CALIFORNIA DEPARTMENT OF WATER RESOURCES

Monitoring Special Study

Draft MSS Plan, May 17, 2022

Bill McLaughlin, P.E., Supervising Engineer

Agenda

1. Welcome & Overview
2. Draft MSS Overview
3. Technical Presentations
   - High-Speed Salinity Transect Mapping
   - Salinity Point Source and Ion Sampling
   - SCHISM 3D Hydrodynamic and Water Quality Modeling
   - Water Quality Data Assimilation Modeling
4. COP and MSS: Explanation of the separation of the COP and the MSS
5. Closing & Next Steps

Stakeholder Meeting #3 Goals

- ✓ Present an overview of the draft MSS and each technical study (draft MSS)
- ✓ Describe how the draft MSS has been informed by 2021 data collection, research, and stakeholder input
- ✓ Provide the opportunity for participants to ask clarifying questions to inform their written comments

Ground Rules & Logistics

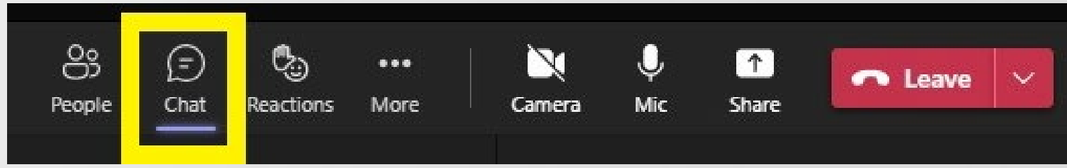
This meeting is focused on providing information on the Draft MSS and answering clarifying questions

Initial comments may be provided during the meeting, but we ask that all comments are provided in writing following the meeting

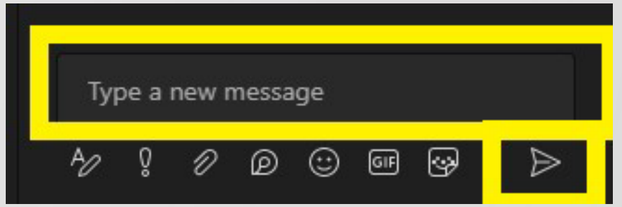
If you have a question or clarifying comment:

- Type it in the **Chat** box:

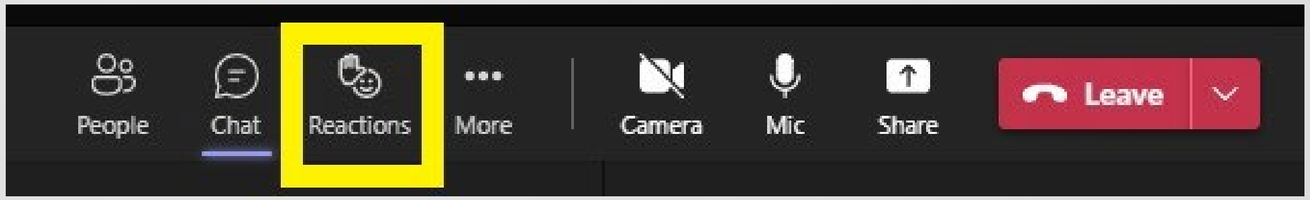
  1st, click "Chat" in the upper right of your screen



  2nd type in the chat box that opens on the right & hit "Send"



- OR, ‘Raise your hand’ to speak. Commenters will be called on in the order in which they ‘raise their hands’



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- Click on “More”
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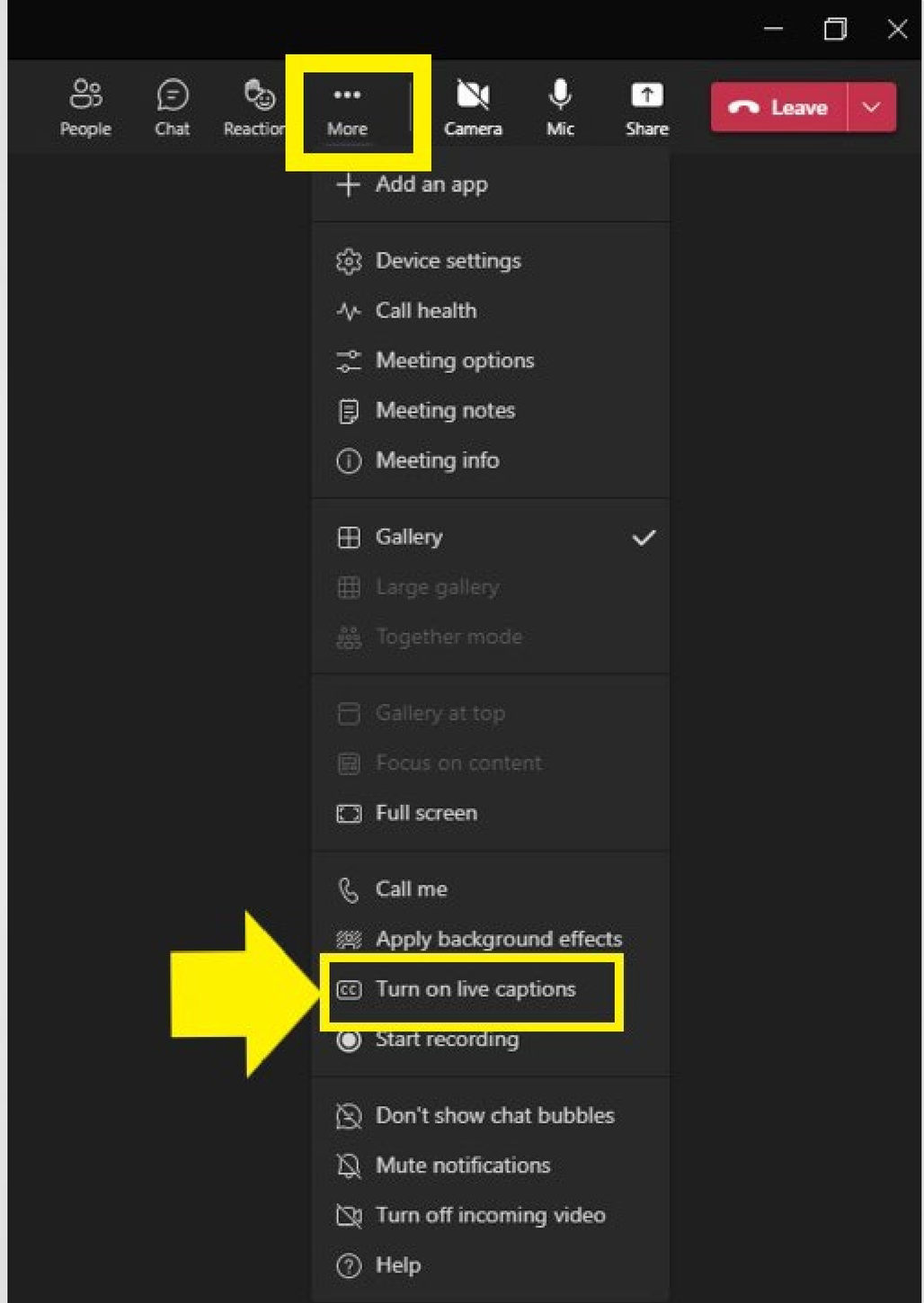

