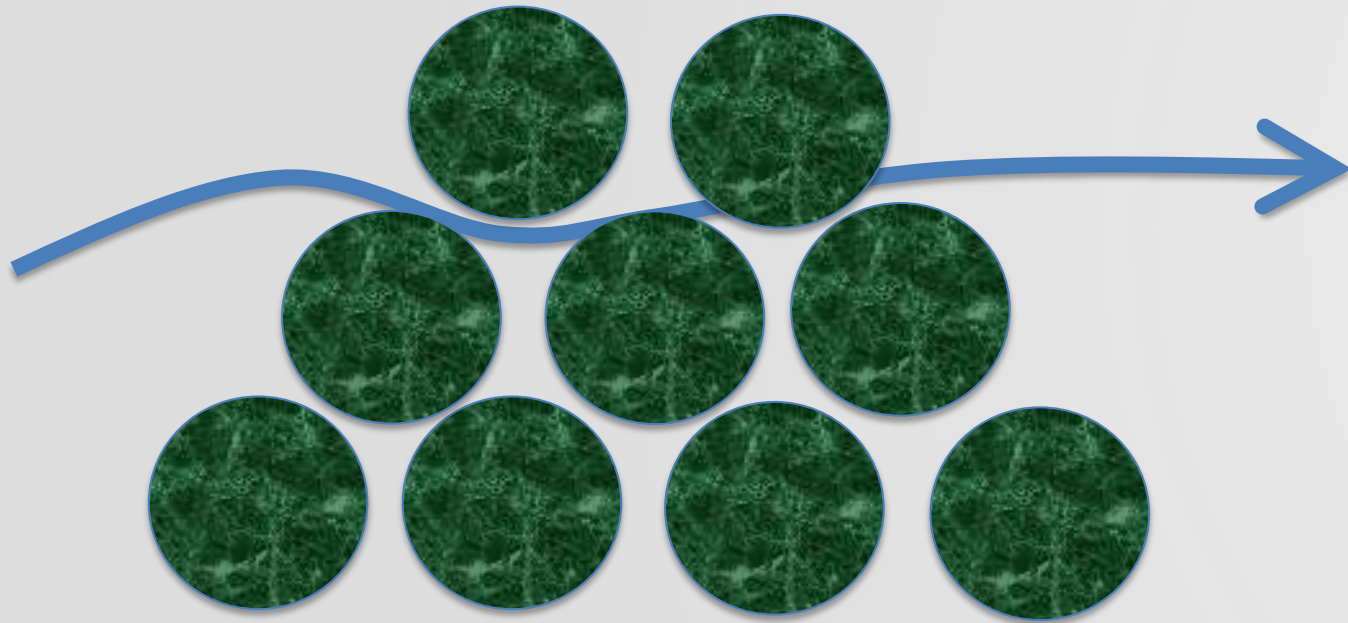


Offset=50 cfs

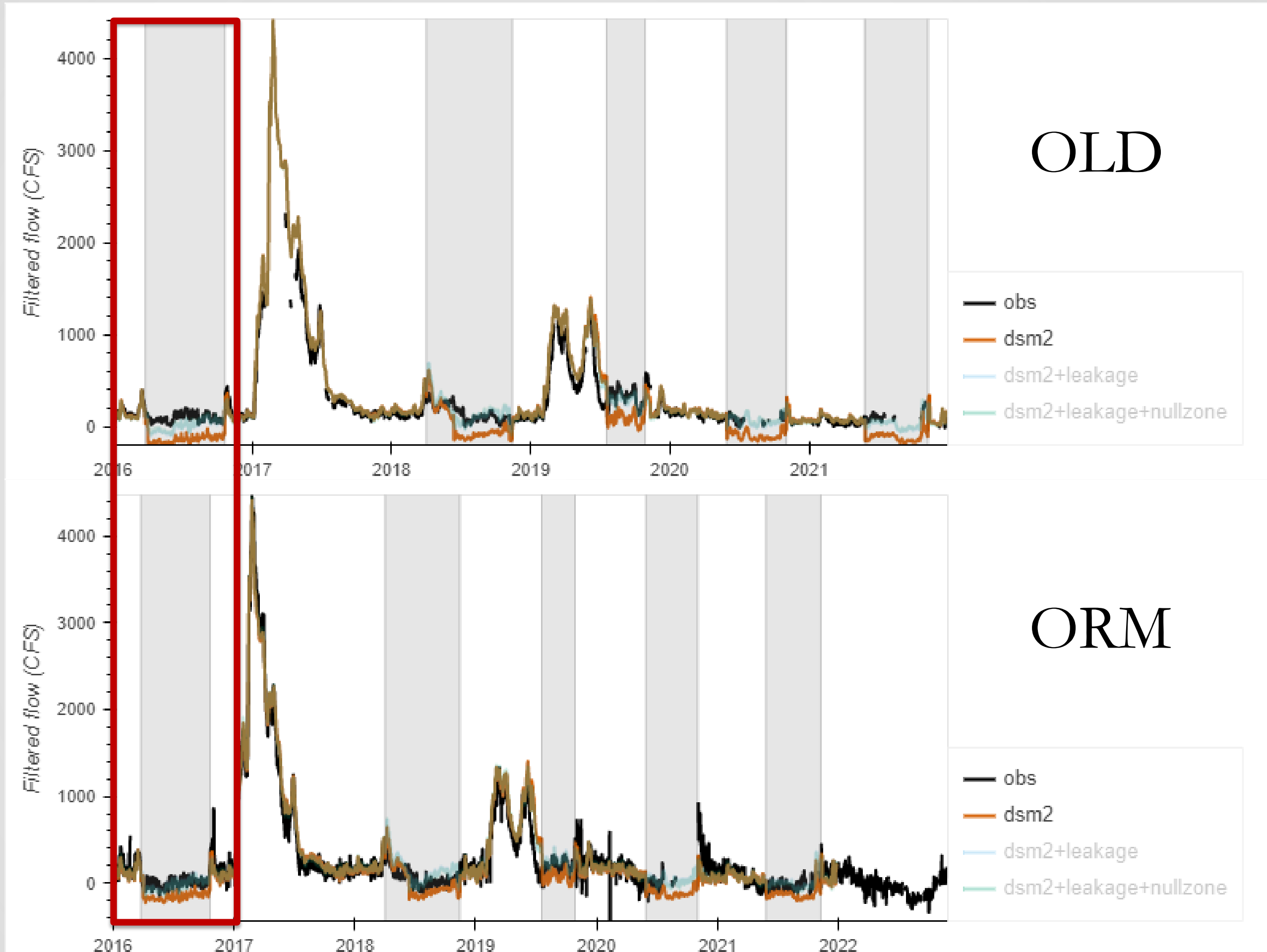




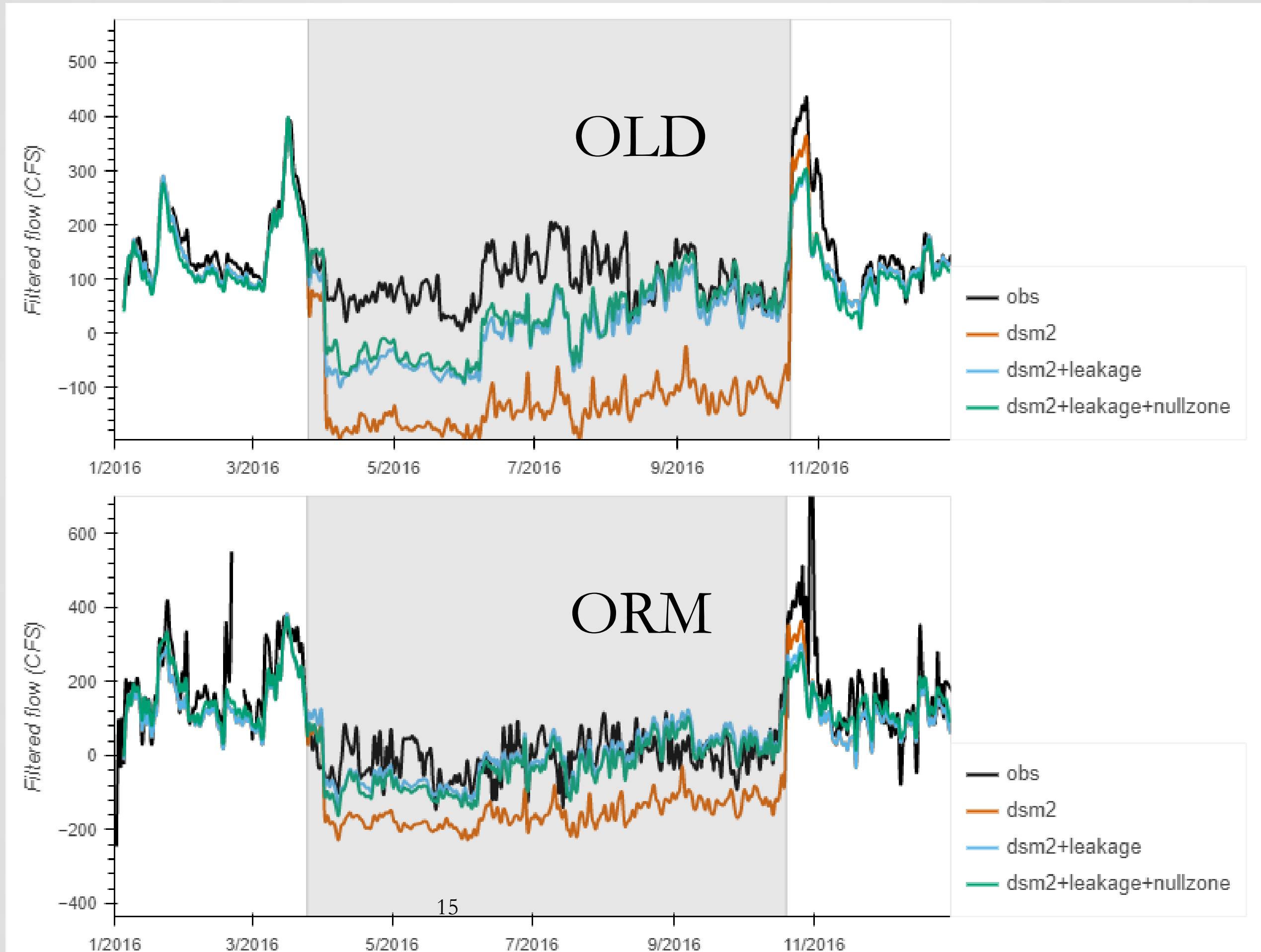
