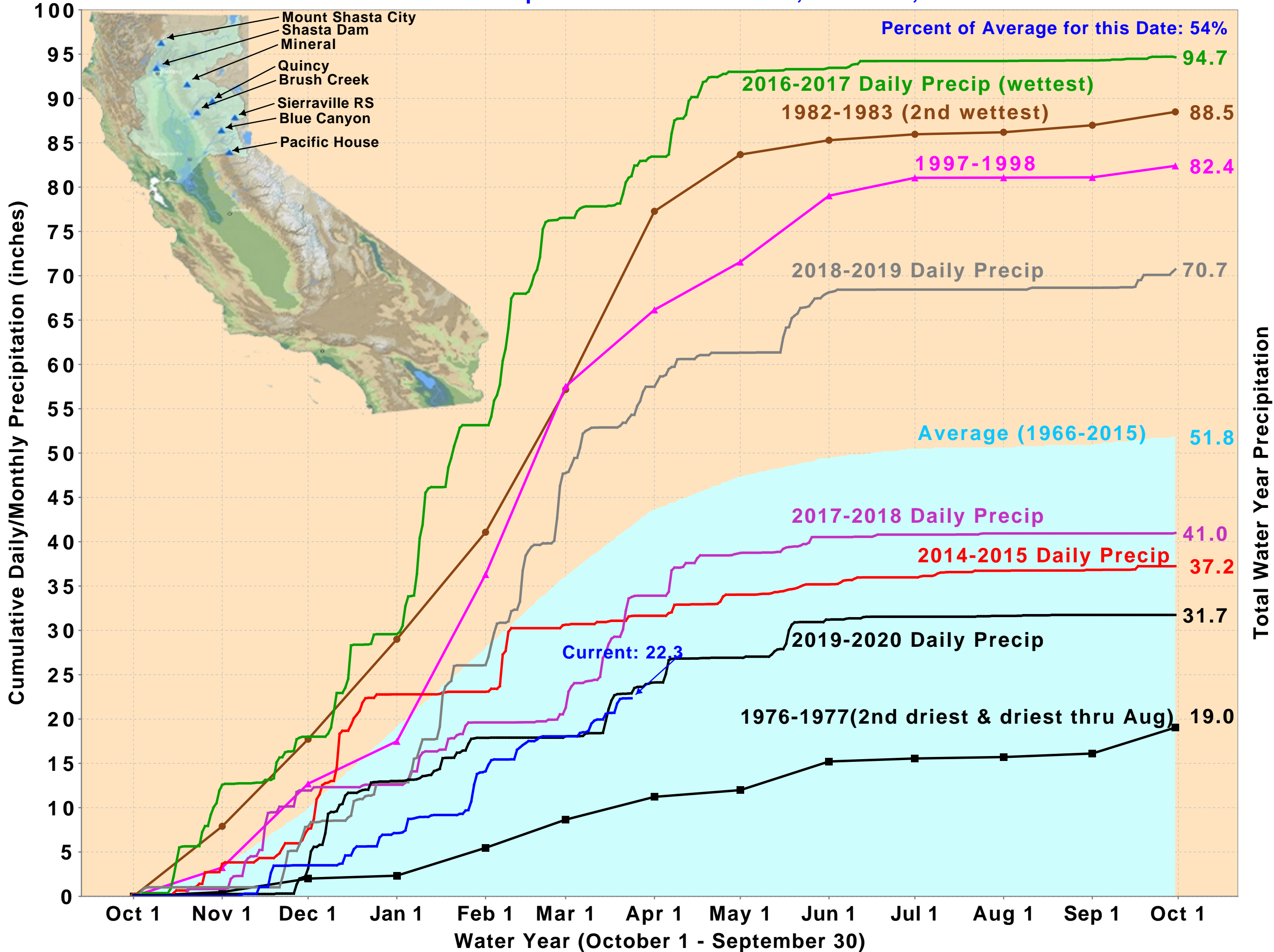
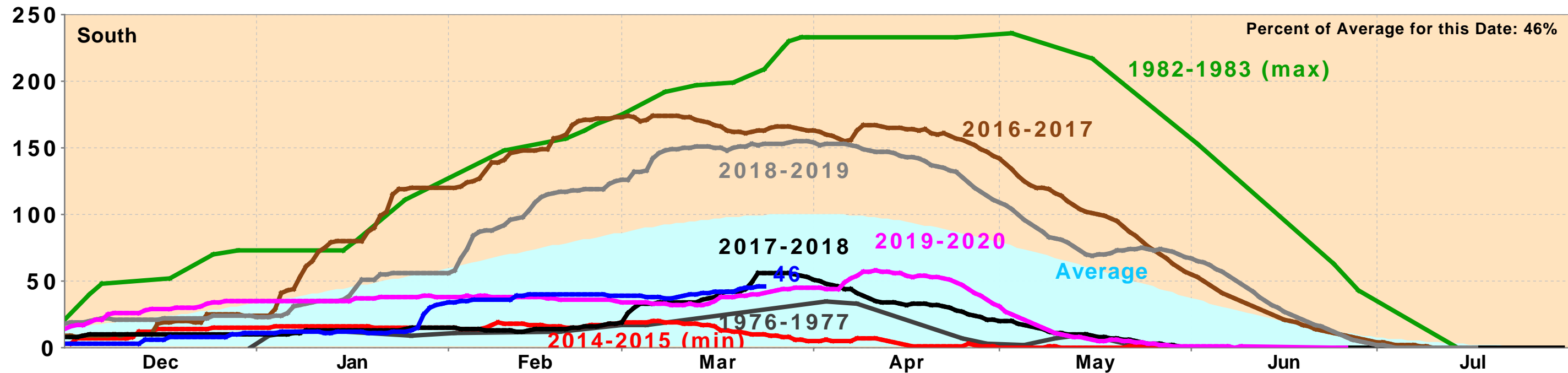
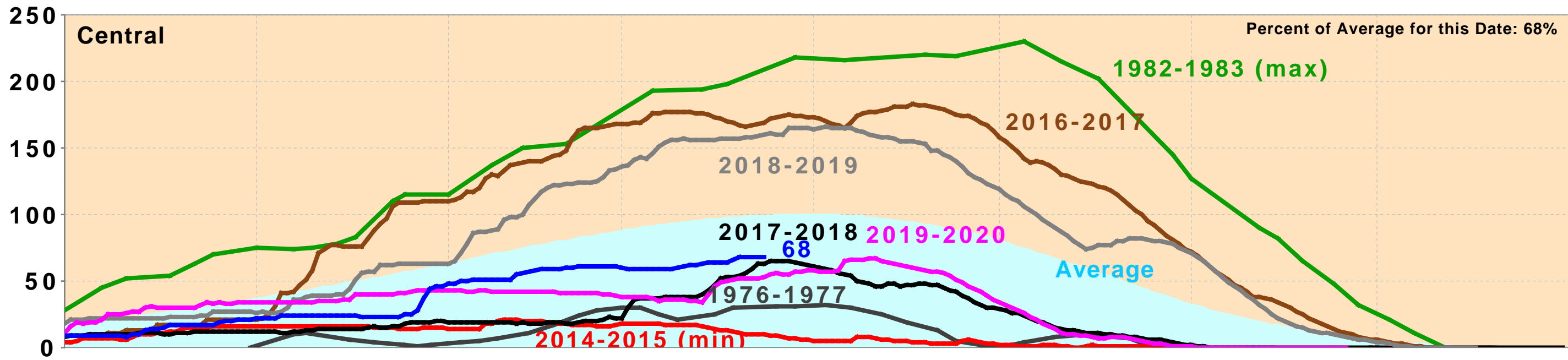
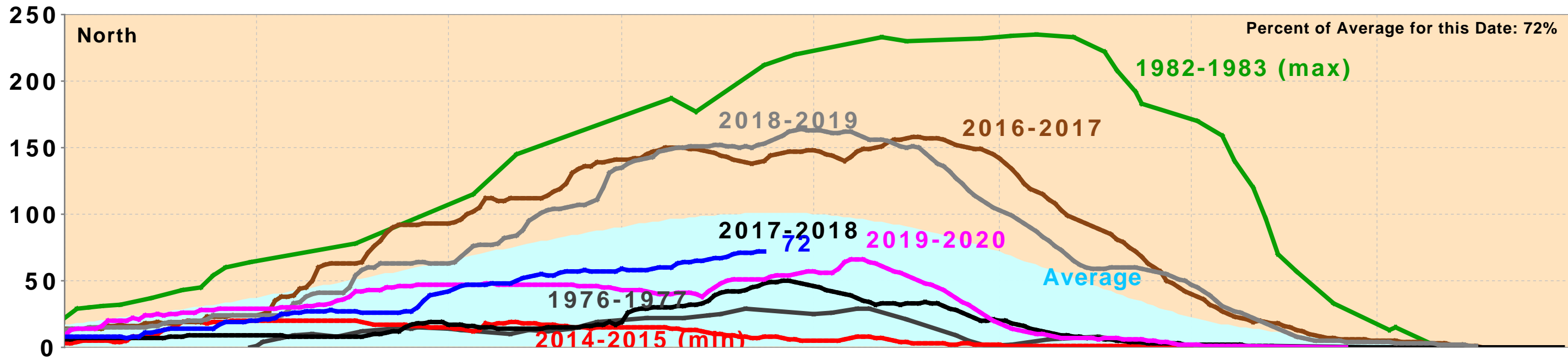