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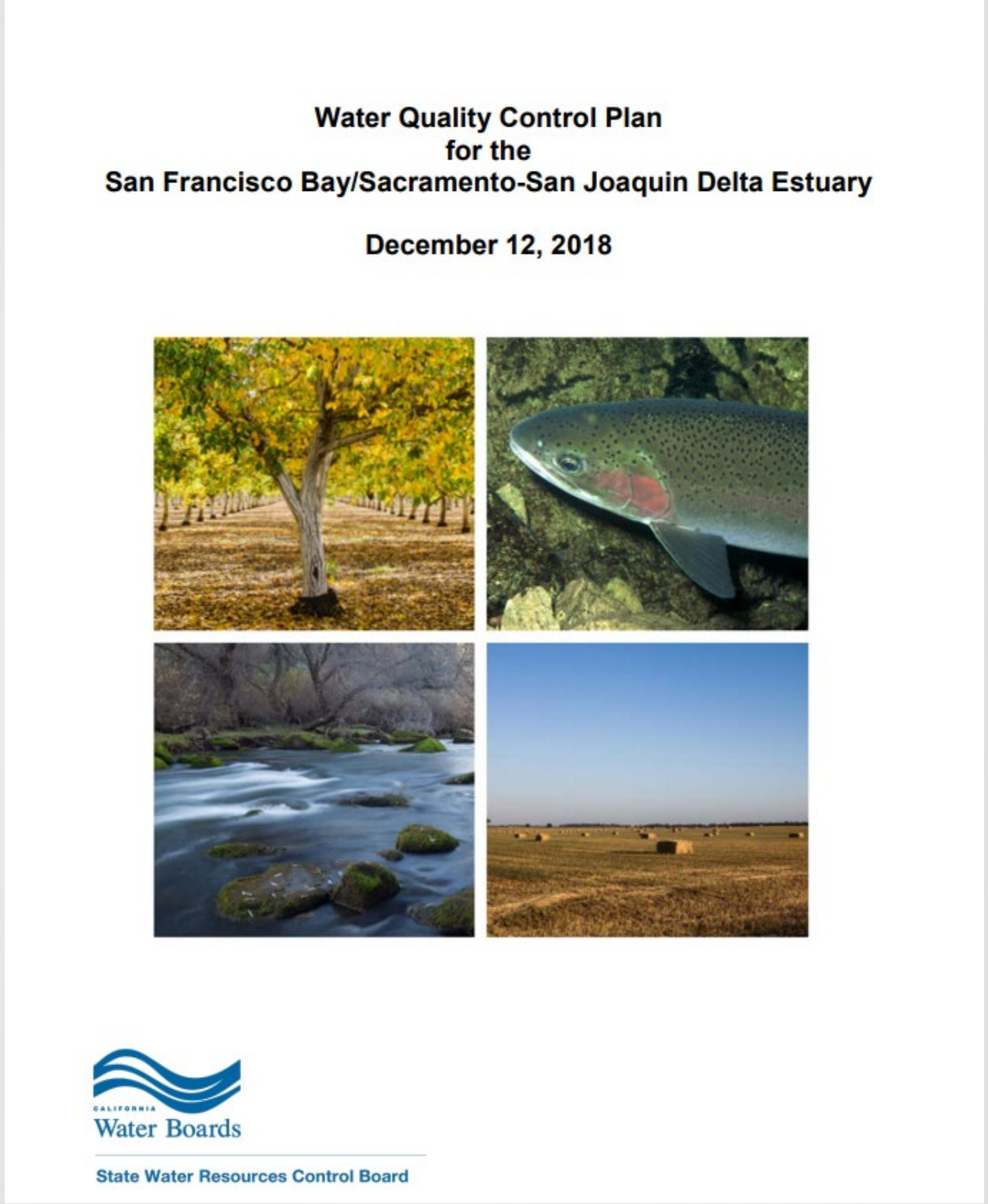
MSS Overview and Background

- 2018 Bay-Delta Plan amendment requires preparation of a Monitoring Special Study (MSS)
- 2021 data collection, research, initial modeling and stakeholder input used to develop the draft MSS
- DWR and USBR plan to conduct 4 or 5* technical studies in the MSS
    1. High-Speed Salinity Transect Mapping
    2. Salinity Point Source and Ion Sampling
    3. SCHISM 3D Hydrodynamic and Water Quality Modeling
    4. Water Quality Data Assimilation Modeling
    5.* Paradise Cut Flushing Study – if hydrology permits



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MSS Goals and Objectives

MSS Goals (page 1)

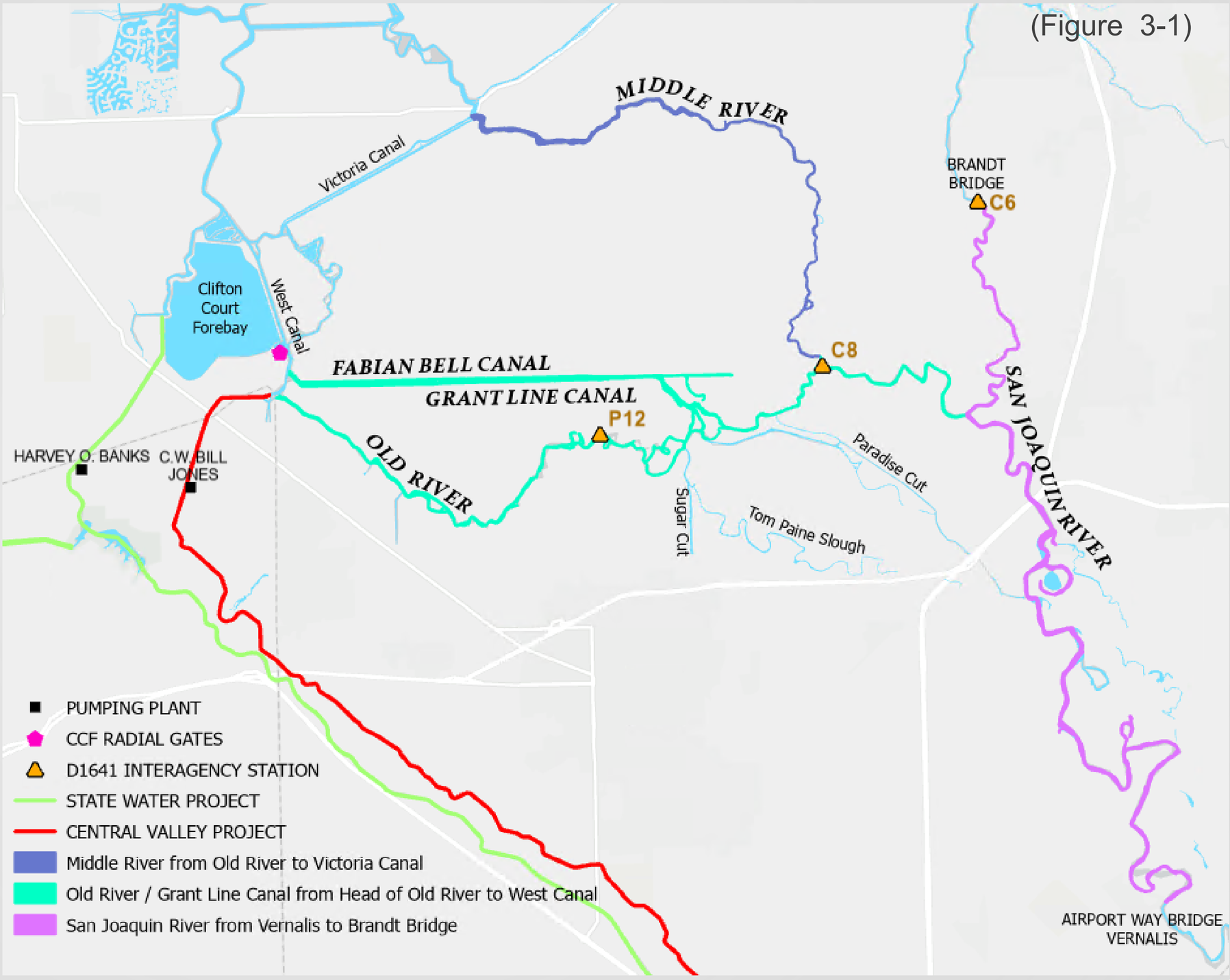
1. Characterize the spatial and temporal distribution and associated dynamics of water level, flow, and salinity conditions in the southern Delta waterways
2. Identify the extent of low or null flow conditions and any associated concentration of local salt discharges
3. Inform the development of a Long-Term Monitoring and Reporting Plan that will:
    a) Assess attainment of the salinity objective in the interior southern Delta that includes monitoring locations in, or monitoring protocols for, the three river segments that comprise the interior southern delta salinity compliance locations.

MSS Objectives (page 1-2)

1. Better understand salinity, flow, and stage conditions in the interior southern Delta, including data collection and/or analysis of:
    a) Flow and salinity levels measured at and downstream of Vernalis
    b) A range of interior southern Delta export pumping scenarios at C.W. Jones Pumping Plant and H.O. Banks Pumping Plant
    c) Flows during and after temporary agricultural barrier season
    d) Interior southern delta processes (i.e., land use patterns, measurement of agricultural and municipal flow and EC)
2. Assess if existing compliance stations are representative of river segments in the interior southern Delta

Draft MSS Study Area

(Figure 3-1)