Big Confounder: Barrier Leakage



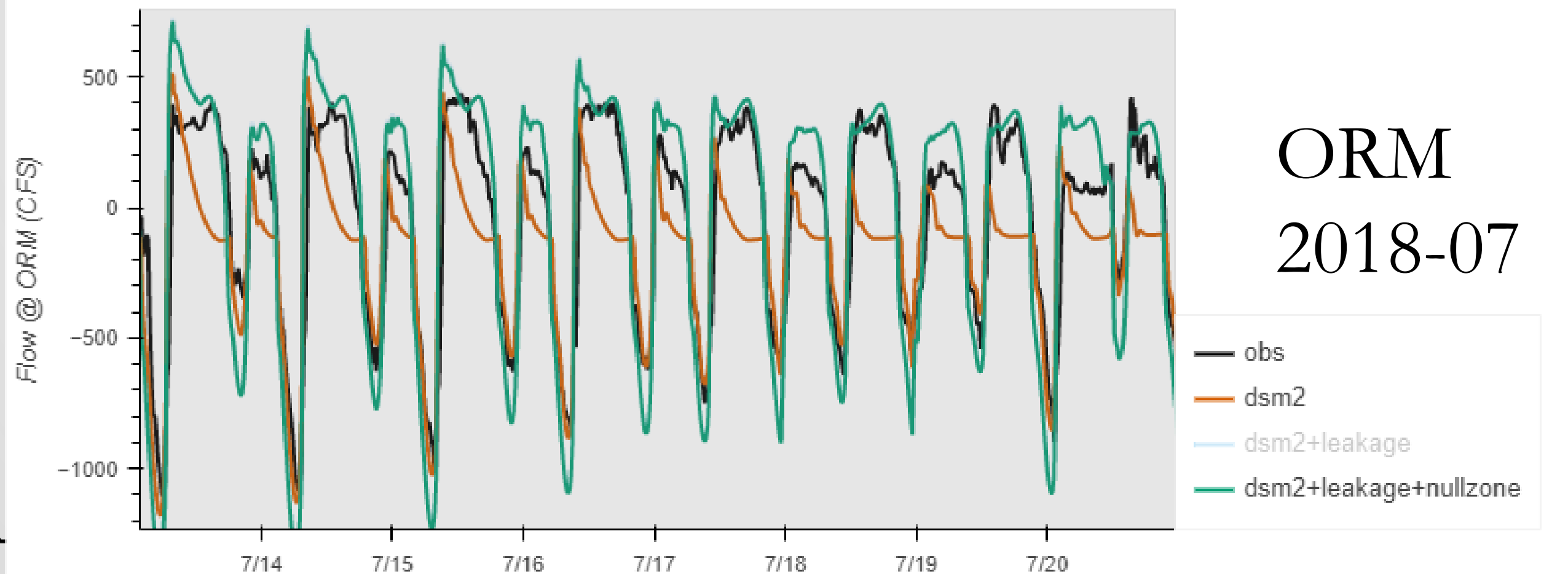
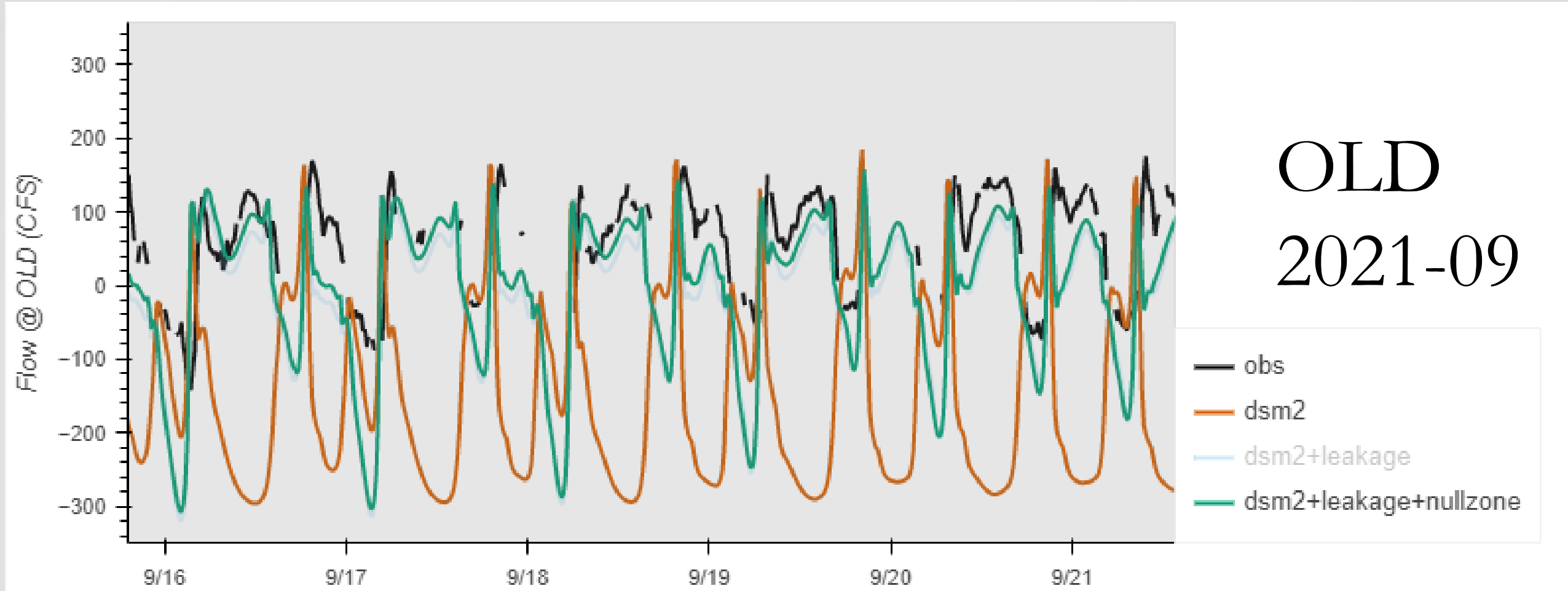
Issue



