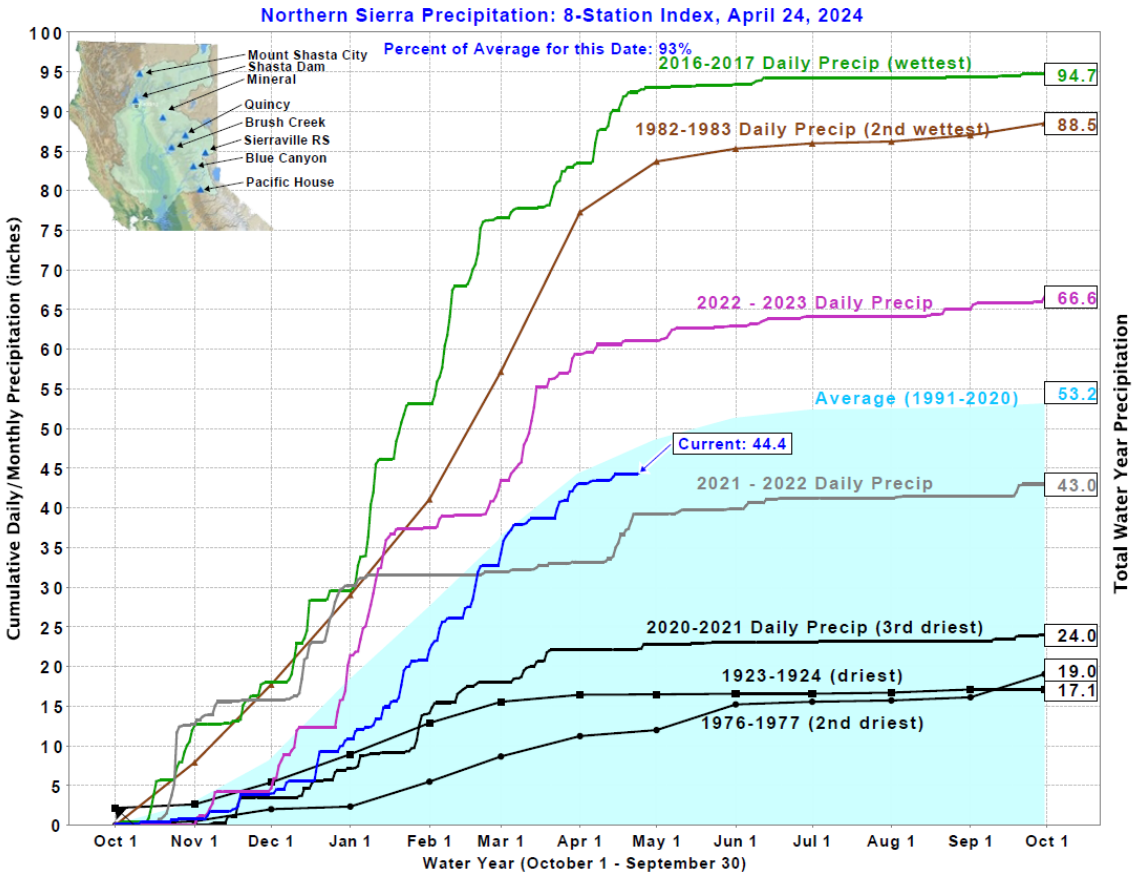
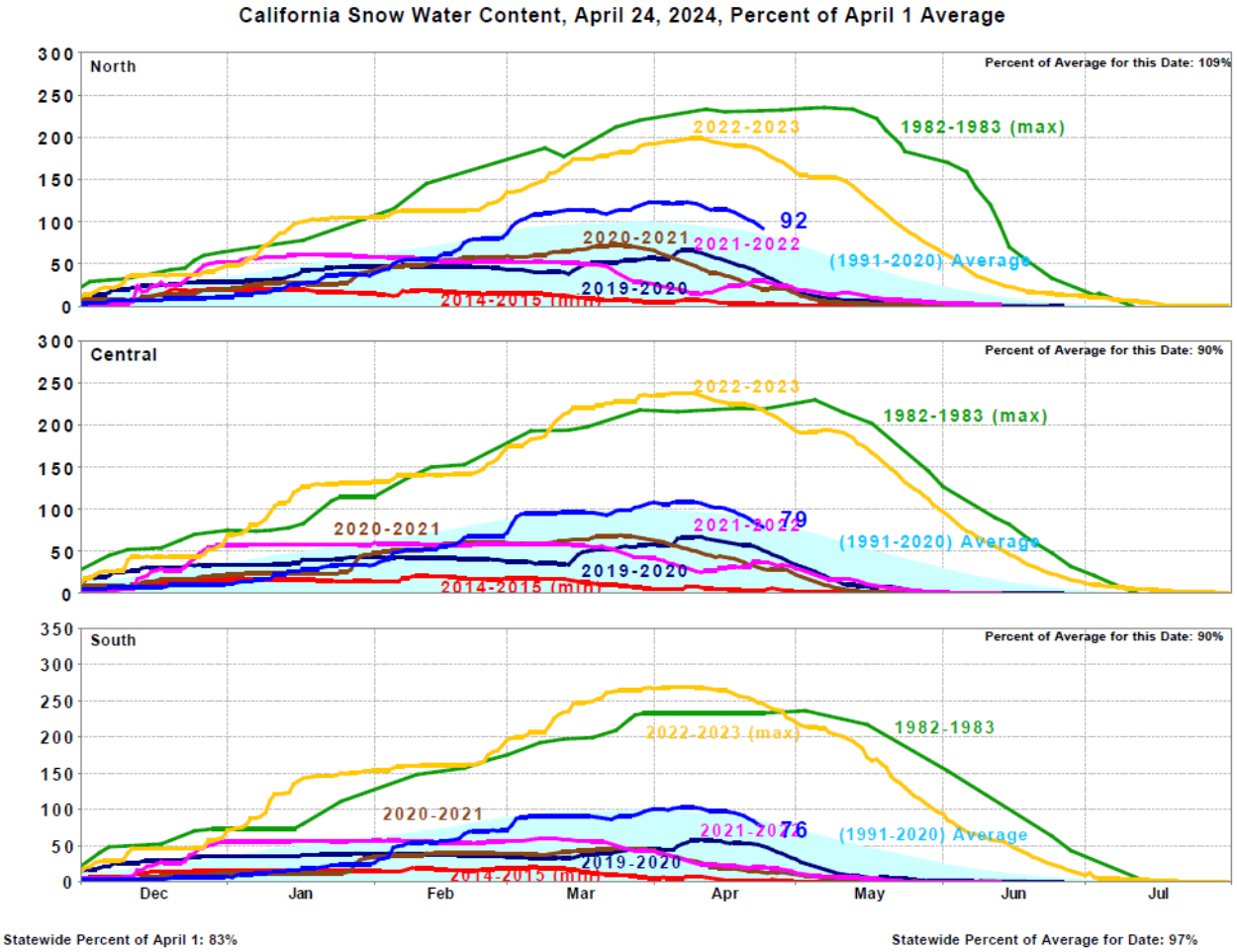
Sacramento River Temperature Task Group Meeting Packet