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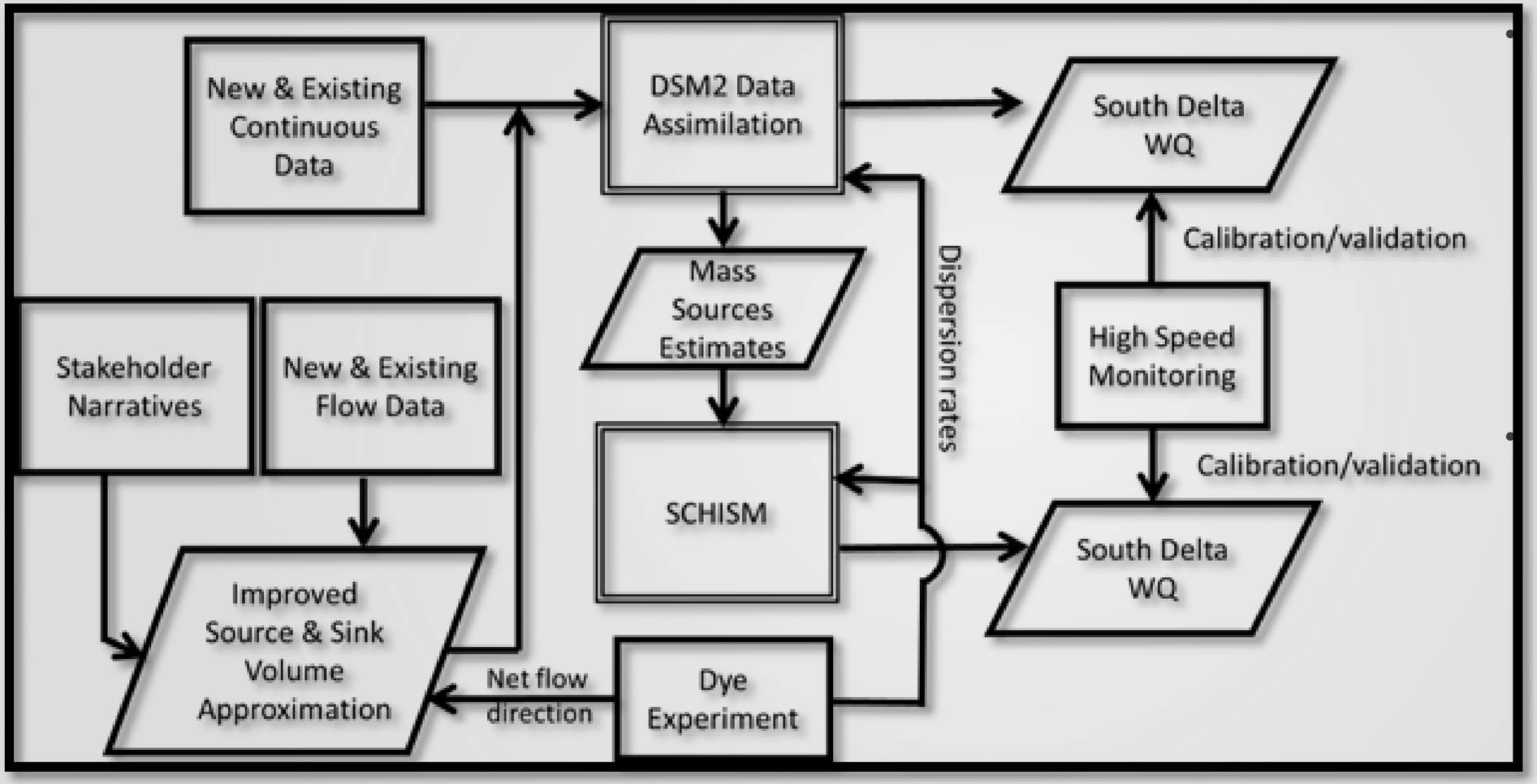
MSS Monitoring & Modeling Effort Flow Chart



(Figure 4-1)

Data collection and modeling will be iterative, data collection will be used to improve modeling and early modeling to identify additional data needs.

"New and Existing Continuous Data" includes but is not limited to data collected from the Salinity Point Source and Ion Sampling Study

Estimated MSS Schedule (Table 6-1)

Task Number	Task Description	Estimated Task Delivery Schedule	Responsible Organizations/Individuals
1	Historical Data Analysis	January 2021 – December 2021	DWR Water Quality Evaluation Section, and DWR Bay-Delta Office
2	Additional Data Collection	July 2021 – December 2023	DWR Water Quality Evaluation Section, and DWR Flow and Special Studies Section
3	Modeling South Delta Salinity Conditions	July 2021 – December 2023	DWR Bay-Delta Office
4	Engagement with Participating Agencies	January 2021 – December 2024 (Quarterly or more frequent if needed)	MSS Team and Meeting Facilitator
5	Technical Studies Drafting	January 2024 – June 2024	Technical Study Leads
6	MSS Final Report Preparation	July 2024 – December 2024	Project Manager

QUESTIONS OR COMMENTS?

Raise your hand or type in the chat

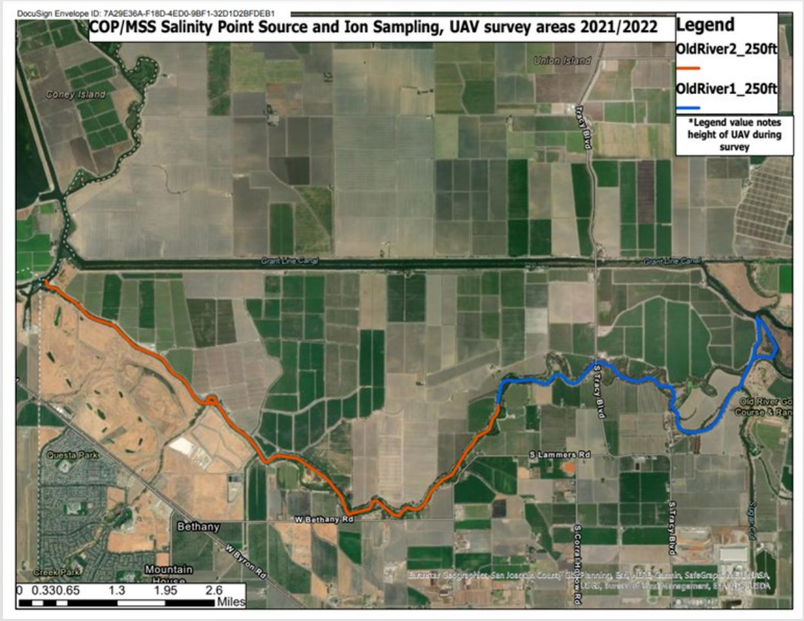
State your name and affiliation

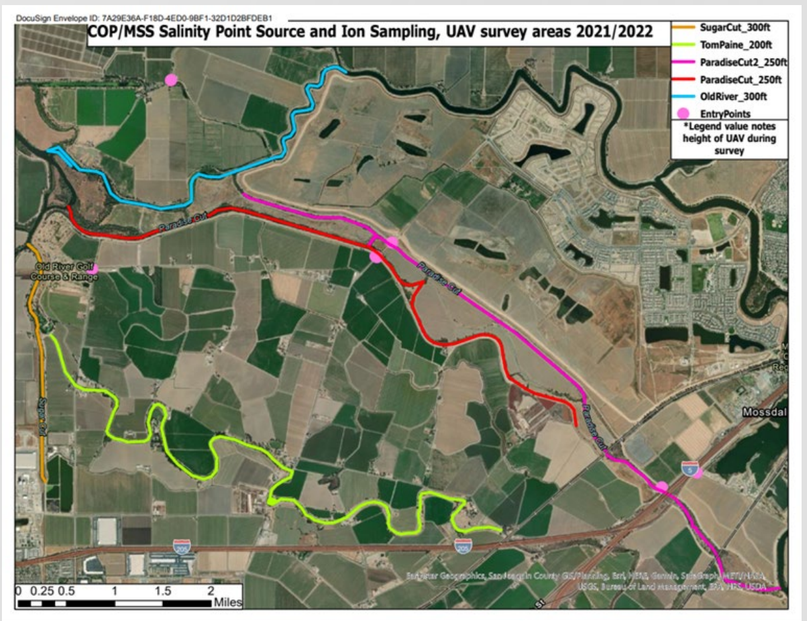
Salinity Point Source and Ion Sampling

Study Plan Updates:

1. ***Drone Imagery***
2. *Continuous EC Monitoring*
3. *Ion Sampling*
4. *Rhodamine Dye Tracer Monitoring*
5. *Pescadero Tract Circulation*