DSM2 Flow Response to Old R Assumptions



Improved Modeling of Tidal Amplitudes



PESCADERO CIRCULATION

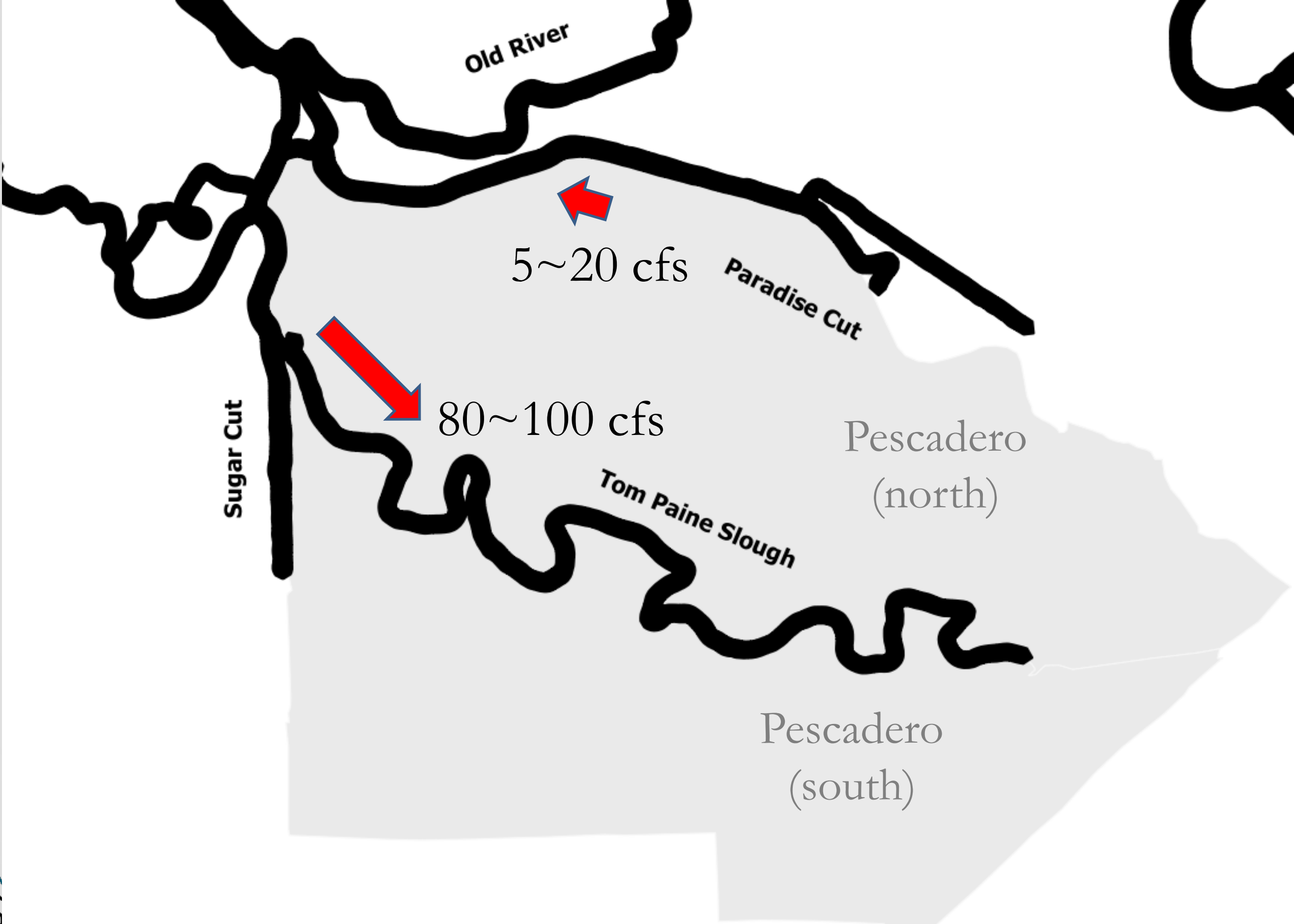
Pescadero Circulation Pattern



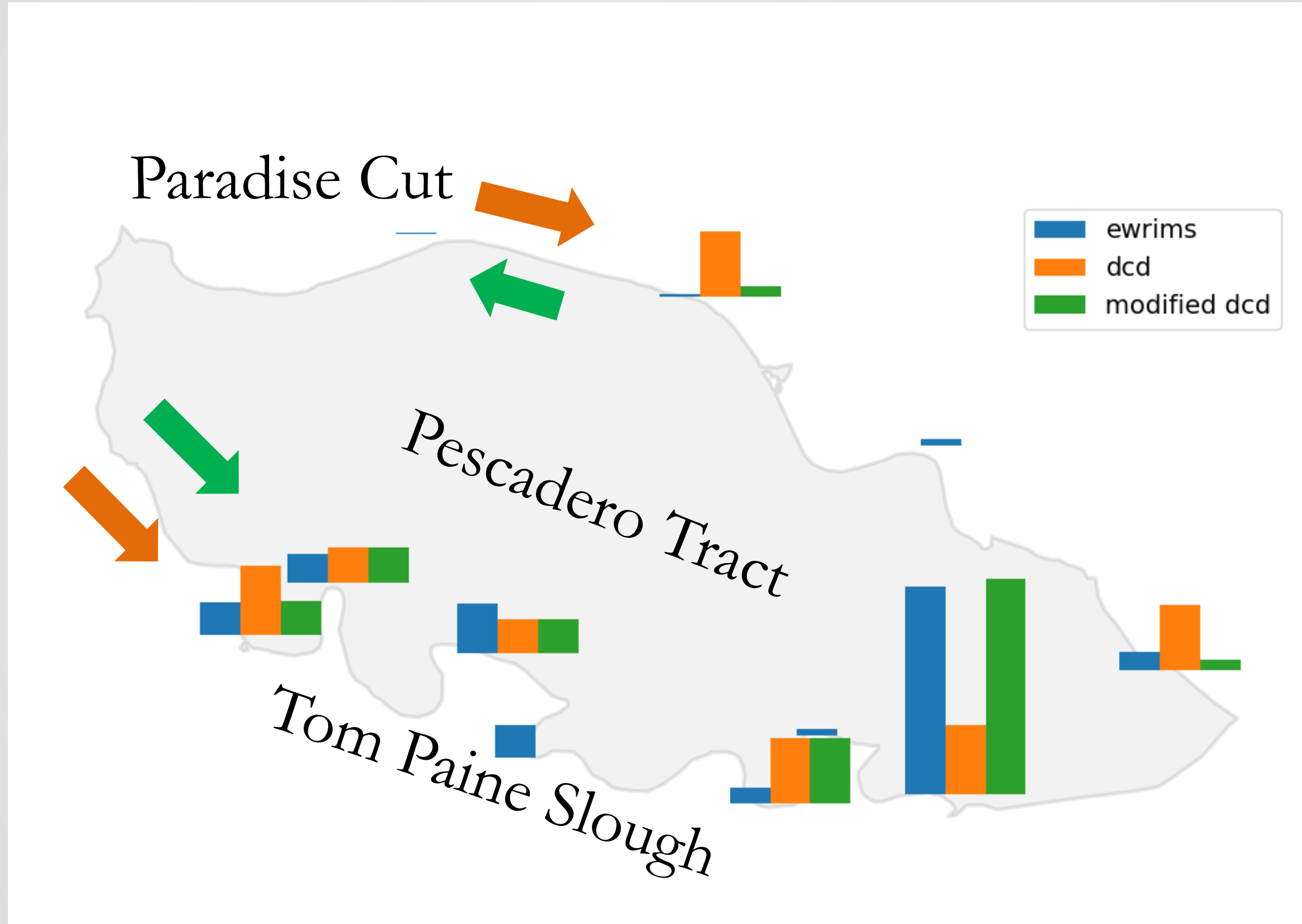