Northern Sierra Precipitation: 8-Station Index, March 24, 2021



California Snow Water Content, March 24, 2021, Percent of April 1 Average



Statewide Percent of April 1: 65%

Statewide Percent of Average for Date: 65%

DAILY CVP WATER SUPPLY REPORT

MARCH 23, 2021

RUN DATE: March 24, 2021

RESERVOIR RELEASES IN CUBIC FEET/SECOND

RESERVOIR	DAM	WY 2020	WY 2021	15 YR MEDIAN
TRINITY	LEWISTON	304	297	304
SACRAMENTO	KESWICK	4,574	3,532	3,532
FEATHER	OROVILLE (SWP)	1,750	1,050	1,350
AMERICAN	NIMBUS	1,505	1,271	1,383
STANISLAUS	GOODWIN	202	203	304
SAN JOAQUIN	FRIANT	210	0	250

STORAGE IN MAJOR RESERVOIRS IN THOUSANDS OF ACRE-FEET

RESERVOIR	CAPACITY	15 YR AVG	WY 2020	WY 2021	% OF 15 YR AVG
TRINITY	2,448	1,659	2,002	1,285	77
SHASTA	4,552	3,384	3,564	2,370	70
FOLSOM	977	577	465	352	61
NEW MELONES	2,420	1,527	1,892	1,543	101
FED. SAN LUIS	966	688	506	447	65
TOTAL NORTH CVP	11,363	7,835	8,429	5,997	77
MILLERTON	520	304	280	175	57
OROVILLE (SWP)	3,538	2,279	2,274	1,410	62

ACCUMULATED INFLOW FOR WATER YEAR TO DATE IN THOUSANDS OF ACRE-FEET

RESERVOIR	CURRENT WY 2021	WY 1977	WY 1983	15 YR AVG	% OF 15 YR AVG
TRINITY	139	72	1,145	480	29
SHASTA	1,392	1,331	6,435	2,706	51
FOLSOM	424	187	3,287	1,176	36
NEW MELONES	193	---	1,069	398	48
MILLERTON	218	106	1,499	411	53

ACCUMULATED PRECIPITATION FOR WATER YEAR TO DATE IN INCHES

RESERVOIR	CURRENT WY 2021	WY 1977	WY 1983	AVG (N YRS)	% OF AVG	LAST 24 HRS
TRINITY AT FISH HATCHERY	15.62	8.73	46.53	25.83 (59)	60	0.00
SACRAMENTO AT SHASTA DAM	23.04	9.87	94.10	50.11 (64)	46	0.00
AMERICAN AT BLUE CANYON	30.67	14.16	88.99	53.55 (46)	57	0.00
STANISLAUS AT NEW MELONES	16.83	---	39.29	22.32 (43)	75	0.00
SAN JOAQUIN AT HUNTINGTON LK	17.32	9.50	70.50	32.93 (46)	53	0.00

DATE	Mean Daily Water Temperatures (°F)														Mean Daily Release (CFS)			Mean Daily Air Temperatures (°F)		
	TCD ¹	SHD	SPP ¹	KWK	SAC	CCR ²	BSF	JLF	BND	RDB	IGO ³	LWS	DGC	NFH	Shasta Generation	Spring Creek P.P.	Keswick Total	RDD	BSF	RDB
Feb	49.7	49.1	47.1	49.2	49.4	49.6	49.3	49.6	49.9	49.9	46.3	45.3	44.2	44.2	2801	238	3281	51.3	49.3	51.6
03/01	49.5	49.0	47.8	49.4	49.7	50.2	50.5	51.0	51.3	51.5	47.1	46.7	45.8	45.6	2782	77	3301	50.0	48.5	51.3
03/02	49.8	49.1	47.8	49.6	49.8	50.2	50.5	?	51.0	51.3	51.7	47.3	46.7	45.9	2935	77	3300	54.0	49.5	52.8
03/03	49.8	49.0	47.9	49.6	49.9	50.4	50.9	51.1	51.4	51.6	47.4	46.9	45.9	45.8	3661	77	3481	53.0	51.8	55.4
03/04	49.3	49.1	48.2	49.5	49.9	50.5	51.3	51.7	52.2	52.1	47.5	47.1	46.3	46.1	3442	77	3481	51.5	51.4	53.7
03/05	49.3	48.8	47.8	49.6	50.0	50.5	51.1	51.6	52.4	52.6	47.5	47.3	46.9	46.5	3287	177	3473	51.0	51.8	56.1
03/06	49.5	48.6	47.5	49.5	50.1	50.6	51.6	52.1	52.7	52.7	47.6	47.4	48.2	47.3	3277	220	3480	49.5	49.1	50.2
03/07	49.3	48.8	47.7	49.6	50.0	50.4	51.2	51.8	52.5	52.8	47.8	47.6	47.9	47.8	3102	155	3479	50.0	48.6	49.9
03/08	49.3	48.6	48.1	49.3	49.5	49.7	50.6	51.2	51.9	52.0	47.3	47.6	47.1	46.7	3404	97	3483	47.0	47.2	48.3
03/09	49.6	48.6	47.6	49.1	49.2	49.3	49.7	49.8	50.3	50.4	46.6	47.5	45.7	45.6	2747	281	3478	47.0	44.4	46.1
03/10	49.5	48.7	48.3	48.8	48.9	49.0	49.3	49.6	50.2	49.8	46.7	47.8	45.6	45.5	3481	77	3475	43.0	41.5	43.5
03/11	49.5	48.8	47.8	48.6	49.1	49.6	49.7	49.9	50.3	50.0	47.6	47.9	47.5	46.6	3424	157	3480	48.5	45.9	49.0
03/12	49.6	49.1	47.6	48.8	49.3	49.8	50.6	51.0	51.6	51.4	48.0	47.7	47.8	47.7	2843	358	3474	56.0	52.2	55.2
03/13	49.6	49.2	48.2	49.1	49.6	50.1	51.0	51.5	52.1	52.1	48.3	47.5	47.9	47.8	2804	257	3481	50.5	48.9	51.6
03/14	49.4	48.8	48.8	49.3	49.3	49.3	50.2	50.9	51.7	51.7	?	47.0	47.2	46.8	3143	78	3479	45.5	44.6	46.5
03/15	49.3	48.8	47.8	49.4	49.6	49.7	48.9	49.1	49.6	50.0	47.8	47.3	45.6	45.9	3187	380	3477	46.0	43.8	44.5
03/16	49.6	49.2	48.6	49.2	49.6	50.0	49.8	50.0	50.3	49.8	47.6	47.4	47.0	46.6	3262	78	3482	50.0	46.6	46.9
03/17	49.6	49.0	48.5	49.2	49.6	50.0	51.0	51.5	52.1	51.5	48.1	47.5	47.0	46.4	3173	77	3481	51.5	49.7	50.4
03/18	49.6	48.9	47.9	49.3	49.3	49.4	?	50.3	51.0	51.9	51.8	47.8	47.8	47.2	2655	429	3484	49.0	49.3	49.9
03/19	49.2	48.7	48.0	49.4	50.1	50.6	50.8	50.9	51.3	51.3	49.3	48.0	48.1	48.0	2687	362	3486	52.5	52.2	53.3
03/20	49.2	48.7	48.0	49.5	50.0	50.6	51.8	52.3	52.8	52.6	48.3	48.0	47.9	48.0	2786	361	3483	48.0	49.3	51.8
03/21	49.8	49.1	48.5	49.5	50.0	50.6	51.8	52.5	53.1	53.2	48.7	48.1	47.7	47.6	3171	167	3529	54.0	51.0	53.0
03/22																				
03/23																				
03/24																				
03/25																				
03/26																				
03/27																				
03/28																				
03/29																				
03/30																				
03/31																				
Mar	49.5	48.9	48.0	49.3	49.6	50.0	50.6	51.0	51.6	51.5	47.7	47.5	46.9	46.7	3107	191	3465	49.9	48.4	50.4