**2 Flights Completed – Nov. 2021 & Apr/May 2022





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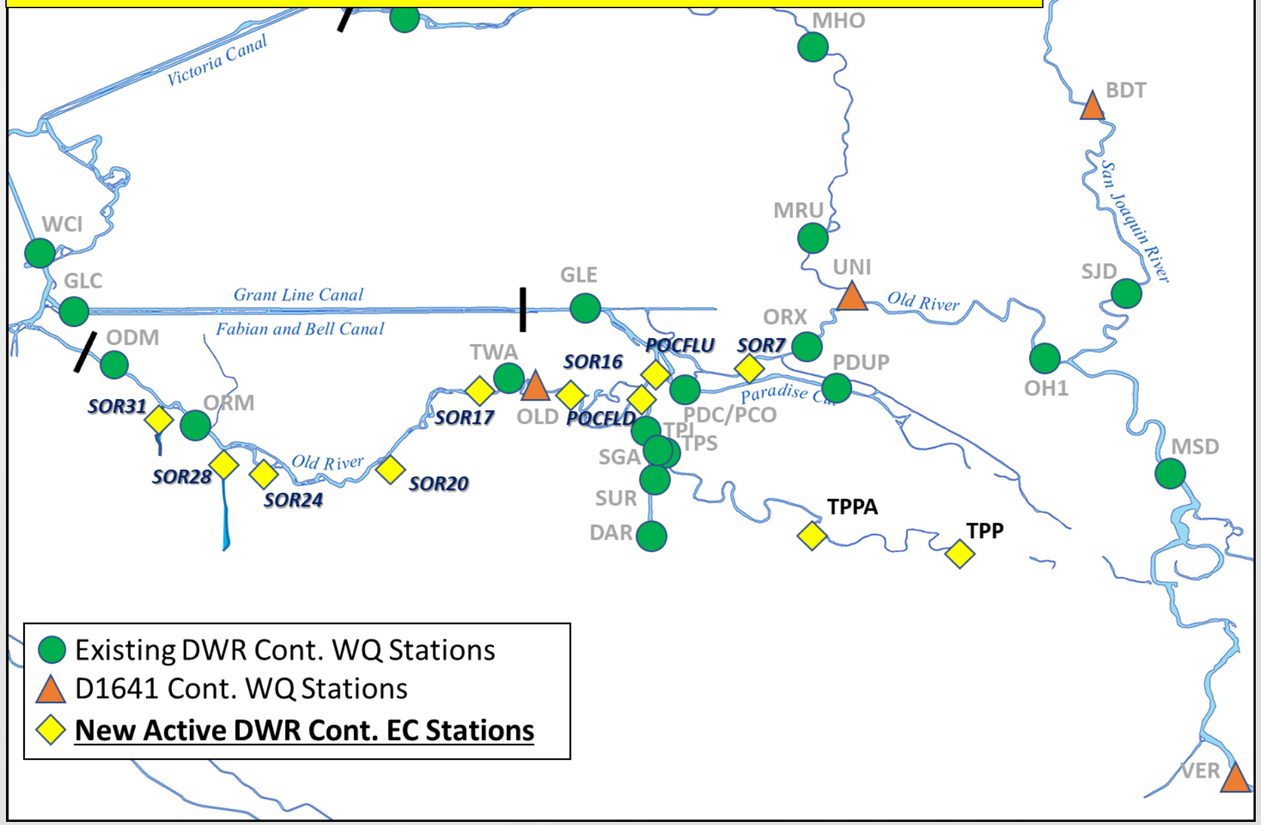
Study Plan Updates:

1. Drone Imagery
2. **Continuous EC Monitoring**
3. Ion Sampling
4. Rhodamine Dye Tracer Monitoring
5. Pescadero Tract Circulation

****11 New Continuous EC Monitoring Stations**
Most Stations Active as of January 2022



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U.S. DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION

Study Plan Updates:

1. Drone Imagery
2. Continuous EC Monitoring
3. ***Ion Sampling***
4. Rhodamine Dye Tracer Monitoring
5. Pescadero Tract Circulation

**Ion Sample Collection During High-Speed EC Transects

**5 New Ion Monitoring Stations
Most Stations Active as of January 2022

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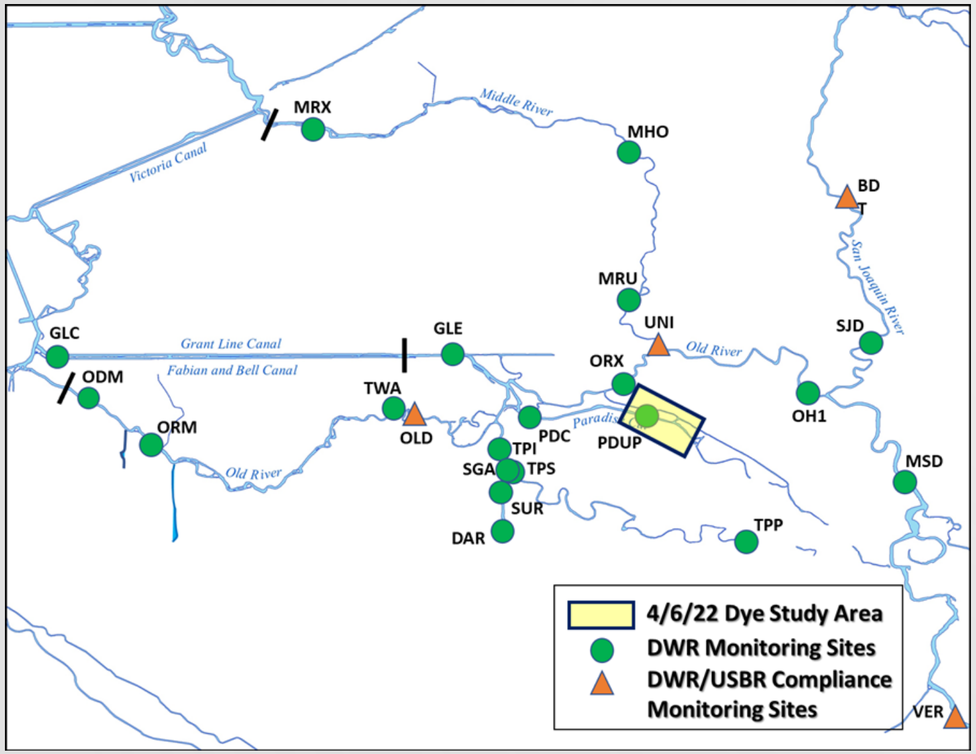
Study Plan Updates:

1. Drone Imagery
2. Continuous EC Monitoring
3. Ion Sampling
4. **Rhodamine Dye Tracer Monitoring**
5. **Pescadero Tract Circulation**

****Completed 1st Dye Tracer Injection on April 5th – 8th 2022**



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QUESTIONS OR COMMENTS?

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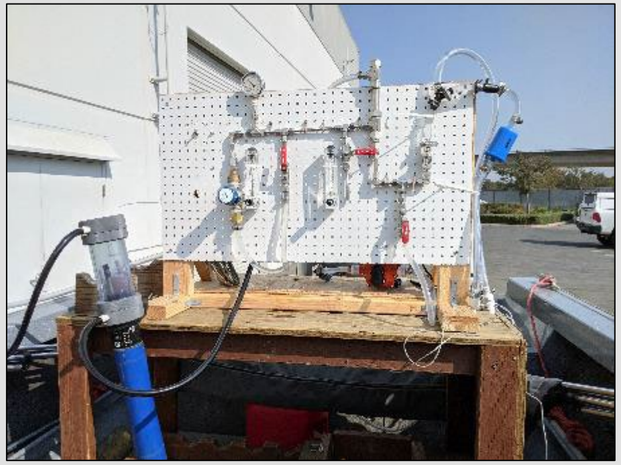
High-Speed Salinity Transect Mapping

Study Plan Update:

- Route 1 – Fabian Tract Perimeter
- Route 2 – Old R Head to DMC Barrier
- Route 3 – 5-Point Confluence
- Route 4 – SJR Brandt Bridge to Vernalis



