STATE BOARD MONITORING SPECIAL STUDY
Public Meeting #6 – MSS Public Meeting
March 15, 2024
9:30 am – 11:30 am

NOTES

Action Items

- Provide Tom Burke an example of a typical standard validation report. (Eli Ateljevich)
- Perform a sensitivity analysis, on a scale of 2-3 weeks, with and without the Contra Costa Water District intake issue. Perturb the background. Distribute the water volume. (Eli Ateljevich/Zhenlin Zhang)
    - Look for drone imagery of this area (Karen Tolentino).
    - Include Jelena Hartman on any updates. (Eli Ateljevich)
- Contact Bill McLaughlin if you have any ideas for the next meeting topic in June. (All)
- Meeting notes and slides will be posted to the MSS website once they are final.

Attendees

- Eli Ateljevich/DWR
- Bryan Barnhart/DWR
- Tom Boardman/Westlands Water District
- Erika Britney/ICF
- Thomas Burke/Hydrologic Systems for SDWA
- Ching-Fu Chang/Contra Costa Water District
- Chandra Chilmakuri/SWC
- David Colvin/DWR
- Janis Cooke/State Water Resources Control Board
- Jared Frantzich/DWR
- Bryant Giorgi/DWR
- Jelena Hartman/State Water Resources Control Board
- Kevin He/DWR
- Denise Hinxman/Captioner
- Peyman Hosseinzadeh-Namadi/DWR
- Dave Huston/DWR
- Jobaid Kabir/USBR
- Hans Kim/DWR
- Shawn Mayr/DWR
- Bill McLaughlin/DWR
- Parviz Nader-Tehrani/DWR
- Jenna O'Neill/ICF
- Nicky Sandhu/DWR
- Jane Tannous/DWR
- Karen Tolentino/DWR
- Teresa Trinh/DWR
- Grace Windler/USBR
- Zhenlin Zhang/DWR
- Jay Ziegler/Delta Water Master

Welcome

Teresa Trinh opened the meeting. The topic for this meeting is to provide updates on the MSS effort. The last update was in October 2023.

Agenda & Logistics

Erika Britney reviewed the agenda, ground rules, logistics, and explained that the meeting was being transcribed by a captioner.

General MSS Updates/Timeline and Q&A

- We have transitioned into the report generation phase for the MSS report.
- Findings from each technical report will be completed by approximately the end of June 2024.
- Analysis and synthesis of findings for the final report will be completed by the end of August 2024.

- The MSS final report will be distributed to the MSS Technical Work Group in late September 2024 for a 30-day review.
- We will continue to have ongoing public/technical meetings.

Technical Study Updates

High-Speed Salinity Transect Mapping and Q&A (Jared Frantzitch)

- Patrick Scott, who was previously leading high-speed mapping, left DWR.
- High-speed mapping data collection ended in December 2023.
- All data has been reviewed, organized, and QA/QC'd.
- Started developing the report: Outlining, figure development, analysis, and writing.
- Data is now published on the DWR Atlas for Public Access:
    - AGOL: https://www.arcgis.com/home/item.html?id=c2b6fe1bd21d4a86b3052fac01b212f1
    - Direct Service URL (ArcGIS Pro): https://utility.arcgis.com/usrsvcs/servers/c2b6fe1bd21d4a86b3052fac01b212f1/rest/services/InlandWaters/i12_Salinity_Transects_SouthDelta/MapServer
- There were no comments or questions.

Salinity Point Source and Ion Sampling and Q&A (Jared Frantzitch)

- Drone imagery and ion sampling data collection completed in December 2023.
- Reduced the MSS Temporary EC Monitoring network.
- Continued data review, organization, and QA/QC.
- Started developing the report: Outlining, figure development, analysis, and writing.
- Data Published to the DWR Water Data Library for Public Access:
    - AGOL: https://www.arcgis.com/home/item.html?id=c2b6fe1bd21d4a86b3052fac01b212f1
    - Direct Service URL (ArcGIS Pro): https://utility.arcgis.com/usrsvcs/servers/c2b6fe1bd21d4a86b3052fac01b212f1/rest/services/InlandWaters/i12_Salinity_Transects_SouthDelta/MapServer

Jay Ziegler, Delta Watermaster:

- How many additional stations are you proposing for water quality?
    - *Response* (Jared Frantzich): We are not proposing any yet. Working with the modelers on the final report will help us determine stations that may be valuable more long-term. At this point there is nothing proposed long-term, but new information may come out in the report that informs potential new, valuable information.
    - *Response* (Eli Ateljevich): We did request that some temporary monitoring stations remain through 2024 so that we can continue monitoring specific areas.

