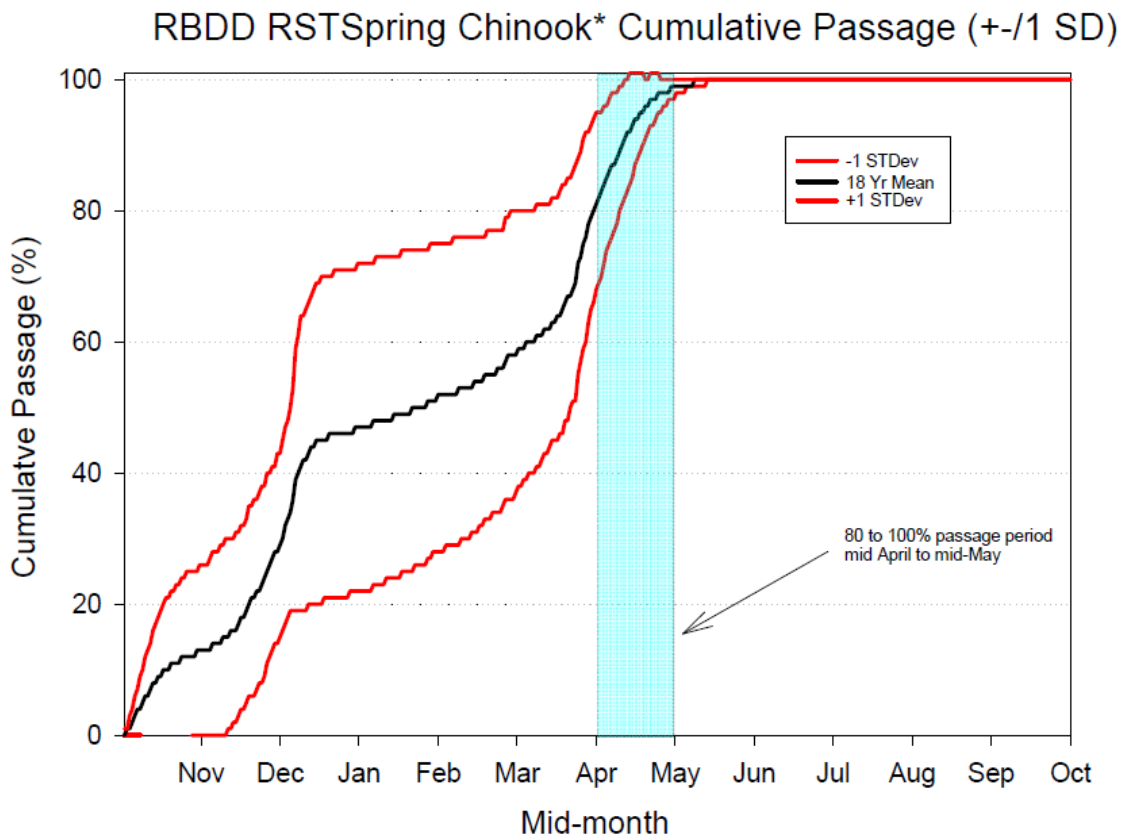




Sacramento River Temperature Task Group Meeting Packet

April 13, 2023



* Length-at-date minus estimated hatchery influence

RBDD RSTSpring Chinook* Cumulative Passage (+/-1 SD)

A line plot of the Cumulative Passage (from 0-100%) of Spring Chinook in the middle of the month, November 2022–April 2023. The blue block highlights April–mid-May as an 80% to 100% passage period. Two red lines show -1 STDev; a black line shows 18 Yr Mean and the top red line shows +1 STDev.

United States Department of the Interior
 Bureau of Reclamation-Central Valley Project-California
 April 2023 Shasta Lake Daily Operations Run Date: 04/12/2023

Day	Elev	Storage 1000- acre- feet in lake	Storage 1000- acre- feet change	Computed Inflow C.F.S.	Release C.F.S. Power	Release C.F.S. Spill	Release C.F.S. Outlet	Evap C.F.S.	Evap inches	Precip. inches
N/A	N/A	3,770.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
1	1,040.14	3,796.3	25.4	14,537	1,717	0	0	0	0.00	0.01
2	1,041.11	3,822.0	25.7	13,986	1,018	0	0	16	0.02	0.01
3	1,041.94	3,844.1	22.1	12,191	965	0	0	94	0.12	0.00
4	1,042.58	3,861.2	17.1	10,993	2,278	0	0	95	0.12	0.00
5	1,043.24	3,878.8	17.7	11,413	2,401	0	0	103	0.13	0.00
6	1,043.86	3,895.5	16.7	11,017	2,535	0	0	87	0.11	0.00
7	1,045.02	3,926.8	31.3	18,259	2,470	0	0	16	0.02	1.62
8	1,046.31	3,961.8	35.0	19,905	2,241	0	0	8	0.01	1.59
9	1,047.51	3,994.6	32.8	17,725	1,119	0	0	89	0.11	0.00
10	1,048.70	4,027.2	32.7	17,712	1,130	0	0	113	0.14	0.00
11	1,049.90	4,060.3	33.1	18,706	1,893	0	0	114	0.14	0.00
Totals	NA	NA	289.6	166,444	19,767	0	0	735	0.92	3.23
Acre- Feet	NA	NA	289,600	330,142	39,208	0	0	1,458	NA	NA

Comments:

* Computed inflow is the sum of change in storage, releases, pumping and evaporation.