Original DCD



Modified DCD

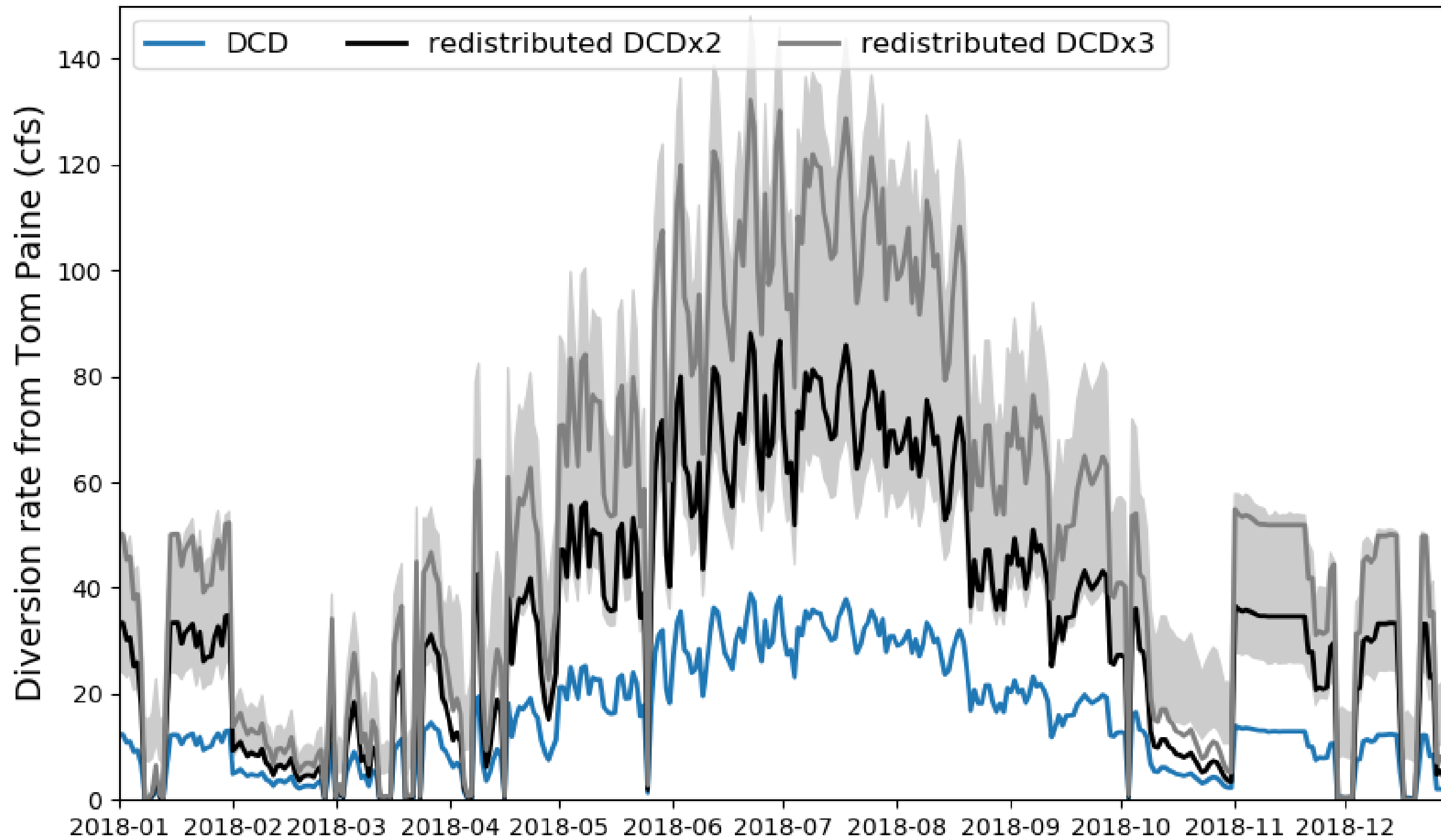


Diversions Distribution: Pescadero Tract



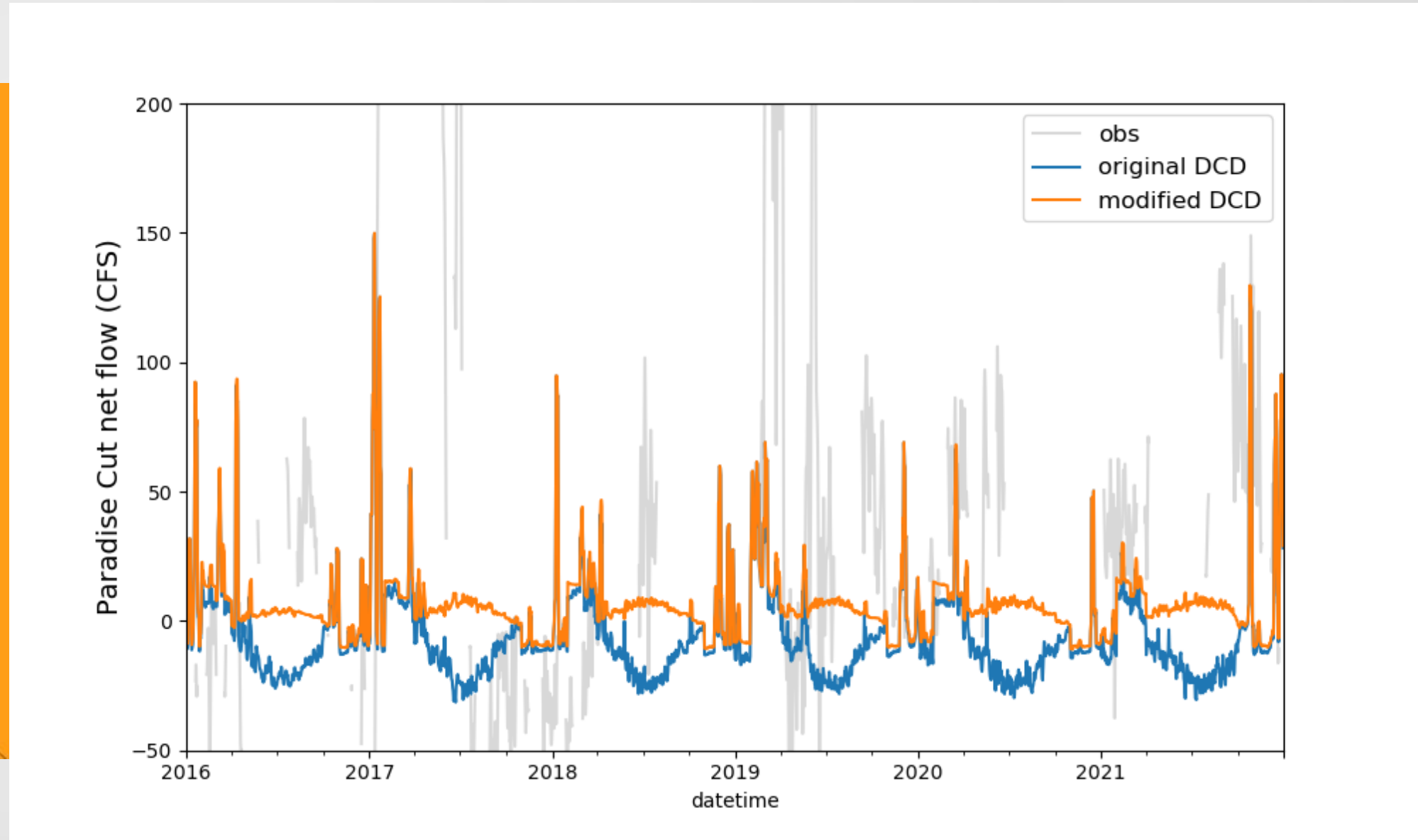
Map of “distribution factors”: Island diversions to channels





