



FRIANT WATER UPDATE

January 16, 2019

NOTE: Five ALERT items, on pages 5-6.

Data current as of January 14, 2019, unless otherwise noted.

Meteorology, Climate, and Hydrology

Recent Precipitation Events

- Precipitation from last week's storms was up to 8 inches at high elevations in the Sacramento Valley, with greatest amounts in the north, and up to 2 inches at low elevations in the Sacramento Valley and in the San Joaquin Valley. Snow water equivalent increased by up to 2 inches at most locations compared to one week ago.

Water Year 2019 Precipitation (Oct 2018 – Sep 2019)

- **Sacramento Valley:** 77% of normal for this week (Link: [HERE](#))
- **San Joaquin Valley:** 80% of normal for this week (Link: [HERE](#))
- **Tulare Lake Region:** 92% of normal for this week (Link: [HERE](#))

WY2019 Snow Accumulation

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

- **North Sierra:** 41% of Apr 1 average; 84% of normal for this week
- **Central Sierra:** 39% of Apr 1 average; 81% of normal for this week
- **South Sierra:** 38% of Apr 1 average; 87% of normal for this week
- **Statewide:** 40% of Apr 1 average; 85% of normal for this week

Looking forward:

- A major winter storm is forecast for Wednesday-Thursday this week. Forecasts are for 1-3 inches of precipitation at lower elevations in the Valley and 2-7 feet of snow above 5,000 feet. Additional precipitation of up to 2 inches is also forecast for Sunday, primarily in the Sacramento Basin. 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 is below normal for 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 January 1 Water Supply Index Forecasts were released on January 9 (Link: [HERE](#))
 - Sacramento River Unimpaired Runoff Forecast: 50% exceedance is 14.0 (78% of average)
 - Sacramento Valley Water Year Type Index (40-30-30): 50% exceedance is 6.6 (Below Normal)

- San Joaquin Valley Water Year Type Index (60-20-20): 75% exceedance is 2.2 (Dry)
- The 50% exceedance for the Sacramento and 75% exceedance for the San Joaquin are the values used to make the final water year determination under D-1641.
- The January 1 Bulletin 120 Report was also released on January 9 (Link for Sacramento Basin: [HERE](#), Link for San Joaquin: [HERE](#))
- DWR commentary on both the Water Supply Index and Bulletin 120 Forecasts is available (Link: [HERE](#)).
- Inflow forecasts show that there is approximately a 10% chance of a Shasta Critical Water Year. The threshold for a Shasta Critical Water Year is if inflow is < 3.2 MAF, or if the accumulated inflow deficit below 4 MAF during the current and prior consecutive water years is > 800 TAF. National Weather Service (NWS) forecasts of Shasta inflows at the 90% exceedance probability are 3,580 TAF, which combined with last year's inflow of 3,609 TAF creates a cumulative deficit below 4 MAF of 811 TAF. DWR's January 1 Bulletin 120 forecasts are very similar, showing a cumulative deficit below 4 MAF of 906 TAF.
- NOAA's Climate Prediction Center issued an update on January 10 that there is a 65% chance of a weak El Nino forming and continuing through spring 2019 (Link: [HERE](#)). While strong El Nino events have been associated in the past with heavy precipitation in California, weak El Nino events are not predictive of above average precipitation in northern California (Link: [HERE](#)). NOAA's winter 2018-2019 outlook, issued on October 18, predicts that precipitation in northern California will be near normal (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

- The Airborne Snow Observatory (ASO) completed a bare earth survey for the Kaweah River basin on Saturday September 15. This completes all bare earth surveys for the 2019 ASO program, covering from the Tuolumne to the Kaweah Rivers and including a few eastern Sierra streams. See inset map here: <http://bit.ly/California-ASO>. Bare earth surveys in the summer establish the snow-free elevations for each basin, which allows the ASO to accurately measure snow depth the following the winter.

North of Delta Reservoirs / Temperature Operations

- **CVP reservoirs:** range from below to slightly above normal with a total storage of 4,278 TAF. Trinity, Shasta, and Folsom are at 104%, 94%, and 86% of their 15-year average storages for this week, respectively. Releases from Keswick Dam (below Shasta Lake) are at 3,800 cfs, slightly lower than last week. Releases from Nimbus Dam (below Folsom Reservoir) are at 1,800 cfs, unchanged from last week.
- Reclamation's daily CVP water supply report is available (Link: [HERE](#)).
- **Oroville:** storage is at 1,086 TAF, which is 61% of its 15-year average. Releases from Oroville are unchanged from last week, with flows below Thermalito currently at 1,750 cfs. Lake levels will be kept lower than normal this winter to provide operational flexibility and prevent use of the emergency spillway.