Summary: Precipitation

Time	Precipitation
This month	3.23
Oct 1, 2022, to date	71.93

Summary: Release (Acre-Feet)

Category	Release Acre-Feet
Power	39,208
Spill	0
Outlet	0
Total	39,208

Sacramento River Station Temperature Summary Report

Date	MDWT TCD ¹	MDWT SHD	MDWT SPP ¹	MDWT KWK	MDWT SAC ²	MDWT CCR	MDWT BSF	MDWT BND	MDWT RBD	MDWT IGO	MDWT LWS	MDWT DGC ³	MDWT NFH	MDR Shasta Genera- tion	MDR Spring Creek PP	MDR Keswick Total	MDAT RDD	MDAT BSF	MDAT RDB
Mar	46.6	46.3	45.7	46.8	47.1	47.4	48.2	47.9	48.3	46.5	45.1	42.0	43.3	1729	883	3597	47.7	46.9	48.3
04/01	46.4	45.8	46.2	47.1	47.3	47.9	49.8	-C	51.5	47.5	44.5	43.6	46.1	1717	460	3304	54.5	52.3	53.7
04/02	46.2	45.8	46.5	47.5	47.9	48.7	50.1	-C	49.3 ^A	47.0	44.7	43.7	45.3	1018	1653	3315	51.0	51.4	52.3
04/03	46.4	45.8	46.7	47.1	47.3	47.8	49.2	-C	50.9 ^A	46.7	45.7	43.8	44.5	965	1650	3322	46.5	45.5	47.4
04/04	46.4	45.9	46.8	47.2	47.6	48.2	49.1	-C	50.1	46.8	46.5	43.8	44.9	2278	330	3321	46.0	44.9	47.3
04/05	47	46.9 ^A	47.4	47.2	47.7	48.7	50.1	-C	50.9 ^A	47.6	45.9	43.9	45.6	2401	37	3320	48.0	48.1	49.6
04/06	47.4	46.8 ^A	47.4	47.2	47.4	48.1	50.5	-C	51.8	47.8	45.9	44.0	45.9	2535	37	3303	53.0	50.9	51.0
04/07	47	47 ^A	46.7	47.5	48.0	48.2	50.4	-C	51.4	48.6	46.4	44.1	46.1	2470	333	3281	53.5	53.3	53.0
04/08	47.1	46.6	46.6	47.9	48.8	49.2	51.2	-C	52A	50.3	45.9	44.2	46.8	2241	533	3310	55.5	54.5	55.3
04/09	47.5	47.3 ^A	46.7	48.1	49.1	50.0	52.7	-C	53.7	50.7	46.0	44.4	46.9	1119	1466	3356	59.5	58.5	59.5
04/10	47.44	46.7	46.9	48.3	49.5	50.7	54.3	-C	55.9	51.9	46.2	44.5	48.1	1130	1561	3344	63.0	62.4	64.4
04/11	47.8	47.7	47.4	48.9	49.8	51.2	56.0	-C	58.0	52.2	45.9	44.8	48.3	1893	676	2984	64.5	63.5	63.2
Apr	47.0	46.6	46.8	47.6	48.2	49.0	51.2	N/A	52.3	48.8	45.8	44.1	46.2	1797	794	3287	54.1	53.2	54.2

Sacramento River Station Temperature Summary Table

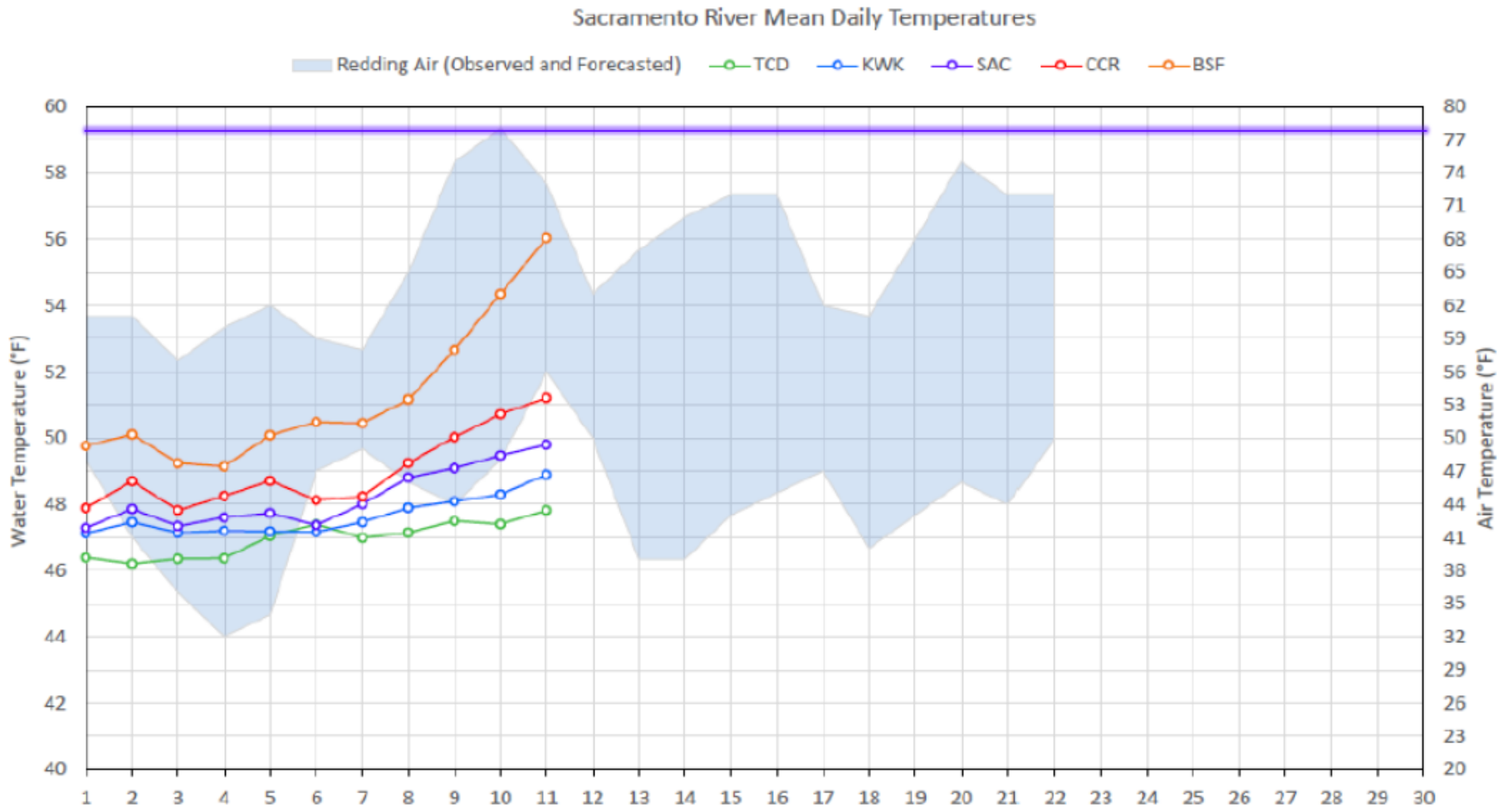
Totals	MDR Shasta Generation	MDR Spring Creek P.P	MDR Keswick Total
CFS	19767	8736	36160
AF	39207	17327	71722

