



Sacramento River Group Summary

August 20, 2026

Participants

- California Department of Fish and Wildlife (CDFW): Tracy Grimes, Michael Memeo, Erica Meyers, Crystal Rigby, Gary Zhao
- California Department of Water Resources (DWR): Kevin Reece
- Cramer Fish Sciences: Steve Zeug
- Friends of the River: Devon Pearse
- MBK Engineers: Yuen Lenh, Catherine Morales-Sandoval
- National Oceanic and Atmospheric Administration (NOAA): Miles Daniels, Kyra Fitz, James Gilbert, Sam Pyros
- Pacific States Marine Fisheries Commission (PSMFC): Darin Olsen
- State Water Resources Control Board (SWRCB): Jeff Laird, Matthew Holland, Craig Williams
- Sacramento River Settlement Contractors (SRSC): Thaddeus Bettner
- San Luis-Delta Mendota Water Authority: Scott Petersen
- U.S. Bureau of Reclamation (USBR): Krystle Catamura, Lisa Elliot, Randi Field, Andrea Hamilton, Mandy Migura, Mechele Pacheco, Tom Patton, Timothy Warner
- U.S. Fish and Wildlife Service (USFWS): Craig Anderson, Robert Null, Bill Poytress
- Westlands Water District (WWD): Bradley Cavallo, Alan Rosenthal
- Kearns & West (K&W): Terra Alpaugh, Mia Schiappi, Anna Rossi
- Other: Mike Deas

Action Items

1. Reclamation will extract and share data on impact to cold water pool temperatures.

2. Reclamation will share specific dates for model issue (date noticed, date fixed).
3. Reclamation will verify the outlet capacity of the 750s.
4. Kearns & West to follow up with CDFW about how they record dates.
5. Reclamation will look into running other scenarios that may include a step/window strategy for temperature targets.

Summary of Actions

Welcome, Agenda Review, and Purpose

Mia Schiappi, Kearns & West, welcomed all participants.

WTMP Updates

Mechele Pacheco, Reclamation, shared updates on the linkage issue to the meteorological data in the Shasta Model. The model was directing to the cooler Lewiston air temperatures instead of Redding, which resulted in lower Shasta inflow temperatures in the model.

Mechele reviewed the plot for 50% exceedance of historical inflow temperatures, 10%-90% historical exceedance temperature band, 25%-75% historical exceedance temperature band, 2025 inflow temperatures, 2026 inflow temperatures, and inflow temperatures used in the May, June, and July WTMP forecast runs. Past April, inflow temperatures are warmer than the median historical inflow temperatures for both 2025 and 2026. The inflow temperatures previously used in the forecast modeling were impacted by both the wrong meteorological location and on average higher temperatures.

With the fixed model, the following plots show warmer temperatures for Shasta releases. Moving downstream, the difference between before and after the model fix is less significant. May had the greatest difference between forecasts, with June and July differences decreasing. Because inflows reduce flow, the effect of the temperature reduces as you move through the water year.

The fixed model will be used for future runs, and Reclamation continues to update and improve the models. Reclamation plans to share as improvements are made. The fixed model runs are on Reclamation's GitHub, released as an alpha study.

Questions and Discussion

- SRSC asked if Reclamation had evaluated how the model issue may have impacted the cold-water pool versus overall temperature impact.
 - Reclamation responded that they could pull that information and share with the SRG.
 - SRSC followed up that they are interested to understand if it is a release issue or cold-water pool issue.
 - Reclamation indicated they believe it is a cold-water pool issue. If the issue was release temperatures, the change would be more noticeable earlier in the season.

- CDFW asked if Reclamation prompted data runs through the ResSiM or W2 model after the correction was made.
 - Reclamation confirmed they ran it through W2 which is linked to ResSiM. The inflow temperatures to Shasta are included in the CEQUAL- W2 model so the entire system was rerun.
- Reclamation also clarified that all three tributaries, not just the Pitt River, were impacted and have been corrected.
- USFWS asked about when the model issue was discovered and the time it took to remediate.
 - Reclamation estimated about 10 days between noticing the issue and the updated model. Reclamation will share specific dates with SRG.
 - USFWS followed up to ask if the issue impacts the way SRG should interpret the data available to them today.
 - Reclamation clarified that everything they have sent out to SRG has been updated. The NMFS model is separate from Reclamation's WTMP so this should not impact NMFS data.
 - Mia asked Miles and Lisa to identify any significant changes associated with the model issue when they present their information.
- CDFW asked to consider, during the SWFSC presentation, if the model issue might explain some of the differences seen in the TDM estimates between SWFSC and Reclamation modeling throughout the season.
 - Reclamation clarified that the differences seen before are not related to the model issue. Previous divergence was impacted by redd and carcass surveys. Now that both data sources have been acquired and processed, the results are more aligned.
 - SWFSC confirmed they would come back to this during their presentation. The carcass data and the aerial redd surveys are part of the story, but not the full picture. SWFSC indicated there were also differences in temperature predictions for the two models earlier in the season.