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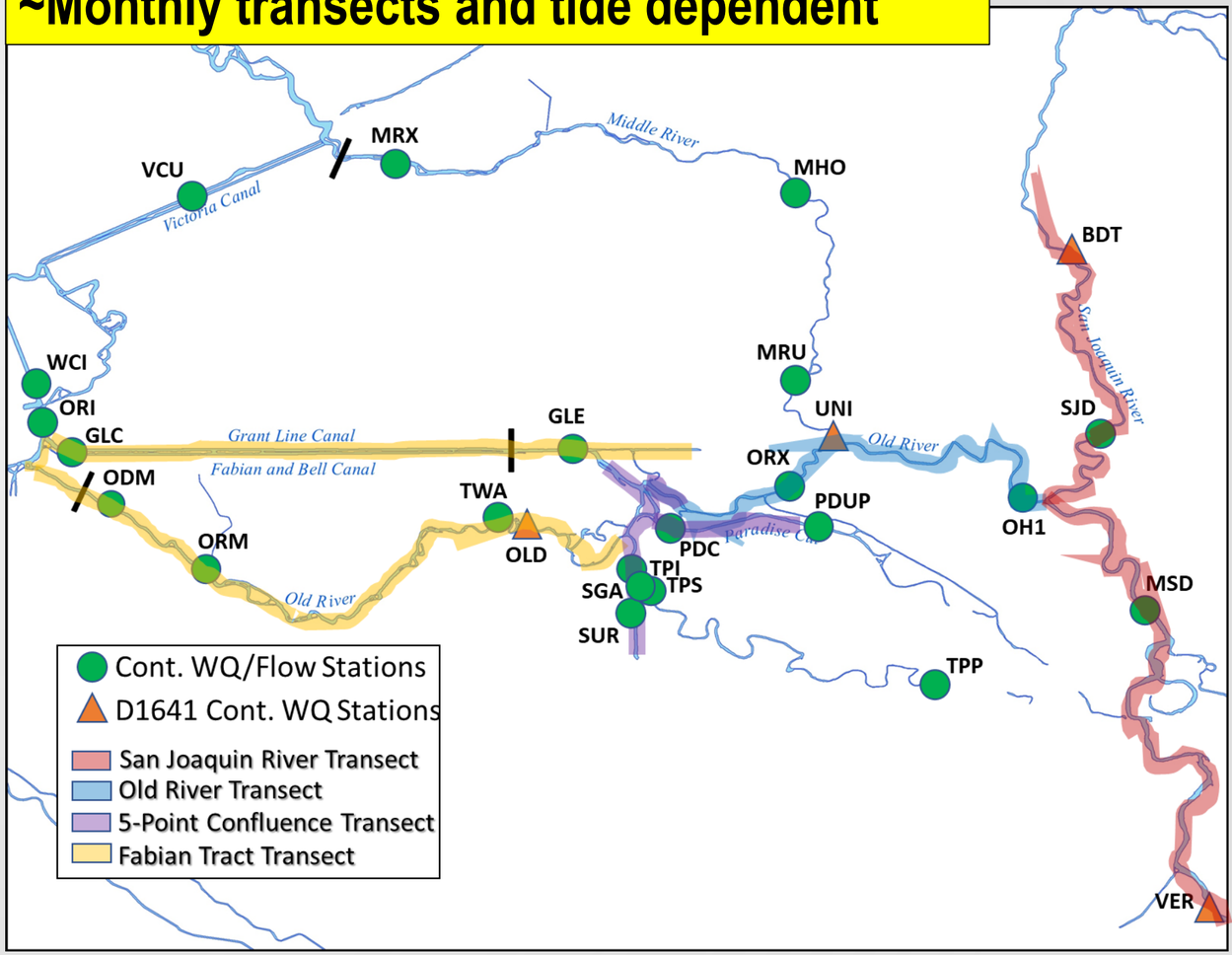
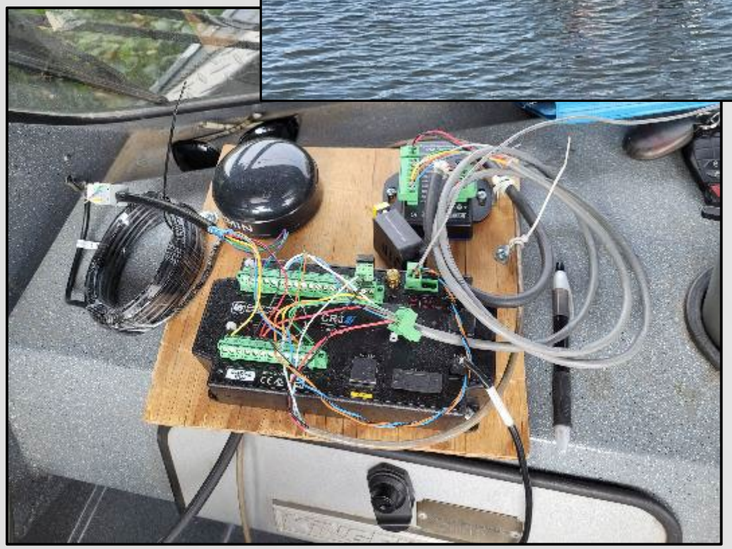
**Organized into 4 different transect routes
~Monthly transects and tide dependent

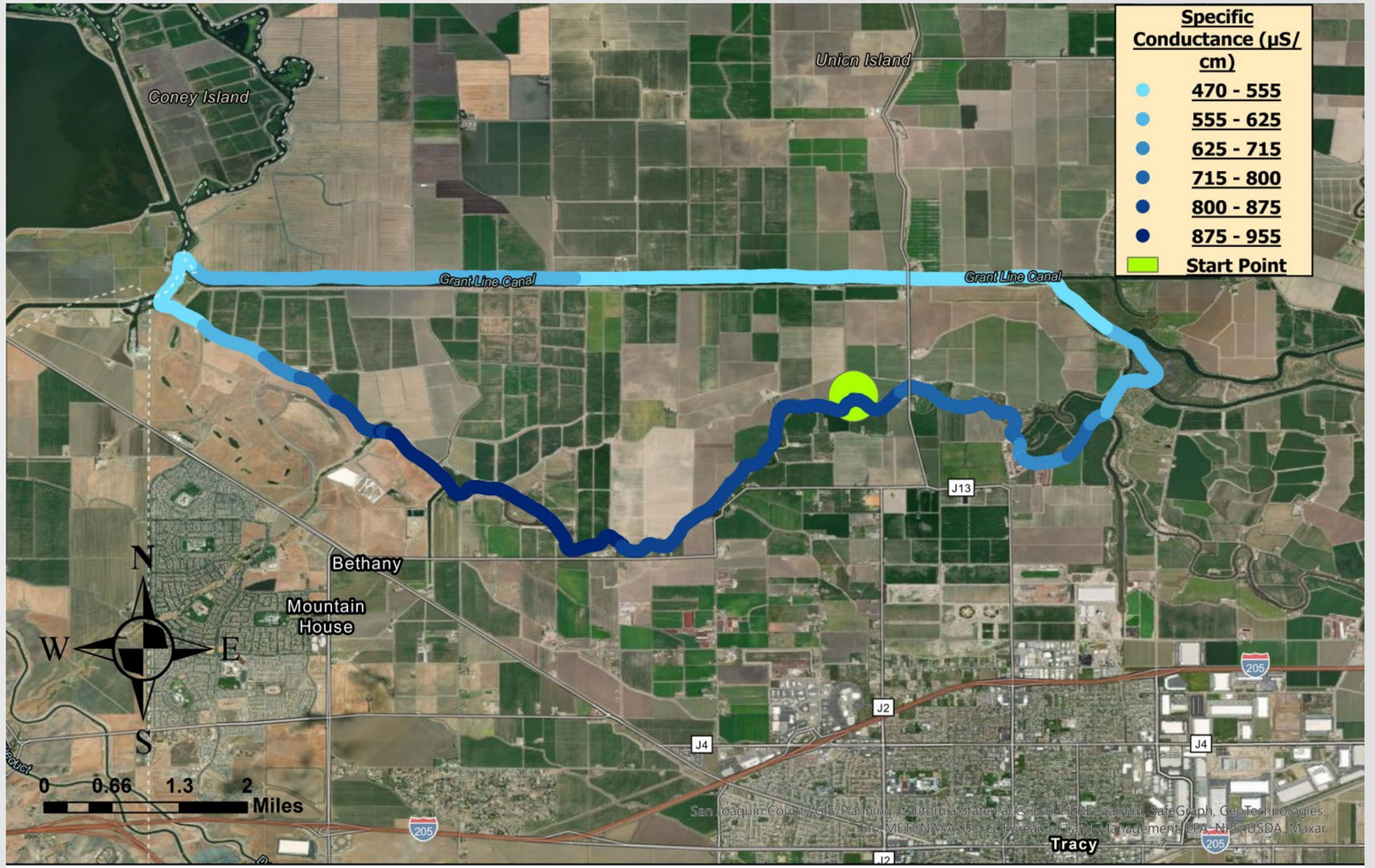


Study Plan Update:

- **Route 1 – Fabian Tract**

****Completed 8 High-Speed Mapping Transects 9/2/21, 9/29/21, 10/16/21, 11/16/21, 12/29/21, 1/27/22, 3/2/22, 3/31/22**





Fabian Tract Transect 3/2/22

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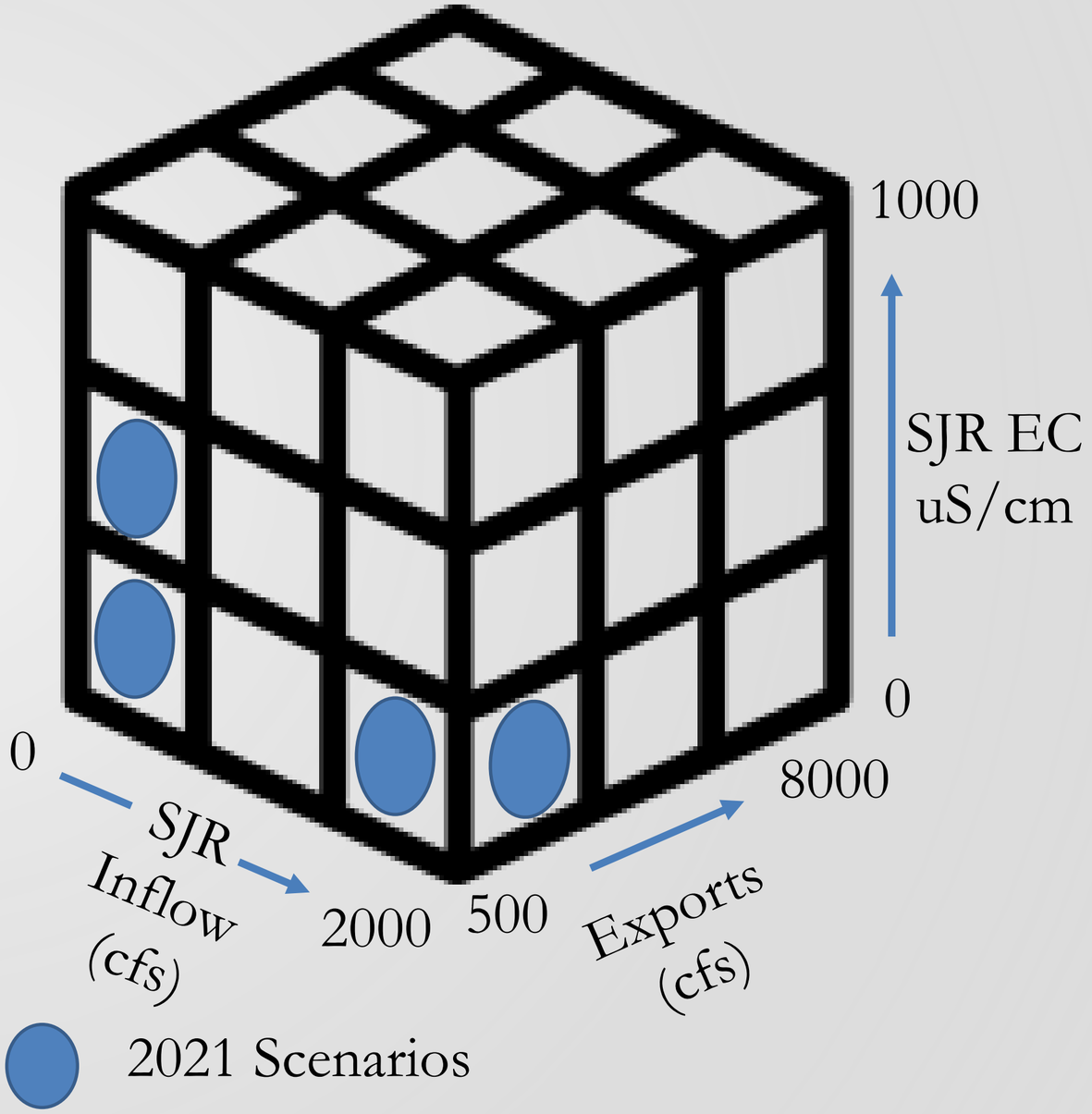
Bay-Delta SCHISM Intro for South Delta Special Studies

May 2022

Eli Ateljevich, P.E., PhD

Goal: South Delta Study Plan

- Vary:
  - SJR Inflow
  - SJR EC
  - Exports
- By perturbing sample recent years
  - e.g., 2021



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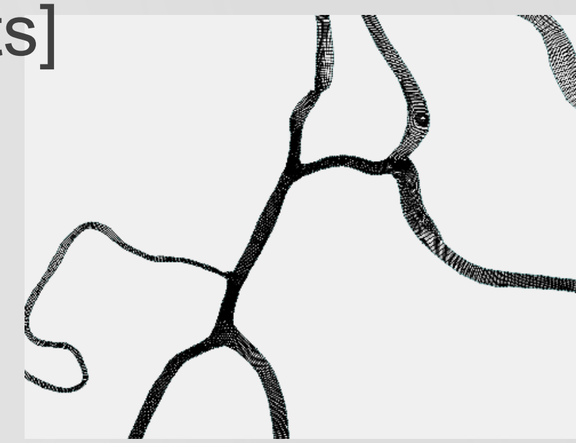
SCHISM South Delta Enhancement

- Utilize data assimilation estimates of sources + new data
- Incorporate/commission bathymetry [collected, to processing]
- Recalibrate barriers and structures [Old R Tracy culverts]
- Validate in region for recent years (2019 – 2022)
- Synthesize work on null zones, dye studies [ongoing]
- Higher resolution grid
  - Resolve channels in high dispersion areas
  - Improve mapping of aquatic vegetation [UCD, 2023]
- Realtime capability by end of MSS (DSM2 w/assimilation + SCHISM)



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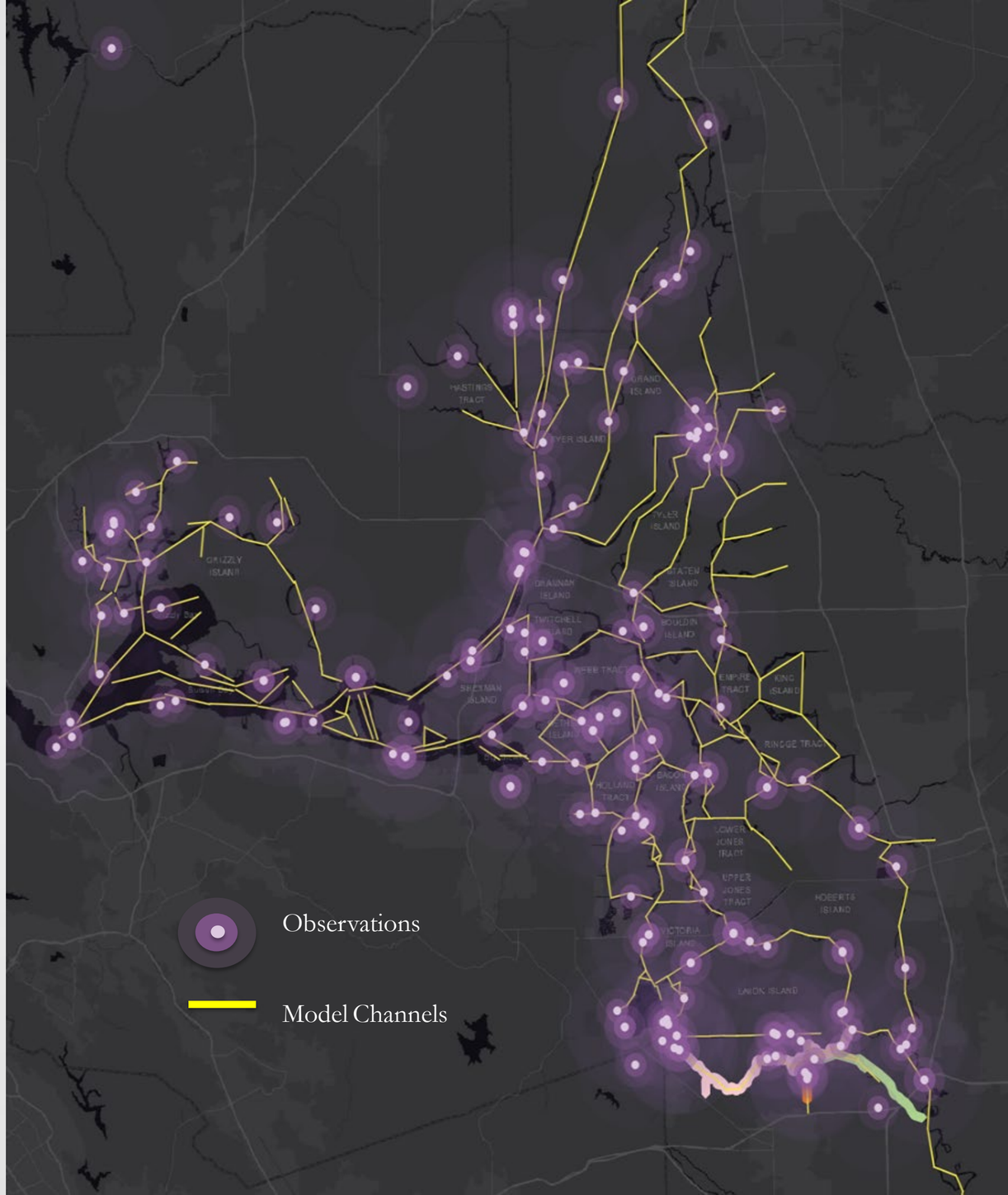
Water Quality Data Assimilation

- Benefit
  - Best available science for inferring data
    - Especially in 2021
  - Identify gaps and improve monitoring

- Stakeholder Engagement
  - Convert assimilation to observation
  - Concerns about liability