Legend

A = 1-9 hours of data missing (Average includes estimations)
B = 10 or more hours of data missing (Average not calculated)
C = Station out of service
D = Record high air temperature
E = Record low air temperature
MDWT = Mean Daily Water Temperature (Fahrenheit)
MDR = Mean Daily Release (CFS)
MDAT = Mean Daily Air Temperatures (Fahrenheit)

Notes

1 Temperatures are weighted averages based on individual penstock flow and temperature
X Highlighted cells in the TCD column indicate a TCD change was made on that day
2 Current Sacramento River control point (see page 4 for more details)
3 Data is currently being collected locally and periodically downloaded.
Once downloaded and certified by USGS, missing data will be added.



Sacramento River Mean Daily Temperatures

This figure shows mean Sacramento River daily temperatures in degrees Fahrenheit at Shasta Power Plant and various stations 0.8, 4.8, 9.7, and 25 miles downstream of Keswick Dam for the past 24 days. It also includes a shaded area depicting observed and forecasted air temperatures in degrees Fahrenheit in Redding California.

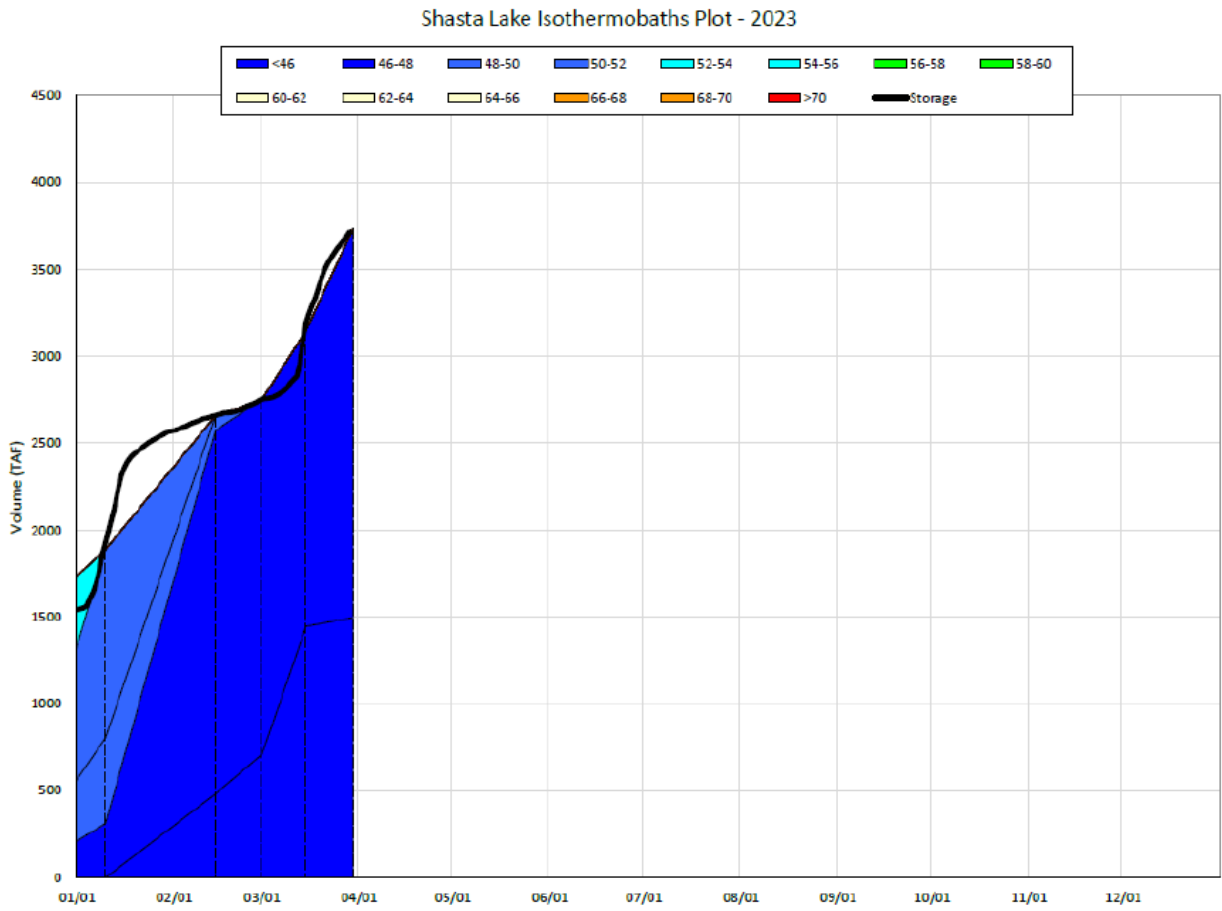
Station Details

Code	Body of Water	Location ¹
TCD	N/A	Shasta Power Plant
SHD	Sacramento River	0.3 miles downstream of Shasta Power Plant
SPP	N/A	Spring Creek Power Plant
KWK	Sacramento River	0.8 miles downstream of Keswick Dam
SAC	Sacramento River	4.8 miles downstream of Keswick Dam
CCR	Sacramento River	9.7 miles downstream of Keswick Dam
BSF	Sacramento River	25 miles downstream of Keswick Dam
JLF	Sacramento River	34 miles downstream of Keswick Dam
BND	Sacramento River	41 miles downstream of Keswick Dam
RDB	Sacramento River	58 miles downstream of Keswick Dam
IGO	Clear Creek	7.3 miles downstream of Whiskeytown Dam