Hydrology Update

Tom Patton, Reclamation, provided the latest forecast and implications for the Sacramento River system, and reported on current hydrologic conditions and dam operations. Patton presented the information contained in the meeting packet shared with the SRG. Because this was an ad hoc convening of the SRG, the meeting packet is revised and shortened and a fully hydrology update will be provided during the regular, monthly SRG meeting on Thursday, August 27. Sections below correspond to groups of graphs, images, and tables in the meeting packet provided by Reclamation.

Current Storage, Releases, Water Temperatures, and Current Operations: Daily CVP Water Supply as of August 19, 2026.

- Reservoir Releases:
 - Keswick Dam releases to the Sacramento River are approximately 10,000 cfs as of this morning. There are no plans to make further reductions, but it is likely that will change toward the end of the month. Generally, the Delta is in good condition, and diversions are winding down for the season.
 - At Trinity, Reclamation is watching for Klamath augmentation flows. There is potential for increased flows, but they should not impact the Sacramento River at this point.
- CVP Storage and Inflow:
 - Shasta is just below 2.8 MAF. It's projected at 2.6 MAF for the end of August and 2.35 MAF at the end of September.
 - A draft forecast was used for modelling, and no changes were made to the northern system in terms of flow. Reclamation will send the final forecast when it is completed.
 - Accumulated inflow is above 100% of the 15-year average.

Temperature Management:

- Reclamation has been adjusting the Temperature Control Device (TCD). As of this morning, Reclamation has fully opened the side gates and all the PRGs are closed. They are planning to open PRG 1 and 2 to help lower temperatures.
- At Balls Ferry, even though temperatures have exceeded 53.5°F, temperatures have been below 56°F.
- Through Aug 17, CCR average temperatures are 53.5°F for the month.
- Adjustments have been made to Spring Creek TRD flows. SPP has been just under 59°F which is high for this time of the year. Reclamation has reduced TRDs slightly to try limiting warmer water entering Keswick. This will put more pressure on Shasta cold water pool.
- At the PRG levels, where the penstocks are, the temperature is around 51°F.
- Shasta Reservoir:
 - The $\leq 52^{\circ}\text{F}$, $\leq 50^{\circ}\text{F}$ and $\leq 48^{\circ}\text{F}$ plots are trending closer to drought years. This is a product of using cold water earlier in the season.
- 90% August Exceedance Forecast:
 - The $\leq 52^{\circ}\text{F}$ plot is down to 75% exceedance. The $\leq 50^{\circ}\text{F}$ is near 90% exceedance and the $\leq 48^{\circ}\text{F}$ plot is above the 95% exceedance.
- Temperature Modeling Results:

- The outlooks were based on the 90% exceedance and have been re-run with the corrected temperature model. This model also considers all PRGs closed and side gates open. Both models use the same inputs.
- 53.5°F Target
 - Shasta is slowly trending toward higher temperatures, being able to hold 53.5°F at CCR through end of August or early September and then trending above 53.5°F.
- 56°F Target
 - The target is relative flat, indicating 56°F could be maintained all the way through the end of the season.
 - There are still fluctuations downstream.
 - This target would also allow Reclamation to potentially close the side gates and proceed with the PRGs until the side gates were needed later in the season.
- Outflow Temperatures
 - When targeting 53.5°F at CRR and SAC for Shasta, there was not much divergence. When targeting 56°F, there was much more divergence.