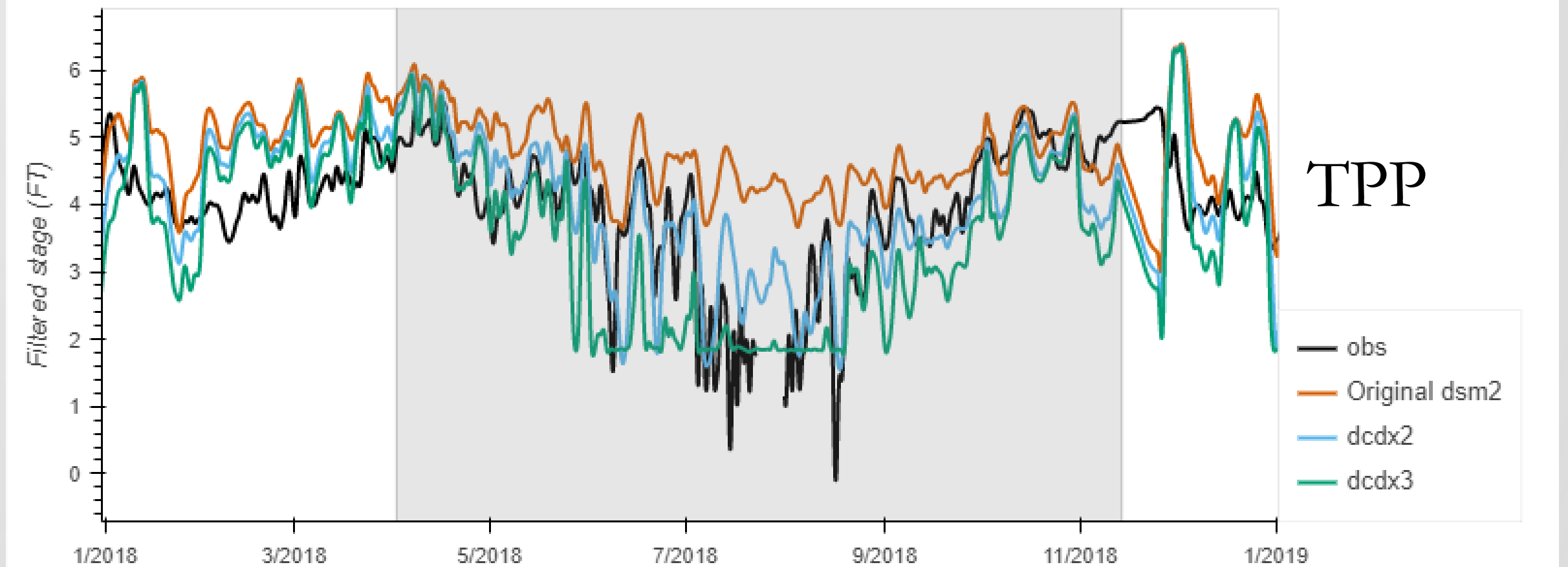
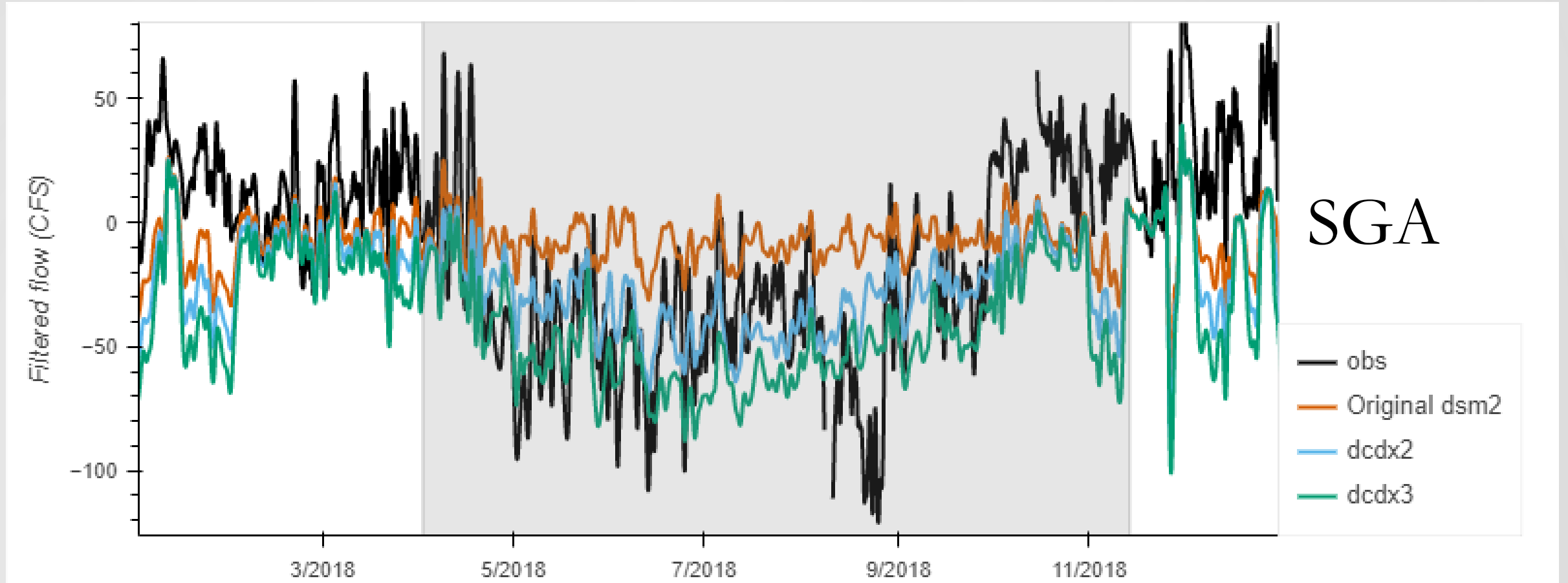
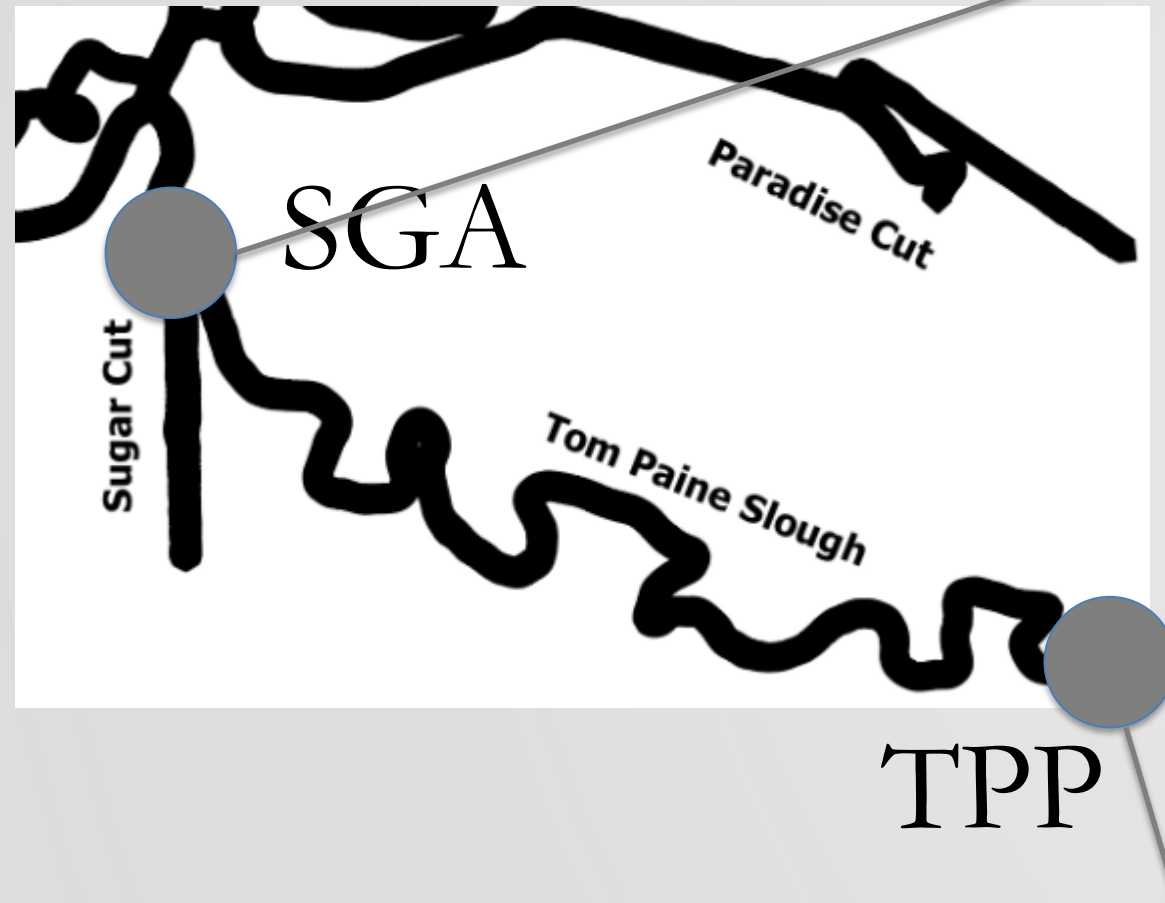
Drainage at Paradise Cut

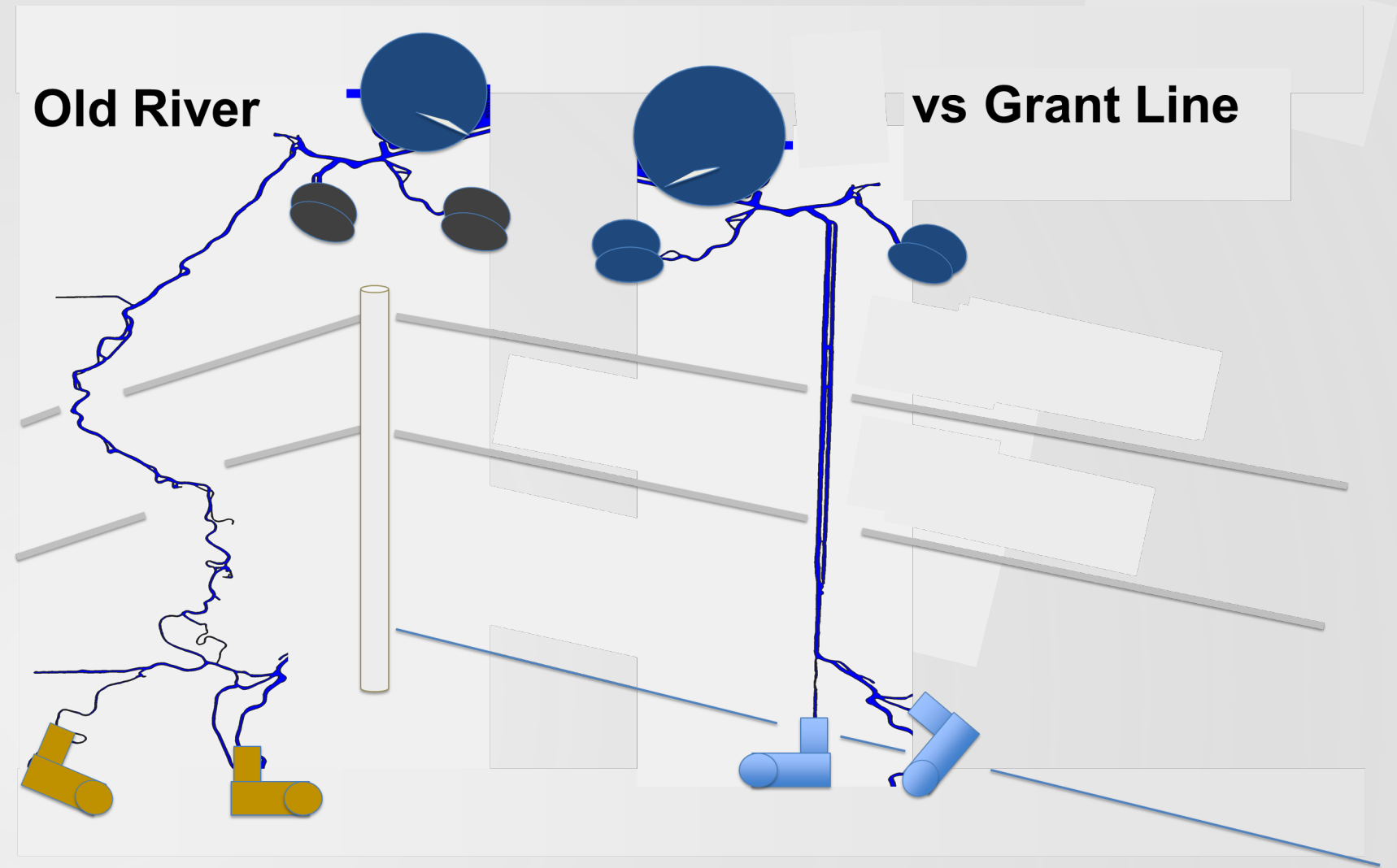
Dye study estimated flow rate ≈ 3 cfs
(largest return pumps off)