Water Right Temperature Control Points

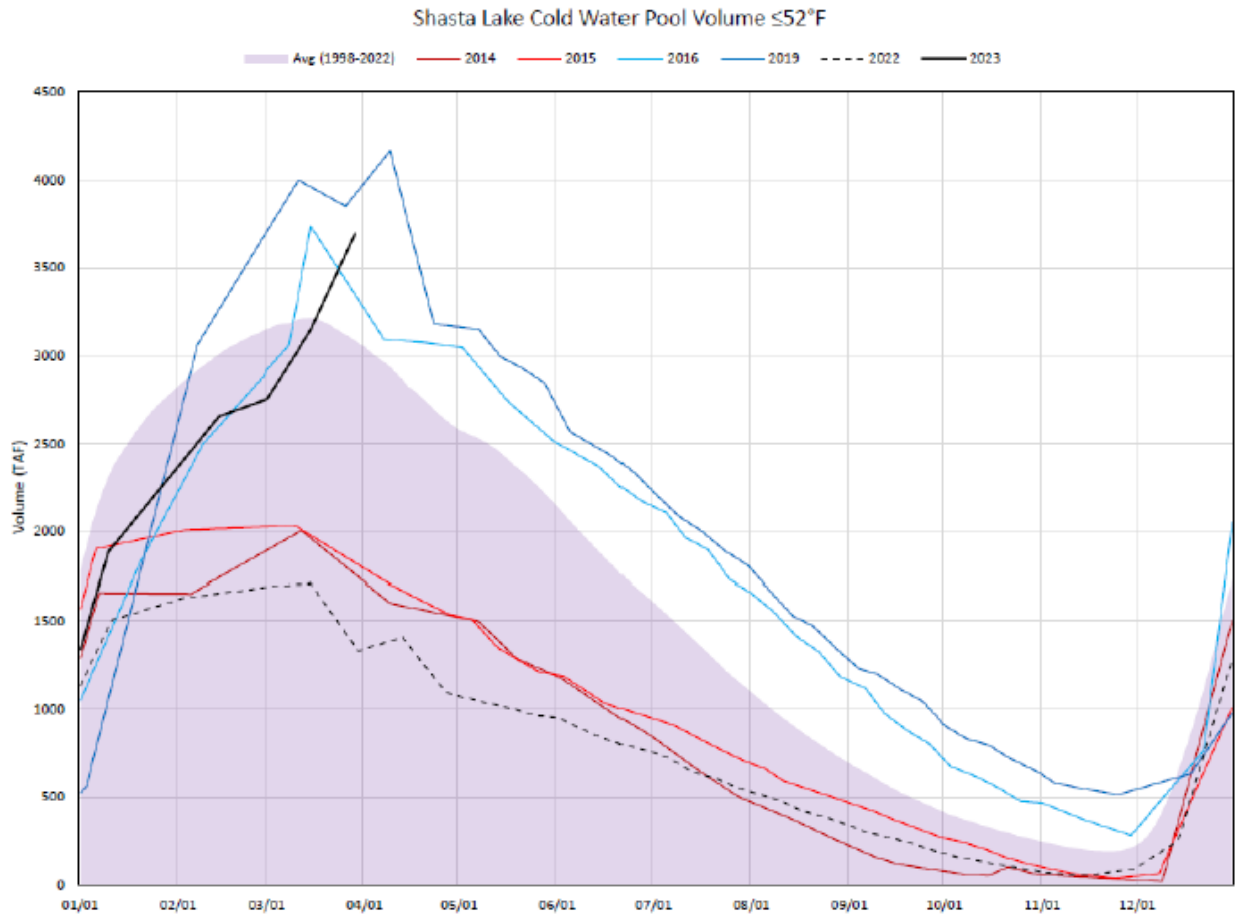
River	Point	Temp (°F)	Begin Date	End Date
Sacramento	SAC	55	06/15/2021	05/02/2022
Sacramento	SAC	58	05/02/2022	06/07/2022
Sacramento	SAC	54.5	06/07/2022	TBD