- Storage levels increased in the last week. CVP North of Delta reservoir storage increased by 206 TAF and Oroville storage increased by 42 TAF.

Looking forward:

Reservoir Inflows

- All North-of-Delta reservoirs will accumulate storage this week, as reservoir inflows in the Sacramento Valley are forecast to increase significantly by Thursday due to the coming storm.

State Water Project

- On November 30, DWR announced an initial water allocation of 10% for the State Water Project (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:** OMR(-5000) (per [DWR Delta Ops report](#))
 - NMFS RPA Action IV.2.3 for OMR flow management has begun as of January 1. This RPA requires that Delta exports be managed to provide for an Old and Middle River flow which is no more negative than -5,000 cfs, measured as a tidally-filtered 14-day average. The flow limit can also be more restrictive depending on fish losses in the Delta. The purpose is to protect juvenile salmonids from entrainment at the export facilities. More information on this RPA is available (Link: [HERE](#)). The Old and Middle River Index Daily Value is -5,100 cfs.
 - Under the recent addendum to the Coordinated Operations Agreement (COA), when OMR standards are controlling, export capacity is shared 60%/40% (Federal/State) under Excess conditions, and 65%/35% under Balanced conditions. The COA addendum is available (Link: [HERE](#))
 - Delta outflow is currently well above the January D-1641 Delta outflow requirement. Delta outflow is 18,600 cfs for the monthly average and 28,900 cfs for the 7-day average, compared to a requirement of 6,000 cfs for the monthly average and 4,800 cfs for the 7-day average.
 - The D-1641 E/I ratio export cap of 65% is currently active, but is not controlling. The ratio is currently at 25% (14-day average).
 - The Delta is currently in Excess Conditions with Restriction. Reclamation's COA accounting report currently shows the SWP in debt to the CVP by 39,400 cfs of exports, which equates to about 78 TAF (Link: [HERE](#)). This occurred because of SWP pumping of unused CVP water in September and October. Eliminating this debt may allow for increased CVP exports over the next few months. 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. Currently both Shasta and Oroville are well below their flood pools.
- Daily Delta outflow is 26,400 cfs, up from 16,400 cfs last week.

- Delta inflow is 29,200 cfs, up from 19,600 cfs last week. Inflow is 27,000 cfs on the Sacramento River at Freeport, 1,300 cfs on the San Joaquin River at Vernalis, 100 cfs from the Yolo Bypass, and 600 cfs from Eastside streams.
- Jones pumping continues at a 4-unit operation of 3,400 cfs, in order to comply with NMFS RPA Action IV.2.3 for OMR flow management (described above).
- Banks pumping has averaged 2,400 cfs over the last week, in order to comply with NMFS RPA Action IV.2.3 for OMR flow management (described above) and the COA sharing percentage. There is currently 0 cfs pumping at Banks to wheel water for the Cross Valley Canal.
- CVP San Luis storage is at 708 TAF, increasing from last week's storage of 675 TAF. This is below full capacity of 966 TAF, and is 115% of its 15-year average.
- CVP San Luis storage includes approximately 29,300 AF of 2018 Recapture water that has accumulated in San Luis, less any that has been delivered to the districts since September 30. Recapture occurred at Mendota Pool in March, April and December and has been occurring at Patterson and/or Banta-Carbona irrigation districts in all months.
- SWP San Luis storage is 892 TAF, up from last week's storage of 871 TAF. Storage is below full capacity of 1,062 TAF, and is 125% 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 from December 1 to January 31, in order to reduce loss of emigrating salmonids and green sturgeon.

Looking forward:

- Jones pumping will increase to a 5-unit operation of 4,000 cfs on Saturday, January 19, in order to take advantage of increased Delta inflow.
- The likelihood of a shortfall to the minimum 75% allocation for the San Joaquin River Exchange Contractors is currently low. Storage in CVP Reservoirs (Trinity, Folsom, Shasta, and CVP San Luis) on January 1 was 4,675 TAF, compared to storage of 3,376 and 3,397 TAF on January 1 of 2014 and 2015, the driest years of the recent drought. The NWS 90% exceedance inflow forecast for Shasta and Folsom for the rest of the water year is 4,082 TAF, and the corresponding DWR Bulletin 120 90% exceedance inflow forecast is 3,768 TAF. These are both significantly greater than the actual inflows during the same period in 2014 and 2015, which were 3,089 and 2,876 TAF. For both inflow forecasts, overall storage plus 90% exceedance forecasted inflows are at least 2 MAF higher than storage plus actual inflows for the same periods in 2014 and 2015.
- Delta inflow will increase through Friday. Flow on the Sacramento River at Verona is forecast to increase from 20,600 cfs on Tuesday to 47,000 cfs on Friday, and flow on the San Joaquin River at Vernalis is forecast to increase from 1,300 cfs on Monday to 4,500 cfs on Friday.

