



FRIANT WATER UPDATE

May 22, 2019

NOTE: Seven ALERT items, on pages 2 and 4-6.

Data current as of May 20, 2019, unless otherwise noted.

Meteorology, Climate, and Hydrology

Recent Precipitation Events

- Last week's storm event brought 3-6 inches of precipitation to the northern Sierra Nevada, and up to 7 inches north of Redding. 3-4.5 inches of precipitation was observed in higher elevations of the San Joaquin valley. The lower elevations of both the Sacramento and San Joaquin basins received 1-2 inches of rain throughout. Freezing levels during these storms were not high enough to create significant rain-on-snow events, so statewide snowpack decreased only slightly from 76% to 72% of the April 1 average during the last week.

Water Year 2019 Precipitation (Oct 2018 – Sep 2019)

- **Sacramento Valley:** 135% of normal for this week (Link: [HERE](#))
- **San Joaquin Valley:** 126% of normal for this week (Link: [HERE](#))
- **Tulare Lake Region:** 129% of normal for this week (Link: [HERE](#))

WY2019 Snow Accumulation

DWR automated snow sensors for snow water content (Link: [HERE](#)).

- **North Sierra:** 60% of Apr 1 average; 149% of normal for this week
- **Central Sierra:** 80% of Apr 1 average; 155% of normal for this week
- **South Sierra:** 73% of Apr 1 average; 136% of normal for this week
- **Statewide:** 72% of Apr 1 average; 147% of normal for this week

Looking forward:

- Late season precipitation will continue, as light to moderate mountain snow and thunderstorms will be possible all week, with an increasing chance of significant precipitation through Memorial Day weekend. Up to 2 inches of precipitation is forecasted in the higher elevations of the Sacramento and San Joaquin basins. See maps of the 6-day precipitation forecast (Link: [HERE](#) for Sacramento Basin and Eastside streams; [HERE](#) for San Joaquin Valley).
- The medium-term precipitation forecast are above normal across the Central Valley, for both the 6- to 10-day and 8- to 14-day outlooks. (Link for 6- to 10-day: [HERE](#); Link for 8- to 14-day: [HERE](#)).
- DWR's May 1 Water Supply Index Forecasts were released on May 8 (Link: [HERE](#))

- Sacramento River Unimpaired Runoff Forecast: 50% exceedance is 24.4 MAF (137% of average)
- Sacramento Valley Water Year Type Index (40-30-30): 50% exceedance is 10.2 MAF (Wet)
- San Joaquin Valley Water Year Type Index (60-20-20): 75% exceedance is 4.2 MAF (Wet)
- The 50% exceedance for the Sacramento Index and 75% exceedance for the San Joaquin Index are the values used by the State Water Board to make the final water year determination that defines regulatory standards under D-1641.
- The May Bulletin 120 Forecasts were also released (Link for Sacramento Basin: [HERE](#), Link for San Joaquin: [HERE](#))
- A Bulletin 120 water supply forecast update summary was posted on May 16 (Link: [HERE](#))
- DWR commentary on both the Water Supply Index and Bulletin 120 Forecasts is available (Link: [HERE](#)).

Other resources:

- An authoritative California climate and meteorology blog (Link: [HERE](#)).
- Interactive, real-time meteorology updates available at Ventusky (Link: [HERE](#)).
- Weather updates from the National Weather Service Sacramento office are available (Link: [HERE](#)).

NASA Airborne Snow Observatory

- **ALERT:** The second campaign of Airborne Snow Observatory (ASO) flights on the San Joaquin was flown May 3-5. Due to weather conditions, a small area was omitted from measurement. From the early May surveys and an estimate for the unmeasured areas, the estimated snow-water equivalent (SWE) is 1,580 TAF for the entire watershed. This represents a 30% decrease in total basin snowpack when compared to the end-of-March 2019 SWE estimate of 2,259 TAF. ASO data was also used by Agriculture Research Service to update the iSnobal model, which was issued on May 14. A third campaign of flights is planned for immediately after the current storm series.