Notes: ¹ Distances are approximate



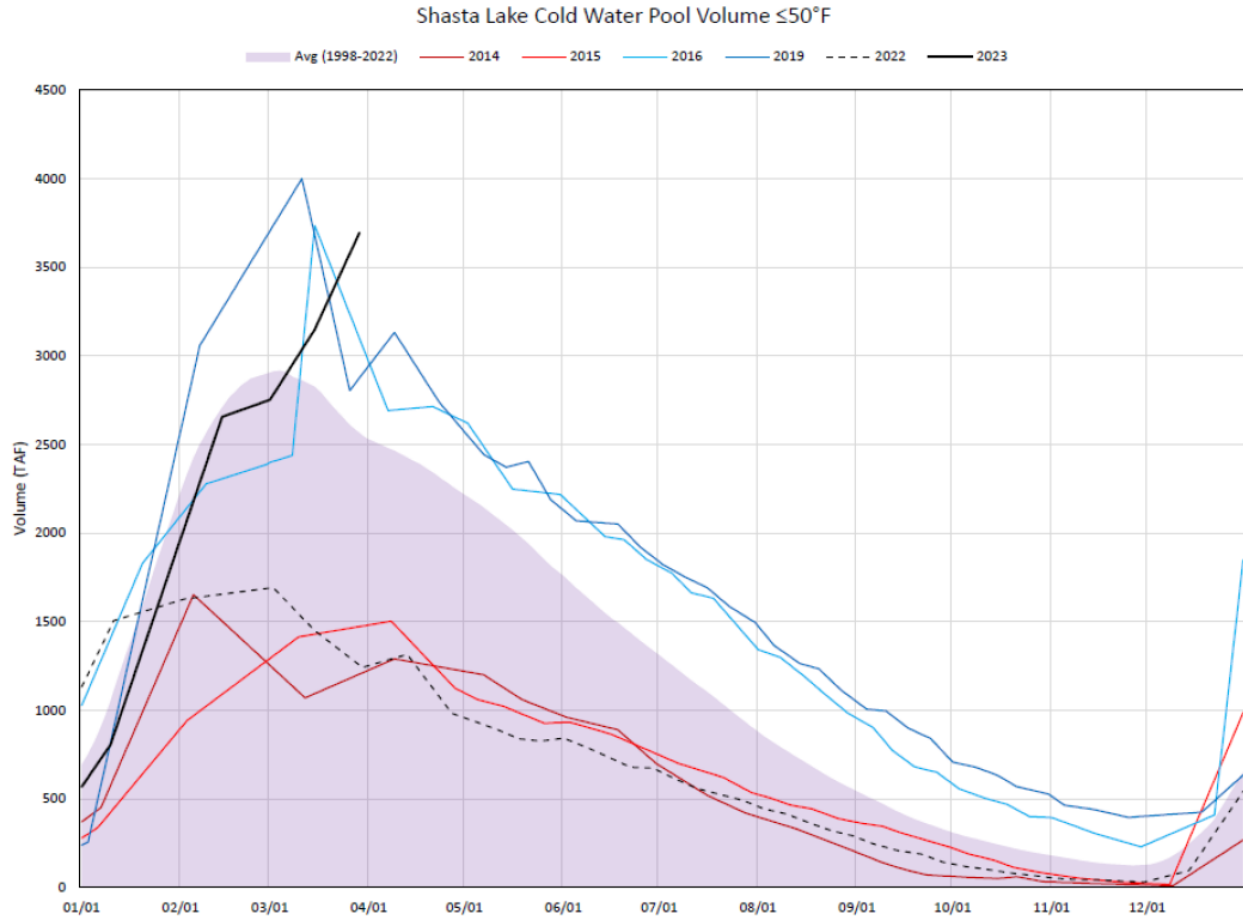
Shasta Lake Isothermobaths Plot - 2023

A chart that shows the temperature in degrees Fahrenheit and storage volume in thousands of acre-feet for 01/01 to 04/01 in Shasta Lake.



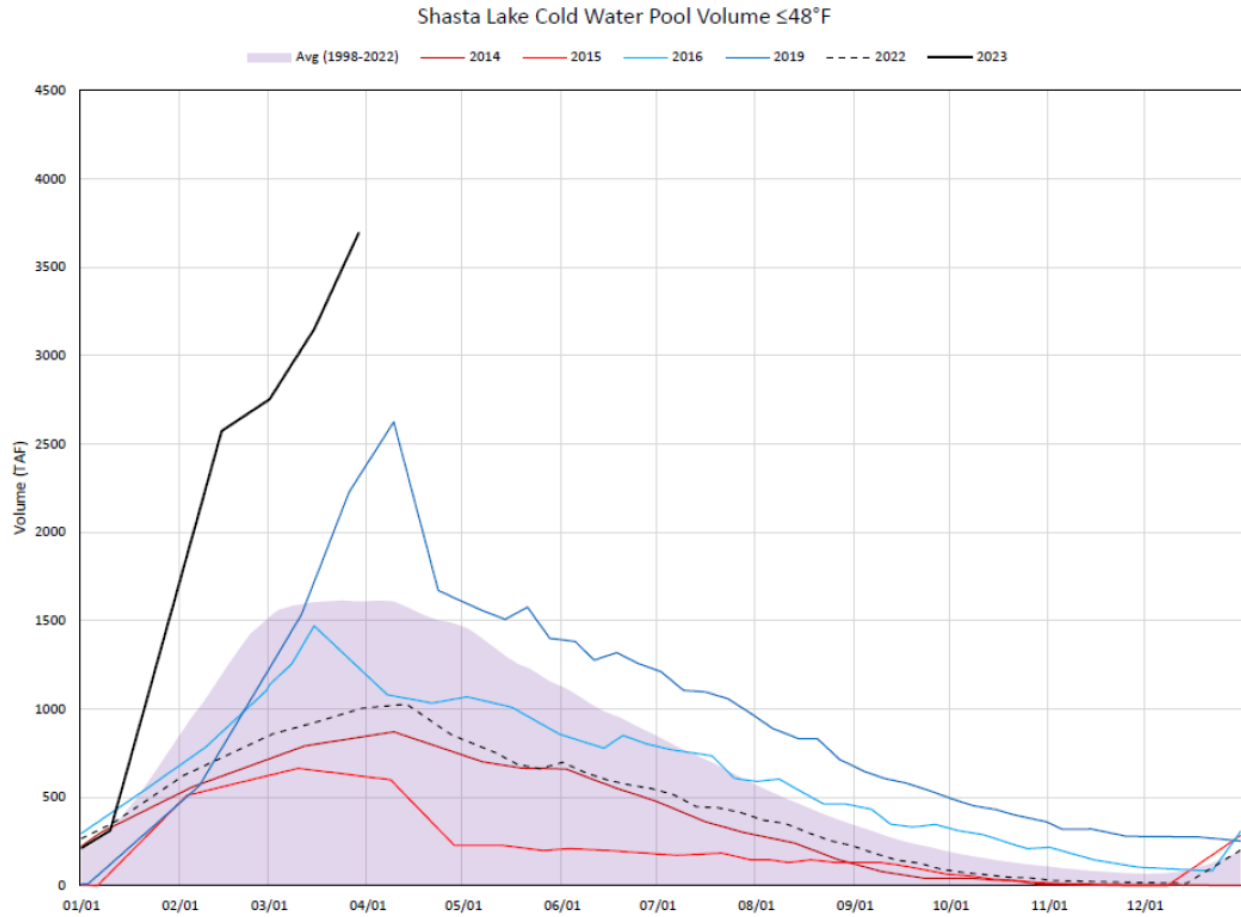
Shasta Lake Cold Water Pool Volume ≤52°F

This figure is a line graph showing Shasta Lake Cold Water Pool Volume equal to or less than 52 degrees Fahrenheit from 01/01 to 12/01. It includes a shaded area of the average 1998-2022 and lines depicting 2014, 2015, 2016, 2019, and 2022 data. The line showing 2023 data is from 01/01 to 04/01.