April 25, 2024



Northern Sierra Precipitation: 8-Station Index, April 24, 2024

This figure shows a line graph precipitation at the Northern Sierra 8-station Index. The graph includes the current cumulative daily and monthly precipitation, 44.4 (93% average for this date), in inches, average for 1991-2020 (53.2), daily precipitation for 2016-2017 (94.7 wettest), 1982-1983 (88.5 2nd wettest), 2018-2019 (70.7), 2021-2022 (43.0), 2019-2020 (31.7), 2020-2021 (24.0 3rd driest), 1976-1977 (19.0 2nd driest), and 1923-1924 (17.1 driest).



California Snow Water Content, April 24, 2024, Percent of April 1 Average

This figure shows three line graphs of percent snow water content for North, Central, and Southern California December – July. The graph shows 92%, 79%, and 76% of current April 1 average for North, Central, and Southern California, respectively. The graph also shows 1991-2020 average, 1982-1983 (max), 2014-2015 (minimum), 2018-2019, 2019-2020, 2020-2021, and 2021-2022.

Daily Central Valley Project Water Supply Report

United States Department of the Interior

U.S. Bureau of Reclamation, Central Valley Project

California Daily CVP Water Supply Report
March 26, 2024
Run Date: March 27, 2024

Reservoir Releases in Cubic Feet Per Second

Reservoir	Dam	WY 2023	WY 2024	15-Year Median
Trinity	Lewiston	9,696	8,148	1,517
Sacramento	Keswick	4,528	10,910	5,505
Feather	Oroville (SWP)	15,000	6,500	1,350
American	Nimbus	7,004	5,012	2,006
Stanislaus	Goodwin	1,501	339	1,501
San Joaquin	Friant	8,718	544	509

Storage in Major Reservoirs in Thousands of Acre-Feet

Reservoir	Capacity	15-Yr Avg	WY 2023	WY 2024	% O 15 Yr Avg
Trinity	2,448	1,702	851	2,096	123
Shasta	4,552	3,675	4,333	4,377	119
Folsom	977	708	737	822	116
New Melones	2,420	1,508	1,479	2,051	136
Fed. San Luis	966	710	961	920	130
Total North CVP	11,363	8,303	8,361	10,266	124
Millerton	521	300	151	476	159
Oroville (SWP)	3,538	2,617	3,173	3,343	128

Accumulated Inflow for water Year to Date in Thousands of Acre-Feet

Reservoir	Current WY 2024	WY 1977	WY 1983	15-Yr Avg	% O 15 Yr Avg
Trinity	1,049	384	1,382	704	149
Shasta	4,233	2,325	6,976	3,485	121
Folsom	1,469	783	4,225	1,710	86
New Melones	537	N/A	1,219	580	93
Millerton	820	465	1,189	670	122

Accumulated Precipitation for Water Year to Date in Inches

Reservoir	Current WY 2024	WY 1977	WY 1983	Avg (N Yrs)	% of Avg	Last 24 Hours
Trinity at Fish Hatchery	34.94	21.65	37.91	27.70 (64)	126	0.00
Sacramento at Shasta Dam	63.08	32.91	83.60	54.37 (69)	116	0.00
American at Blue Canyon	46.10	N/A	112.06	58.83 (50)	78	0.00
Stanislaus at New Melones	26.98	N/A	36.55	25.01 (47)	108	0.00
San Joaquin at Huntington LK	30.18	11.50	65.00	36.68 (51)	82	0.00

