This is an important Report from Tom Boardman. You will want to note in particular the parts we circled on his page 2. Notes in red are by The Water Agency, Inc.

Westlands Water District

MEMORANDUM

TO: SLDMWA BOARD OF DIRECTORS
FROM: TOM BOARDMAN, WATER RESOURCES ENGINEER
SUBJECT NOVEMBER OPERATIONS UPDATE
DATE: NOVEMBER 1, 2019

Project Operations

- Jones pumped at minimum capacity during most of October in order to comply with the fall X2 standard required by the delta smelt BiOp. The remaining part of the fall X2 requirement is expected to allow exports to increase during November so long as the Projects ensure that delta outflow is at least 5,700 cfs. As such, Jones is scheduled to increase to 3 units (2700 cfs) on November 4. CVP operators are opposed to increasing upstream releases to support Jones pumping, so absent significant storms, Jones pumping may be forced to minimum levels by mid-November to meet the minimum outflow requirement.
- Banks pumping during October was slightly less than Jones due to the fall X2 requirement. Banks has a one-week outage scheduled for the first week of November, thus; Jones will be pumping the SWP's share of export during the outage. Banks pumping during the remainder of November will be constrained similar to Jones.
- Shasta storage is about 3.27 MAF and gradually declining to reach a target storage of 3.2 MAF by December 1 per flood control requirements. Releases will soon be reduced to 5,000 cfs and are not expected to increase over the next several months unless flood control releases are necessary.
- Folsom storage is at 598 TAF which is 145% of its 15-year average. The current release is at 2,700 cfs as storage is dropping to meet a flood control limit of about 500 TAF.
- CVP demands were about 220 TAF during October; about 50% more than the 15-year average. About 10-15% of the additional demand was due to CVP transfers to Cross Valley Canal contractors and water banking.

2019-20 San Luis Operations

The attached chart titled "Historical Northern CVP Storage" shows that the current upstream CVP storage is within the upper quartile of historical levels for October. Although shortages to refuges and water rights contractors triggered by deficiencies in Shasta inflow rather than by storage levels, wetter antecedent conditions in the northern state should help to ensure that the Shasta deficiency criteria does not result next year under 90% exceedance conditions. However, initial 2020 allocations to Ag and Urban contractor allocations may be reduced due to a lower CVP San Luis storage at the end of October because of the fall X2 standard. As shown on the attached chart titled "Historical CVP San Luis Storage", fall X2 reduced CVP San Luis storage by about 150 TAF. Consequently, CVP San Luis will fall

short of refilling by 200 TAF under dry conditions but may fill by March under average conditions as shown on the attached San Luis storage projection charts.

Revised BiOps for delta smelt and salmon have been posted and will go into effect when they are finalized early next year. The revised BiOps are expected to reduce the degree of uncertainty around export projections such that higher, earlier allocations will be possible. The following table contains projected allocations based on Reclamation's most recent Project operations studies under the current BiOps compared to allocations under the revised BiOps.

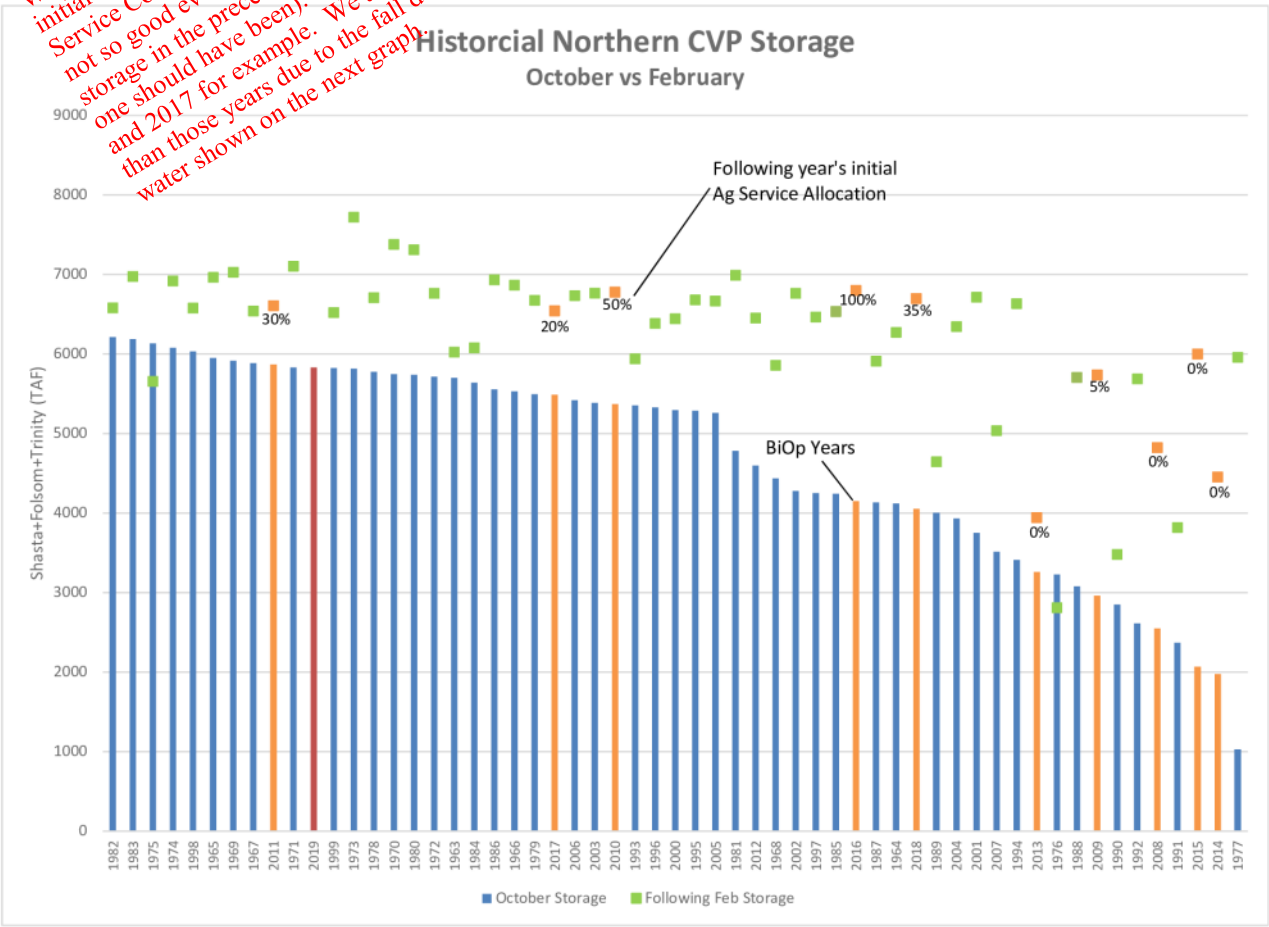
New Year Allocation Forecasts

Hydrology	90% Exceedance		50% Exceedance	
	Existing BiOps	Revised BiOps	Existing BiOps	Revised BiOps
Water Rights/Refuges	100%	100%	100%	100%
Ag Service	20-25%	20-30%*	50-70%**	60-80%**
Urban	50%	50-55%	75-95%	100%