Shasta Lake Cold Water Pool Volume ≤50°F

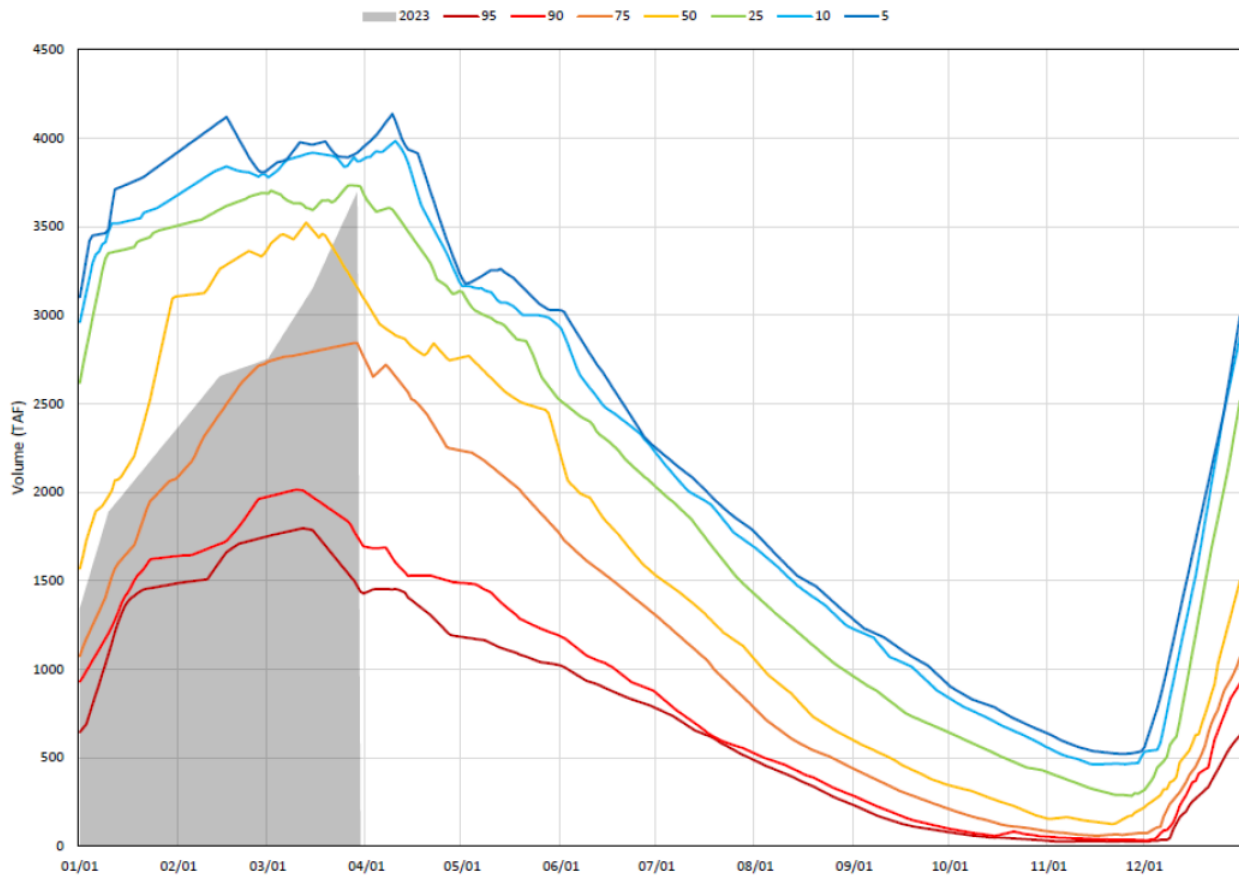
This figure is a line graph showing Shasta Lake Cold Water Pool Volume equal to or less than 50 degrees Fahrenheit from 01/01 to 12/01. It includes a shaded area of the average 1998-2022 and lines depicting 2014, 2015, 2016, 2019, and 2022 data. The line showing 2023 data is from 01/01 to 04/01.



Shasta Lake Cold Water Pool Volume ≤48°F

This figure is a line graph showing Shasta Lake Cold Water Pool Volume equal to or less than 48 degrees Fahrenheit from 01/01 to 12/01. It includes a shaded area of the average 1998-2022 and lines depicting 2014, 2015, 2016, 2019, and 2022 data. The line showing 2023 data is from 01/01 to 04/01.

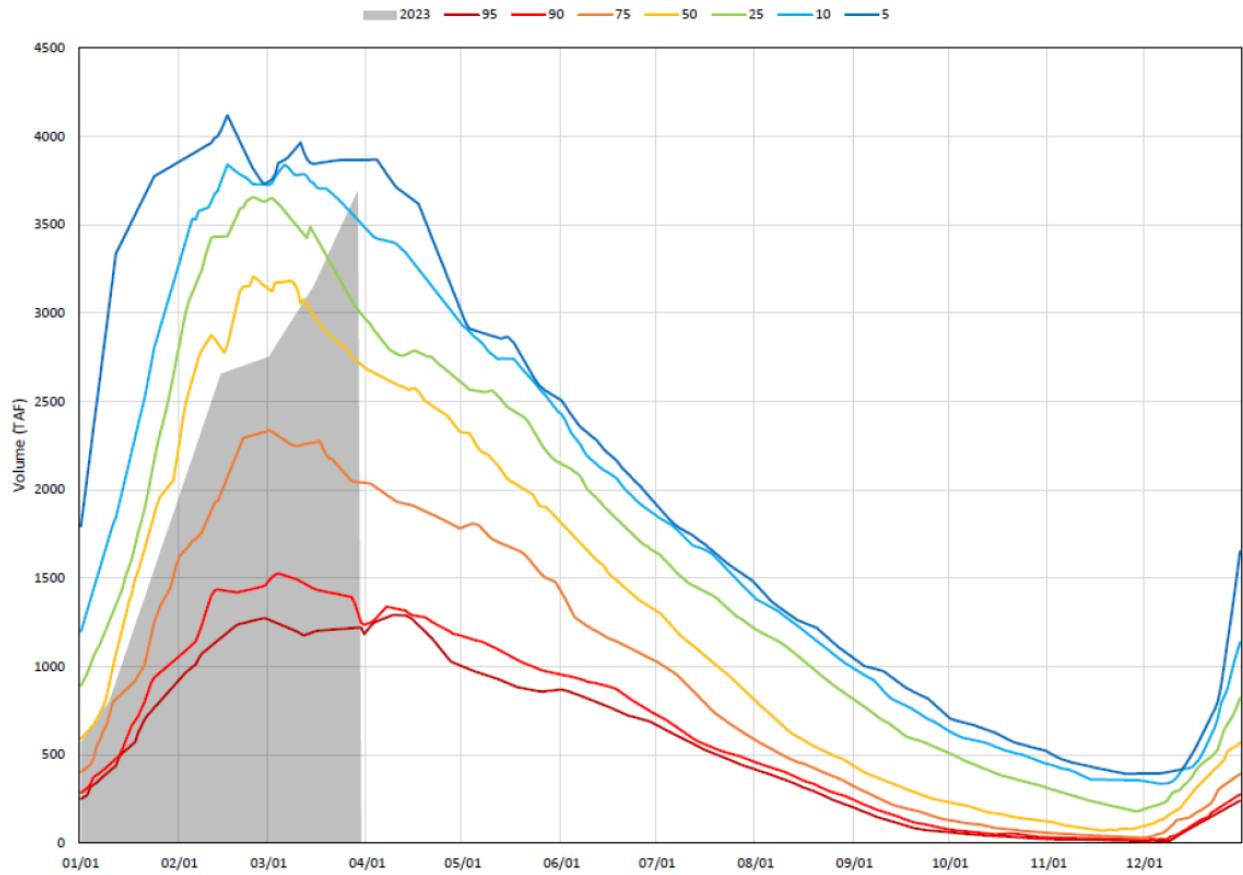
Shasta Lake Cold Water Pool Volume $\leq 52^{\circ}\text{F}$ - Percent Exceedances (1998-2022)