Total CFS	65253	4019	72767
Total AF	129427	7972	144330

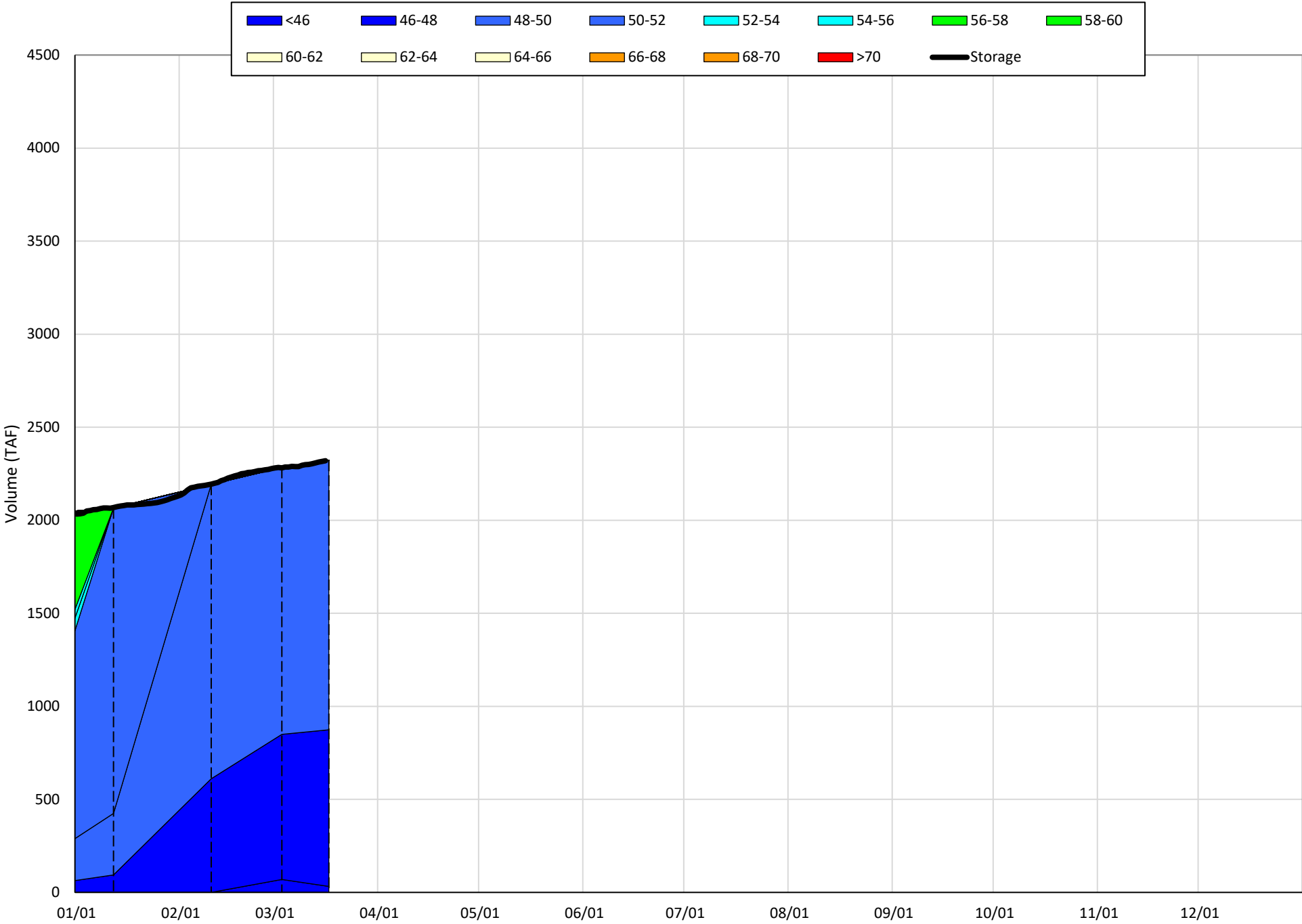
Legend

- ? = 1-9 hours of data missing (Average includes estimations)
- ! = 10 or more hours of data missing (Average not calculated)
- # = Station out of service
- ↑ = Record high air temperature
- ↓ = Record low air temperature
- = Monthly Averages

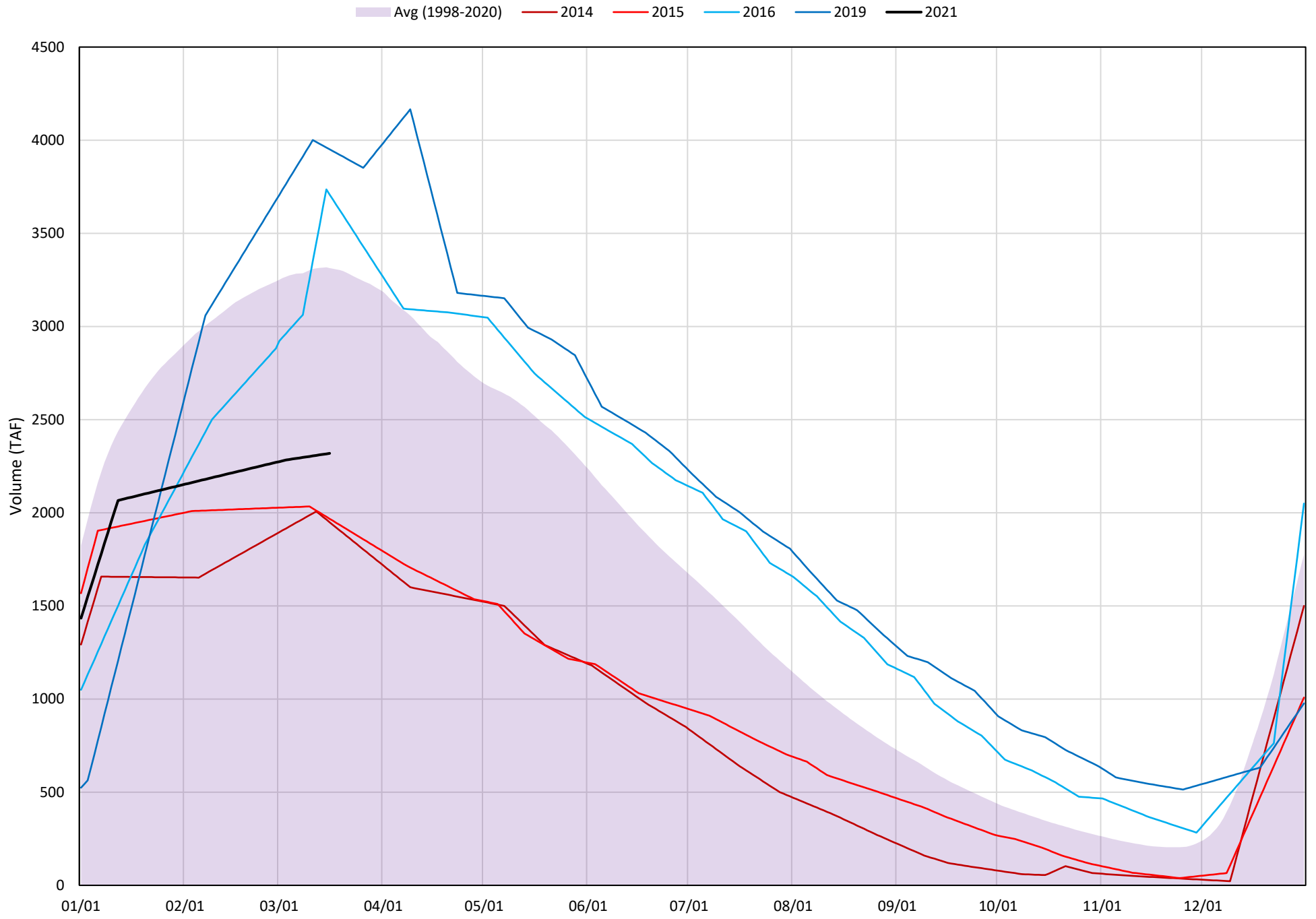
Notes

- ¹ Temperatures are weighted averages based on individual penstock flow and temperature
- 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)