DSM2 Model Results for Pescadero

Assumptions

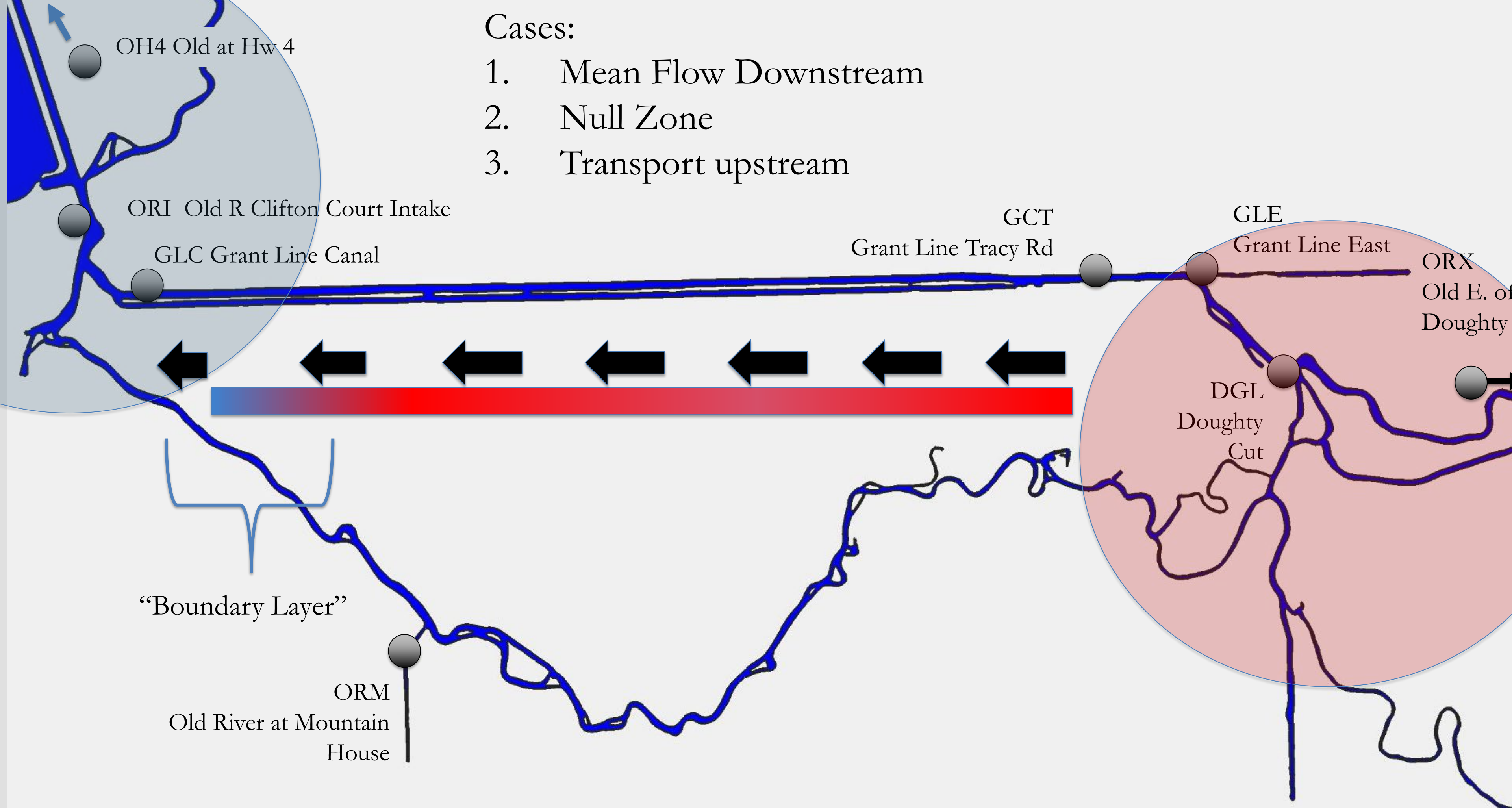




GRANT LINE: SIMILARITIES & DIFFERENCES

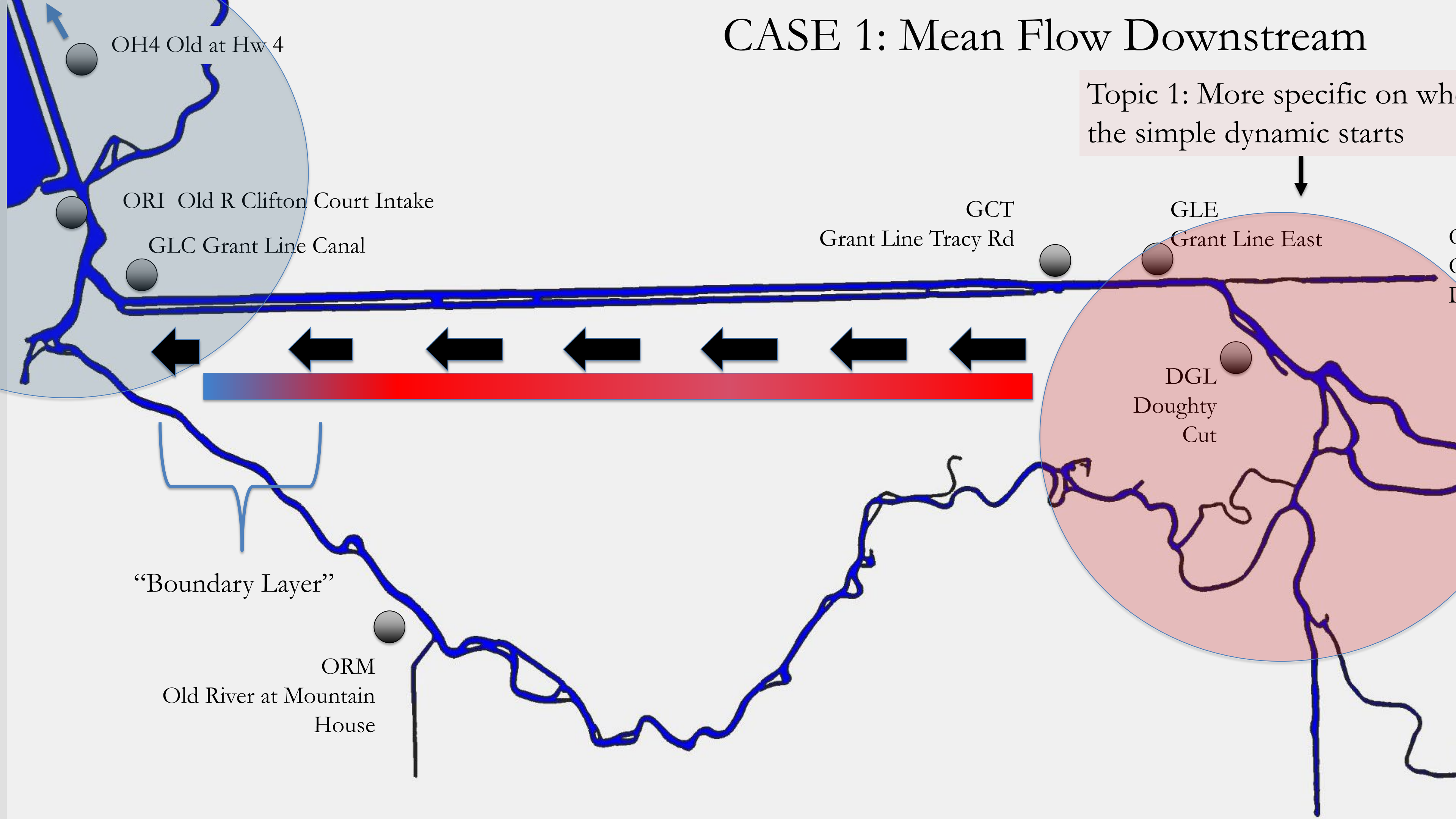
Cases:

1. Mean Flow Downstream
2. Null Zone
3. Transport upstream

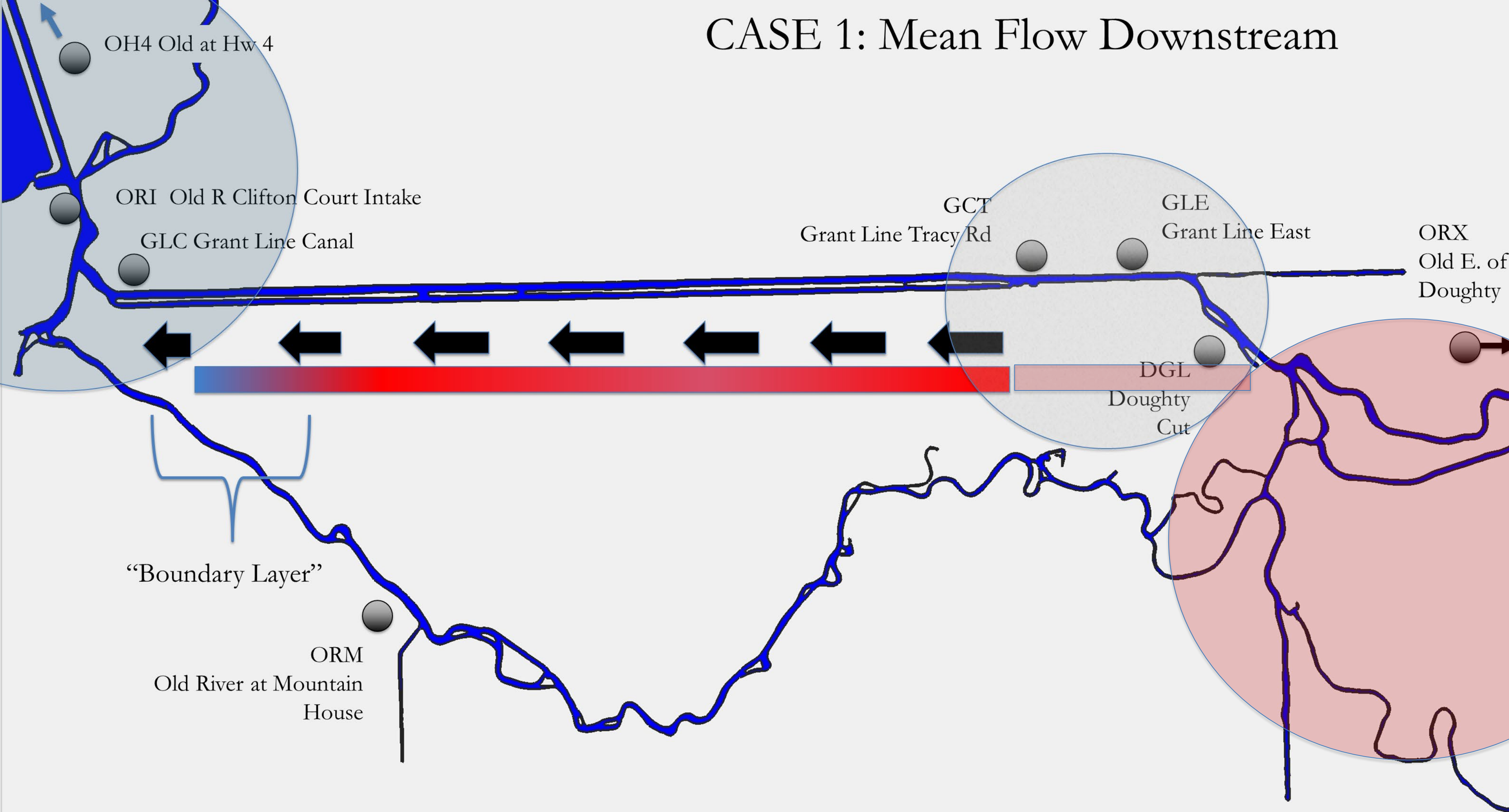


CASE 1: Mean Flow Downstream

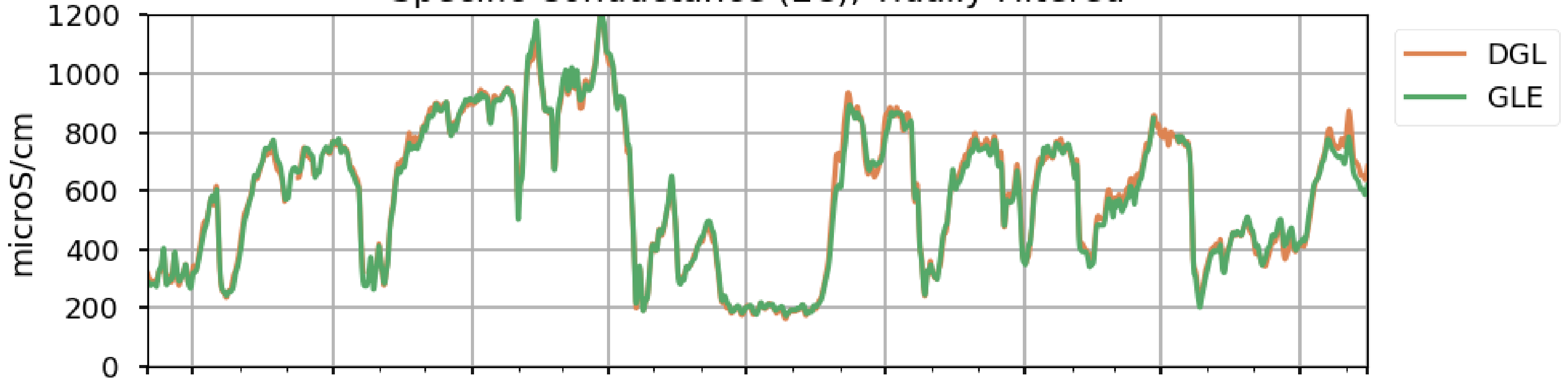
Topic 1: More specific on where the simple dynamic starts