Shasta Lake Cold Water Pool Volume $\leq 52^{\circ}\text{F}$ - Percent Exceedances (1998-2021)

This figure is a line graph showing Shasta Lake Cold Water Pool Volume less than or equal to 52 degrees Fahrenheit as percent exceedances from 01/01 to 12/01. It includes a shaded area for 2023 data from 01/01 to 04/01 and lines depicting 95, 90, 75, 50, 25, 10, and 5% exceedances.

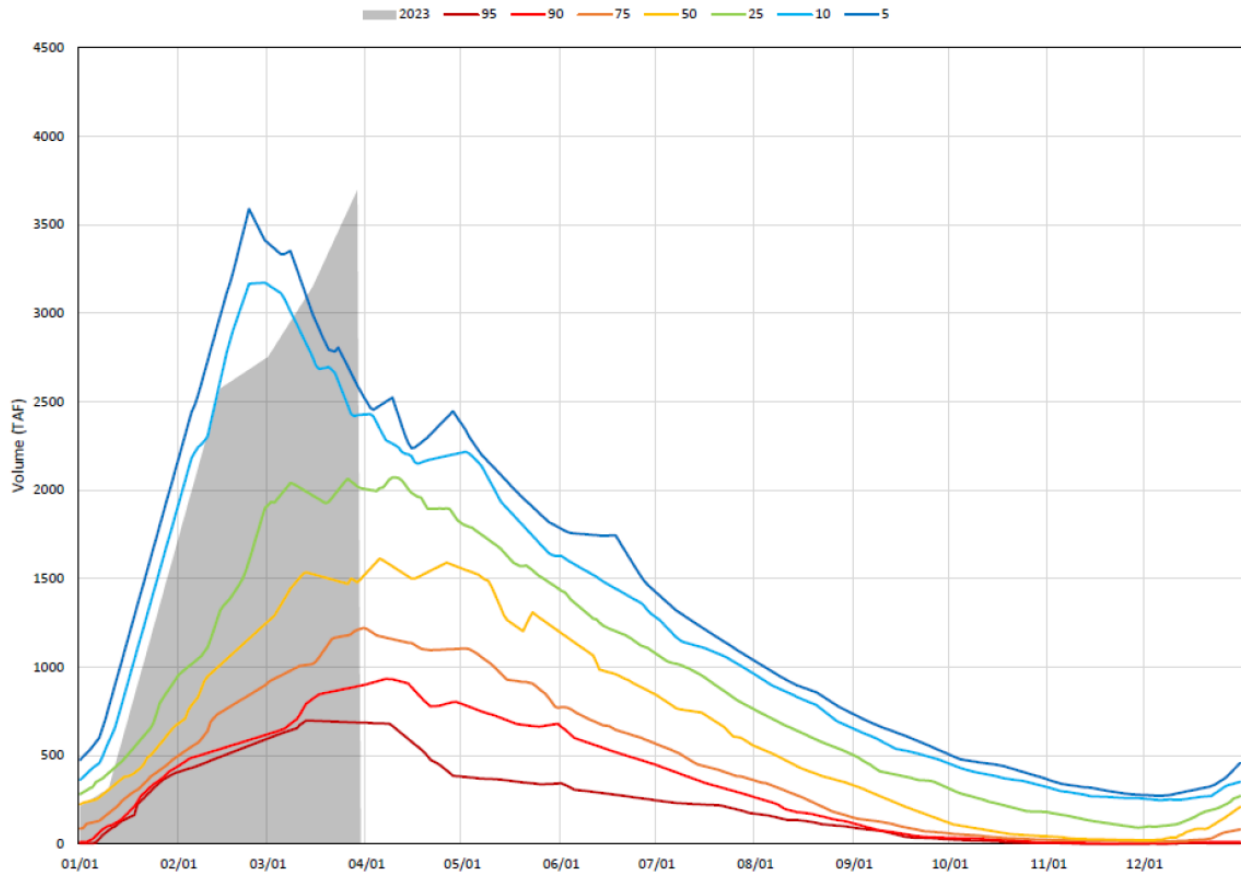
Shasta Lake Cold Water Pool Volume $\leq 50^{\circ}\text{F}$ - Percent Exceedances (1998-2022)



Shasta Lake Cold Water Pool Volume $\leq 50^{\circ}\text{F}$ - Percent Exceedances (1998-2021)

This figure is a line graph showing Shasta Lake Cold Water Pool Volume less than or equal to 50 degrees Fahrenheit as percent exceedances from 01/01 to 12/01. It includes a shaded area for 2023 data from 01/01 to 04/01 and lines depicting 95, 90, 75, 50, 25, 10, and 5% exceedances.