Shasta Lake Isothermobaths Plot - 2021

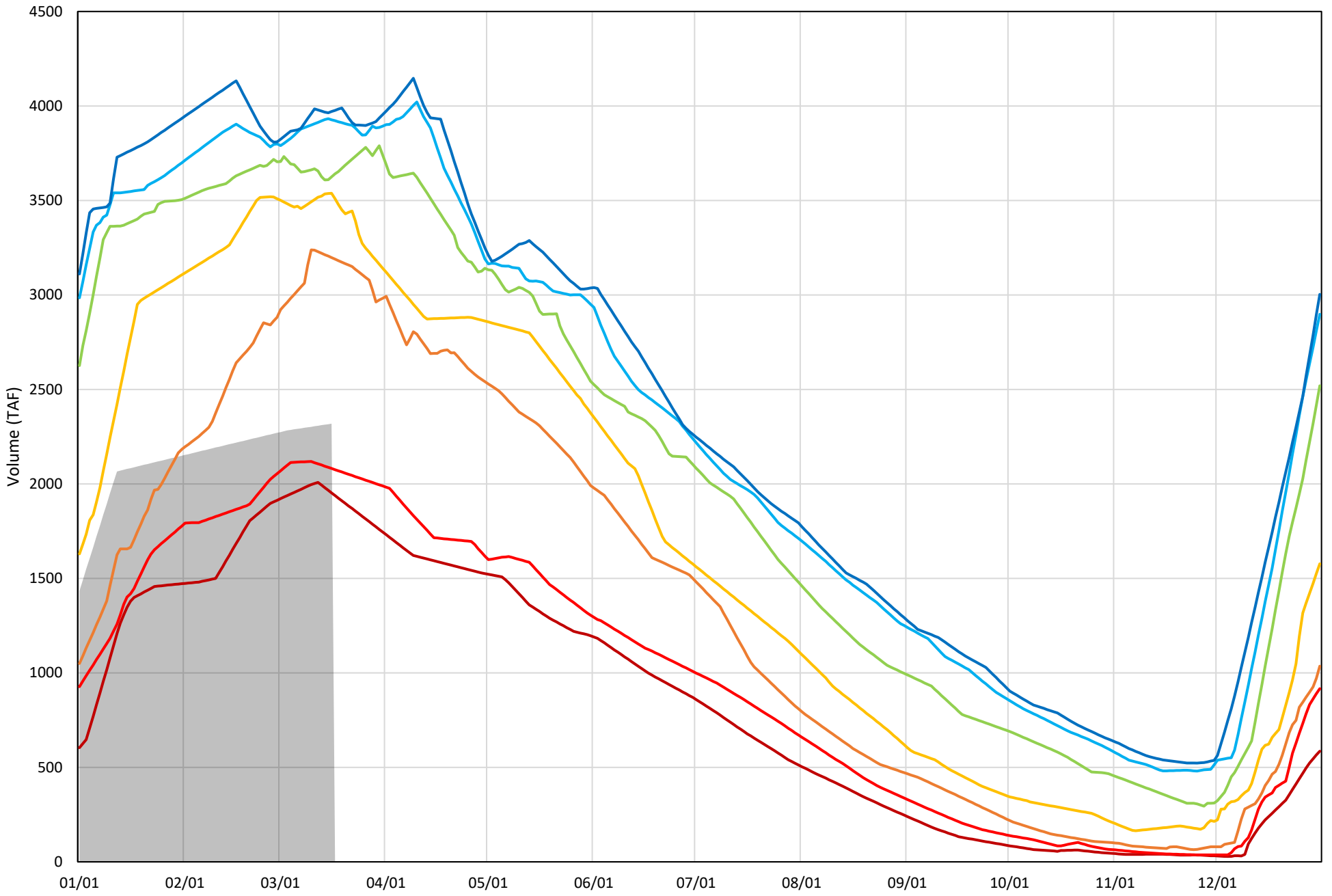


Shasta Lake Cold Water Pool Volume $\leq 52^{\circ}\text{F}$

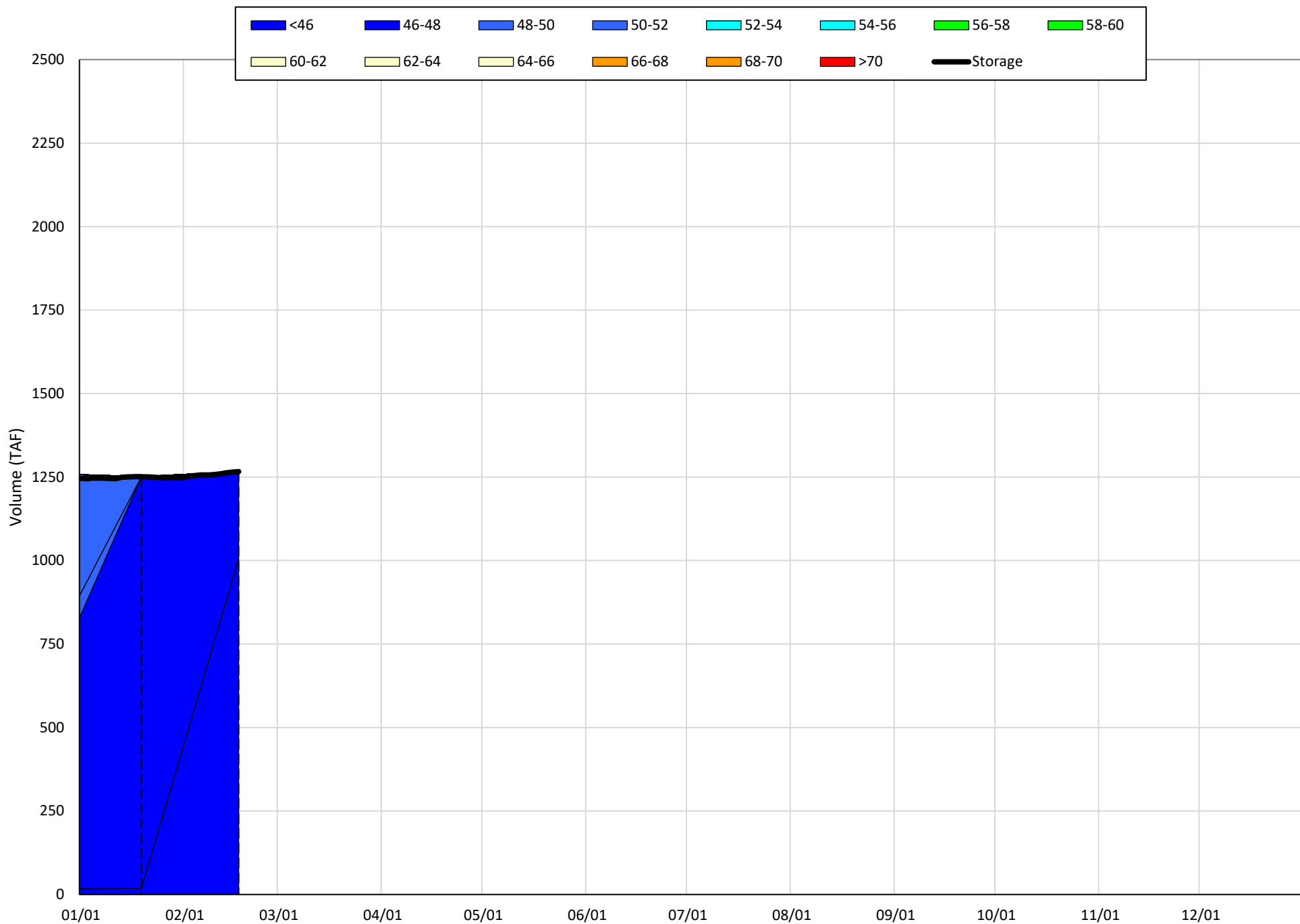


Shasta Lake Cold Water Pool Volume $\leq 52^{\circ}\text{F}$ - Percent Exceedances (1998-2020)

