

STATE BOARD MONITORING SPECIAL STUDY
Public Coordination Meeting #5
October 3, 2023
9:00 am – 11:00 am

MEETING NOTES

Attendees (listed alphabetically)

In Person

- Eli Ateljevich/DWR
- Erika Britney/ICF
- Tom Burke/Hydrologic Systems
- Amanda Maquire/DWR
- Bill McLaughlin/DWR
- Jenna O’Neill/ICF
- Nicky Sandhu/DWR
- Patrick Scott/DWR
- Teresa Trinh/DWR
- Grace Windler/USBR
- Zhenlin Zhang/DWR

Via Teams

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| <ul style="list-style-type: none">▪ Amy Aufdemberge/USBR▪ Bryan Barnhart/DWR▪ Manny Bahia/State Water Contractors▪ Tom Boardman/Westlands Water District▪ Ching-Fu Chang/Contra Costa Water District▪ David Colvin/DWR▪ Janis Cooke/CVRWQCB▪ Jared Frantzich/DWR▪ Jelena Hartman/ State Water Resources Control Board▪ Anna Hegedus/DWR | <ul style="list-style-type: none">▪ Tracy Hinojosa/DWR▪ Dave Huston/DWR▪ Hans Kim/DWR▪ Liz Kiteck/USBR▪ Michelle Leinfelder-Miles/UC Extension▪ Shawn Mayr/DWR▪ Jacob McQuirk/DWR▪ Karen Morgan/Mountain House CSD▪ Nader Shareghi/Mountain House CSD▪ Jane Tannous/DWR▪ Karen Tolentino/DWR▪ Ramona/Captioner |
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Action Items

- Coordinate a small group to review the temporary monitoring stations that will be removed at the end of 2023. Teresa will coordinate with Tom Burke.
- Send out Doodle Poll for December Quarterly Technical Workgroup meeting (12/7, 12/12, 12/14) (ICF).
- Get input from group on topics for next Quarterly Technical Workgroup meeting on data integration in December (Teresa and Zhenlin).

Welcome & Logistics

Teresa Trinh, the new DWR MSS Project Manager, opened the meeting. The purpose of this meeting is to provide updates on the technical studies. This is the first hybrid meeting since the inception of the MSS project, and DWR is excited to be starting to host these meetings in person. Erika Britney went over in-person and virtual logistics and ground rules, explained that the meeting is being transcribed, and thanked everyone for coming.

General MSS Updates

- Teresa Trinh gave an overview of the timeline of the MSS efforts since 2018:



Technical Study Updates

High-Speed Salinity Transect Mapping/Patrick Scott

Key Highlights:

- The salinity mapping efforts are designed to meet the MSS goals and support decision-making.
- 2023 was a very wet year, which impacted our spring and winter transects because we were not able to get out there because of high flows and safety and access concerns.
- The Paradise Weir overtopped consistently from March to late June.
- The high flows allowed us to perform the flushing study in a natural way.
- We are still processing this data, but there are some preliminary results to show (see presentation).
- The goal is to have all datasets available in early January 2024.
- Transect data is now publicly available on the DWR GIS Atlas pages:
 - AGOL Link: <https://www.arcgis.com/home/item.html?id=c2b6fe1bd21d4a86b3052fac01b212f1>
 - Direct Service URL (ArcGIS Pro): https://utility.arcgis.com/usrvcs/servers/c2b6fe1bd21d4a86b3052fac01b212f1/rest/services/InlandWaters/i12_Salinity_Transects_SouthDelta/MapServer
- Many of the temporary monitoring stations will be pulled out by the end of 2023. Some key strategic stations will stay in.

Tom Burke, South Delta Water Agency:

- It looks like there was a high salinity concentration coming into Paradise Cut coming in from one of the side channels (just north of Paradise Cut).
 - *Response* (Patrick Scott): That's very low-flow and we can't get our boat in there. We did walk in a little and take some point samples. We definitely saw a strong enough signal there that it was registering in the main channel.
 - *Response* (Tom Burke): When you say you're picking it up in the main channel, do you think it's seepage coming through that is not directly connected?

- *Response* (Patrick Scott): Stewart Tract has a drainage that runs through the whole tract and then has a drainage into that channel. When it's an outgoing tide, it seems to be pulling it into the main channel. It's been blocked there for quite a while.

Parviz Nader-Tehrani, via chat:

- What was the salinity in Old River between Wicklund Cut and State Channel (Clifton Court Forebay)?
 - *Response*: The salinity remained low in that area during that time period.

Nicky Sandhu, DWR:

- Are these fixed or temporary stations?
 - *Response* (Patrick Scott): We are planning on pulling many of the temporary stations out at the end of this year, and keeping some strategic locations.