Shasta Lake Cold Water Pool Volume $\leq 48^{\circ}\text{F}$ - Percent Exceedances (1998-2022)



Shasta Lake Cold Water Pool Volume $\leq 48^{\circ}\text{F}$ - Percent Exceedances (1998-2021)

This figure is a line graph showing Shasta Lake Cold Water Pool Volume less than or equal to 48 degrees Fahrenheit as percent exceedances from 01/01 to 12/01. It includes a shaded area for 2023 data from 01/01 to 04/01 and lines depicting 95, 90, 75, 50, 25, 10, and 5% exceedances.

Estimated CVP Operations 50% Exceedance

Storages – Federal End of the Month Storage/Elevation (TAF/Feet)

Facility	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb
Trinity	799	959	1101	1162	1158	1104	1035	979	965	972	1010	1072	1178
Trinity Elev.	N/A	2250	2266	2272	2272	2266	2259	2253	2251	2252	2256	2263	2274
Whiskeytown	211	206	238	238	238	238	238	238	206	206	206	206	206
Whiskeytown Elev.	N/A	1199	1209	1209	1209	1209	1209	1209	1199	1199	1199	1199	1199
Shasta	2747	3676	4188	4407	4308	4075	3818	3662	3492	3551	3734	4068	4279
Shasta Elev.	N/A	1036	1054	1062	1059	1050	1041	1035	1028	1031	1038	1050	1058
Folsom	552	740	897	963	962	843	651	565	464	437	428	457	553
Folsom Elev.	N/A	443	459	465	465	454	434	424	412	408	407	411	423
New Melones	1098	1208	1262	1458	1624	1631	1590	1577	1536	1558	1581	1612	1663
New Melones Elev.	N/A	970	976	999	1016	1017	1013	1011	1007	1009	1012	1015	1020
San Luis	673	905	948	876	654	362	193	181	253	312	501	669	854
Total	6080	7694	8634	9104	8943	8253	7525	7202	6916	7036	7459	8083	8733

State End of the Month Reservoir Storage (TAF)

Facility	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb
Oroville	2576	3000	3296	3515	3513	3147	2691	2325	2094	2057	2104	2345	2724
Oroville Elev.	N/A	864	885	899	899	874	841	812	791	788	792	814	844
State San Luis	888	1062	956	870	961	1030	1127	1253	1173	1111	1175	1204	1343
Total San Luis (TAF)	1561	1967	1904	1746	1615	1392	1320	1434	1426	1424	1676	1873	2197
Total San Luis Elev.	N/A	538	533	520	509	490	483	494	493	493	514	531	557

Monthly River Releases (TAF/cfs)

Facility	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb
Trinity (TAF)	18	80	258	126	68	53	52	23	18	18	18	17
Trinity (cfs)	300	1347	4189	2120	1102	857	870	373	300	300	300	300
Clear Creek (TAF)	12	17	12	19	9	9	9	12	12	12	12	11
Clear Creek (cfs)	200	284	200	318	150	150	150	200	200	200	200	200
Sacramento (TAF)	200	193	277	416	461	461	357	277	238	200	277	555
Sacramento (cfs)	3250	3250	4500	7000	7500	7500	6000	4500	4000	3250	4500	10000
American (TAF)	504	393	504	375	277	312	198	126	120	123	123	167
American (cfs)	8200	6600	8200	6300	4500	5077	3326	2053	2012	2000	2000	3000

Facility	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb
Stanislaus (TAF)	93	83	96	56	18	18	18	49	12	12	14	13
Stanislaus (cfs)	1521	1400	1555	940	300	300	300	797	200	200	232	236
Feather (TAF)	101	476	424	238	400	479	464	258	74	77	77	69
Feather (cfs)	1643	8000	6900	4000	6500	7800	7800	4200	1250	1250	1250	1250

Trinity Diversions (TAF)

Diversion Facility	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb
Carr PP	N/A	1	25	8	23	19	20	19	3	5	2	3	7
Spring Creek PP	N/A	33	0	10	10	10	10	10	25	0	5	25	40

Delta Summary (TAF)

Facility	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb
Tracy	260	250	258	255	265	260	249	229	162	260	240	235
USBR Banks	0	0	0	0	31	31	31	0	0	0	0	0
Contra Costa	12.7	12.7	12.7	9.8	11.1	12.7	14.0	4.6	2.8	2.7	14.0	14.0
Total USBR	273	263	271	265	307	304	294	234	165	263	254	249
State Export	320	111	121	291	410	401	386	213	195	260	160	245
Total Export	593	374	392	656	717	705	680	447	360	523	414	494
COA Balance	18	18	18	18	18	10	0	0	0	0	0	0
Vernalis (TAF)	620	1,114	1,200	933	542	110	107	127	99	103	109	303
Vernalis (cfs)	10094	18731	19524	15682	8824	1797	1796	2066	1662	1680	1778	5459
Old/Middle River calc.	-3472	3001	3286	-2,021	-5601	-8608	-8583	-5255	-4499	-6381	-4976	-4984
Computed DOI	65508	45856	38602	21752	10183	5856	7094	6865	6505	7873	17601	30401
Excess Outflow	54105	25551	12575	5598	2180	0	0	0	0	3,367	11599	17776
% Export/Inflow	13%	11%	13%	30%	44%	53%	52%	45%	45%	52%	28%	22%
% Export/inflow std.	35%	35%	35%	35%	65%	65%	65%	65%	65%	65%	65%	45%

Hydrology

Statistic	Trinity	Shasta	Folsom	New Melones
Water Year Inflow (TAF)	1328	5,338	4,242	2,001
Year to Date + Forecasted % of mean	110%	96%	156%	189%

CVP actual operations do not follow any forecasted operation or outlook; actual operations are based on real-time conditions.

CVP operational forecasts or outlooks represent general system-wide dynamics and do not necessarily address specific watershed/tributary details.

CVP releases or export values represent monthly averages.

CVP Operations are updated monthly as new hydrology information is made available December through May.