Questions and Discussion

- SRSC asked what factors influenced the decision to move less Trinity water this year.
 - Reclamation confirmed the decision was made for several reasons. Initially, there was an unscheduled outage that lasted a week. The temperatures are high and not helping with cooling the river in the short term. Additionally, Spring Creek has been mostly maxed out. The model may predict higher movement than what can physically be moved through the one available unit. Reclamation is adjusting diversions in the short term to see how it impacts temperatures through the end of the season. The temperature increase may also be impacted by the curtains at Spring Creek and Carr Power Plant, which both need some revamping. There is cold water coming through Trinity into Whiskeytown, but it is difficult to get that cold water to Spring Creek Powerplant. Historically, Spring Creek does warm up, but later in the season. The current temperatures aren't abnormally high when compared to historical data.
- SWRCB asked Reclamation to share more about opening the PRG gates.
 - This year, Reclamation tried to ease into the use of cold water rather than release a lot of cold water early in the season. They explained that they started with closing the PRG#1 and PRG#2 after opening both side gates. They noticed penstocks one and two warmed up when PRGs one and two were closed. Looking to past years, PRGs one and two have been open while

water is running through the side gates. Reclamation will track the impact of opening the PRGs and readjust as needed. There is potential that this is the coldest water that can come through the TCD. If that's the case, the priority in place is maintaining coldest unit 5 and minimizing unit 1. As flows come down, the issue may improve when less than 5 units are running for extended periods.

- Friends of the River wanted to return to the comment about maxing out cold water movement through the TCD. They asked about an alternative option of releasing water around the TCD by bypassing it and potentially accessing a larger amount of the cold water pool. Is that something that can or should be discussed here, whether a bypass approach would be beneficial in the fall?
 - Reclamation shared that, in the past under extremely low reservoir conditions, they have looked at bypassing through 750 outlets. Typically, that would not be necessary considering the storage levels seen this year. The side gates tend to pull water with lower temperatures than the 750 outlets, but they will continue to monitor the impact of the open side gates through September and October. The high storage but minimal cold water state for this year could trigger an exploration of utilizing the bypass option.
 - SWRCB followed up to ask why Reclamation would not typically use the 750 outlets under high storage conditions. Is it an issue of physical limitations that make it inadvisable or not typical practice?
 - Reclamation shared that the 750s bypass power, so there would need to be an evaluation of forgone power generation that needs to be considered. In the past we have run tests to see if there is colder water through 750s versus side gates. Because we are currently releasing high flows, it would be difficult to do that additional testing and would need to strategize on how to run a good test under these conditions.
 - SWRCB asked what the outlet capacity of the 750s is.
 - **Reclamation believes there are 4 of the 750 outlets but can verify and provide that information later.** Confirmed there are four 750 river outlets with an approximate capacity of 4,500 cfs each.
 - Reclamation also confirmed that a bypass could be considered and that they would need to engage the power group at CVO and WAPA to discuss further.
 - SWRCB noted that average CCR temperatures have been above 53.5°F for the last two weeks. They asked why there is a difference between the model and reality.
 - Reclamation noted that the model predicts the side gates opening on September 2, when in reality the side gates were opened earlier. The model

is not for comparison purposes; it is meant to be a projection of possible future conditions.

- SWRCB followed up to discuss the cold bias further. There could be a static bias or a dynamic bias happening. In thinking about how we translate this information into advice on management actions, the uncertainty and risk of dynamic bias matters. Do you have thoughts on how we can assess the risk of a dynamic loss of temperature controls that is qualitatively different from what we have seen in terms of time series?
 - Reclamation shared that, from a modeling perspective, the region is dynamic. In terms of uncertainty, Reclamation did look into moving the compliance point from 53.5 from CCR up to SAC and it did not result in significant changes. Reclamation is adjusting approach to understanding what the best configuration is. There are different flow rates through penstocks, too.
- NMFS noted that the 90% exceedance outlook shows a steep drop after October before increasing again. Is that due to the model being calibrated based on the TCD ending in October?
 - Reclamation clarified this was due to air temperatures. That data projection is for downstream at Balls Ferry, which likely has a cool period, typically in November. There are, in general, more variations as you move downstream.
- SRSC asked about lower temperatures in October for the benefit of Fall run. If there is a 5,000 cfs target in October, does the river continue warming because there is less thermal mass moving down the river?
 - Reclamation shared that they are projecting 7,000 cfs at Keswick for October and 5,000 cfs for November. Other factors, like air temperature and de-watering, will also affect whether cooler temperatures can be maintained with 5,000 cfs. Reclamation will continue to work through those challenges. They are reviewing historical data for challenging years to help inform decisions.
 - In past years, the compliance point has been moved so this is not a proposal that is out of the ordinary.
- CDFW asked to amend the language around compliance locations to be temperature targets.
 - Reclamation agreed.
- USFWS noted the packet did not have estimated CVP operations for 90% or 50% and asked if they were available online.
 - Reclamation responded that they are working to finalize them and will send to SRG members when completed.