Tom Burke, South Delta Water Agency:

- Can we see some of that data before you pull those stations? We may want to use some of that data for a longer period. Maybe we can meet together with a smaller group on this?
 - *Response*: This has to be soon because the end of the year, when stations will be pulled, isn't far away. Teresa Trinh will coordinate something at the end of October/early November.
 - *Response* (Jacob McQuirk): I'm supportive of having a side group, but in the end, it's a financial thing, so it's to be determined how long they can be extended. We have limited resources. Tom agreed.

Salinity Point Source and Ion Sampling/Jared Frantzich

Key Highlights:

- Jared credited David Colvin for all of the hard work that goes into data collection.
- We're using this additional high resolution salinity monitoring and mineral or ion monitoring to better determine the origins of salt and how hydrodynamics may contribute to exchange increase in lower Old River, specifically focusing on our compliance point.
- This monitoring is expanding our spatial and temporal monitoring within the south Delta channels, including low and no flow regions.
- We're using the data to help validate the monitoring work that Patrick's been leading with the high-speed EC mapping.
- We're also using it to help ground truth the modeling work.
- The wet year has created very different conditions from 2022.
- Paradise Cut overtopping was a unique event and we were able to capture this, and how it looked afterwards, on the drone.
- Drone videos can be viewed on the DWR NCRO UAV YouTube channel: [youtube.com/@NCRO_UAC/videos](https://www.youtube.com/@NCRO_UAC/videos)
- Aerial photo data can be viewed on the DWR Atlas website: https://gis.water.ca.gov/arcgisimg/rest/services/Aerial_Photography
- We've been collaborating with USBR to get some isotopes analyzed. We've been collecting samples monthly. This is another way of fingerprinting, so it adds some validation to the ion sampling.
- We are hoping to continue stable isotope sampling through the end of this year and into 2024.

Tom Burke, South Delta Water Agency:

- How are you taking this isotope data and tying it back to source identification or analysis? Some sources show up in some samples, others in different samples, etc. What are we doing to tie that back to different sources?
 - *Response* (Grace Windler): It's preliminary because there are not a lot of isotope data available yet. We first need to characterize the isotopes in different seasons, locations, etc. We don't have a map yet that will tell us that this will definitely work. Data should be available in about 5 weeks. Then we will be able to see if the values are different enough, and we can come up with a "mixing value". It's very high level at this time. I can't say for sure that things will be different enough. The different sources will be identifiable enough though.
 - *Response* (Tom Burke): Will this include groundwater?
 - *Response* (Grace Windler): Yes, we might be able to pinpoint different sources. There are some previous data on groundwater in the coastal range that may be able to contribute to this.
 - *Response* (Tom Burke): Could we get some groundwater samples from wells in the delta?
 - *Response* (Eli Ateljevich): The upstream section of Paradise Cut, beyond the wells, was heavy in boron, so if there is a distinctive signature like this, it would help pinpoint unique source.
 - *Response* (Grace Windler): I think the isotopes will be valuable to validate the ion data.

Modeling: SCHISM 3D and Water Quality Data Integration Modeling/Dave Huston and Eli Ateljevich

Key Highlights:

- We are days away from a bathymetry data release. This has been a long time in the process, but the data is now stitched.
- We also lucked out with the Division of Flood Management's green laser data release, which came out at about the same time and fills in some of our data gaps.
- OLD seems to be affected tidally from the west and less from the east. We are not yet sure if this is due to bathymetry or vegetation.
- Conditions are always changing, and we are expecting more change this wet season.
- The rest of this model will settle in the next couple of weeks. Then it will be integrated into other programs such as DSM2. (note that the MSS DSM2 is finer; something to discuss when the time comes).
- Some of you have gotten an invite for participating in the main study design. This is the end-goal of modeling so we can look at the mutual influence of San Joaquin River inflow, EC, and exports. Eli wants to keep it small and working-group-like, but please reach out if you feel that someone else should be included in this.
- The December Quarterly Technical Workgroup will be focused on data integration. What should we focus on? (Zhenlin and Teresa will coordinate input on this)
 - What is the goal? (infer source terms sufficiently for the main study)
 - What are the different "flavors"? How are they useful? (Nudging, response-based, Kalman)
 - Challenges? Weaknesses? (uniqueness, sensitivity to discharge)
 - Compare to calibration
 - Difference between data assimilation and model calibration?
 - Physical vs making models happy

Tom Burke/South Delta Water Agency:

- What area were the green laser tests performed in?

- *Response* (Eli Ateljevich): Upstream on the San Joaquin River. Very little of it actually covered the Delta. There's been some trepidation about using green laser because of vegetation, turbidity, etc. I was hoping to catch shallower water. It's not penetrating more than a meter or two. It seems to be penetrating deeper on the Upper San Joaquin than downstream in the Delta. This is not available on the Atlas yet because it's considered "extra".