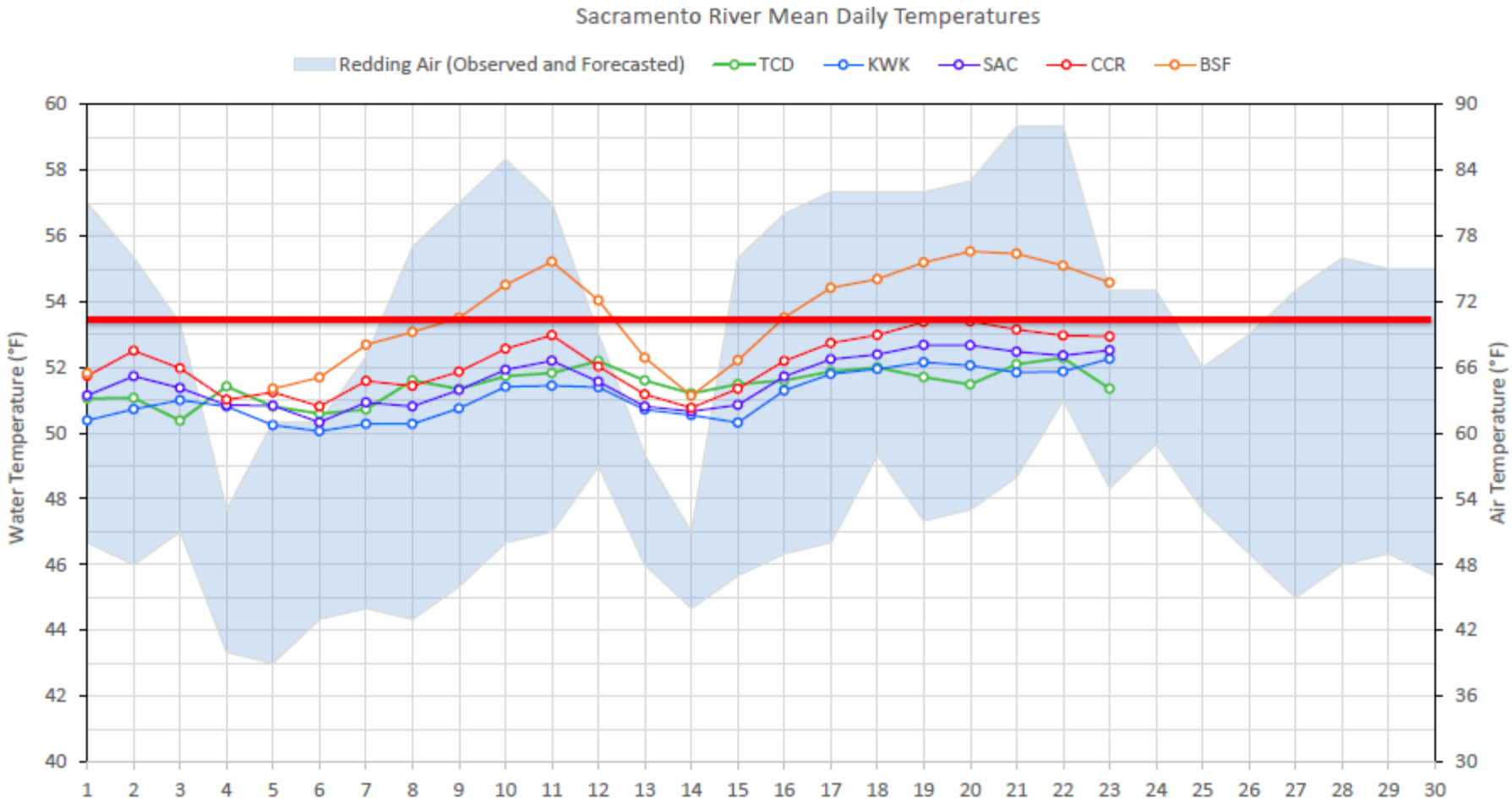
Sacramento River Station Temperature Summary Report