North of Delta Reservoirs / Temperature Operations

- **CVP reservoirs:** are now above normal with a total storage of 7,700 TAF. Trinity, Shasta, and Folsom are at 124%, 112%, and 115% of their 15-year average storages for this week, respectively. Releases from Keswick Dam (below Shasta Lake) remain at 8,000 cfs. Releases from Nimbus Dam (below Folsom Reservoir) increased from 8,200 cfs to 9,600 cfs, on the way to a planned release of 10,000 cfs which will maintain storage space in advance of coming storms. Both Shasta and Folsom are releasing the same volume as inflows and are getting close to filling.
- Reclamation's daily CVP water supply report is available (Link: [HERE](#)).
- **Oroville:** storage remains at 3,400 TAF, which is 124% of its 15-year average. Releases from Oroville (below Thermalito) are at 9,500 cfs, increasing from 7,500 cfs last week. This is for flood management purposes. Lake levels will be kept lower than normal this winter to provide operational flexibility and prevent use of the emergency spillway.
- Storage levels for CVP North of Delta reservoirs increased by 180 TAF over the last week.

Looking forward:

CVP Allocation and Operations

- Reclamation updated the allocation for CVP north-of-Delta contractors on March 15 (Link: [HERE](#)). The allocation is as follows:
 - Agricultural service contractors: 100% of their contract supply
 - M&I water service contractors (including American River and In-Delta): 100% of historic use
- Reclamation submitted updated operational forecasts and Sacramento River temperature modeling results to NMFS on March 13, 2019. Model results show a high likelihood of meeting a 56° F daily average temperature at the Balls Ferry compliance point from now through September, though with some potential issues in meeting that target in April and May during limited time periods. This is due to projected warm early season runoff at local creeks. Temperature compliance at the next upstream location (Clear Creek) is good during these limited periods. Reclamation's submittal and NMFS' response are available (Link: [HERE](#))

Reservoir Inflows

- Inflows to North-of-Delta reservoirs are forecasted to rise slightly throughout the week in response to recent precipitation in the Sacramento basin.

State Water Project

- DWR is currently forecasting that Oroville Reservoir storage will peak at about 3,350 TAF under a 90% inflow exceedance forecast and 3,540 TAF under a 50% exceedance forecast (Link: [HERE](#)).
- DWR has completed an operations plan for the 2018-19 flood season which will maintain lower-than-average Oroville lake levels during the winter months. This is to provide operational flexibility to ensure flood protection, meet water deliveries, meet environmental requirements, and prevent use of the emergency spillway this winter, as construction will continue on the emergency spillway into early 2019 (Link: [HERE](#) (see other updates)).

Delta/South of Delta Operations

Flow values in this section are rounded to the nearest 100 cfs.

- **Controlling Factor(s) in the Delta:** Vernalis 4:1 (per [DWR Delta Ops report](#))
 - NMFS RPA Action IV.2.1 - the San Joaquin River Inflow to Export (I/E) Ratio - is controlling. This RPA reduces the vulnerability of emigrating steelhead to entrainment in the export pumps. It restricts exports in April and May to a proportion of flows on the San Joaquin River at Vernalis, based on the forecasted San Joaquin River 60-20-20 Water Year Type. Under the current forecast of a Wet Water Year type, the export cap is 25% of flow at Vernalis. Vernalis flows are currently 10,400 cfs on a 7-day average. Under this RPA exports can never be constrained to be less than 1,500 cfs for health and safety reasons.
 - NMFS RPA Action IV.2.3 for Old and Middle River (OMR) flow management and FWS RPA Action 3 (to protect larval and juvenile delta smelt) are currently in effect, but are not controlling operations. Both regulations require OMR flows to be no more negative than -5,000 on a 14-day running average and -6,250 cfs on a 5-day running average. The OMR Index Daily Value is currently 2,600 cfs.
 - The D-1641 X2 requirement must be met for the entire month of May at Chipps Island (74 km), either on a daily or 14-day average basis. That requirement can also be met with a 3-day average Delta outflow of 11,400 cfs. The X2 requirement at Port Chicago (64 km) was triggered for 28 days in May. There are 3 carryover days for April that can be used to meet this requirement. The

Port Chicago requirement can also be met with a 3-day average Delta outflow of 29,200 cfs. Currently both requirements are being met with a daily X2 position of 59.7 km and a 3-day average outflow of 59,600 cfs.