Tom Burke/South Delta Water Agency:

- Can you clarify the difference between the two DSM2 model versions?
 - *Response* (Eli Ateljevich): Yes, the traditional DSM2 hydro uses 5000-foot resolution, and the MSS version uses 2,000-foot. We can probably create a local resolution request so that the South Delta is done with some refinement.
 - *Response* (Tom Burke): We would like to see the higher level/higher quality bathymetry.
 - *Response* (Eli Ateljevich): This might be possible.
 - *Response* (Nicky Sandhu): We are currently improving bathymetry, but I am not sure how the timing will align.

Tom Burke/South Delta Water Agency:

- How are you incorporating vegetation in the model, since it's seasonal?
 - *Response* (Eli Ateljevich): You can't do anything about that. Susan Ustin's CSTARS Lab at U.C. Davis does repeated measurements every year using the Normalized Density Vegetation Index. It is loosely connected to density. It's usually better to incorporate vegetation than not, but it's not ever going to be precise.
 - *Response* (Tom Burke): Have you thought about having two models – a vegetation model and a non-vegetation model for different times of the year?
 - *Response* (Eli Ateljevich): Yes, we've done this with the Virginia Institute of Marine Sciences lab. We can look at this; but the quality of the information is questionable. How would we validate it? I would rather have something that shows the mean vegetation year-round until this is figured out.
 - *Response* (Nicky Sandhu): We can stop the model and re-set it with different inputs.
 - *Response* (Eli Ateljevich): We will mark this as a comment to try and address it when we can.

Shawn Mayr/DWR, via chat:

- What about a flow-dependent roughness factor? During floods vegetation gets blown out or lays down. During low flow the vegetation dominates.
 - *Response* (Eli Ateljevich): In the past, tides were the main factor. With the wet year last year, it's different. It may already be back.

Ching-Fu Chang/Contra Costa Water District

- Regarding the main study design/small group – I appreciate it, it's moving in the right direction. This question may be more suited to that group. There are more ways to explore potential solutions than changing these three variables. One example is: There is Head of Old River Scour Hole Project, which is a potential vegetation hot spot for salmon. USBR is trying to find a way to mitigate that. I'm not saying that the project is a solution, but there could be future projects changing the bathymetry, flow split, hydrodynamics, etc., in the region. This could be used to see if the expected outcome of the study could change. Maybe small changes to the channel/grid could change the outcome. Regarding SCHISM, there could be facilitated flows that are pumped or recirculated (forced circulation). All contribute to the end goal.

- *Response* (Eli Ateljevich): We are not saying these are the only three variables. We can explore other ideas, but we also can't do other people's projects that are project-specific. But this is what I was hoping you would say. I think that inducing a faster circulation across Pescadero Tract would be very interesting. We have to have some foundation, and we can't do other people's projects. But please do suggest these types of things!

Tom Burke/South Delta Water Agency

- Could there be a link made between satellite imagery and the model (color, etc.).
 - *Response* (Eli Ateljevich): The normalized vegetation index is already a remote sensing image. We can look at what's possible. What are the possible influences of vegetation? What is the range of variability that different vegetation fields could induce? More of a planning/less of a sensitivity would be realistic; but not monthly. This is likely a question for Shruti Kanna of Fish and Wildlife.
 - *Response* (Nicky Sandhu): The barriers are a big factor in vegetation growth here. There is no way to predict it. We can look at it more as a sensitivity study than trying to change the model month to month.
 - *Response* (Bill McLaughlin): It's not just the barriers, but low flow on the San Joaquin, temperature, etc.

Flow Monitoring

Key Highlights:

- Plan is to install a flow station co-located with PCCU temporary EC station to look at salt exchange in between the upper Old River/Doughty Cut/Grant Line corridor and the Paradise Cut/Sugar Cut/lower corridor.
- We were not able to install this last year because of high flow conditions. Hopefully we will be able to install it next year (April/May – November).
- It takes quite a while in post-processing to calculate flows and then fluxes. This data likely will not be included in the MSS Report that's due at the end of 2024, because we probably won't have the data ready.

Closing & Next Steps

The next Quarterly Technical Workgroup meeting will be in December. We will send out a Doodle Poll for the 1st or 2nd week of December.

The MSS website is up and running: <https://water.ca.gov/Programs/State-Water-Project/Operations-and-Maintenance/Monitoring-Special-Study>. Past meetings presentations and notes are all posted here. The MSS plan and all attachments and conditional approval letter are also posted here.

Thank you to all the presenters and attendees!