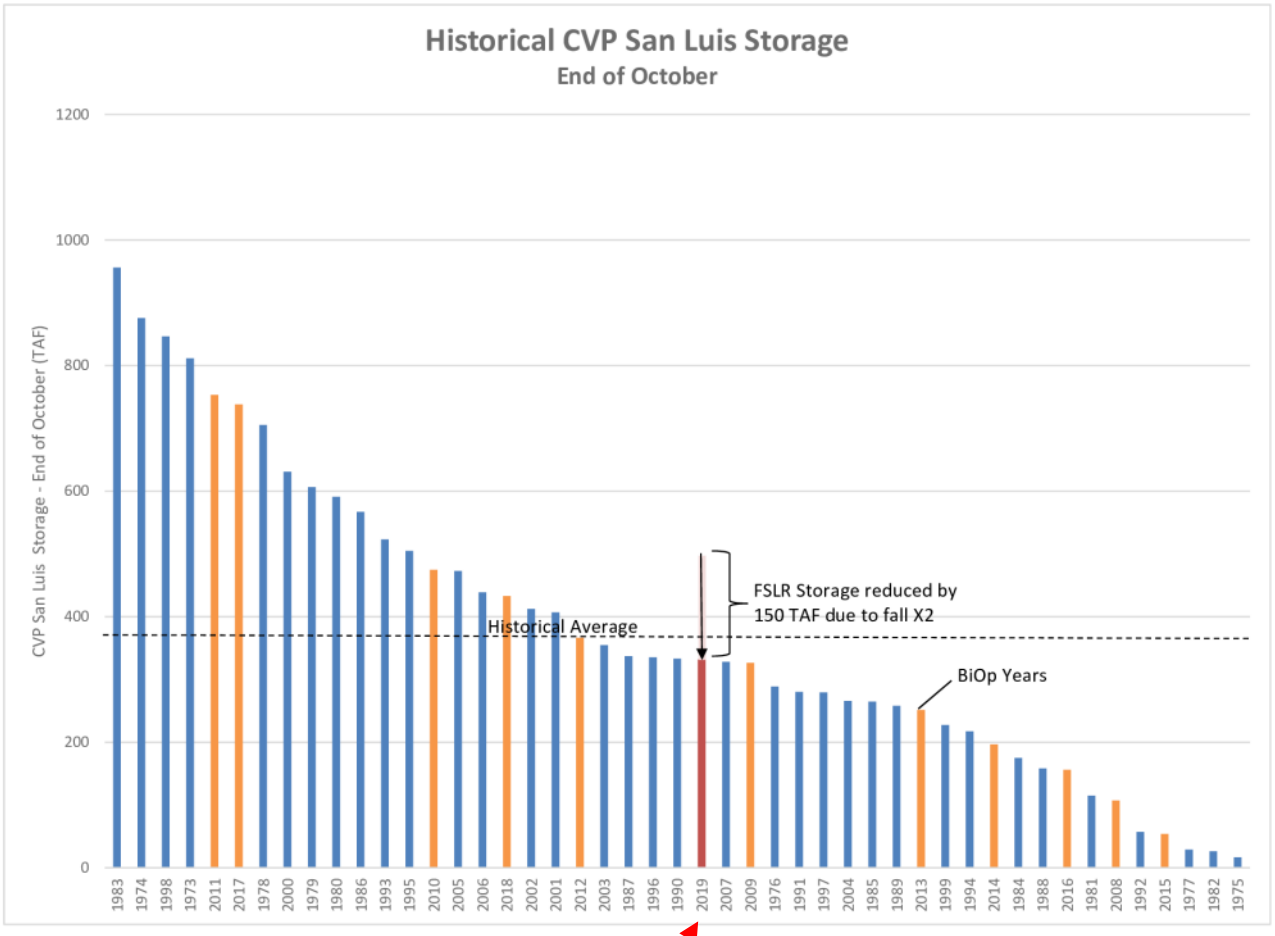
* Dry conditions may limit the benefit of the revised BiOps to less than 5%. The upper range of the projected allocation will depend on Reclamation's assumed demand used to support the allocation.

** Benefits of the revised BiOps estimated 5-10% with remainder of allocation increase dependent on Reclamation's assumed demand used to support the allocation.

We read Tom's graph here to show that initial South of Delta Agricultural Water Service Contractor's allocations often are not so good even in years following good storage in the preceding October (like this one should have been). See 2010, 2011 and 2017 for example. We are lower than those years due to the fall dump of water shown on the next graph.

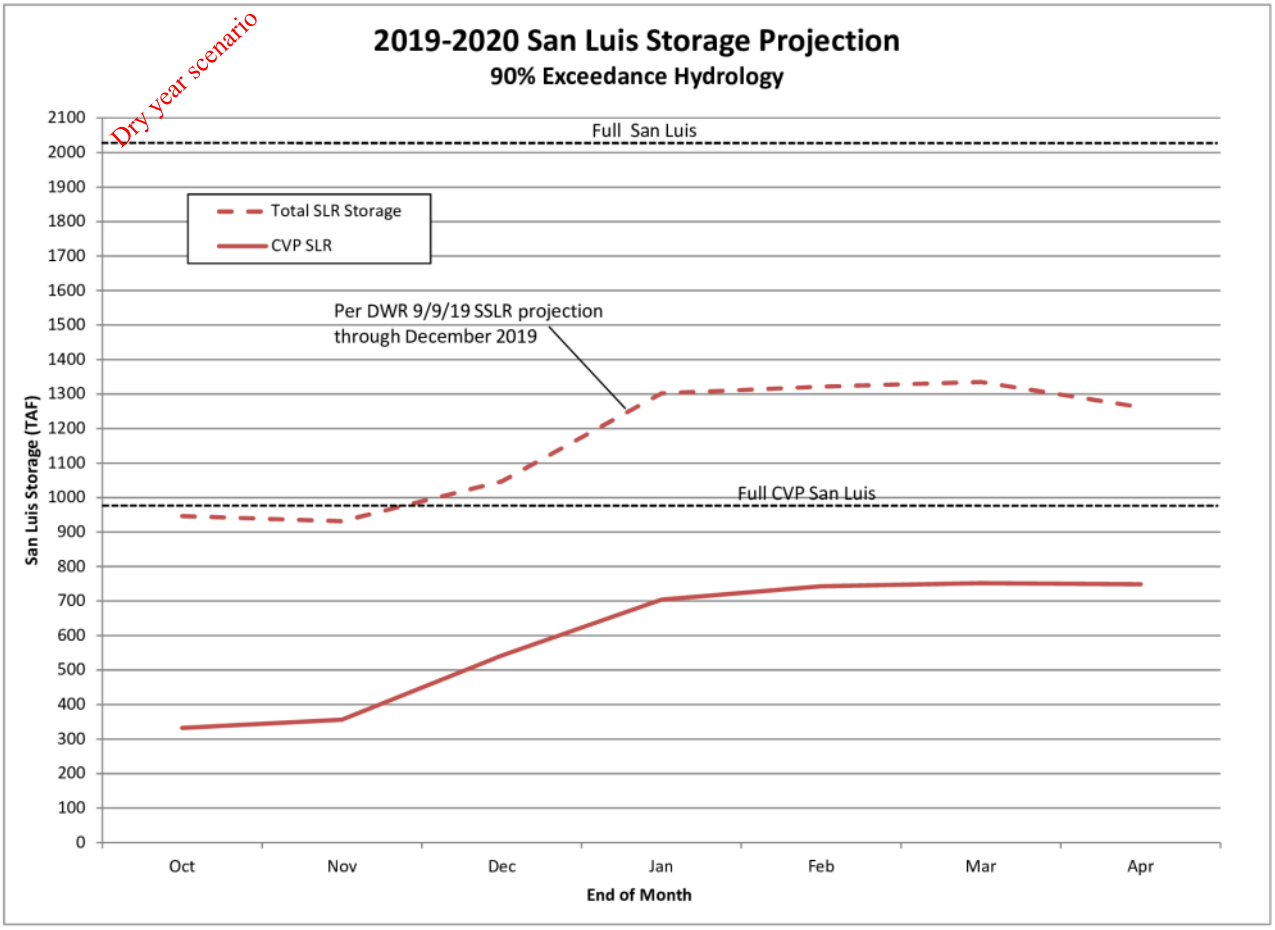


T. Boardman, WWD
11/1/2019



T.Boardman, WWD
11/1/2019

2019 Fall Storage is significantly less than would have been expected in a year like this. That is due to the old Endangered Species Act Biological Opinions protecting Delta Smelt and Salmon.