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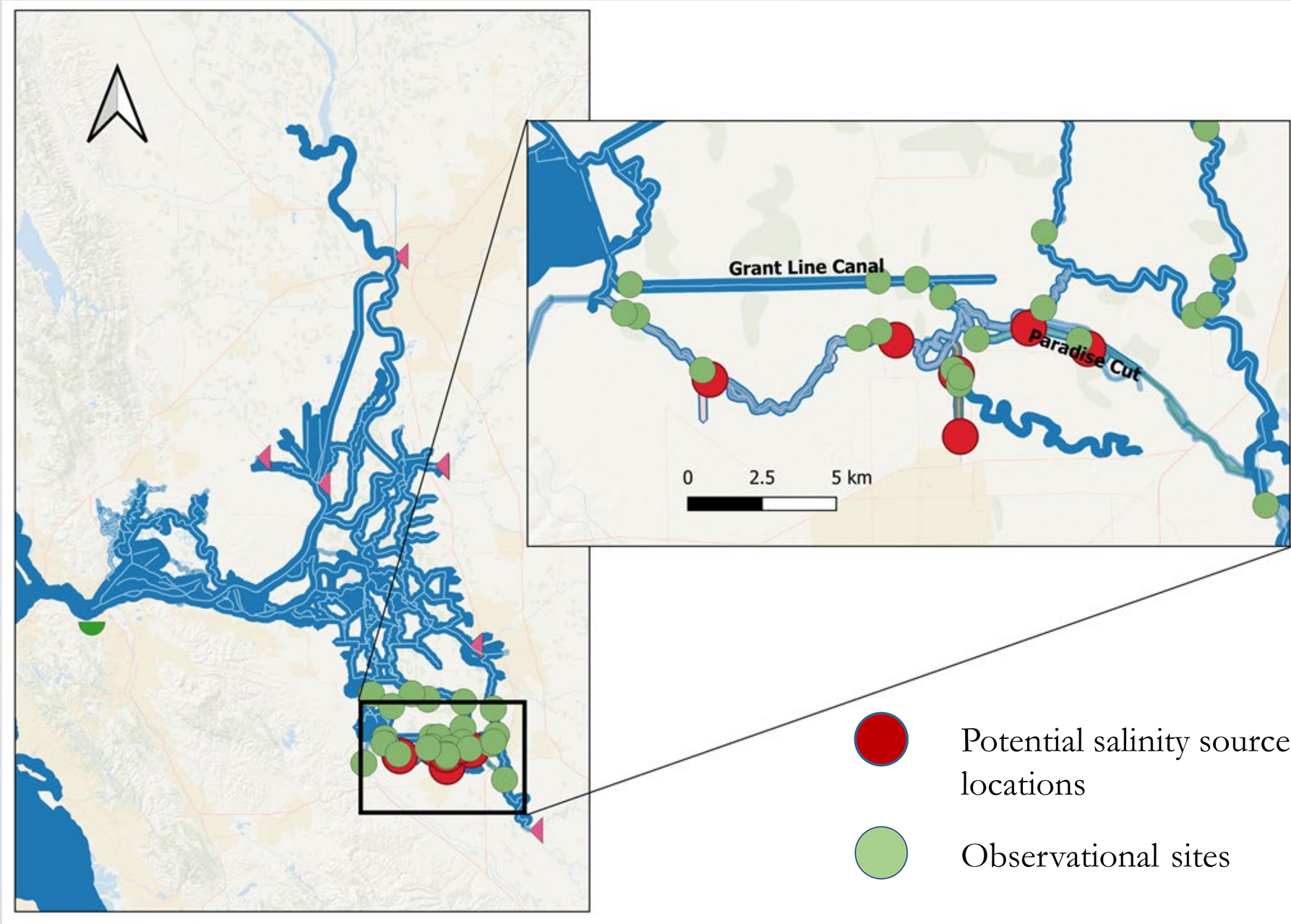
Inferring EC sources