Isotopes and Q&A (Grace Windler)

- Grace is working on a framework for analyzing source water mixing. She is gathering as much pre-existing isotope data as possible for rain water, surface waters, ground waters, and water from the Bay Area, to try to characterize all the major sources of water that come into the MSS study area.
- Will be using monthly samples from ion sampling locations.
- Analysis framework is in progress.
- Full dataset is delayed; expected in the next 2-3 weeks.
- Will be included as a supplemental write-up in the final MSS report.

Ching-Fu Chang, Contra Costa Water District:

- With this data, will you be doing some sort of end-member mixing? I've never seen end-member mixing in a tidal configuration before. How do you plan to integrate the tidal cycle information into this?
    - *Response* (Grace Windler): Since one of the end-members is sea water, I think it will be included in the mixing model. The end-member mixing will be on a sample-by-sample basis, the samples were collected monthly. A sample that was collected at a certain location on a specific date will be a snapshot of the mixing that resulted in that composition from all of the end-member sources at that point in time. It is not aggregated over an hour, for example. The data will roughly show monthly conditions throughout the year.

Tom Burke, Hydrologic Systems for SDWA:

- You say you're collecting monthly samples. Is that at all of these sites [on Slide 29], or at a specific subset of these sites?
    - *Response* (Grace Windler):The blue circles [in the South Delta on Slide 29] are sites that were collected for the supplemental study; these have roughly monthly data from February 2023 through December. The blue samples further upstream in the San Joaquin were collected as part of a Reclamation monitoring group as part of an effort to characterize more of the surface waters that are contributing to source water mixing. The red circles are not monthly; that is point data previously collected by the USGS. That's an example of how the isotopic values change, and you can see that in the system.

Modeling and Q&A (45 min)

Major modeling activities:

- Hosted December workshop on source inference.
- Held February meetings/interviews on MSS Final Study design.
- Completed DSM2 and SCHISM South Delta grids to conform to latest bathymetry.
- Inferred source terms for modeling.
- Started main study runs.

Tom Burke, Hydrologic Systems for SDWA:

- [Slide 39] shows where the data simulation indicates increased local sources for salinity. Those locations that you've identified, especially near Old River at Tracy and going towards Paradise Cut, are areas that are referred to as null zones right now. These areas also have dense SAV that may be affecting flow. Are you accounting for that there may be increased salinity discharges there, or that the vegetation buildup is not flushing out the salt buildup in these locations?
    - *Response* (Zhenlin Zhang): We did account for some SAV. We increased the friction for DSM2 for the part of Old River you just mentioned, and part of Middle River. We're properly accounting for some of the hydrodynamics. After we implemented the vegetation, we looked at how it improves the flow and the stage modeling, which indicates the vegetation is properly accounted for.
    - *Response* (Tom Burke): Distinguishing between the two potential causes for high salinity values at those locations is fuzzy. The vegetation [photo on Slide 36] was actually hyacinth has long tentacles of roots that hang down all the way to the channel bottom creating a screen which can change your flow rate by 100%. You may have 50% of the flow you think you have during the periods when you have that vegetation there, especially in Old River

near Tracy and the five-points area. We're seeing that vegetation there through large portions of the year now, it's extremely dense vegetation and hard to get boats through. Our concern is that i what you are accounting for is actually modeling everything correctly.

- *Response* (Eli Ateljevich): A lot of this will come out in the validation document. If you've got the right exchanges matching the gauges in a large number of locations, that means the instrumentation was pretty good. I think the effects of tidal flow are well accounted for. Seasonally things can fluctuate around that, but they're stable across time. They're similar between years, and there isn't gross flow error in any of these stations. I think we're keeping our eye on that effect. The model is calibrated to stage, not flow. We can show you an example of a typical standard validation report. They are pretty complete for the data that's out there.
- *Response* (Tom Burke): We would like to see that. It would help us feel comfortable with how you're able to match flows accurately at each of those locations, especially given the fact that we're seeing such a huge change in geometry or bathymetry at these locations and a small change at bathymetry would change the flow curve at these stations completely.