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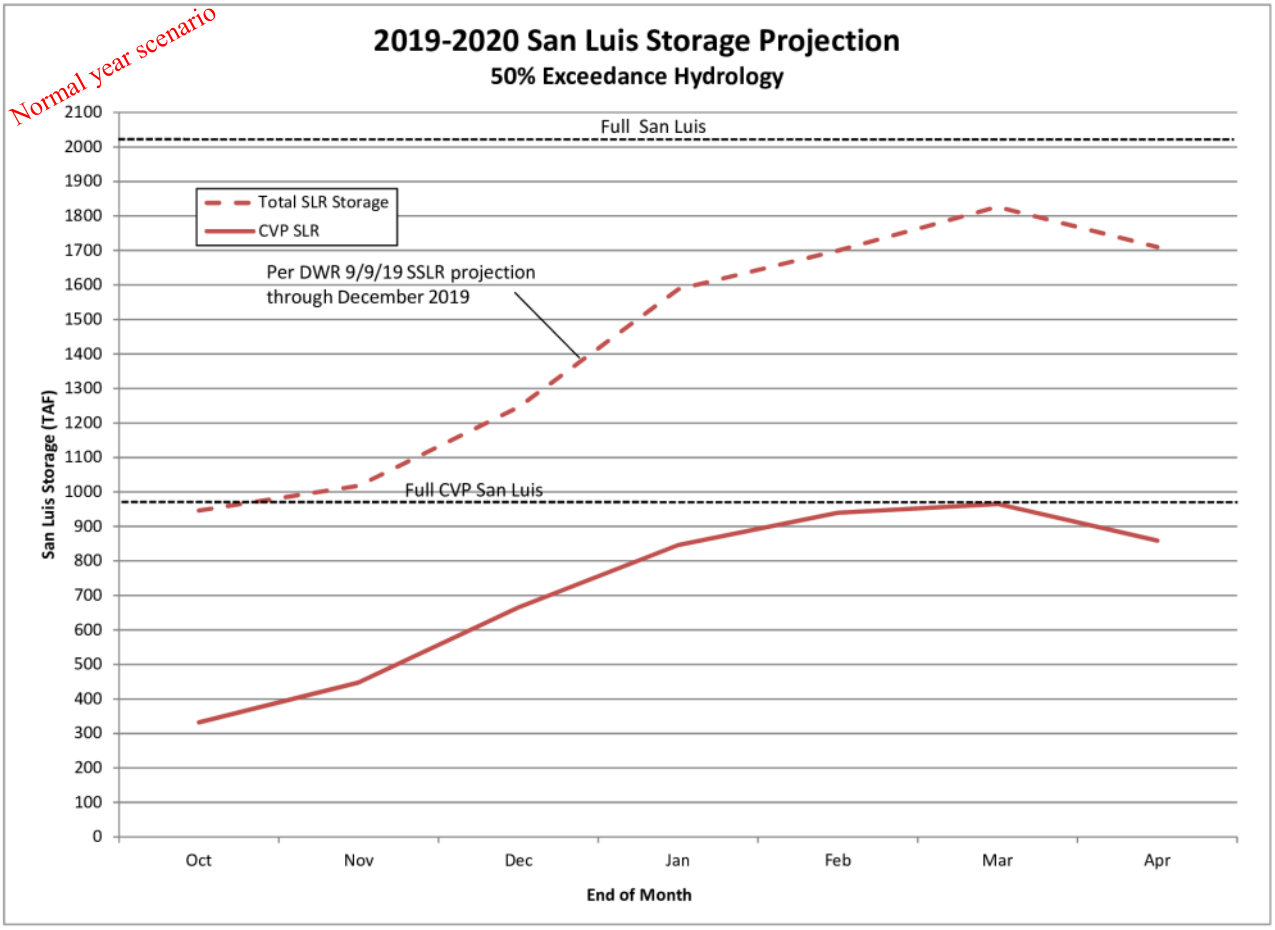
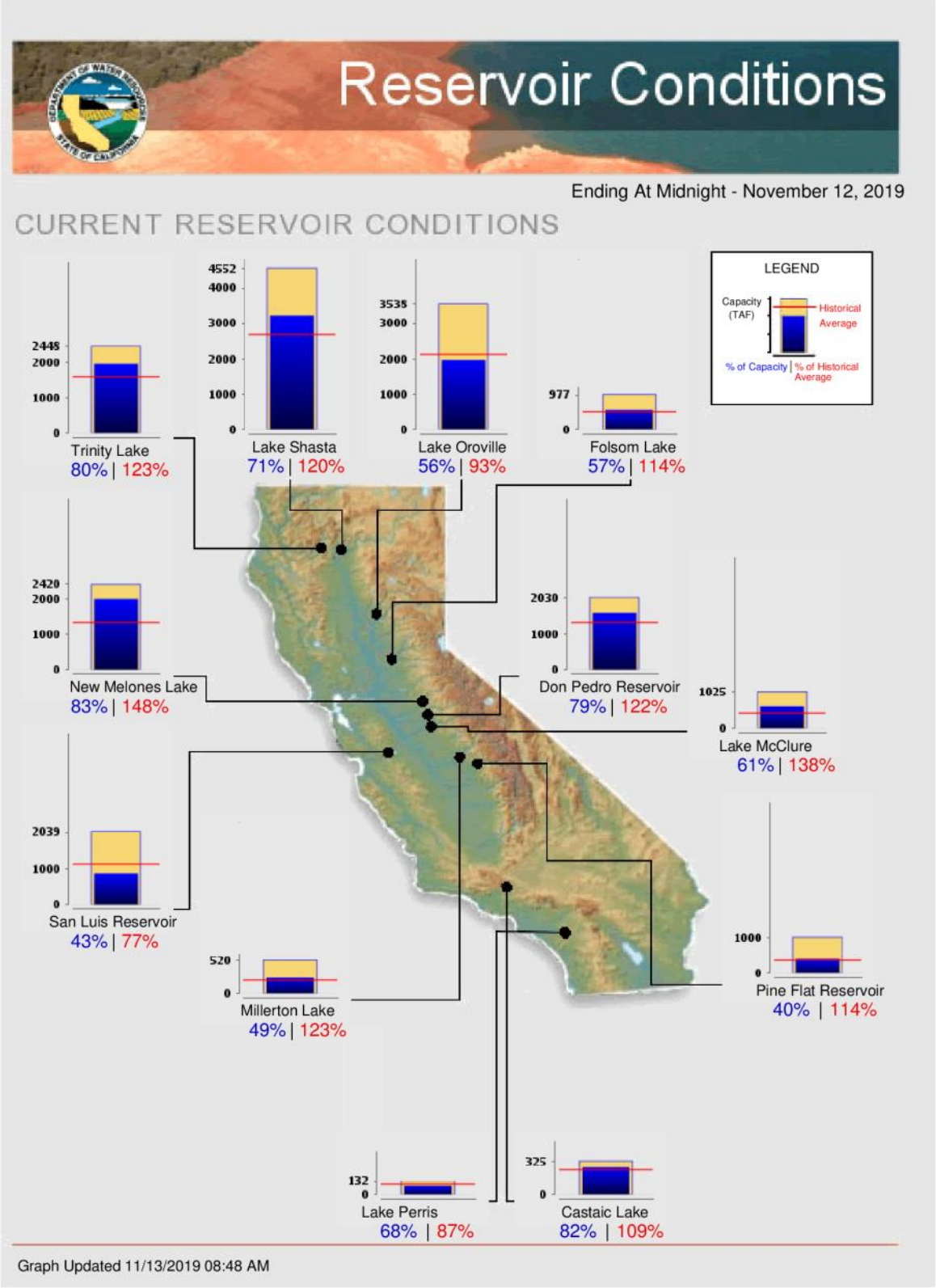