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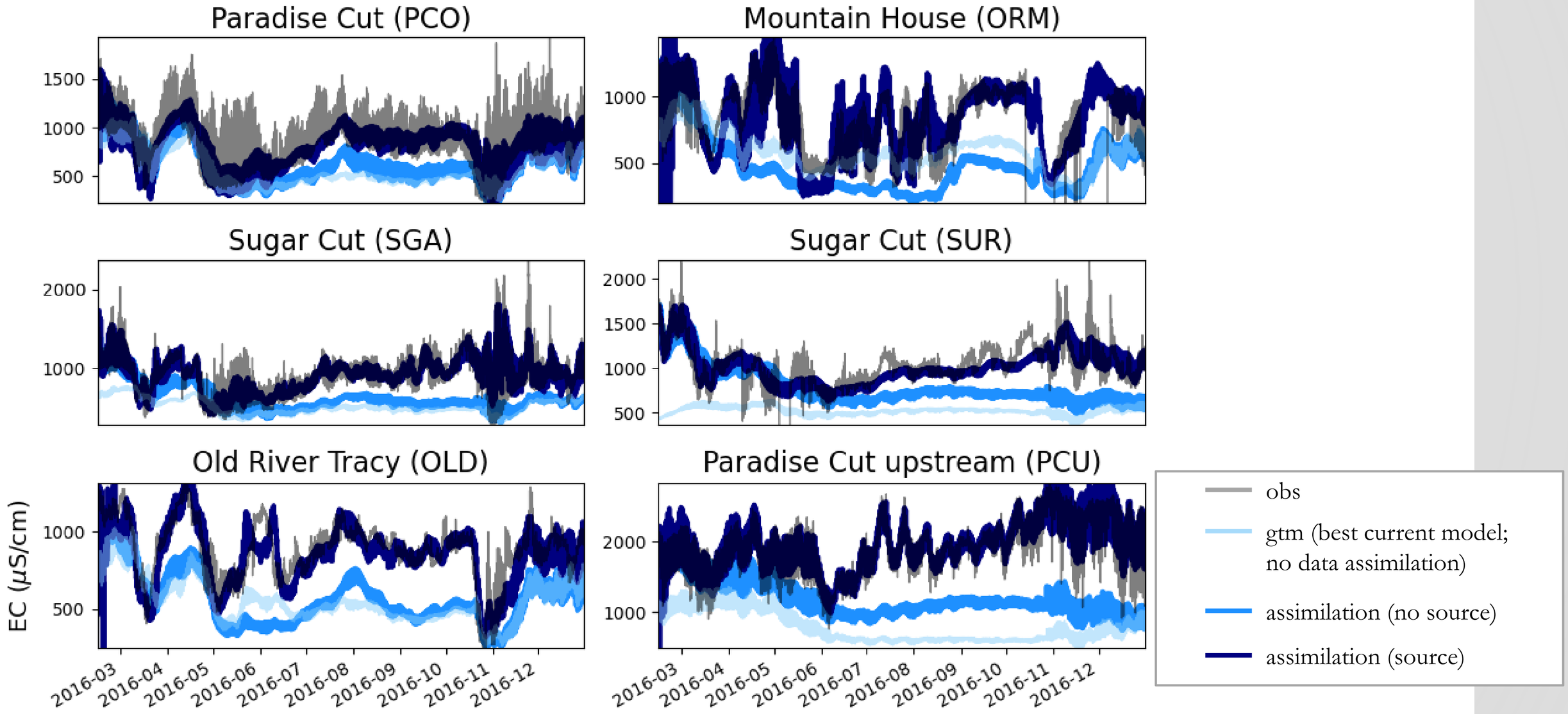
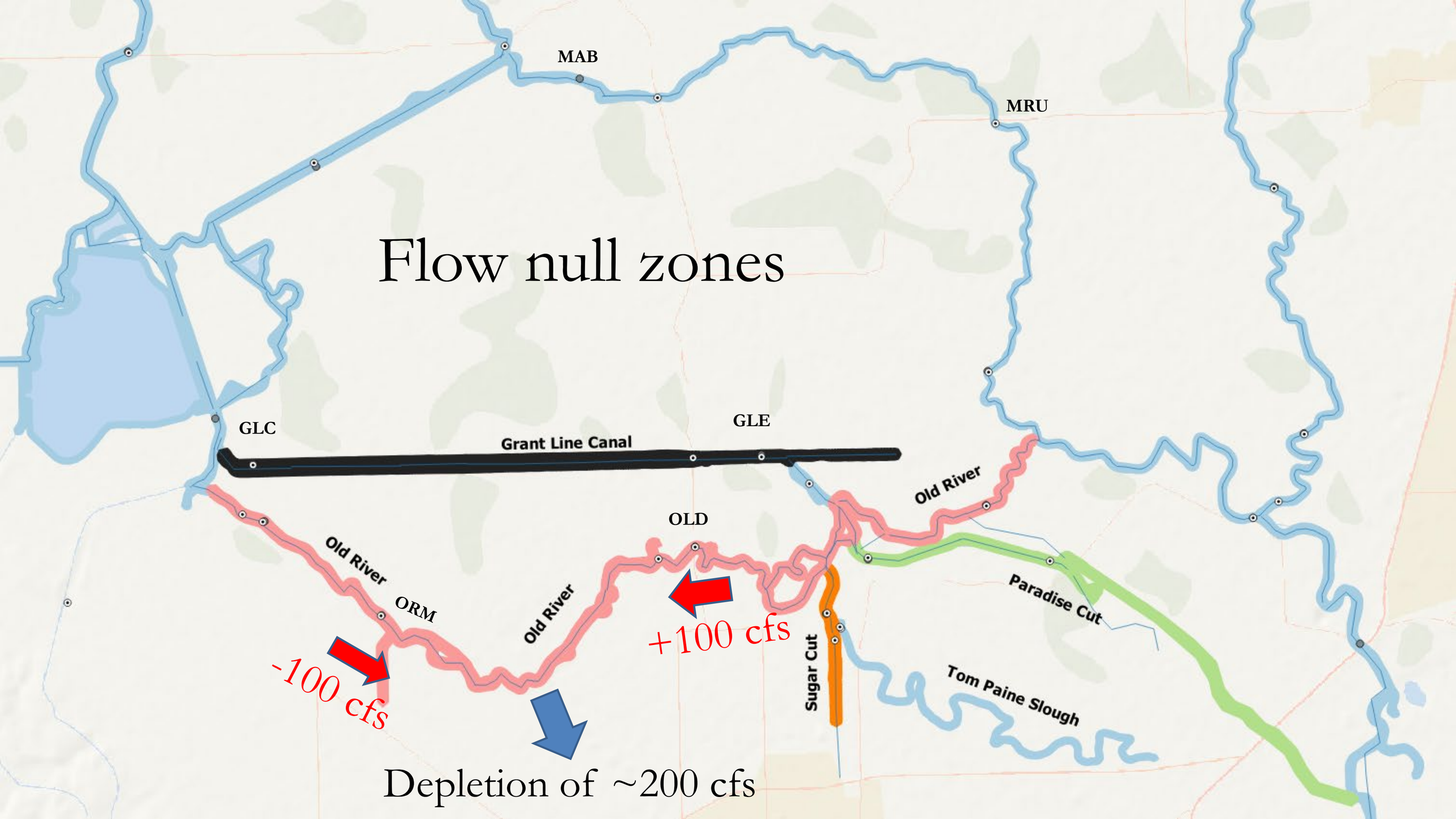
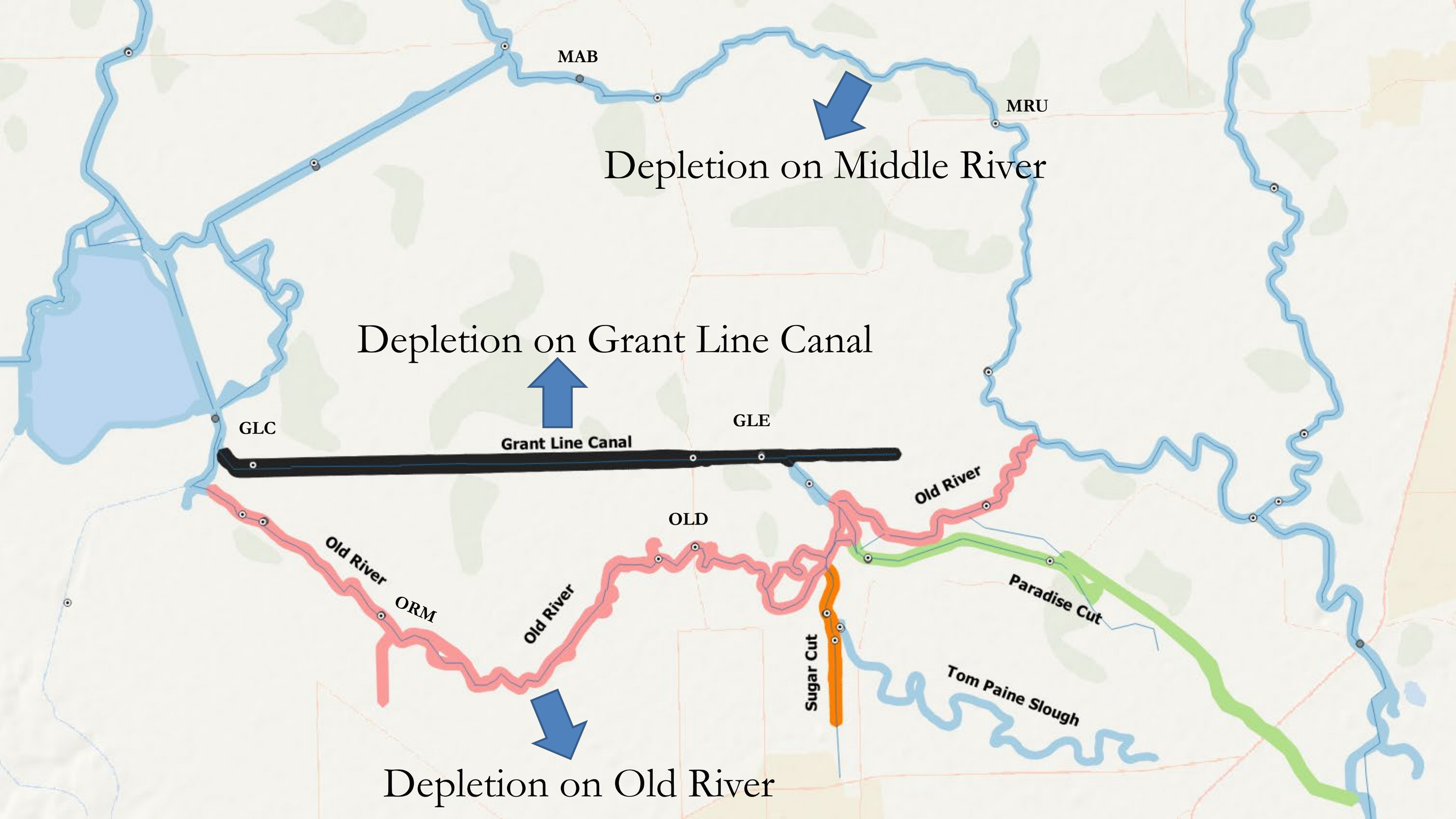
Observed vs. Modeled EC



Accomplishments and on-going improvements

- A good 2016 proof-of-concept run
- Provide best available sources for DSM2+SCHISM for studying inflows and exports (2016-2022) [ongoing]
- Better flow conceptual model
  - **null zones** on Old, Middle and Grantline
  - Continual improvement of flow gauge ratings
  - Redistribute sources/sinks to correspond to Pescadero circulation
  - Lessons from dye study
- Improve consistency between inferred sources and existing Delta Channel Depletion model


MAB
MRU
Flow null zones
GLC
GLE
Grant Line Canal
Old River
OLD
Old River
ORM
Old River
+100 cfs
-100 cfs
Paradise Cut
Sugar Cut
Tom Paine Slough
Depletion of ~200 cfs


MAB
MRU
Depletion on Middle River
Depletion on Grant Line Canal
GLC
GLE
Grant Line Canal
Old River
OLD
Old River
ORM
Old River
Paradise Cut
Sugar Cut
Tom Paine Slough
Depletion on Old River

Pescadero circulation pattern

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COP and MSS

- Last draft of COP included MSS as a chapter
- May have caused confusion between COP and MSS requirements
- COP requirements include:
  - Describe actions that address impacts of SWP and CVP export operations on flow/stage that affect salinity
    - Including assimilative capacity for local sources of salinity
  - Details of facilities and operations in the Plan
  - ID performance goals for the facilities
- State Board has directed DWR and USBR that the two documents be separated

MSS Comments & Next Steps

Draft MSS Plan:

- Comments due by May 27, 2022
- Send comments to Ibraheem Alsufi at Ibraheem.Alsufi@water.ca.gov

We appreciate your comments and look forward to continued collaboration during implementation of these studies

Next steps:

- Compile and respond to comments
- Finalize MSS
- Submit final MSS Plan to the Board
- Continued stakeholder and/or technical work group meetings – TBD
- Updates to the DWR Website

QUESTIONS OR COMMENTS?

Raise your hand or type in the chat

State your name and affiliation

Contacts

Bill McLaughlin, PE
Department of Water Resources
South Delta Branch
William.McLaughlin@water.ca.gov
Phone: (916) 902-9899

Ibraheem Alsufi
Department of Water Resources
South Delta Branch
Ibraheem.Alsufi@water.ca.gov
Phone: 916-902-9903

Grace Windler, PhD
U.S. Bureau of Reclamation
Regional Water Quality Coordinator
Interior Region 10 - California-Great Basin
Gwindler@usbr.gov
Phone: (916) 978-5088

Erika Britney, PMP
ICF
Erika.Britney@icf.com
Phone: (206) 801-2802

Website

The website is currently down for maintenance. Contact Ibraheem Alsufi if you need access to any documents.

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