Friant Division Operations

- Friant Water Supply Allocation and use for WY 2018-19 as of 12/7/18:
 - Class 1 88% Residual Allocation plus 14.5 TAF delivered during Uncontrolled Season
 - Class 2 Limited Uncontrolled Season: 130 TAF was moved through May 10.
 - Unreleased Restoration Flows (URF) 100 TAF: 38 TAF used during April; 51 TAF used through May 28, 11 TAF was made available on June 26 for schedulable use during the remainder of the

water year. The first 38 TAF was made available based on Class 2 contract quantities; the remaining 62 TAF was made available based on Class 1 contract quantities.

- 96 TAF of the 2017 allocation was carried over into 2018 WY
- 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:** Based on a January 11 Reclamation spreadsheet showing projected Friant operations, projected Millerton storage on February 28, 2019 will be approximately 306 TAF, including an estimated 52 TAF of Rescheduled Water. Millerton reservoir storage peaked at 478,680 AF on June 13. Storage in Millerton was 302,842 AF on January 14, a decrease of approximately 176,000 AF since June 13. Storage is unchanged from last week.
- The Class 1 allocation was increased to 88% as of September 24, increasing from the prior allocation of 85%, based on the latest forecast information (Link: [HERE](#)).
- Inflow forecasts for Millerton are available from DWR's Bulletin 120 (Link: [HERE](#)) and from NWS (Link: [HERE](#)). SCCAO and SJRRP agreed on an 80%/20% meld of DWR forecast and NWS forecast data, respectively, for the purpose of preparing the water supply scenarios.
- **ALERT:** Based on January 10 conditions and the 80/20 blend of forecasts from DWR and the NWS, Reclamation indicated during a January 11 water supply meeting that the current range of possible initial allocation is from 60% to 100% Class 1 supply based on 90% and 50% exceedance forecasts, respectively. Reclamation has requested that all Friant Long-Term Contractors submit schedules based on 60% and 100% Class 1 contract supplies by Wednesday, January 16.

San Joaquin River Settlement Implementation

Restoration Flow Releases

- As of May 22, the allocated Restoration Flows totaled 280,258 AF for the 2018-19 water year. The allocation of Restoration Flows is based on a prescribed formula related primarily to total projected runoff, without regard to timing or rates of runoff. Reclamation has determined that this will be the last change in the SJRRP allocation this year regardless of runoff variability. These flows are subject to the prescriptive Restoration Flow Guidelines required by the Settlement.
- The current schedule calls for a Gravelly Ford target flow of 255 cfs (250 cfs of Restoration Flows) for the months of January and February, except for a 10-day pulse starting February 10, 2019 when 670 cfs is scheduled to be released from Friant Dam based on the October 18 schedule submitted by the Restoration Administrator (RA). This latest RA recommendation is still pending final approval by Reclamation. A water supply impact test related to moving the pulse from November to February is required and is being conducted by Reclamation to determine if such a change in the schedule would result in an increase in water supply reductions to Friant Contractors.
- **ALERT:** Reclamation is currently preparing the initial Restoration Allocation for the 2019-2020 Restoration Water Year and is expected to submit the Restoration Allocation and Default Flow Schedule to the RA on January 17. It is expected that the allocation will be based on a 75% exceedance forecast of a Normal-Dry year, which is in excess of 200,000 AF, pursuant to procedures defined in the Restoration Flow Guidelines. The allocation will be updated monthly or more frequently, as conditions warrant.

Recapture/Recirculation

- **@ Mendota Pool:** Restoration releases in March through May resulted in approximately 1,666 AF recapture at Mendota Pool (MP). Reclamation has determined that 1,638 AF of recapture occurred in MP during December due to maintenance activities at the Sack Dam/Arroyo Canal headworks that limited water levels and releases past Sack Dam.
- **@ Patterson ID and Banta-Carbona ID:** BCID recaptured all 3,250 AF of the available Restoration Flows that reached them in December. PID is currently not conveying any Restoration Flows due to system maintenance that is expected to last through February 2019. Projected available Restoration Flows for BCID recapture in January are 5,250 AF, but BCID has indicated that, due to some power outage and maintenance issues this month, they expect to recapture only about 4,500 AF. A total of 30,632 AF has been recaptured at PID and BCID between March 1 and December 31, 2018.
- **Current Recaptured Supplies in San Luis Reservoir:** Accumulation of recaptured water in San Luis Reservoir began in March. There is currently no risk that recaptured water could be lost to spill prior to the end of February 2019. Recapture volumes appear on pages 7-8, in Tables 1 and 2.
- **Distribution of Recaptured Water:** Water recaptured through August 31 was distributed to Friant districts based on Class 1 contract quantities, to all Class 1 districts for MP recapture, and to districts that executed Repayment Agreements for PID/BCID recapture. Because of the increased allocation as of September 24, total CVP supplies available to Class 1 contractors have reached 800 TAF, so September through December recapture has been allocated to Friant contractors based on the Class 2 contract amounts of PID/BCID Repayment Agreement participants. All future recapture in the current water year will be allocated to Class 2 participating contractors using the same procedure.