- The D-1641 E/I ratio export cap of 35% is currently active, but is not controlling. The ratio is currently at 6.0 % (14-day average).
- The D-1641 baseflow requirement on the San Joaquin River at Vernalis is 3,420 cfs for the monthly average and 2,736 cfs for the 7-day average, and is being met with a monthly average flow of 9,400 cfs and a 7-day average flow of 10,900 cfs (Link: [HERE](#)).
- The Delta is currently in Excess Conditions. Reclamation's COA accounting report now shows 0 debt owed by the SWP to the CVP (Link: [HERE](#)). The debt was zeroed out on March 25. COA debt is typically settled up towards the end of the year, but it can also be zeroed out if storage in the major reservoir (Shasta or Oroville) of the project that is owed water hits its flood pool.
- Daily Delta outflow is 72,300 cfs, up from 39,500 cfs last week.
- Delta inflow is 60,200 cfs, up from 43,600 cfs last week. Inflow is 42,400 cfs on the Sacramento River at Freeport, 9,400 cfs on the San Joaquin River at Vernalis, 500 cfs from the Yolo Bypass, and 4,200 cfs from Eastside streams.
- Jones pumping is at a 1-unit operation of 1,000 cfs, after decreasing from a 3-unit operation of 2,600 cfs on Saturday, May 18.
- Banks pumping averaged 700 cfs over the last week, compared to 1,200 cfs during the prior week. There is currently 0 cfs pumping at Banks to wheel water for the Cross Valley Canal.
- Sharing of Delta exports between the projects is according to the December 2018 Addendum to the Coordinated Operating Agreement. Currently the Delta is in Excess conditions, so the sharing formula is 60% CVP and 40% SWP.
- CVP San Luis storage is at 754 TAF, down from 783 TAF last week. This is 116% of its 15-year average. The reservoir began its sustained drawdown for the year on April 8.
- SWP San Luis storage is 733 TAF, down from 768 TAF last week. Storage is at 101% of its 15-year average.
- Reclamation South of Delta daily operations report is available (Link: [HERE](#)).
- Delta Cross Channel gates were closed on November 30, and will remain closed until further notice, as is required under NMFS BO Action IV.1.2. This RPA requires that the gates be closed beginning December 1, in order to reduce loss of emigrating salmonids and green sturgeon.

Looking forward:

- **ALERT:** Reclamation updated the 2019 water supply allocation for the CVP south-of-Delta contractors on May 22 (Link: [HERE](#)). The increase was due to the recent storms in May, but further increases in the allocation are limited by the need to plan for meeting the Fall X2 requirement under the U.S. Fish and Wildlife Service's 2008 Biological Opinion. The updated allocation is as follows:
 - Agricultural water service contractors: 70% of their contract supply (increased from the 65% allocation issued on April 17)
 - M&I water service contractors: 95% of their historic use (increased from the 90% allocation issued on April 17)
- Jones pumping will increase to a 3-unit operation of 2,700 cfs on Thursday, May 23, and then will likely decrease to a 1-unit operation of 900 cfs on Tuesday, May 28 because of a planned outage at the O'Neill Pumping Plant.
- On March 20, DWR announced an increase in the State Water Project allocation to 70%, up from the previous 35% allocation announced in February (Link: [HERE](#)).

- Flow on the Sacramento River at Verona is projected to fall slightly throughout the week, from 33,300 cfs Wednesday to 32,300 cfs Sunday. Flow on the San Joaquin River at Vernalis is projected to rise slightly from 13,500 cfs Wednesday to 14,400 cfs Sunday.

Friant Division Operations

- **ALERT:** Friant Water Supply Allocation for WY 2019-20 as of 5/21/19:
 - Class 1 100% Allocation
 - Class 2 Unlimited Uncontrolled Season (up to Class 2 contract amount) was extended through June 14, from the prior period of April 27 to May 31. An Uncontrolled Season of 130 TAF also occurred from April 5 through April 30. Residual Class 2 water (i.e. schedulable after the end of Uncontrolled Season and flood release) is expected to be in the range of 5-25% of Class 2 contract quantities, depending on conditions at the time when both flood releases and Uncontrolled Season operations are ended for the year, likely sometime in mid-July.
 - Effective May 17, Section 215 water will be available to Friant Division Long-term contractors and may be made available to non-Long-Term contractors if conditions warrant.
 - Recovered Water Account (RWA) of 80 TAF (pro-rata) will be available through May 28th
- **ALERT:** On April 19, SJRRP, in consultation with the Restoration Administrator and under the authority of the Contracting Officer, announced the availability of a third block of 2019 Unreleased Restoration Flows (URFs) of 76,000 acre-feet. This is on top of two previous blocks totaling 132,000 acre-feet (net at the turnouts) announced earlier. These are available to Class 2 contractors, and are Tier 1 URFs priced at \$20 per AF, which goes directly to the SJRRP Restoration Fund. These URFs must be scheduled and delivered anytime before May 28. URFs must be paid for at the time of scheduling. There are no refunds for any undelivered water. Additional URFs may be available later in the year; acceptance or decline of this first block of URFs has no bearing on subsequent URF offerings. Class 2 contractors may participate by either 1) accepting the pro-rata quantity and commitment to purchase, 2) accepting the pro-rata quantity and interest in making a commitment for additional URFs should other contractors not accept their full quantity, or 3) accepting an amount of water less than the pro-rata quantity (or zero). Should Class 2 contractors not commit to all of this water, it may be offered to Class 1 contractors.
- **ALERT:** Millerton releases for flood management are expected to begin this week. See Figure 1 on page 7 for a schematic of San Joaquin Basin flood operations (courtesy of the San Joaquin River Exchange Contractors Water Authority).
- Millerton Lake daily operations report (Link: [HERE](#)), CDEC information (Link: [HERE](#)), and Water Year accumulation plot (Link: [HERE](#)). The final runoff for the October 2017-September 2018 Water Year was 1,348,797 AF.