Tom Burke:

- On Slide 41 (flow comparison @ MRU), has the flow comparison in the top graph been updated to the new bathymetry at this location to show that we get 1-2' of sedimentation in this area? You may not be getting the same cross-sectional flow area that you may have had when you first developed this rating curve at that location.
  - *Response* (Dave Huston): Our transect location is on a deeper cut/bend. Our bathymetry group also goes out yearly to take bathymetry measurements (and also on request). So we can compare the two. We will change the stage area (but not often) if it's more than 3% change. It's less than that, we don't worry about it too much. When we track those changes through time. I don't think that this flow data was different from a period prior to or after. I can offer to show you what we consider to be a standard validation report from various projects so you get a sense. We generally develop water flows side by side you can get a sense of the tradeoffs between the two.
  - *Response* (Nicky Sandhu): Is the vegetation perpetually there, or only during certain times? The time series here is across the whole year. Perhaps SAV needs to be accounted for different times of year.
  - *Response* (Eli Ateljevich): It's a surprisingly small variation in the spring. There is a colonization effect for the primrose. This would show up as an inter-annual variation. With a once-a-year snapshot, we're not going to be able to make fine descriptions, but we can describe the influence it might have on flushing.
  - *Response* (Dave Huston): Observationally, we see a lot of vegetation buildup in the drier years. We also have an SAV issue—it seems to be ok in winter, then it starts to colonize in spring and summer from the bank towards the middle of the channel. We may not be seeing a change in the overall flow of the channel, but we do see a change in the profile of where the velocities are highest. Also, typically, July-November is a tough time to get rough vertical areas because of the hyacinth.

Ching-Fu Chang, Contra Costa Water District:

- I'd like to clarify the so-called "preference" for the data assimilation method. It's more of an "acceptance" than a preference. Due to the lack of justification for nudging, we concluded that this

method is acceptable. If you still believe that methods that involve nudging are better, then I'm open to further discussion. I would like to see justification for them nudging and assumed location. Also, Zhenlin mentioned the algorithm that was used to come up with potential sources in sinks. Its very convenient if you want to publish this in a scientific paper, but coming back to this MSS process, if this doesn't fit perfectly with the MSS schedule, we still need to see the details of that algorithm. But we need to see that before we can accept that methodology.

Finally, there was a long technical discussion regarding inferred sources and sinks in the model (Slide 39). Ching-Fu Chang reiterated his concern that "this map includes both the inferred sources and sinks, and also your assumed one from DCD. The discussion about data assimilation can be focused only on those locations where you actually perform the inference. You either have to prove that with or without the correction, it doesn't affect it at all; or you do the correction now. Saying that you will do the correction in the future is not good enough." Eli Ateljevich apologized, "That's my fault; I had agreed to a sensitivity test in our one-on-one, and I did not communicate that fully to Zhenlin."

Ultimately, in order to show that the model assumptions will not have a big effect on inference or modeling results, it was agreed that the modeling team will perform a sensitivity analysis, on a scale of 2-3 weeks, with and without the Contra Costa Water District intake issue. They will also find a way to perturb the background. The water volume will be distributed.

- Karen Tolentino will look for drone imagery of this area.
- Include Jelena Hartman on any updates.

Five-Points Flux Study (Dave Huston)

- To satisfy the Board's condition number 4, we will be installing a temporary flow station in the Five-Points region next to the PCCU temporary EC station. After a long purchasing process, this will hopefully be installed in May. The new station will be fully submerged underwater with battery packs. We won't be able to access it for six months. We'll likely wait until the barriers come out to obtain the data. We'll probably get the data and have it processed sometime in December. This will not make it into the MSS report.
- The ORM station near Mountain House that was vandalized last year is finally back up and running as of February 6.
- The PDC station is currently down due to damage from a submerged tree.

Closing & Next Steps (5 min)

- The next MSS meeting will be in June. This could be a technical work group meeting or a public coordination meeting, based on feedback from the participating agencies on the topic. If you have any ideas for meeting topics, please let us know.
- Teresa Trinh announced that this will be her last MSS meeting. If you have any questions, contact Bill McLaughlin.
- The presentation and the notes will posted on the MSS website once finalized.