River Settlement, Restoration Area Conditions:

- Based on preliminary estimates, the San Joaquin River Restoration Program has captured 307 salmon fry at three rotary screw traps (RSTs) installed in Reaches 1 and 2, as of January 13. All but 16 of these fry were captured at the RST at Owl Hollow.

Looking forward:

Recapture Supplies in San Luis Reservoir

- **ALERT:** Recaptured water for March-December 2018 is shown in Table 1 below, along with projected water available for recapture for January – February 2019. The distribution of recaptured water by contractor for March-November 2018 is shown in Table 2 below. Potential recapturable water in January and February has been adjusted to reflect that Patterson ID will be out of service for that period.
- **ALERT:** Reclamation has not yet publicly announced terms and conditions for Rescheduling CVP water in San Luis Reservoir past February 2019, but it is likely that there will be a volume limitation similar to last year. If that is the case, all rescheduling capacity will likely be used by South of Delta CVP contractors, leaving no room for rescheduling Recaptured Water. Districts should plan to use or otherwise make arrangements for use or storage of their Rescheduled water by the end of February 2019.

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.

Table 1. Monthly Actual and Projected Recapture Volume during March 2018 – February 2019 for Friant Contractors in acre-feet. Recapture supplies are held in San Luis Reservoir unless otherwise scheduled for delivery by individual contractors. (Source: Reclamation e-mail to Friant Contractors, December 7, 2018, and subsequent update for December recapture)

Month	At Mendota Pool, AF	At Lower SJR,AF	Total
March	552	3,130	3,682
April	1,114	4,200	5,314
May	-	3,900	3,900
June	-	2,699	2,699
July	-	1,503	1,503
August	-	2,650	2,650
September	-	2,850	2,850
October	-	3,200	3,200
November	-	3,250	3,250
December	1,638	3,250	4,888
January	-	5,250	5,250
February	-	5,000	5,000
Total Actual Through December	3,304	30,632	33,936
Total Actual + Projected	3,304	40,882	44,186

Table 2. Monthly Recapture Volume during March-November 2018 for Friant Contractors in acre-feet. Recapture supplies are held in San Luis Reservoir unless otherwise scheduled for delivery by individual contractors. (Note: “2017 Class 2 Recirculation Adjustment” involves overuse by two districts in 2017, and only affects Mendota Pool Recapture available supply total and has no effect on 2018 Lower SJR Recapture.) (Source: Reclamation e-mail to Friant Contractors, December 7, 2018)

Contractor	2017 Class 2 Recirculation Adjustments	Mendota Pool Recapture, AF	Lower SJR Recapture, AF	Cumulative Available through Sept, AF
Arvin-Edison WSD	-	83	3,224	3,307
Chowchilla WD	-	115	2,514	2,629
City of Fresno	-	125	-	125
City of Lindsay	-	5	-	5
City of Orange Cove	-	3	-	3
County of Madera	-	0	-	0
Delano-Earlimart ID	-	227	3,239	3,466
Exeter ID	-	23	413	436
Fresno Co. WW #18	-	0	-	0
Fresno ID	-	-	-	-
Garfield WD	-	7	-	7
Gravelly Ford WD	-	-	-	-
Hills Valley WD	-	3	-	3
International WD	-	2	-	2
Ivanhoe ID	-	14	165	179
Kaweah Delta WCD	-	2	-	2
Kern-Tulare WD	(10)	-	-	-
Lewis Creek WD	-	2	-	2
Lindmore ID	-	69	977	1,046
Lindsay-Strathmore ID	-	57	683	740
Lower Tule River ID	-	127	3,223	3,350
Madera ID	(131)	177	3,446	3,446
Orange Cove ID	-	82	975	1,057
Porterville ID	-	31	589	620
Saucelito ID	-	202	769	814
Shafter-Wasco ID	-	45	1,526	1,630
So San Joaquin MUD	-	104	2,735	2,937
Stone Corral ID	-	21	249	270
Teapot Dome WD	-	15	180	195
Terra Bella ID	-	60	722	782
Tri-Valley WD	-	1	-	1
Tulare ID	-	62	1,753	1,815
TOTALS	(141)	1,666	27,382	28,871