2021 95 90 75 50 25 10 5

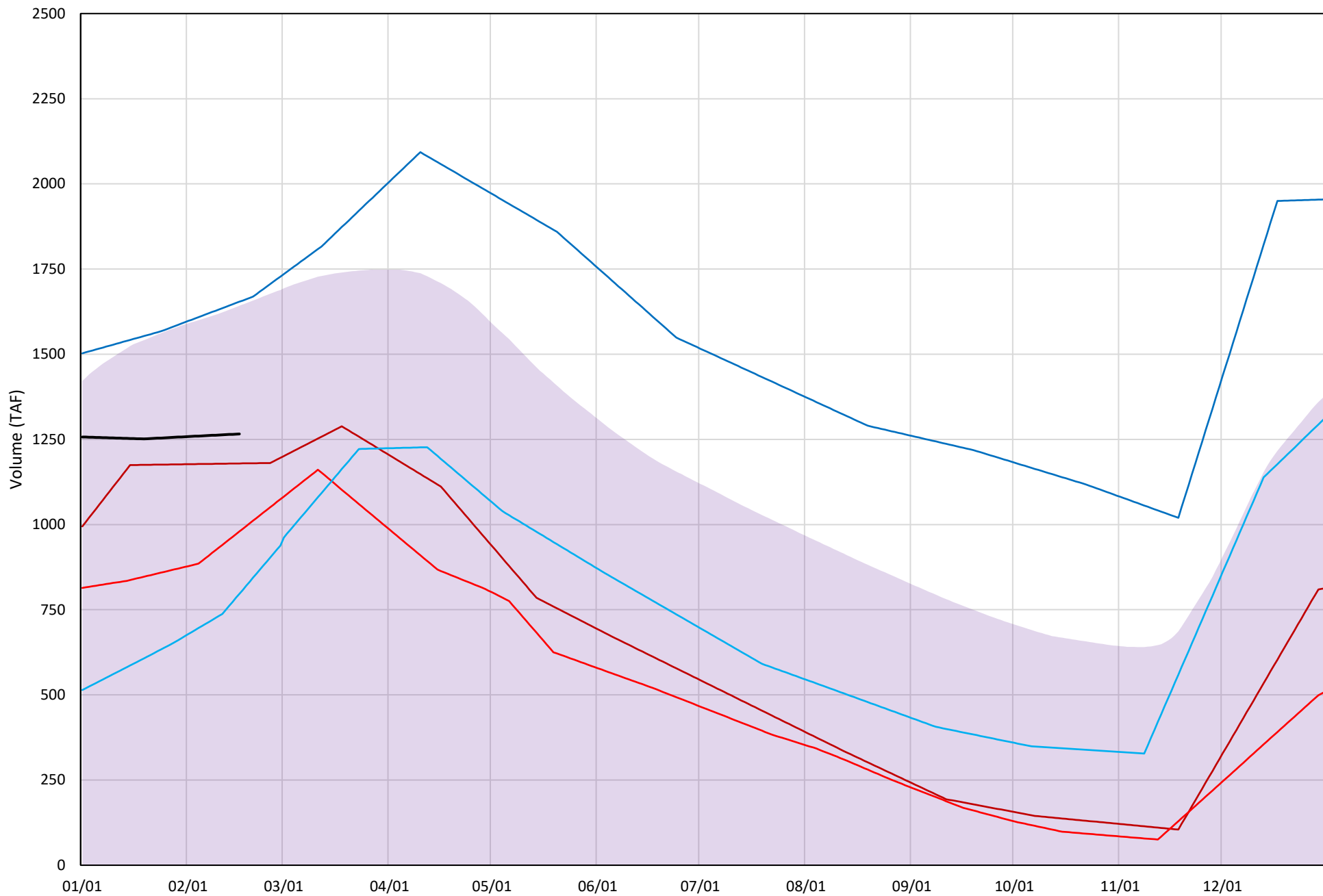


Trinity Lake Isothermobaths Plot - 2021

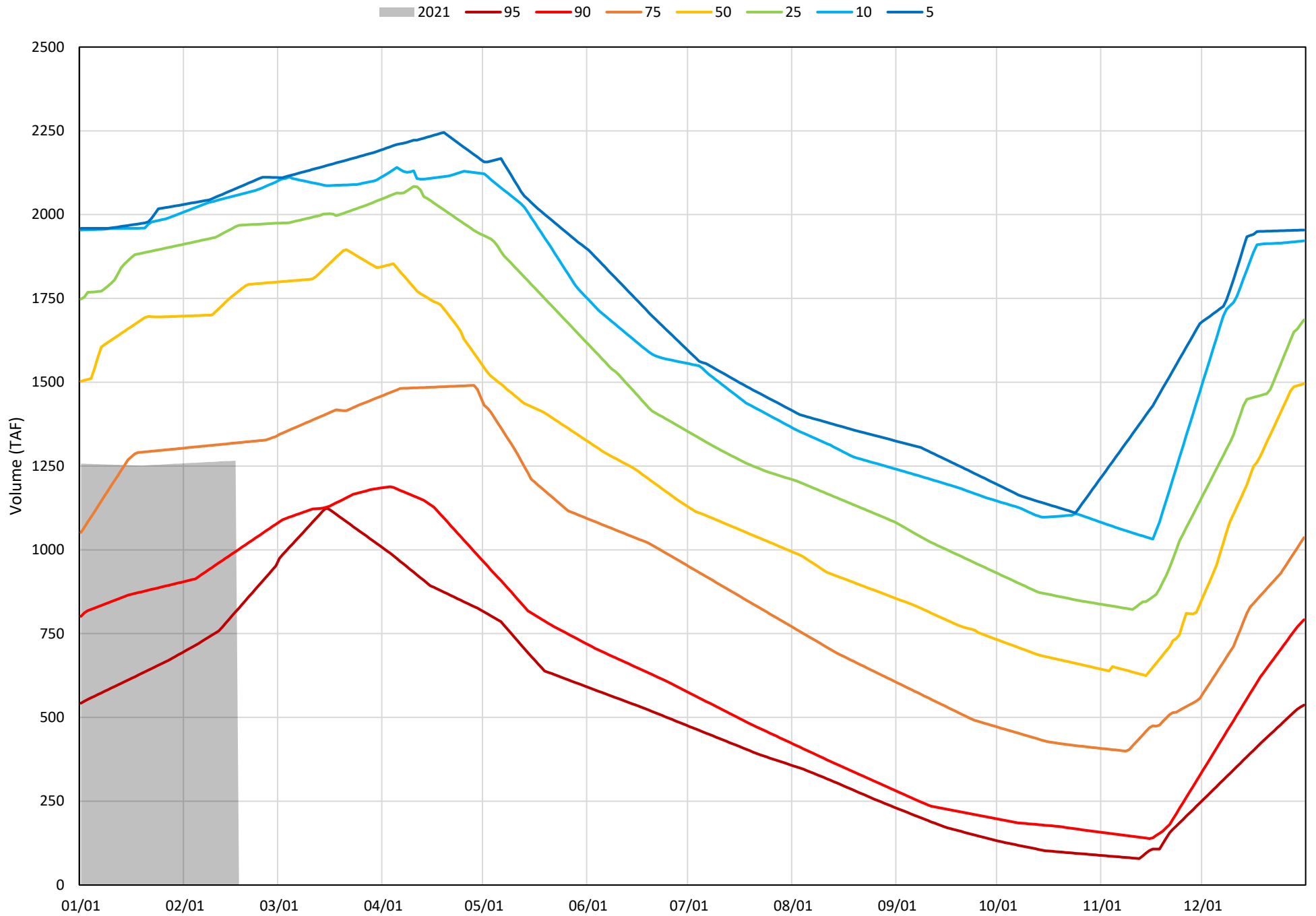


Trinity Lake Cold Water Pool Volume $\leq 52^{\circ}\text{F}$

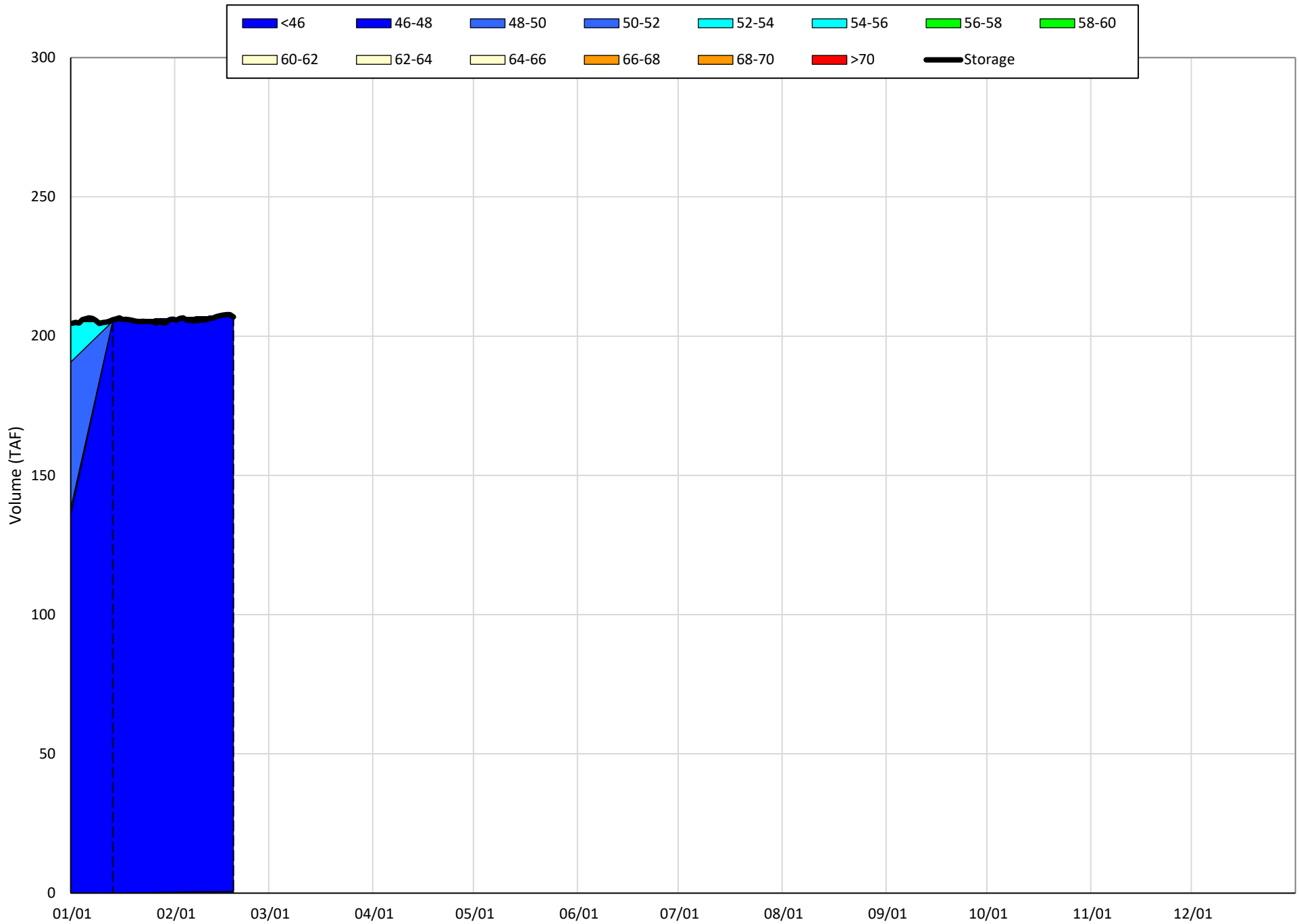
Avg (2000-2020) 2014 2015 2016 2019 2021



Trinity Lake Cold Water Pool Volume $\leq 52^{\circ}\text{F}$ - Percent Exceedances (2000-2020)



Whiskeytown Lake Isothermobaths Plot - 2021



Estimated CVP Operations 50% Exceedance

Storages

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

		Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	
Trinity		1273	1264	1354	1281	1172	1051	899	749	713	695	705	725	796
	Elev.	2282	2291	2284	2273	2261	2243	2224	2219	2216	2218	2221	2230	
Whiskeytown		206	206	238	238	238	238	238	206	206	206	206	206	
	Elev.	1199	1209	1209	1209	1209	1209	1209	1199	1199	1199	1199	1199	
Shasta		2277	2384	2584	2651	2426	2077	1811	1744	1666	1655	1770	1968	2330
	Elev.	978	988	992	981	962	946	942	937	936	943	955	976	
Folsom		346	342	444	478	473	393	362	352	338	331	343	406	523
	Elev.	394	409	414	413	402	397	396	394	392	394	404	419	
New Melones		1555	1539	1507	1465	1384	1300	1231	1191	1155	1167	1181	1195	1210
	Elev.	1007	1004	999	990	981	972	967	963	964	966	968	970	
San Luis		225	268	243	151	20	28	100	173	340	545	749	923	1009
	Elev.	442	431	408	375	361	358	364	401	435	473	503	517	
Total		6003	6370	6263	5713	5085	4641	4446	4418	4598	4955	5423	6074	