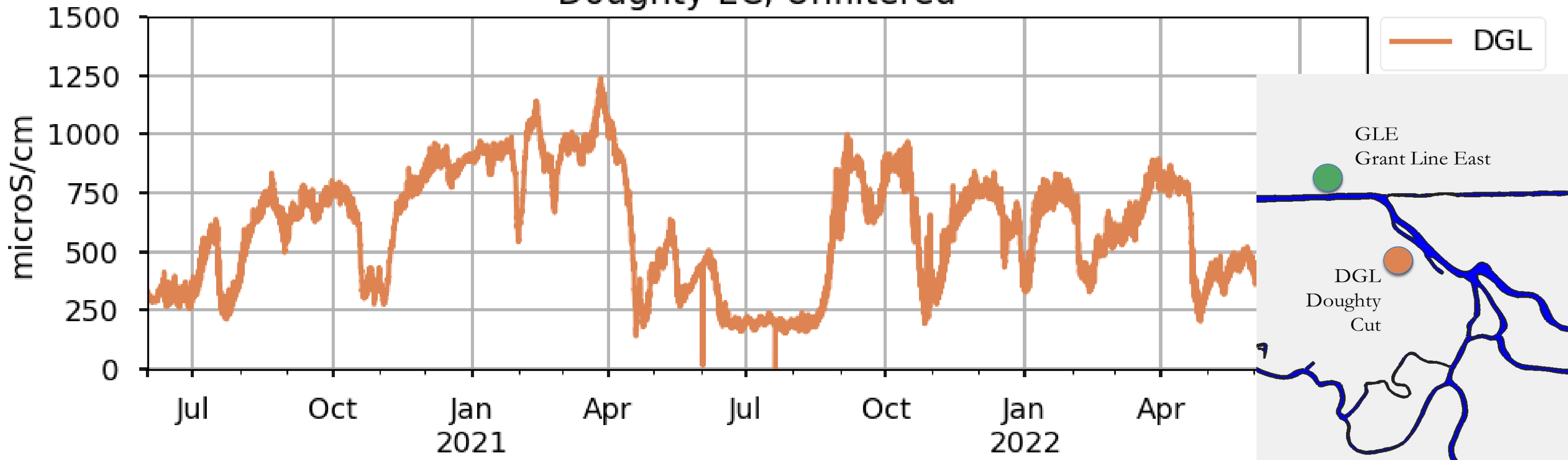
CASE 1: Mean Flow Downstream



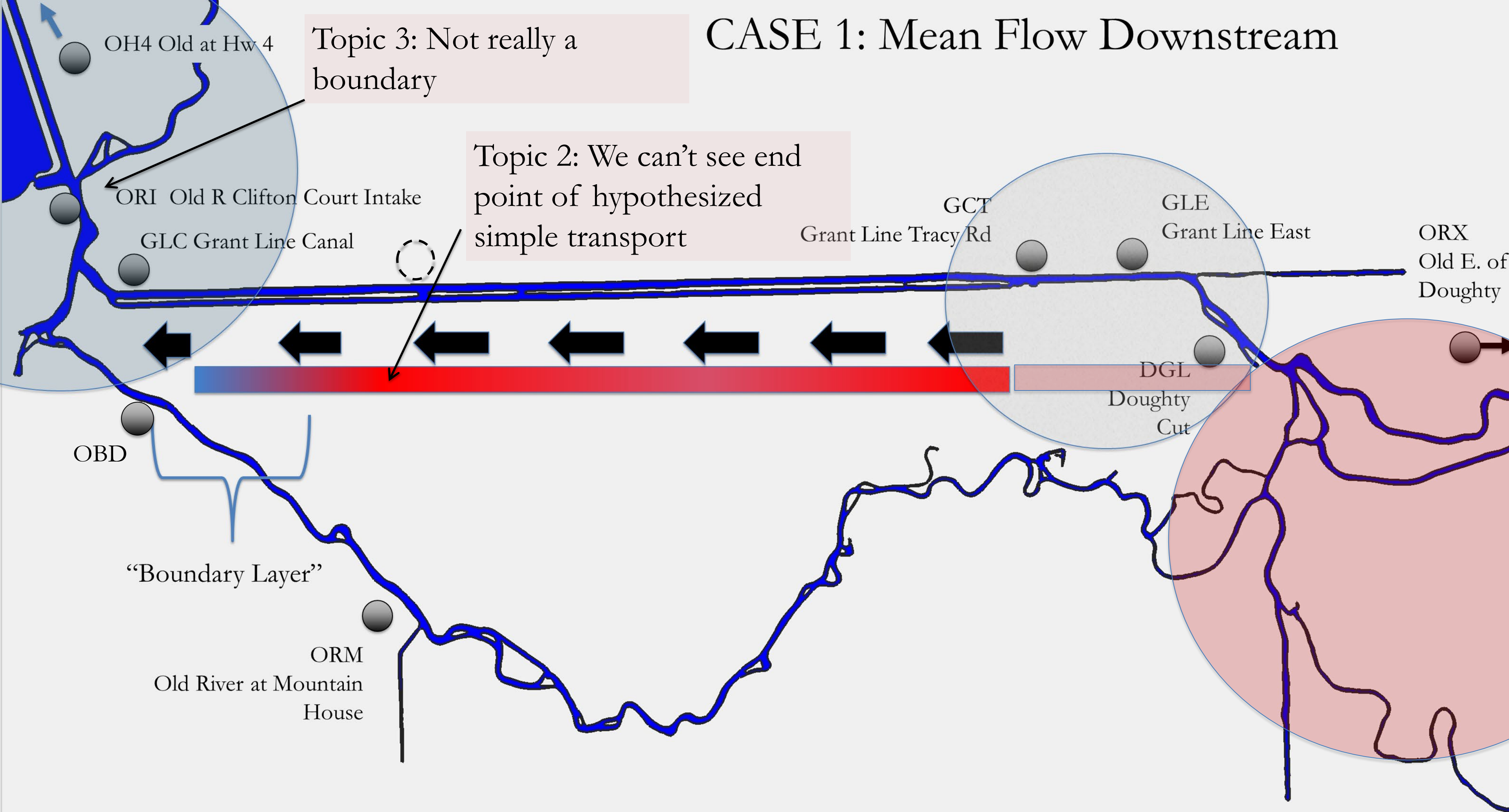
Specific Conductance (EC), Tidally Filtered



Doughty EC, Unfiltered

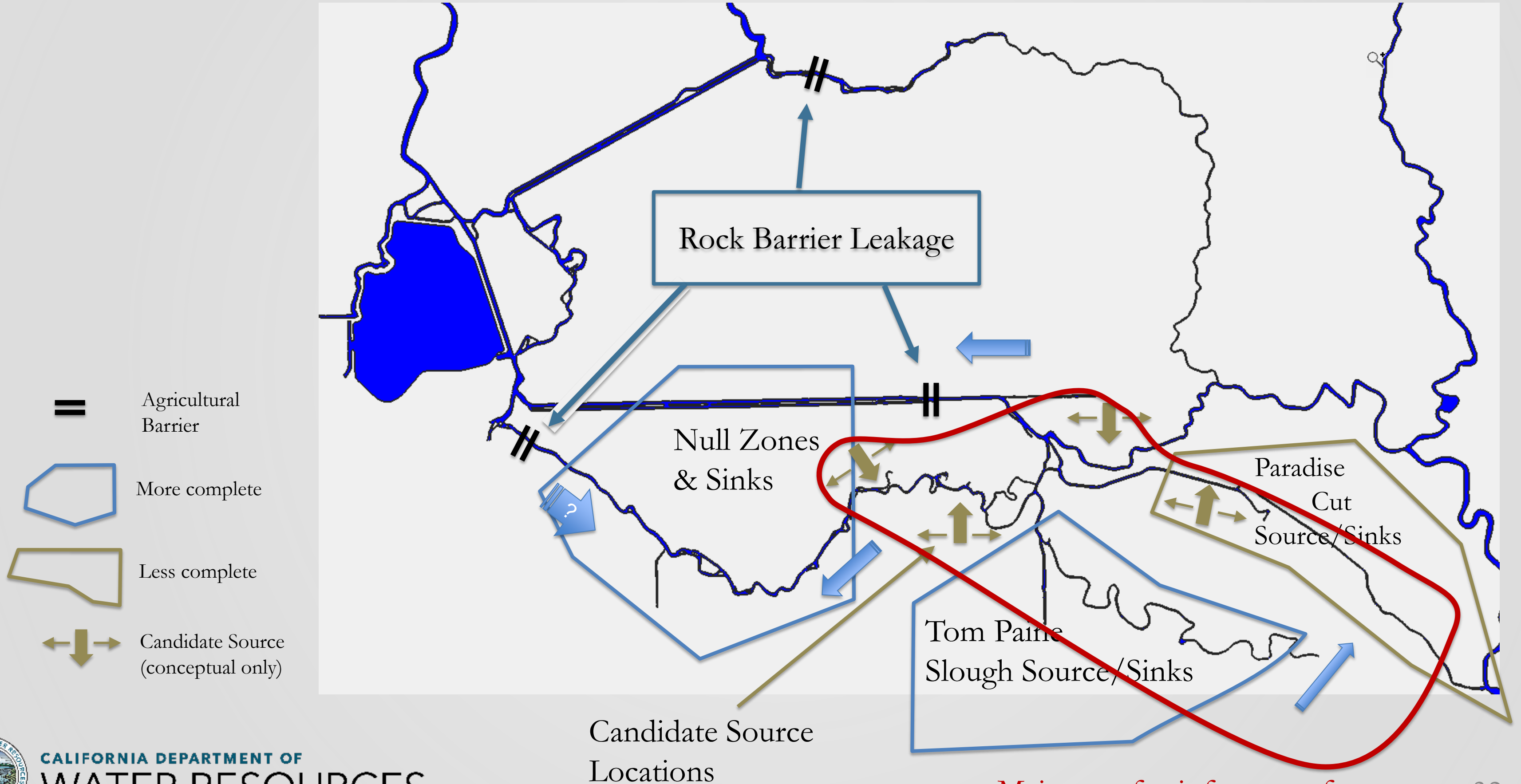


CASE 1: Mean Flow Downstream



SUMMARY AND IMPLICATIONS

Major Assumptions



Now What? Implications & Next Steps

- Good enough to begin data assimilation and SCHISM
- Thin margins of mean flow control water quality
 - Hope! Use this property
 - Tradeoffs
- EC over the “reach” is a real thing
 - Additional monitoring station on Grant Line



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