T. Boardman, WWD
11/1/2019

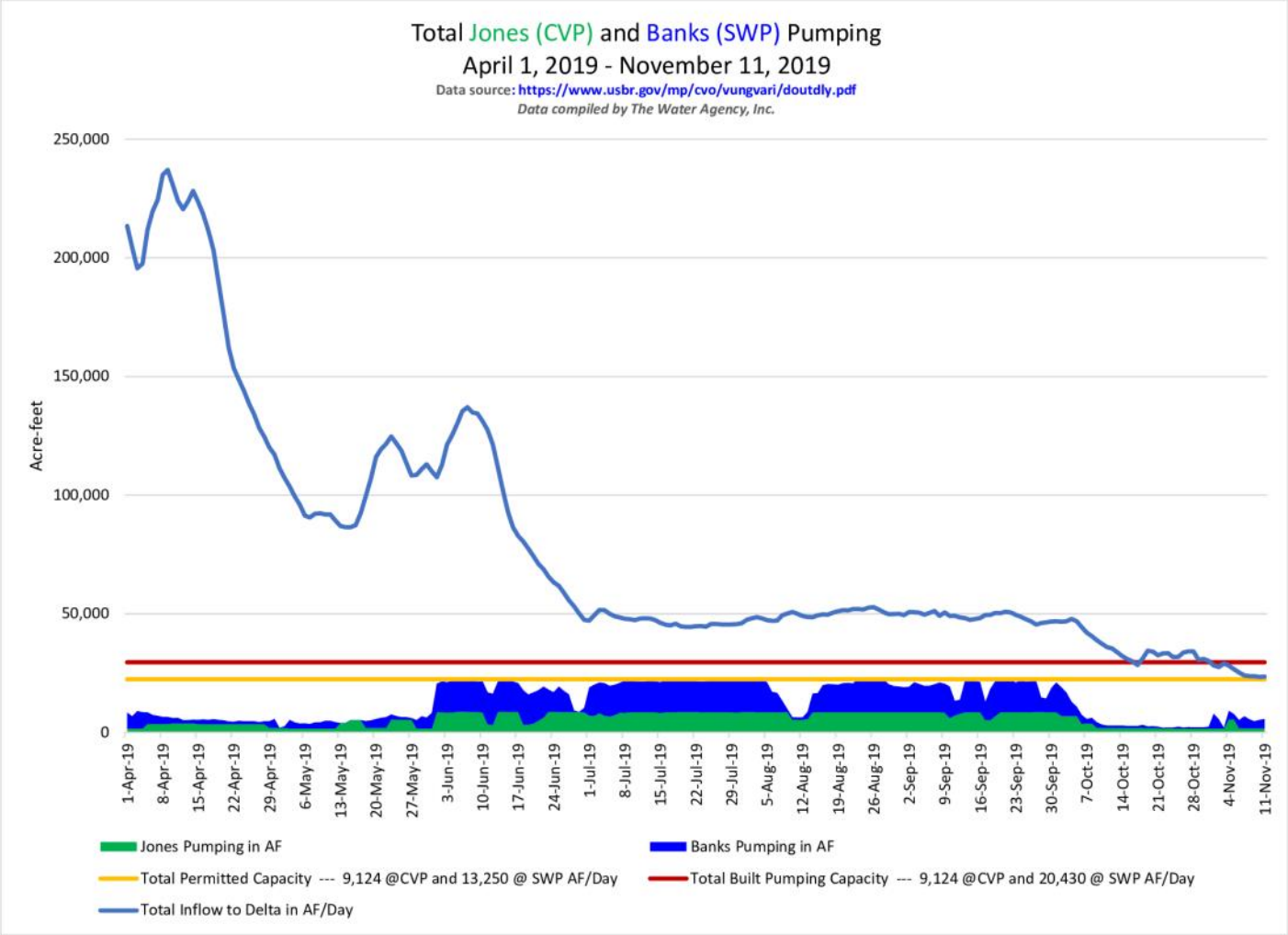
Reservoir Conditions

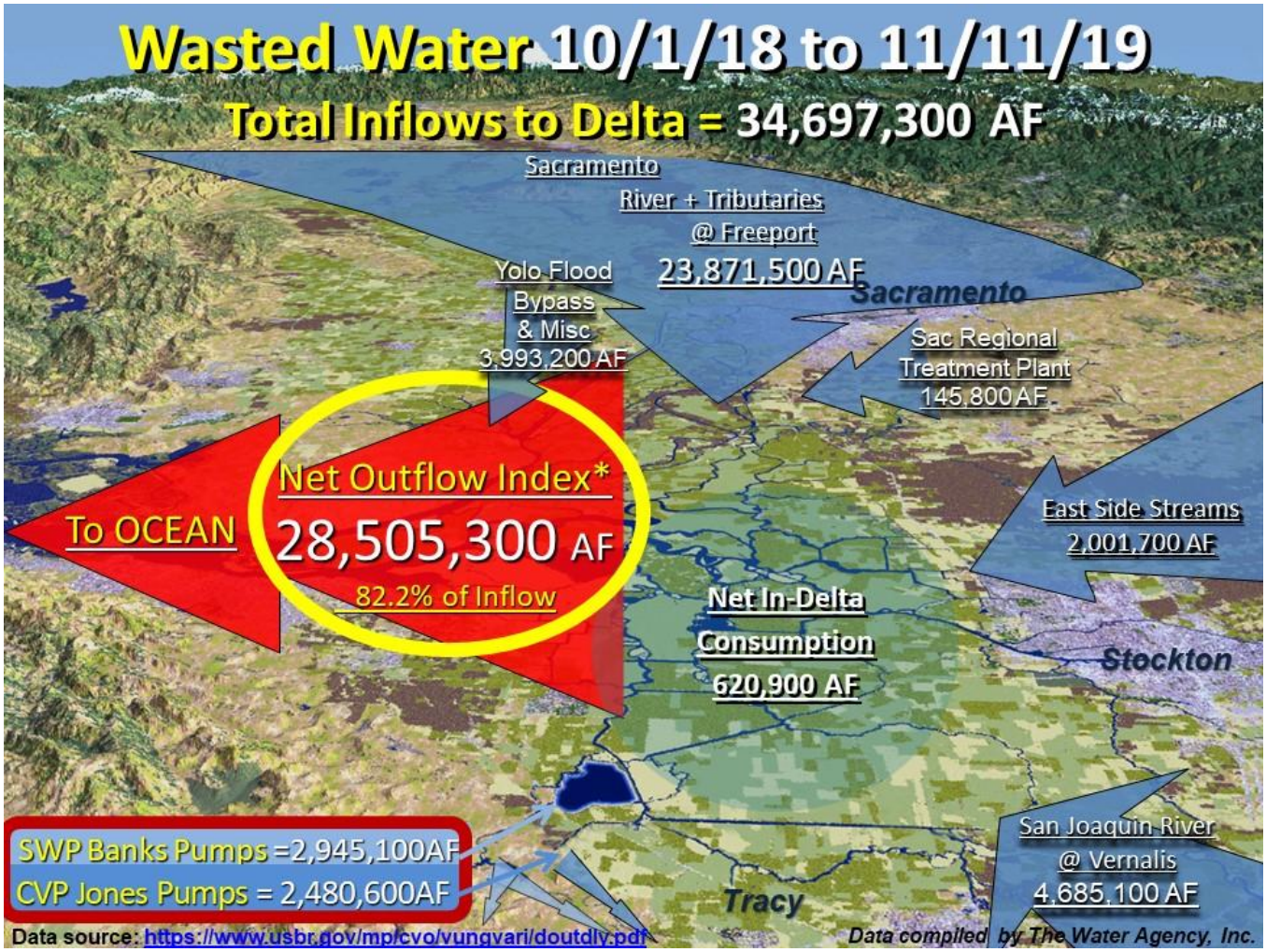
As of November 12, 2019, Northern California reservoirs are between 93-123% of historical average and 56-80% of capacity. The central ones are between 77-148% of historical average and 40-83% of capacity.

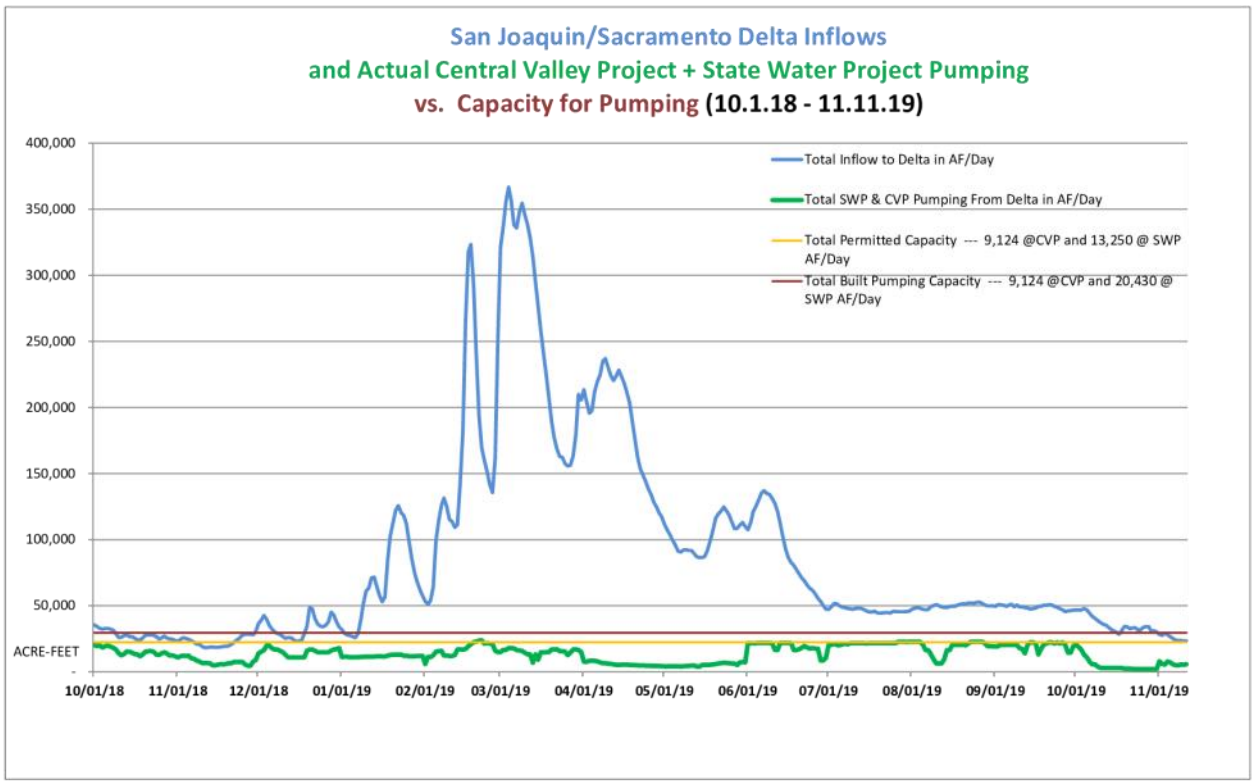


http://cdec.water.ca.gov/cgi-progs/products/rescond.pdf

Jones (CVP) and Banks (SWP) Pumping




Wasted Water 10/1/18 to 11/11/19
Total Inflows to Delta = 34,697,300 AF
Sacramento River + Tributaries @ Freeport
23,871,500 AF
Yolo Flood Bypass & Misc
3,993,200 AF
Sacramento
Sac Regional Treatment Plant
145,800 AF
Net Outflow Index*
28,505,300 AF
82.2% of Inflow
To OCEAN
East Side Streams
2,001,700 AF
Net In-Delta Consumption
620,900 AF
Stockton
SWP Banks Pumps =2,945,100AF
CVP Jones Pumps = 2,480,600AF
Tracy
San Joaquin River @ Vernalis
4,685,100 AF
Data source: https://www.usbr.gov/mp/cvo/vungvari/doutdly.pdf
Data compiled by The Water Agency, Inc.