Looking forward:

- **ALERT:** Millerton is expected to fill in the late June to mid-July time frame. Storage in Millerton was 447,107 AF on May 20. Storage increased by about 47,400 AF compared to last week.
- Inflow forecasts for Millerton are available from DWR's Bulletin 120 (Link: [HERE](#)) and from NWS (Link: [HERE](#)). SCCAO and SJRRP agreed on an 50%/50% meld of DWR forecast and NWS forecast data, respectively, for the purpose of preparing the water supply scenarios.

San Joaquin River Settlement Implementation

Restoration Flow Releases

- **ALERT:** On May 20, Reclamation released an updated “Wet” Restoration Allocation (total Restoration Flow of 556,542 AF above holding contract deliveries) for the 2019-20 water year, based on a 50 percent exceedance forecast of unimpaired inflow during the Water Year of 2,690 TAF. During the Wet Restoration year type, a portion of the allocation to support the Settlement may be met by flood releases, with the remainder expected to be met from reductions in water deliveries to Friant Contractors. This is the last Restoration Allocation for 2019.
- The current default flow schedule calls for a Gravelly Ford target flow of 335 cfs (340 cfs of Restoration Flows) and the target at Sack Dam is 235 cfs. The RA recently submitted a recommended schedule for the remainder of the water year and it is pending approval by Reclamation. The volume of Restoration Flows available at the end of Flood Flow releases will be reduced by the actual Restoration Flow releases before and after Flood management releases plus the scheduled amount of Restoration Flows that would have been released absent the Flood Flows.

Recapture/Recirculation

- **@ Mendota Pool:** SJRRP has indicated that some water was recaptured at MP in early March and April, but it has not been distributed pending confirmation of the amounts and space to store in SLR.
- **@ Patterson ID and Banta-Carbona ID:** The SWRCB approved a temporary permit for the two districts to convey water from the San Joaquin River to the DMC. FWA and the districts are in the process of completing revised conveyance agreements for recapture now that the SWRCB approval is in place and there is space in San Luis Reservoir for new recaptured water.
- **Current Recaptured Supplies in San Luis Reservoir:** Reclamation sent a notice to Friant Contractors on May 17 that they expect to recapture between 5,000 and 10,000 AF in Mendota Pool and store it in SLR before pending flood management releases and offered to exchange that water for previously contracted URF water in Millerton Reservoir. The purpose of the exchange, in addition to providing a mechanism for Recirculation of Recaptured water, is to ensure there is sufficient water to allow flood flows to be released past Sack Dam while still meeting all demands in Mendota Pool during flood releases. Districts wishing to exchange URF in Millerton for Recaptured Water in SLR were requested to notify Reclamation of their intent by COB May 22.
- **Distribution of Recaptured Water:** Because the Class 1 allocation is currently at 100% and is expected to remain at that level throughout the water year, it is expected that all recapture in the current water year will be allocated to Class 2 contractors.

River Settlement, Restoration Area Conditions:

- Based on preliminary estimates, the San Joaquin River Restoration Program has captured 449 wild salmon at three rotary screw traps (RSTs) installed in Reaches 1 and 2, as of May 12. This includes 307 fry, 30 parr, and 112 smolts. 9 fish were captured in the last week.