State End of the Month Reservoir Storage (TAF)

Oroville		1345	1474	1797	1869	1680	1458	1322	1315	1329	1392	1492	1663	1959
	Elev.	727	763	770	751	726	709	708	710	718	730	749	779	
San Luis		705	630	548	436	319	219	129	95	189	284	472	616	698
Total San Luis (TAF)		930	899	790	587	339	247	229	268	529	829	1221	1540	1707
	Elev.	442	431	408	375	361	358	364	401	435	473	503	517	

Monthly River Releases (TAF/cfs)

Trinity	TAF	18	36	92	47	28	53	52	23	18	18	18	17
	cfs	300	600	1,498	788	450	857	870	373	300	300	300	300
Clear Creek	TAF	12	12	16	12	9	9	9	12	12	12	25	11
	cfs	200	200	265	200	150	150	150	200	200	200	400	200
Sacramento	TAF	215	268	350	535	615	523	327	338	274	215	200	180
	cfs	3500	4500	5689	9000	10000	8500	5500	5500	4600	3500	3250	3250
American	TAF	95	123	159	96	141	94	71	49	48	49	49	44
	cfs	1550	2068	2585	1608	2300	1524	1188	802	800	800	800	800
Stanislaus	TAF	12	27	11	9	9	9	9	39	12	12	13	12
	cfs	200	460	185	150	150	150	150	635	200	200	213	214
Feather	TAF	65	48	49	174	226	172	68	74	57	59	59	53
	cfs	1050	800	800	2925	3680	2800	1150	1200	950	960	960	960

Trinity Diversions (TAF)

	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb
Carr PP	29	55	92	96	99	100	99	23	21	12	15	17
Spring Crk. PP	26	35	90	90	90	90	90	45	15	12	10	35

Delta Summary (TAF)

	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	
Tracy	99	48	49	48	212	235	198	260	256	235	195	129	
USBR Banks	0	0	0	0	15	15	15	0	0	0	0	0	
Contra Costa	12.7	12.7	12.7	9.8	11.1	12.7	14.0	16.8	18.4	18.3	14.0	14.0	
Total USBR	112	60	62	58	238	263	227	277	274	253	209	143	
State Export	25	18	18	12	22	20	33	158	133	200	195	139	
Total Export	137	78	80	70	260	283	260	435	407	453	404	282	
COA Balance	0	32	45	42	33	13	0	34	35	35	35	0	
Vernalis	TAF	120	117	110	56	48	46	51	108	83	83	92	111
Vernalis	cfs	1957	1961	1785	940	784	752	856	1758	1393	1355	1498	1997
Old/Middle River Std.													
Old/Middle R. calc.	cfs	-1,422	-719	-793	-1,070	-3,495	-3,793	-3,570	-5,245	-5,236	-5,658	-4,976	-3,602
Computed DOI		7434	10119	7385	7094	4002	2993	3009	2993	3496	5336	9842	11400
Excess Outflow		49	0	0	0	0	0	0	0	0	1838	3839	0
% Export/Inflow		21%	9%	11%	9%	33%	39%	42%	59%	60%	56%	41%	31%
% Export/Inflow std.		35%	35%	35%	35%	65%	65%	65%	65%	65%	65%	65%	45%

Hydrology

	Trinity	Shasta	Folsom	New Melones
Water Year Inflow (TAF)	510	3,014	1,260	507
Year to Date + Forecasted % of mean	42%	54%	46%	48%

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.

Estimated CVP Operations 90% Exceedance

Storages

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

		Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	
Trinity		1273	1275	1333	1249	1112	984	829	676	629	594	577	575	604
	Elev.	2283	2289	2281	2267	2253	2235	2214	2207	2201	2198	2198	2202	
Whiskeytown		206	206	238	238	238	238	238	206	206	206	206	206	
	Elev.	1199	1209	1209	1209	1209	1209	1209	1199	1199	1199	1199	1199	
Shasta		2277	2368	2379	2173	1918	1595	1352	1286	1246	1264	1335	1463	1671
	Elev.	978	978	967	952	932	915	910	906	908	913	923	937	
Folsom		346	346	412	458	393	310	264	261	237	232	236	250	300
	Elev.	395	405	411	402	389	381	380	375	374	375	378	387	
New Melones		1555	1524	1471	1386	1295	1217	1152	1116	1076	1078	1082	1085	1080
	Elev.	1006	1000	991	980	971	963	958	953	953	953	953	954	953
San Luis		225	229	212	151	70	-53	-88	9	131	204	328	504	519
	Elev.	442	433	413	391	365	352	368	386	406	431	463	467	
Total		5948	6044	5656	5027	4291	3746	3587	3525	3578	3764	4084	4380	

State End of the Month Reservoir Storage (TAF)

Oroville		1383	1522	1499	1306	1075	906	810	828	849	889	971	1100
	Elev.	717	733	730	707	675	649	633	636	640	647	660	679
San Luis		661	600	477	379	329	285	284	286	371	458	597	630
Total San Luis (TAF)		930	890	812	629	449	196	292	417	575	786	1101	1149

Monthly River Releases (TAF/cfs)

Trinity	TAF	18	36	92	47	28	53	52	23	18	18	18	17
	cfs	300	600	1,498	783	450	857	870	373	300	300	300	300
Clear Creek	TAF	17	12	16	11	9	9	9	12	12	12	12	11
	cfs	275	200	265	190	150	150	150	200	200	200	200	200
Sacramento	TAF	215	357	476	525	555	473	297	281	230	200	200	180
	cfs	3500	6000	7738	8817	9029	7699	5000	4570	3873	3250	3250	3250
American	TAF	92	83	55	124	134	98	48	66	48	49	49	53
	cfs	1500	1400	900	2083	2183	1594	800	1072	800	800	800	953
Stanislaus	TAF	18	27	24	12	9	9	9	39	12	12	13	12
	cfs	300	460	384	200	150	150	150	635	200	200	219	214
Feather	TAF	65	48	54	121	161	125	138	59	58	59	59	70
	cfs	1057	807	878	2034	2619	2033	2320	960	975	960	960	1261

Trinity Diversions (TAF)

	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb
Carr PP	17	44	25	99	100	101	100	24	30	21	15	10
Spring Crk. PP	10	15	15	90	90	90	90	45	20	12	10	10

Delta Summary (TAF)

	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	
Tracy	51	45	51	60	48	105	226	209	120	151	190	49	
USBR Banks	0	0	0	0	0	0	0	0	0	0	0	0	
Contra Costa	10.5	9.5	9.5	9.5	7.4	8.3	9.5	10.5	12.6	13.8	13.7	10.5	
Total USBR	62	54	61	70	55	113	236	220	133	165	204	60	
State Export	76	18	20	14	16	15	30	17	88	88	190	100	
Total Export	138	72	81	84	71	128	266	237	221	253	394	160	
COA Balance	0	30	74	102	149	163	93	65	72	44	44	30	
Vernalis	TAF	104	84	84	43	42	37	43	98	74	75	76	82
Vernalis	cfs	1699	1419	1359	721	687	605	722	1595	1242	1225	1244	1475
Old/Middle River Std.													
Old/Middle R. calc.		-1,548	-884	-992	-1,347	-1,175	-1,925	-3,702	-2,834	-2,886	-3,205	-4,962	-2,138
Computed DOI		7581	7094	4002	4001	4002	2993	3009	4181	4942	4994	6361	11400
Excess Outflow		195	0	0	0	0	0	0	0	0	0	1854	0
% Export/Inflow		22%	11%	16%	14%	11%	23%	46%	39%	38%	41%	52%	19%
% Export/Inflow std.		35%	35%	35%	35%	65%	65%	65%	65%	65%	65%	65%	45%