San Joaquin/Sacramento Delta Inflows
and Actual Central Valley Project + State Water Project Pumping
vs. Capacity for Pumping (10.1.18 - 11.11.19)
Total Inflow to Delta in AF/Day
Total SWP & CVP Pumping From Delta in AF/Day
Total Permitted Capacity --- 9,124 @CVP and 13,250 @ SWP AF/Day
Total Built Pumping Capacity --- 9,124 @CVP and 20,430 @ SWP AF/Day
400,000
350,000
300,000
250,000
200,000
150,000
100,000
50,000
ACRE-FEET
10/01/18
11/01/18
12/01/18
01/01/19
02/01/19
03/01/19
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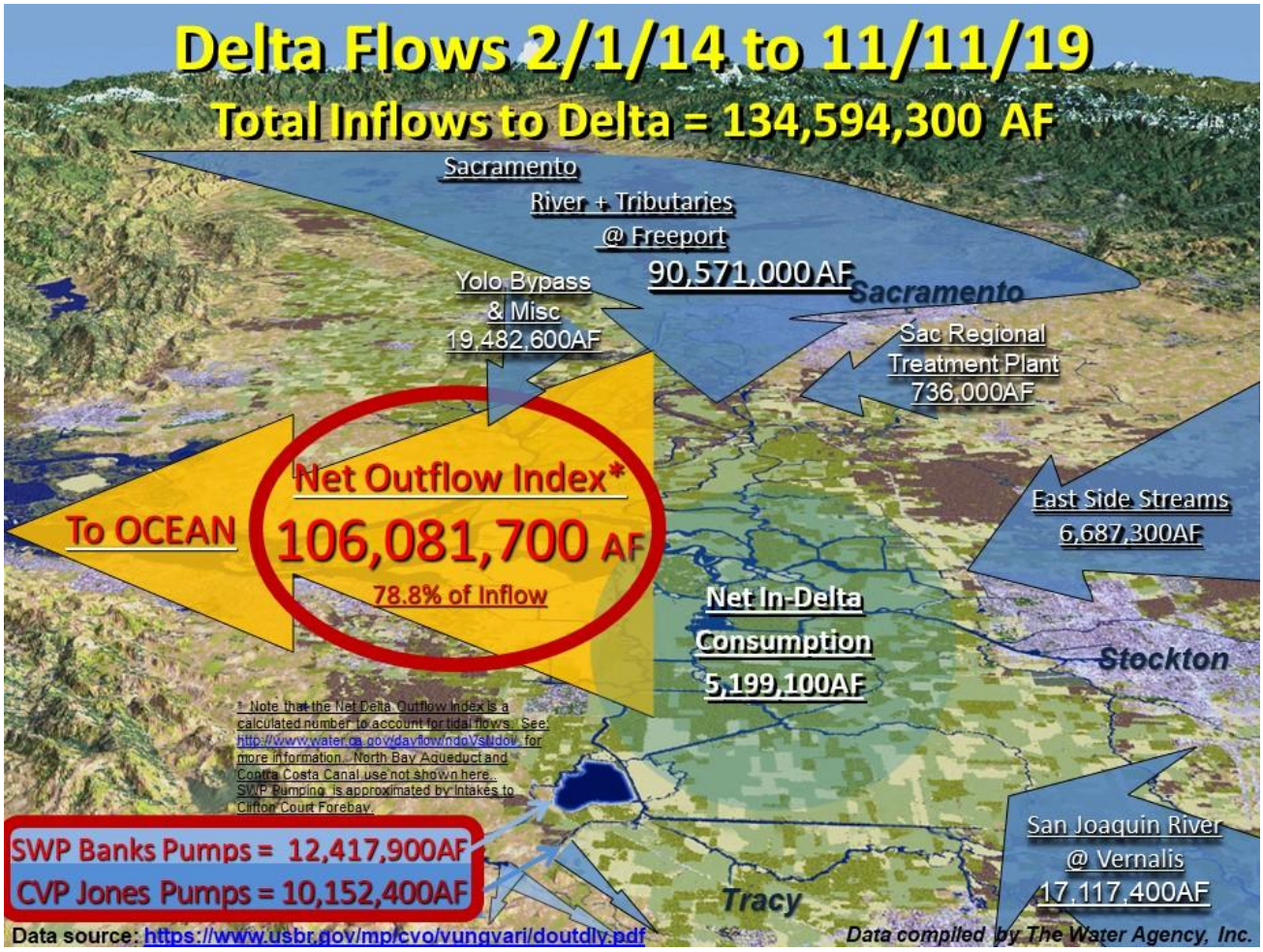
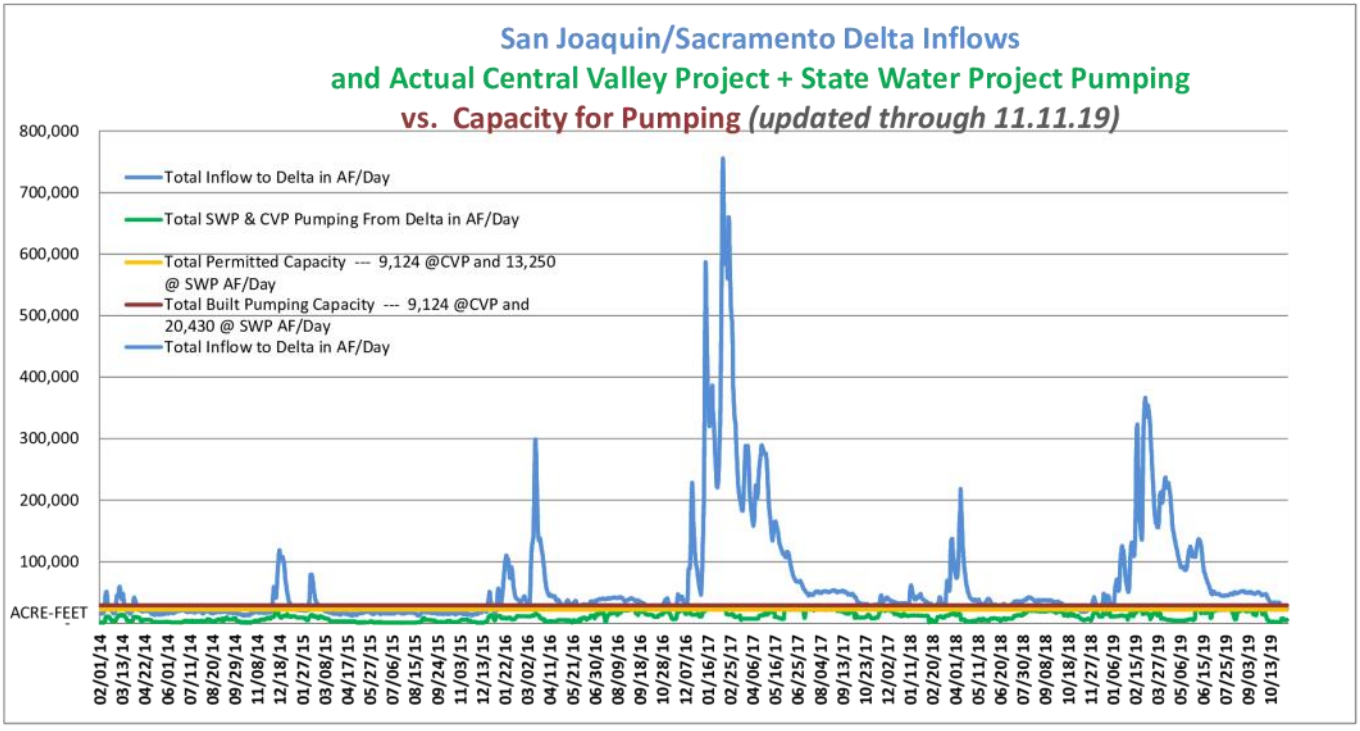
10/01/19
11/01/19


Delta Flows 2/1/14 to 11/11/19
Total Inflows to Delta = 134,594,300 AF
Sacramento River + Tributaries @ Freeport 90,571,000 AF
Yolo Bypass & Misc 19,482,600AF
Sacramento
Sac Regional Treatment Plant 736,000AF
Net Outflow Index*
To OCEAN
106,081,700 AF
78.8% of Inflow
East Side Streams 6,687,300AF
Net In-Delta Consumption 5,199,100AF
Stockton
* Note that the Net Delta Outflow Index is a calculated number to account for tidal flows. See http://www.water.ca.gov/dayflow/ndoVSndov for more information. North Bay Aqueduct and Contra Costa Canal use not shown here. SWP Pumping is approximated by Intakes to Clifton Court Forebay.
SWP Banks Pumps = 12,417,900AF
CVP Jones Pumps = 10,152,400AF
San Joaquin River @ Vernalis 17,117,400AF
Tracy
Data source: https://www.usbr.gov/mp/cvo/vungvari/doutdly.pdf
Data compiled by The Water Agency, Inc.