Looking forward:

Fisheries Monitoring

- Reclamation's Fisheries and Wildlife Resources Group and the California Department of Fish and Wildlife will perform rotary screw trap monitoring for juvenile spring-run Chinook salmon in Reaches 1–2 of the Restoration Area from November 1, 2018 through June 30, 2019. Data collected for this multi-year study

will inform SJRRP fisheries and flow management decisions and habitat rehabilitation efforts that aim to increase Chinook Salmon abundance by reducing juvenile mortality/losses in a highly modified river system.

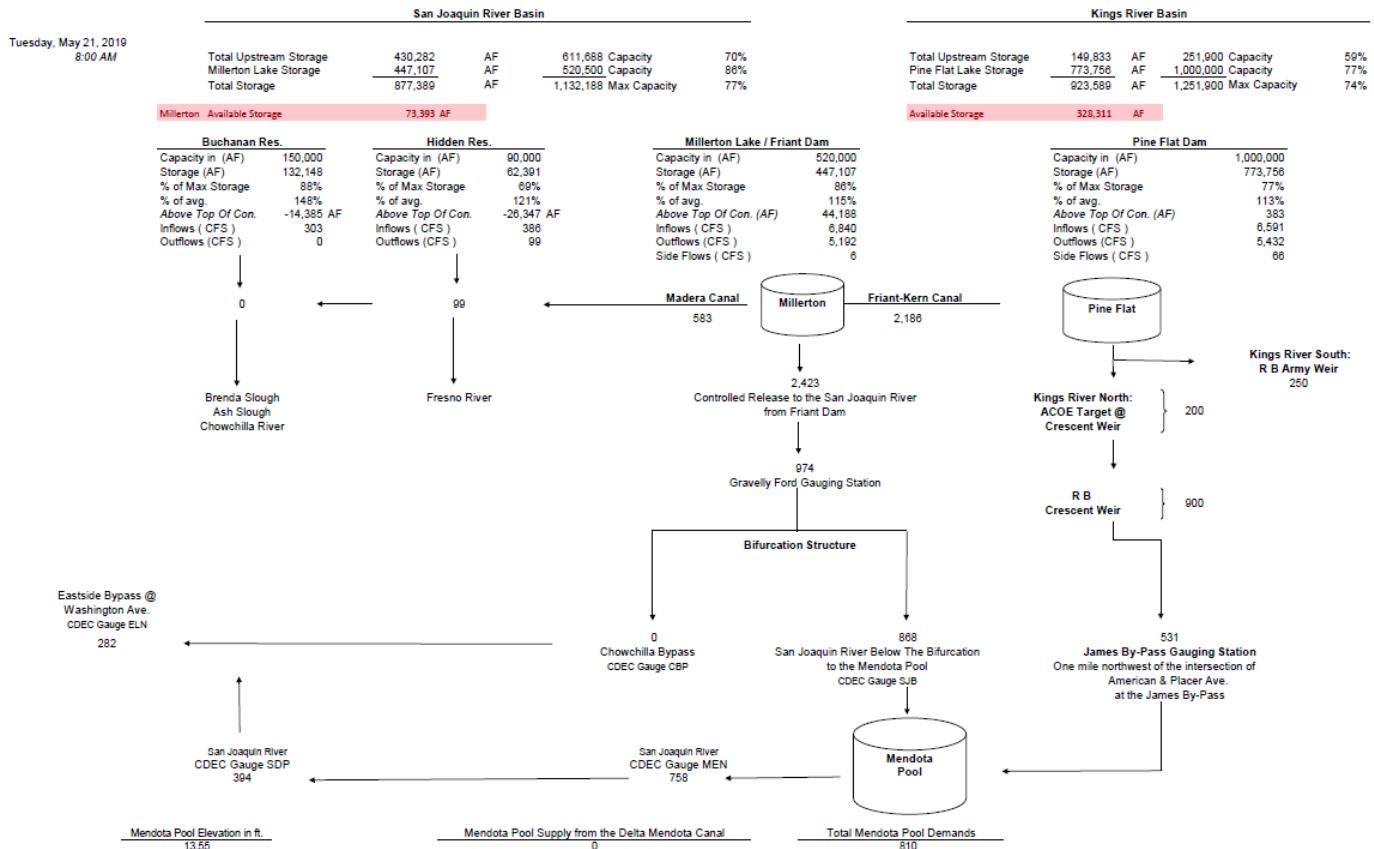


Figure 1. Detailed schematic of San Joaquin Basin Flood Control Operations