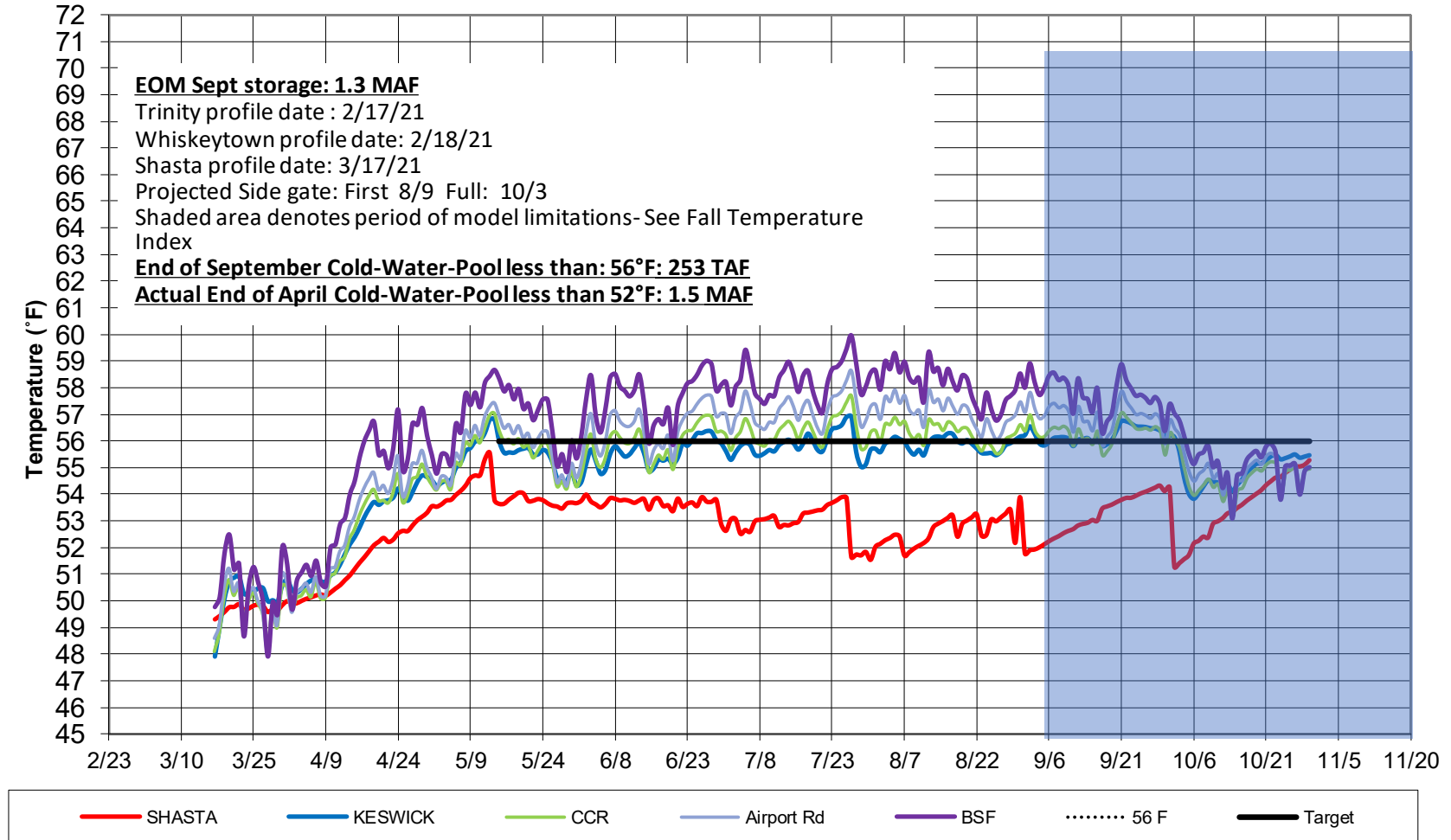
Hydrology

Water Year Inflow (TAF)	Trinity	Shasta	Folsom	New Melones
Year to Date + Forecasted	353	2,725	985	368
% of mean	29%	49%	36%	35%

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

Upper Sacramento River Preliminary Temperature Analysis - March 25, 2021

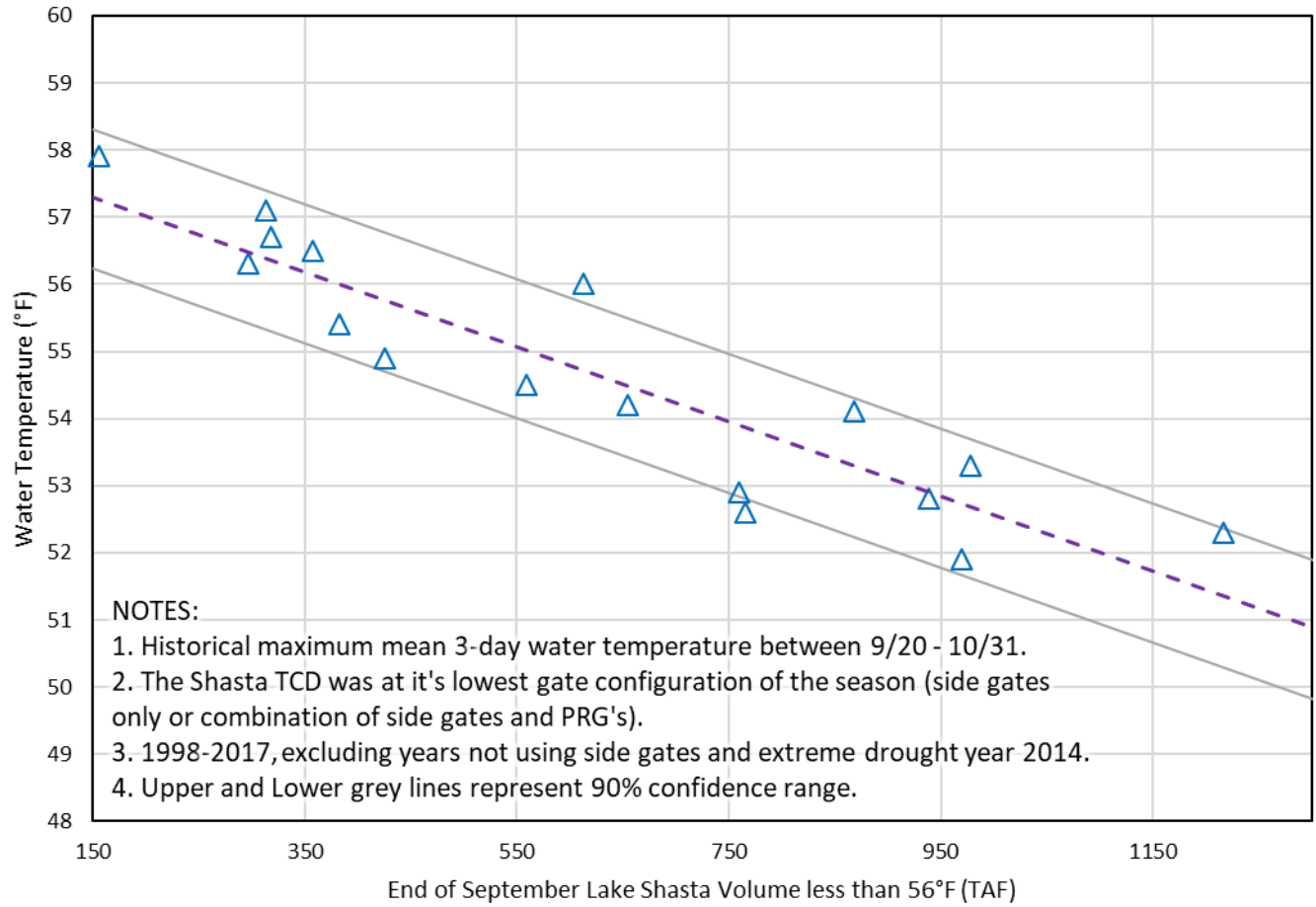
Sacramento River Modeled Temperature 2021 Mar 90%-Exceedance Water Outlook - 25% Historical Meteorology



Model Performance and Fall Temperature Index:

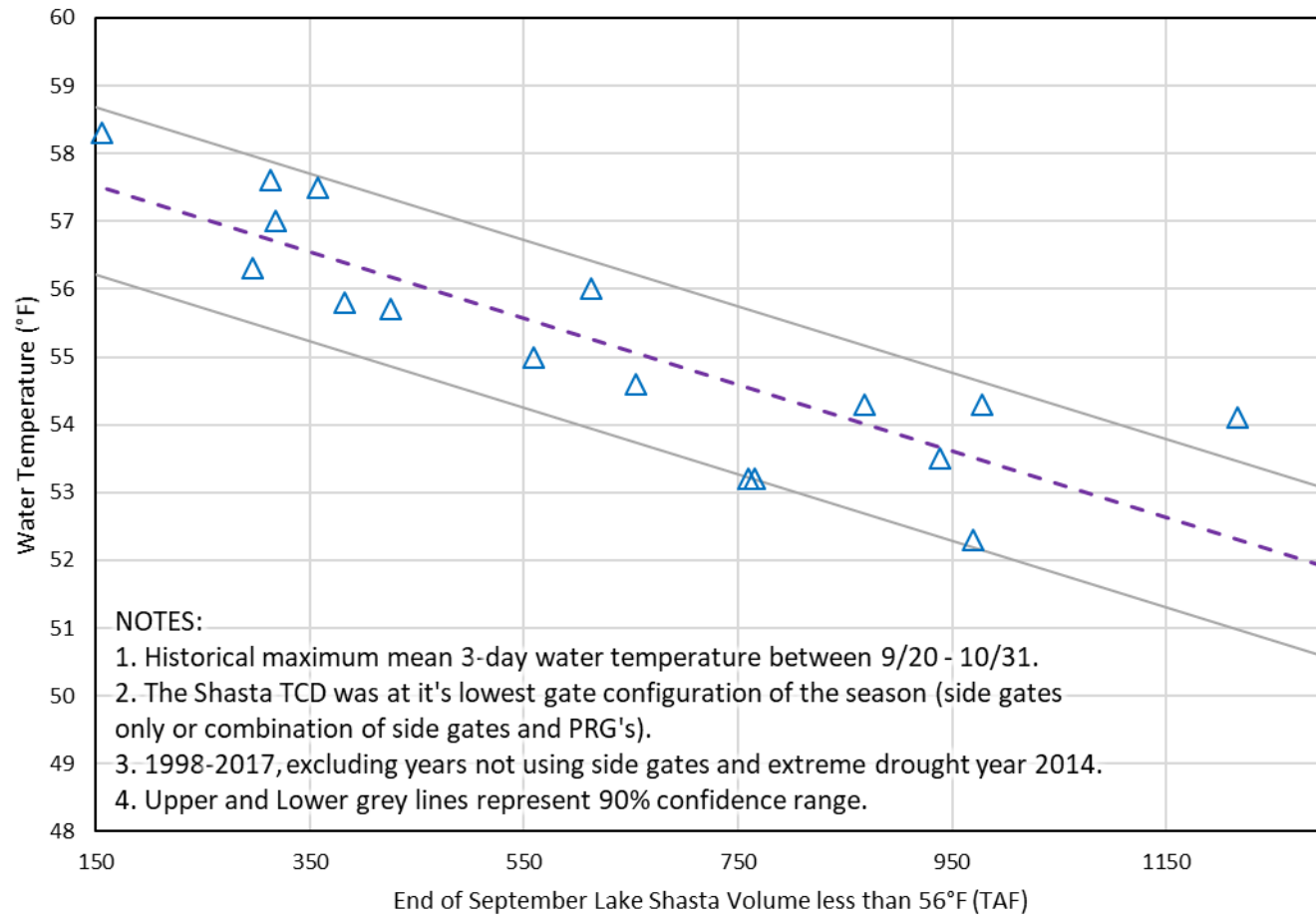
1. Based on past analyses, the temperature model does not perform well in late September and October. One factor is that the modeled release temperatures are cooler than has historically been achieved when all release is through the side gates (lowest gates), especially when there's a large temperature gradient between the pressure relief gates (PRG) and the side gates.
2. Based on historical records, the end-of-September Lake Shasta volume below 56°F is a good indicator of fall water temperature in the river reaches.
3. Based on these records and estimates, the charts below illustrate a range of uncertainty in the expected river temperatures based on the end-of-September lake volume less than 56°F.