San Joaquin/Sacramento Delta Inflows
and Actual Central Valley Project + State Water Project Pumping
vs. Capacity for Pumping (updated through 11.11.19)
800,000
700,000
600,000
500,000
400,000
300,000
200,000
100,000
ACRE-FEET
Total Inflow to Delta in AF/Day
Total SWP & CVP Pumping From Delta in AF/Day
Total Permitted Capacity --- 9,124 @CVP and 13,250 @ SWP AF/Day
Total Built Pumping Capacity --- 9,124 @CVP and 20,430 @ SWP AF/Day
Total Inflow to Delta in AF/Day
02/01/14
03/13/14
04/22/14
06/01/14
07/11/14
08/20/14
09/29/14
11/08/14
12/18/14
01/27/15
03/08/15
04/17/15
05/27/15
07/06/15
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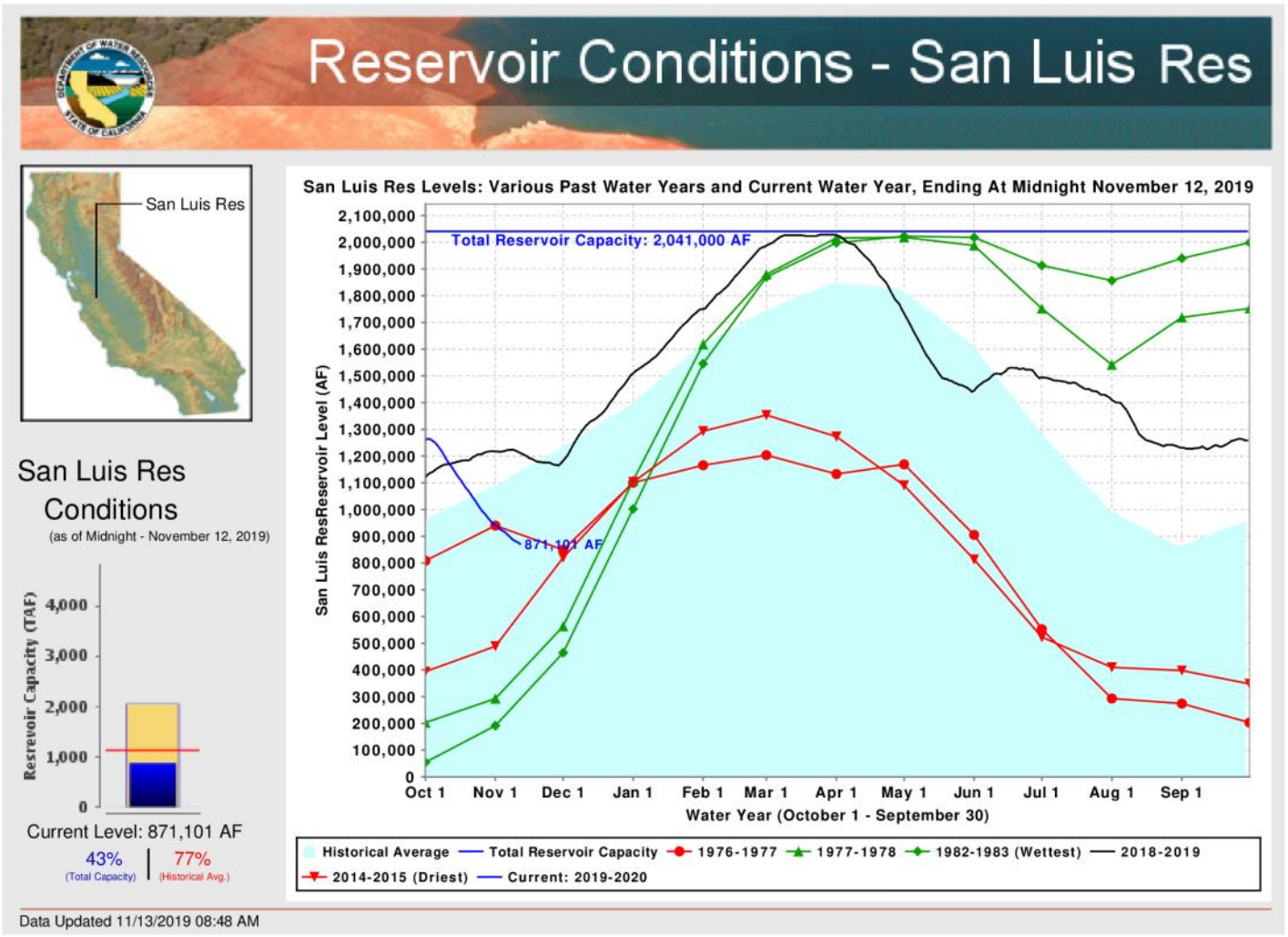
11/27/18
01/06/19
02/15/19
03/27/19
05/06/19
06/15/19
07/25/19
09/03/19
10/13/19

San Luis Reservoir

As of November 12, 2019, San Luis is at 77% of the historical average. San Luis total (CVP + SWP) storage is at 871,101 AF and is at 43% of the 2,041,000AF of capacity. As of November 12, 2019, the CVP share is 283,271 AF (at 29.3% of capacity).

https://www.usbr.gov/mp/cvo/vungvari/sccao_snldop.pdf



http://cdec.water.ca.gov/cgi-progs/products/snlres.pdf

Federal Storage within San Luis Reservoir

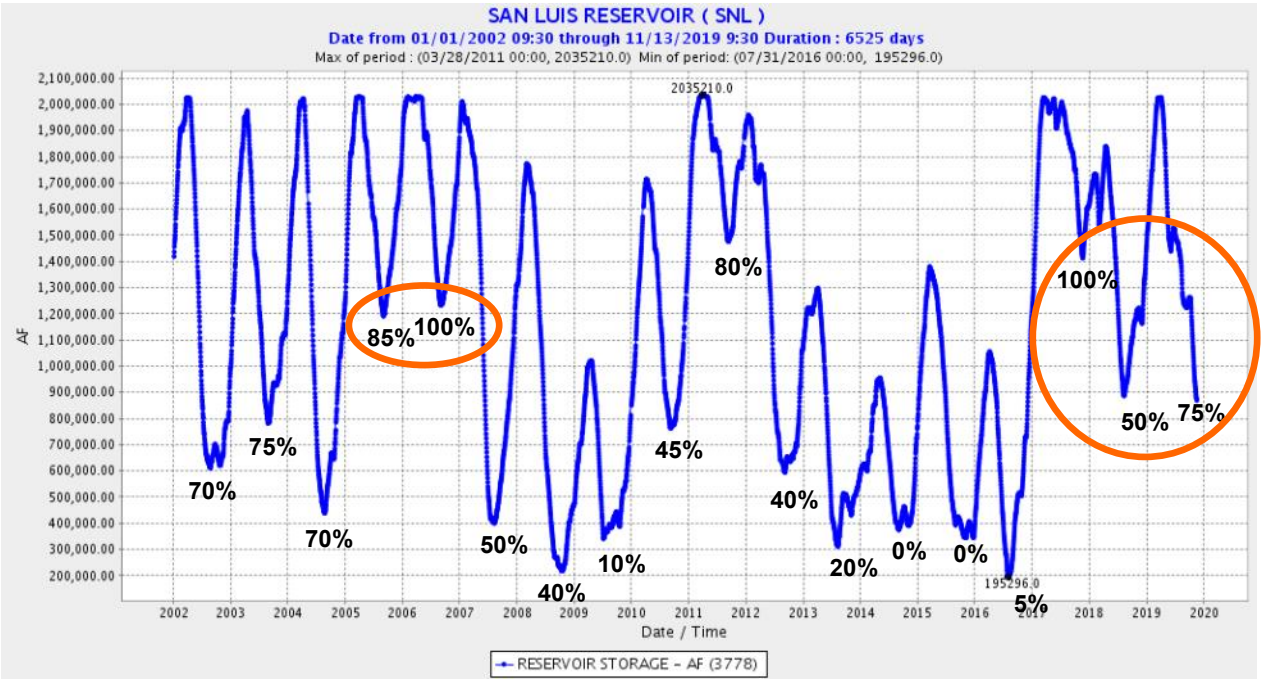
As of November 12, 2019, federal storage was at 283,271AF (29.3% capacity). Total federal storage capacity is 965,655AF.