- USFWS wanted to clarify that Reclamation opened the full side gates without PRGs on 8/18 and then went back to opening some PRGs. The temperatures did not appear to cool down across August 18, 19 and 20. Is it correct to assume when using the side gates, you are getting a mixture of higher, warm water and lower, cool water?
 - Reclamation shared that they think there is possible leakage at PRG level. It is possible the PRGs are not fully closed so opening and closing may adjust that. Reclamation is testing a few options to track the temperature changes at the penstocks. The penstock temperatures can be tracked on [CDEC](#)

Temperature Dependent Mortality Monitoring

Lisa Elliot, Reclamation, shared updates on Reclamation's temperature dependent mortality modeling. The model uses two scenarios, targeting 53.5°F at CCR (Scenario A) and 56 at CCR (Scenario B). These are the updated data and use the August 11 Shasta profile. Reclamation looked at both carcass and aerial in stage-dependent and stage-independent model runs.

Table 1. Summary of winter-run Chinook salmon TDM estimates for the 08/11/2026 proposed 2026 Sacramento River Temperature Management Plan Scenario A (53.5°F at CCR target) and Scenario B (56°F at CCR target). Pooled values are the simple mean of per-brood-year T.

Redd source × Kernel	Scenario A Pooled mean (%)	Scenario A Range minimum (%)	Scenario A Range maximum (%)	Scenario A Brood year 2025 (%)	Scenario B Pooled mean (%)	Scenario B Range minimum (%)	Scenario B Range maximum (%)	Scenario B Brood year 2025 (%)
Carcass × Stage- dependent (Anderson, 2022)	1.7	0.2	8.7	1.0	29.1	13.9	54.3	54.3
Carcass × Stage- independent (Martin et al., 2017)	10.4	4.7	22.4	19.9	49.1	43.7	60.4	60.4
Aerial × Stage-dependent (Anderson, 2022)	14.6	4.5	30.5	30.5	41.9	20.2	80.3	80.3
Aerial × Stage- independent (Martin et al., 2017)	18.3	7.9	47.7	47.7	57.1	48.2	79.3	79.3

Elliot also presented the daily mean water temperature from the 5 WTMP gauge stations. Under both scenarios, the graphs consider daily winter on Chinook Salmon, red deposition counts, summed across reaches, and brewed years, using the 2013 to 2025 carcass data and using the aerial data.

Questions and Discussion

- NMFS asked if, in the 53.5°F scenario, the goal is to keep temperatures as close to 53.5°F as possible?
 - Reclamation confirmed that the 53.5°F is trying to stay below 53.5°F as long as possible. When temperatures rise above 53.5°F, the model doesn't see it as possible.
- CDFW commented that the graph depicting how many redds are still in the gravel emerging and have alevin is really useful to see how the season is progressing.
- USFWS noted that the figures presented indicates results similar to 2025, including spawning distribution, timing, and location. The figures seem to have a more positive outlook than reality. Is that correct, that we are experiencing something similar to a 2025 year?
 - Reclamation indicated the SWFSC reporting has more information on comparative studies.

Miles Daniels, SWFSC, presented the Science Center's TDM estimates. SWFSC used the same two scenarios provided by Reclamation in addition to two scenarios designed by SWFSC.

- SWFSC used the same August forecast as Reclamation. Hydrology is using the DWR Bulletin 120 May 90th percentile forecast, and meteorology uses 2014, a comparatively warm year in the record. The new simulation starts on the 8/18 with a profile from 8/17.
- The 53.5°F and the 56°F projections are mostly aligned with some divergence later in the season. SWFSC models run an additional month.
- The stage-independent model predicts higher temperature dependent mortality than the stage-independent model as does the aerial survey in most but not all cases.
- For the 53.5°F, August shows lower temperature-dependent mortality compared to July projections.
- In an analysis of actual 2026 carcass survey data (through 8/15), carcass distributions occurred later in the season compared to other years in the historical times series for both 2025 and 2026. Only fresh female carcasses were used, with carcasses collected from four river sections.
 - SWFSC built an uncertainty estimate for the 10th/50th/90th percentile to account for additional carcasses that arrive throughout the season.