Sacramento River - Lake Shasta Early Fall Water Temperature - Keswick (KWK)



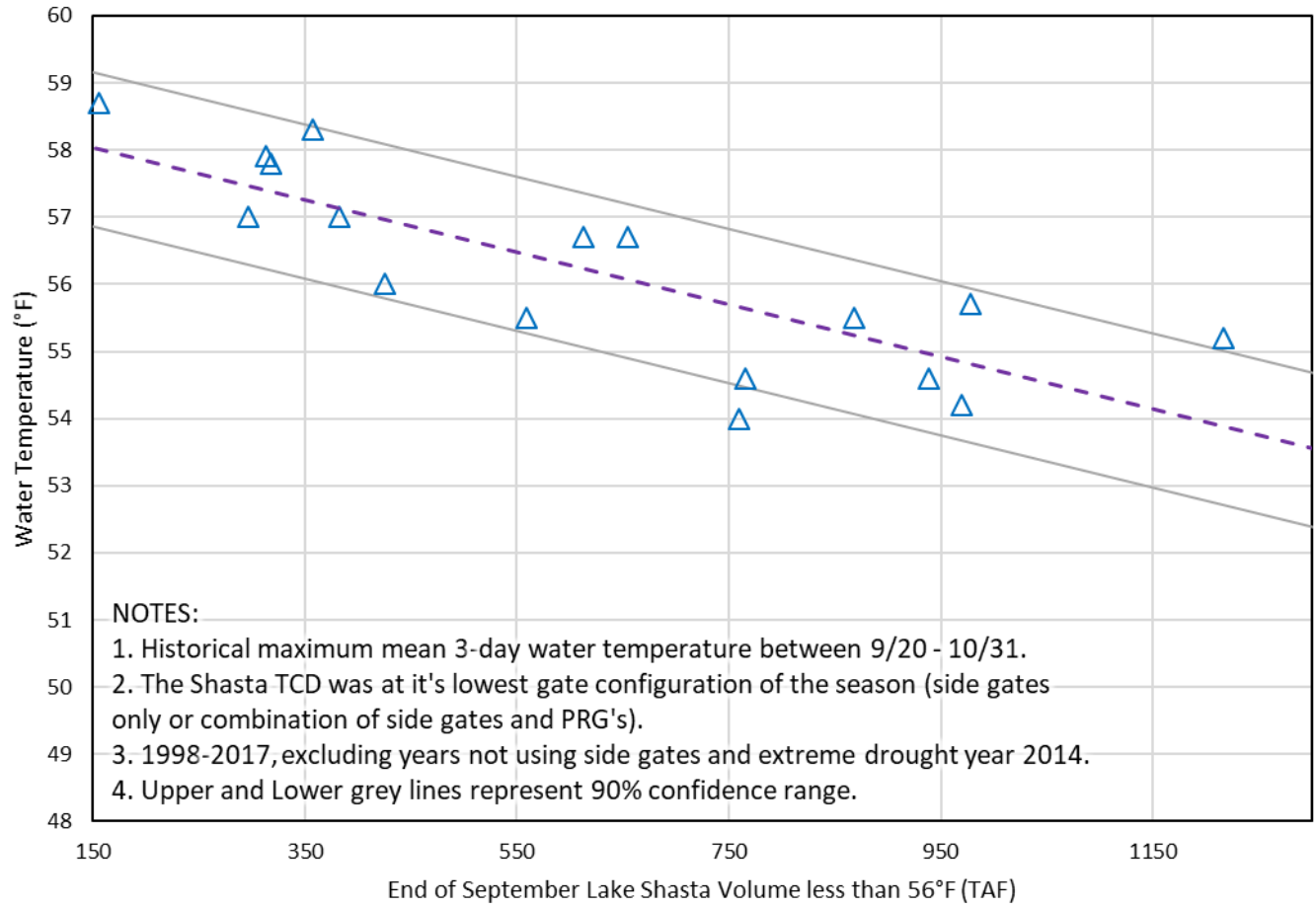
Historical relationship between Lake Shasta cold-water-pool characteristics and early fall Keswick water temperature.

Sacramento River - Lake Shasta Early Fall Water Temperature - Sac River above Clear Creek (CCR)



Historical relationship between Lake Shasta cold-water-pool characteristics and early fall Sacramento River above Clear Creek confluence water temperature.

Sacramento River - Lake Shasta Early Fall Water Temperature - Balls Ferry (BSF)



Historical relationship between Lake Shasta cold-water-pool characteristics and early fall Balls Ferry water temperature.

Summary Document for Shasta/Keswick Operational Scenarios
 Prepared by the Southwest Fisheries Science Center on March 24th, 2021

Below are results for one USBR scenario ran March 23rd 2021. The scenario has hydrology (Input 90% exceedance) and air temperature (25% exceedance of L3MTO) as inputs. Inputs from the scenario are used to generate daily average Sacramento River water temperatures using the RAFT model and associated temperature-dependent egg mortality and survival estimates using the NMFS stage-independent temperature mortality model (Martin et al. 2017) for the 2021 temperature management season.

Further details of modeling methods are at: <https://oceanview.pfeg.noaa.gov/CVTEMP/>

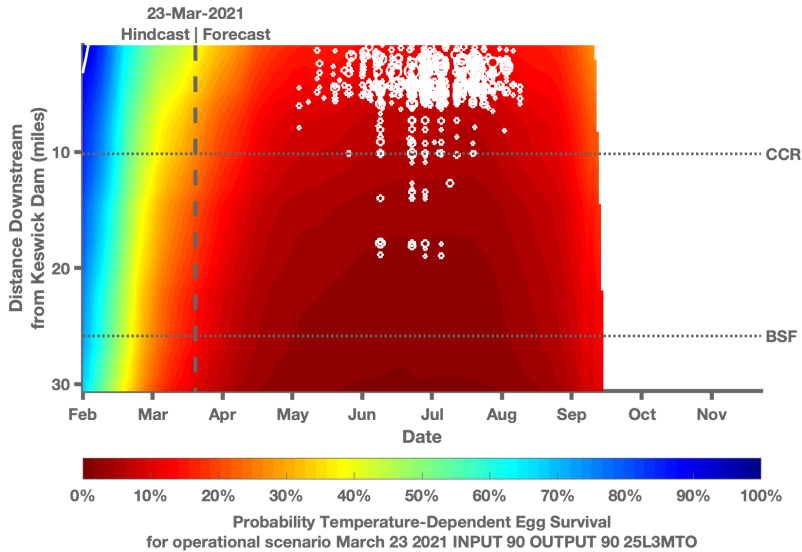


Figure1: Estimated temperature-dependent egg survival produced by the NMFS stage-independent temperature mortality model under the one March 23rd 2021 scenario. 2012-2019 redd distributions are used for all plots.

Table 1: Estimated temperature-dependent egg mortality under the one March 23rd 2021 scenario assuming a 2012-2019 spatial and temporal redd distribution using output from RAFT model.

Scenario	River Model	Mean (%)	Median (%)
March_23_2020_INPUT_90_OUTPUT_90_25L3MTO	RAFT	89	90