State Storage within San Luis Reservoir

As of November 12, 2019, state storage was at 587,830AF (55.3% capacity). The total state storage capacity in SLR is 1,062,180AF. https://www.usbr.gov/mp/cvo/vungvari/sccao_snldop.pdf

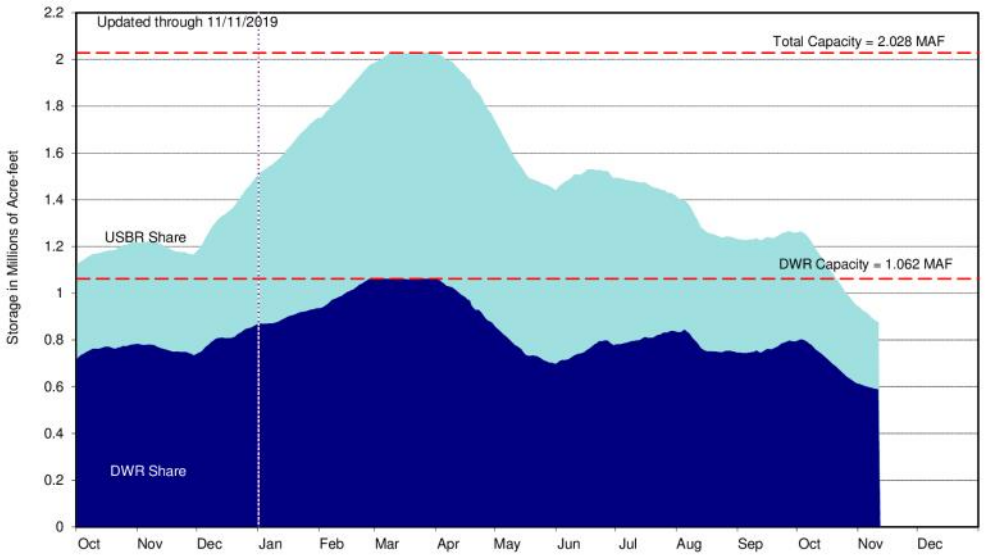
2019 Central Valley Project (CVP) allocation is 75%, and the State Water Project (SWP) allocation is 75%.

(CVP Allocations have been added to this chart.)



Reservoir Storage: http://cdec.water.ca.gov/jspplot/jspPlotServlet.jsp?sensor_no=3778&end=11%2F13%2F2019+9%3A30&geom=huge&interval=6525&cookies=cdec01

Summary of Water Supply Allocations: https://www.usbr.gov/mp/cvo/vungvari/water_allocations_historical.pdf



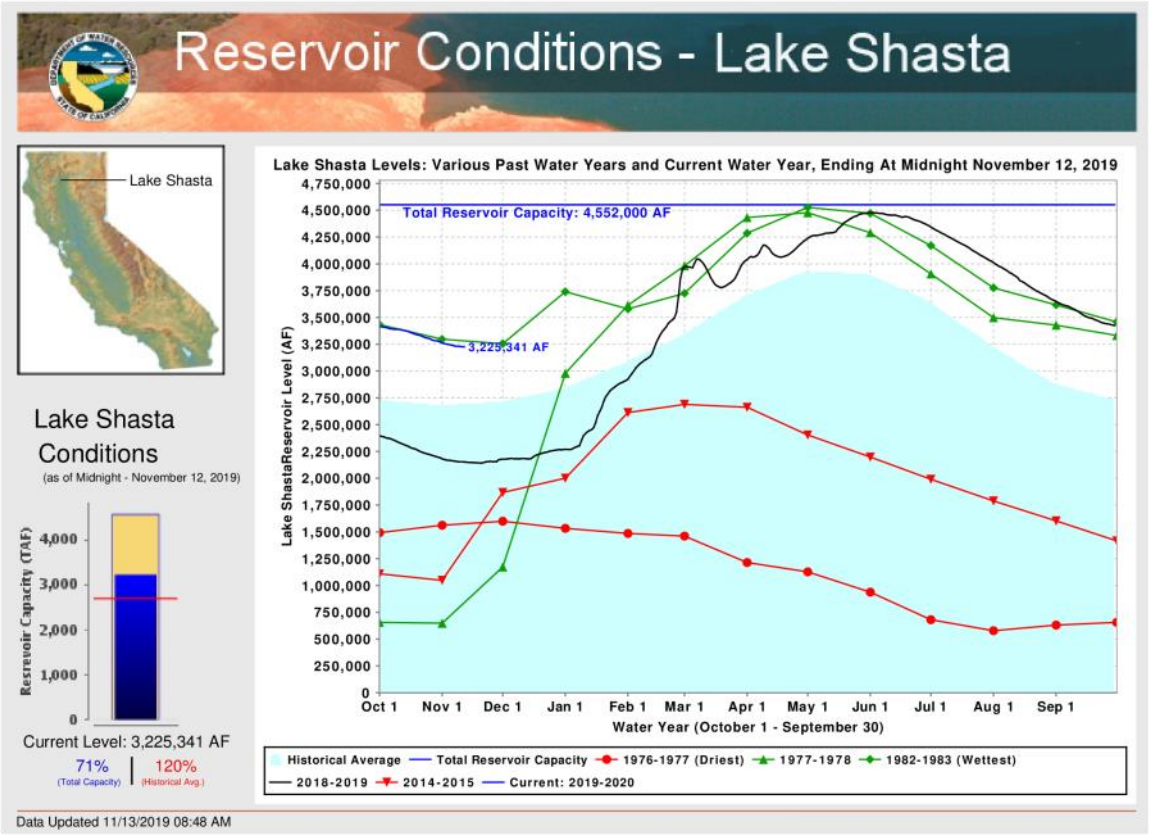
https://water.ca.gov/-/media/DWR-Website/Web-Pages/Programs/State-Water-Project/Operations-And-Maintenance/Files/Operations-Control-Office/Project-Wide-Operations/San-Luis-Weekly-Reservoir-Storage-Chart.pdf?la=en&hash=8D8540CC235C213FD1DA5371CFECCD0B30BC310B

Shasta Lake Storage

As of Tuesday, 11/12/2019, storage in Shasta Lake was approximately 3,225,341 AF (71% of capacity and 120% of the historical average). That's down 26,508 AF from last week.

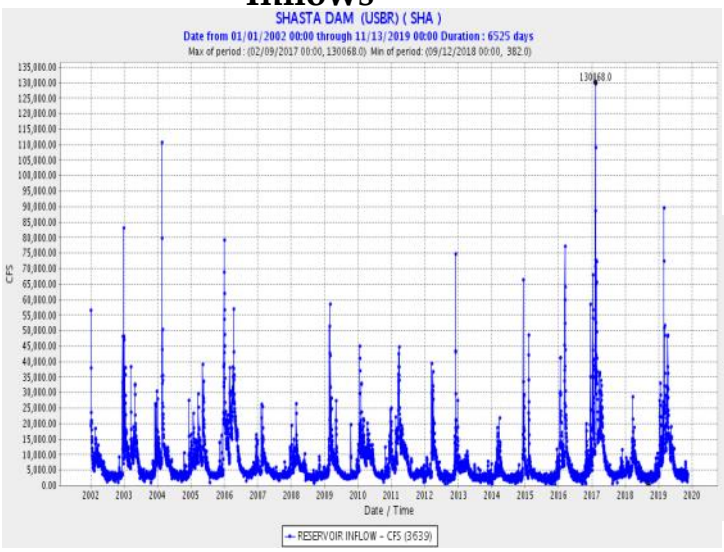
Total capacity is about 4,552,000 AF.

As of Sunday, the weekly average daily inflows were calculated as 2,880 CFS, and the weekly average daily outflows were calculated as 4,431 CFS.