- Using the median uncertainty estimate with 2026 carcasses, there is 16% TDM. Using the 2025 carcass data, TDM is 21%. 2026 is trending lower than 2025, with this pattern holding under 56°F.
 - Sensitivity analysis was conducted for the 53.5°F and 56°F based on potential numbers of additional carcasses. For ~50 carcasses, TDM is 15% and 51%. For more than 500 fish, TDM increases to 21 and 55%, which aligns closely with 2025 comparisons.
- Follow-up analyses suggest differences are driven more by spawn timing than location. Median carcass dates in 2026 were about 3-4 days earlier than 2025. In a year like this where we are operating at the margin of losing temperature control, a few days can have a meaningful impact.
- SWFSC has not yet included aerial survey data into the model. Aerial survey data will be incorporated. Typically, aerial survey data predicts higher TDM estimates than carcass survey data.
- The SWFSC model results show a similar cold bias to Reclamation's model results. It has been around 1°F colder, which could indicate status bias. The SWFSC reported they may pursue a model correction factor.
- All this data is accessible on the SWFSC website.

Questions and Discussion

- SRSC asked for clarity on if SWFSC modelling is using carcass or aerial surveying.
 - SWFSC responded that they use both but the 2026 data only include carcass data because the aerial survey data has not yet been incorporated.
 - SRSC followed up to ask if CDFW has changed the way they record dates or weeks of dates and if that changes the curve.
 - Mia confirmed that there were not CDFW folks on the call but that Kearns & West would inquire.
- USFWS commented that it was very helpful to see the numerical differences and to see the incorporation of available, real-time data for 2026.
- Friends of the River asked for clarity about the idea of switching compliance to 56°F. Is the advantage that we can maintain lower temperatures for longer if there is less effort put in to keep temperatures low early in the season? Is it just a modelling exercise to see impact?
 - Reclamation clarified that its in part to see what alternatives are available and in part to address temperatures later in the season. Knowing there is a large number of Fall-run Chinook, it is good to know what alternatives there are even if we keep the status quo.
- USFWS asked about what a 55°F scenario might look like or other scenarios.

- Reclamation shared that they looked at a 55°F target but it was not able to be held through the season. Temperatures began to exceed 55°F in late October.
- SWRCB noted that there are endless possibilities to develop. In the past, windows have been used to address these challenges. We are currently trying to pick between 53.5°F and 56°F for a near-term target for Winter-run Chinook and the model indicates sticking with the status quo would be most effective. But could a step change or tiered approach to go from 53.5°F to 55°F to 56°F later be an option? They advised that SRG keep open options for, including a stepped approach, to try to meet Winter and Fall run needs.
- CDFW reiterated what SWRCB said. Seeing SWFSC models, it seems like any spawning after 8/15 is unlikely to survive as far as temperature is concerned. We have the floor of what TDM looks like in the river right now and that certainty gives us something to plan around. Another trade-off could be maintaining through October to help get additional redd emergence.
 - SWFSC shared a graphic depicting stage-independent and stage-dependent models under the 53.5°F target (using 2025 data as a stand in). SWFSC then showed the same graphic under the 56°F, showing a drastic difference in redd distribution under the two models.
 - NMFS agreed that looking at emergence timing similar to flow changes could be useful. Additionally, they provided support for looking at more temperature scenarios, especially seeing high TDM estimates under the 56°F.
 - Kearns & West asked Reclamation if exploring other temperature scenarios was possible.
 - Reclamation responded that they may have capacity for 1-2 more model runs. They generally have a sense of what they will look like but with slightly different tradeoffs.
 - K&W clarified if the trade-offs discussion should be held for the Fall flows meeting or be discussed during the SRG monthly meeting.
 - Reclamation confirmed yes for the monthly meeting.
- Kearns & West noted the need for emergence data and asked who is responsible for managing that data.
 - CDFW manages some of the data as does USFWS. CDFWs model for Redd dewatering is more conservative as it looks at full redd emergence, unlike other models using 50% emergence.

- SWFSC added that there is an assumption about the percentage of the population impacted to consider. SWFSC could add that estimate.
- CDFW added that the carcass crews have been seeing more natural origin than hatchery origin as the season progresses. There is a potential of disproportionately affected natural return to consider.

Additional Announcement & Review Action Items

Mia Schiappi, Kearns & West reviewed action items and discussed topics for Thursday's SRG Monthly. Reclamation will have the updated forecast to present and will work to develop other temperature scenario runs. Reclamation and SWFSC will work on updated TDM modeling but may not be available to present significantly new data.

The next SRG meeting is scheduled for Thursday, August 27.

Adjourn