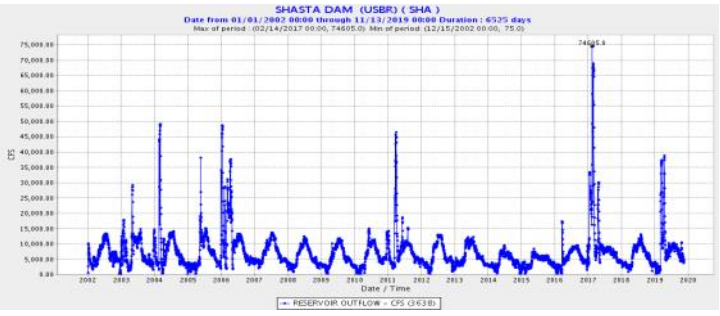


Reservoir graphs from: http://cdec.water.ca.gov/reservoir_map.html

Inflows

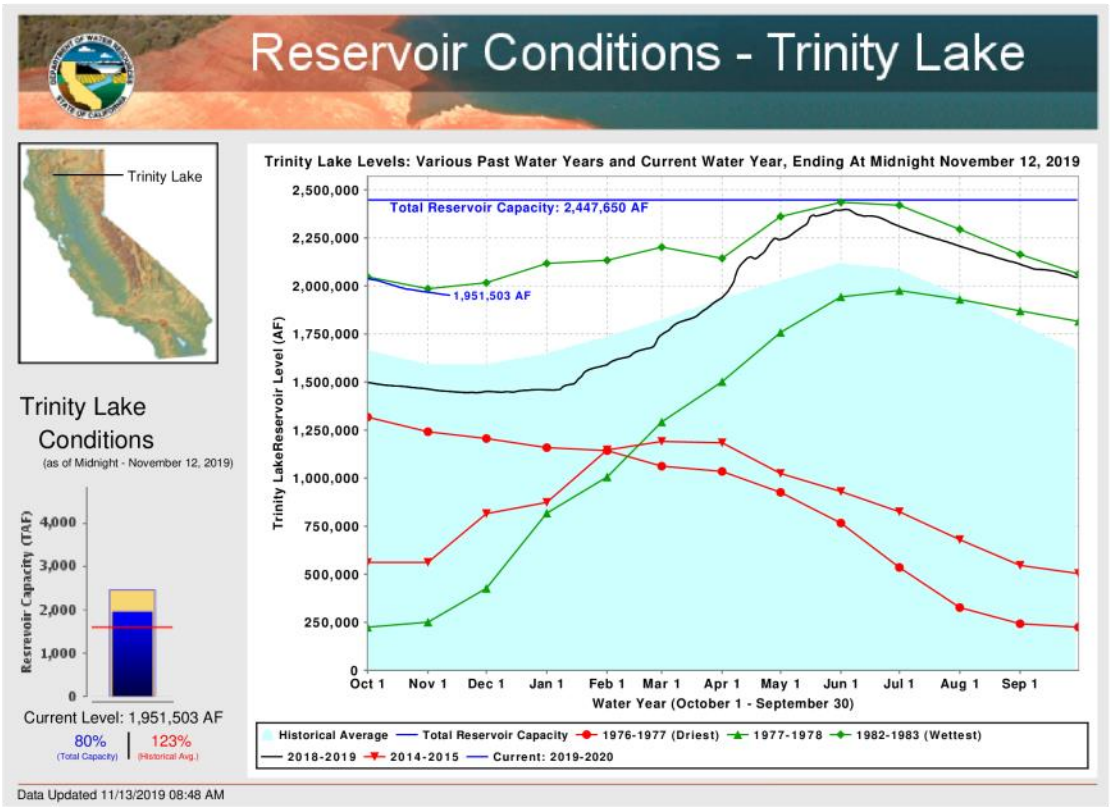


Outflows



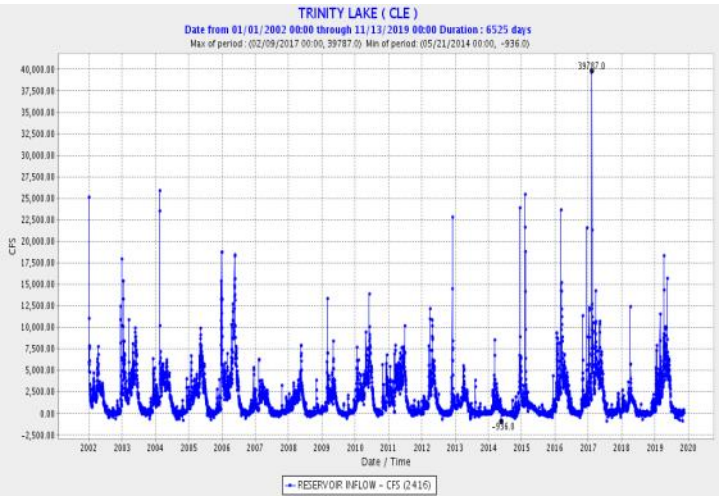
Trinity Lake Storage

As of Tuesday, 11/12/2019, storage in Trinity Lake was approximately 1,951,503 AF (80% of capacity and 123% of the historical average). That's down 13,163 AF from last week. Total capacity is about 2,447,650 AF.

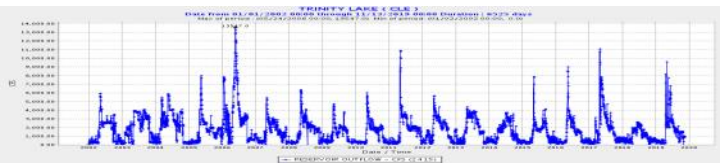


As of Sunday, the weekly average daily inflows were calculated as 227 CFS, and the weekly average daily outflows were calculated as 953 CFS.

Inflows

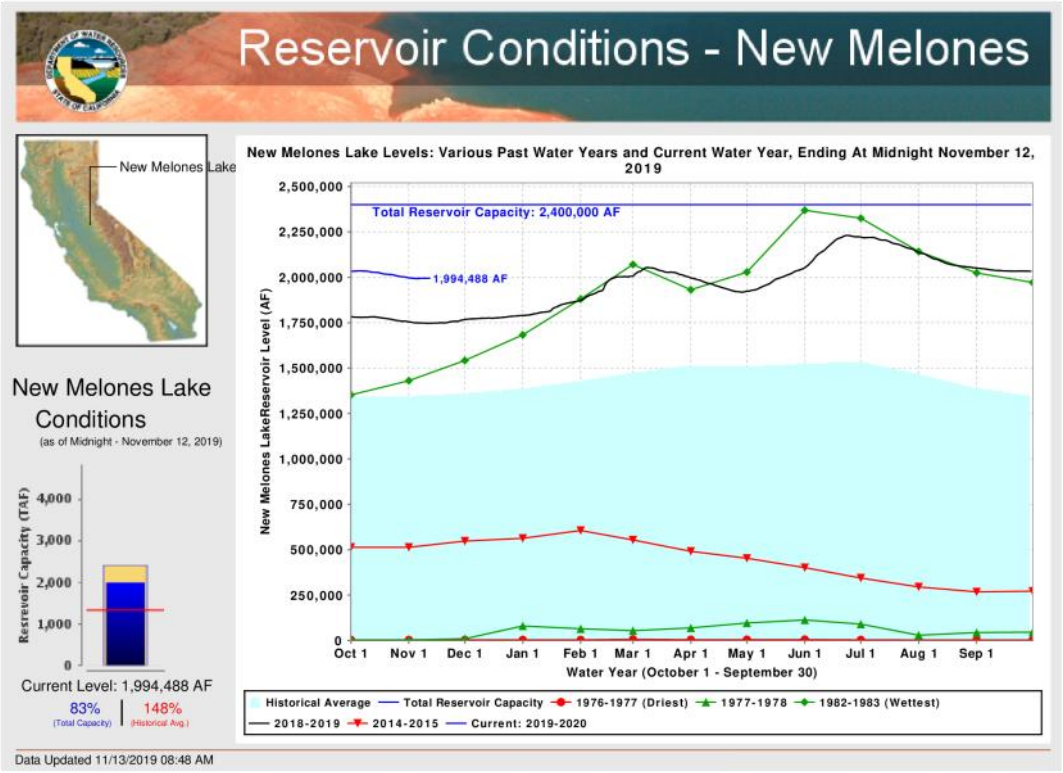


Outflows



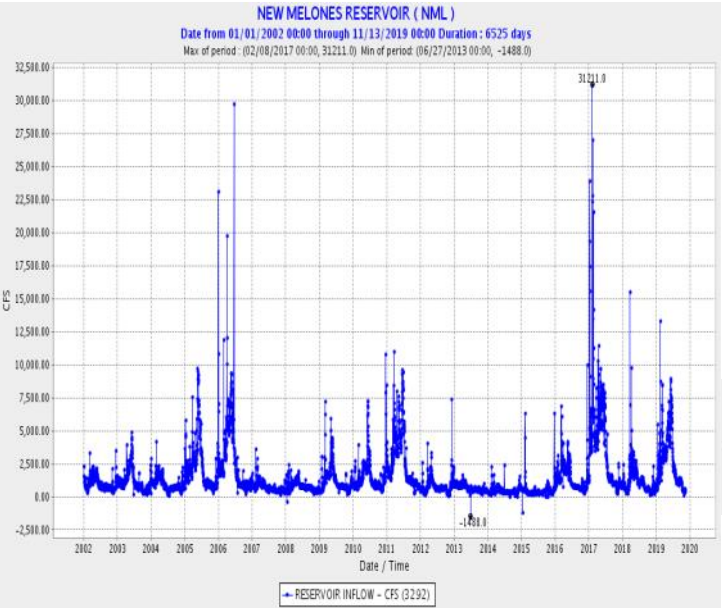
New Melones Storage

As of Tuesday, 11/12/2019, storage in New Melones was approximately 1,994,488 AF (83% of capacity and 148% of the historical average). That's down 220 AF from last week. Total capacity is about 2,400,000 AF.



As of Sunday, the weekly average daily inflows were calculated as 487 CFS, and the weekly average daily outflows were calculated as 406 CFS.

Inflows



Outflows