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	50.6	48.8	48.6	49.4	49.8	50.0	50.7	51.1	51.5	49.3	48.5	46.5	47.0	9436	1066	10134	55.1	51.8	53.3
04/01	51.1	49.6	47.0	50.4	51.1	51.7	51.8 C	54.1	54.6 A	51.0	50.2	49.4	49.8	3771	44	4183	65.5	61.4	61.6
04/02	51.1	49.3	47.1	50.7	51.7	52.5	N/A C	55.5	56.1	52.1	50.3	51.2	51.5	4109	44	4183	62.0	58.6	60.5
04/03	50.4	49.3	47.6	51.0	51.4	52.0	N/A C	56.5	57.3	51.3	50.3	50.8	50.9	4110	61	4181	60.5	56.3	58.5
04/04	51.4	49.3	46.9	50.8	50.9	51.0	N/A C	53.6	54.5	49.5	50.2	46.5	47.0	4155	44	4182	46.5	46.6	46.2
04/05	50.8	49.3	47.2	50.2	50.8	51.2	51.4	51.2	52.0	49.5	50.6	47.6	47.0	4063	44	4183	50.0	47.0	47.6
04/06	50.6	49.0	49.4	50.1	50.3	50.8	51.7	52.2	52.7	49.3	50.8	47.4	47.5	4094	185	4149	52.0	47.3	47.9
04/07	50.7	49.6	47.9	50.3	50.9	51.6	52.7	53.1	53.7	50.8	51.1	49.6	49.4	4129	44	4113	55.5	53.7	55.3
04/08	51.6	50.3	47.4	50.3	50.8	51.4	53.1	54.0	54.9	51.0	51.2	49.6	50.1	6251	44	6084	60.0	56.9	58.5
04/09	51.3	49.8	47.5	50.8	51.3	51.9	53.5	54.4	55.4	52.2	51.5	51.5	51.6	6089	44	6128	63.5	59.3	61.0
04/10	51.7	50.1 A	47.5	51.4	51.9	52.6	54.5	55.7	56.8 A	52.6	51.7	52.5	52.6	5820	44	6190	67.5	62.7	64.2
04/11	51.8	50.4 A	48.4	51.4	52.2	53.0	55.2	56.6	57.8	53.3	52.0	53.1	53.0	6088	72	6110	66.0	63.2	65.7
04/12	52.2	50.2	47.5	51.4	51.6	52.0	54.0	56.2	57.8	51.8	52.0	51.3	51.2	8591	44	8017	63.0	61.4	61.8
04/13	51.6	50.0	47.5	50.7	50.8	51.2	52.3	53.2	54.3	50.7	52.1	49.5	49.1	8415	44	8086	53.0	51.4	50.9
04/14	51.2	49.8	47.4	50.6	50.7	50.8	51.1	51.3	52.1	49.6	52.0	48.5	48.2	8332	44	8049	47.5 D	45.8	47.5
04/15	51.5	50.4 A	47.6	50.3	50.9	51.4	52.2	52.1	52.5	51.7	52.3	51.0	50.3	7784	44	8040	61.5	56.4	57.3
04/16	51.6	50.8	47.7	51.3	51.7	52.2	53.5	54.4	55.1	52.3	51.9	52.5	52.2	8219	44	8046	64.5	60.9	61.5
04/17	51.9	50.9	47.6	51.8	52.2	52.7	54.4	55.6	56.6	52.6	52.2	52.3	52.5	8512	43	8017	68.5	62.5	63.3
04/18	52.0 A	51.1	47.7	52.0	52.4	53.0	54.7	55.9	57.0	52.6	52.2	52.6	52.8	8337	44	7948	70.0	62.1	64.2
04/19	51.7	50.5	48.4	52.2	52.7	53.4	55.2	56.5	57.7	53.2	51.3	52.3	53.4	8610	61	8056	67.0	63.8	66.1
04/20	51.5	50.4 C	49.5	52.1	52.7	53.4	55.5	57.2	58.5	53.3	50.9	51.9	52.7	7611	166	8076	68.0	65.6	67.4
04/21	52.1	50.9	49.8	51.8	52.5	53.2	55.5	57.3	58.7	53.5	50.3	51.6	52.0	7612	270	8052	72.0	65.8	68.6
04/22	52.3	51.1 A	50.0	51.9	52.4	53.0	55.1	56.9	58.4	53.4	49.1	50.8	51.3	8082	432	8047	75.5	65.8	68.4

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
04/23	51.4	51.0	48.1	52.3	52.5 A	52.9	54.6	56.3	57.6	53.0	48.7	49.0	50.1	11598	47	10910	64.0	60.8	62.0
Apr	51.5	50.1	48.0	51.1	51.6	52.1	53.6	54.8	55.7	51.8	51.1	50.5	50.7	6712	85	6653		61.9	58.1
N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Total CFS	154382	1953	153030	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Total AF	306210	3874	303529	N/A	N/A	N/A

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 25 days. It also includes a shaded area depicting observed and forecasted air temperatures in degrees Fahrenheit in Redding California.

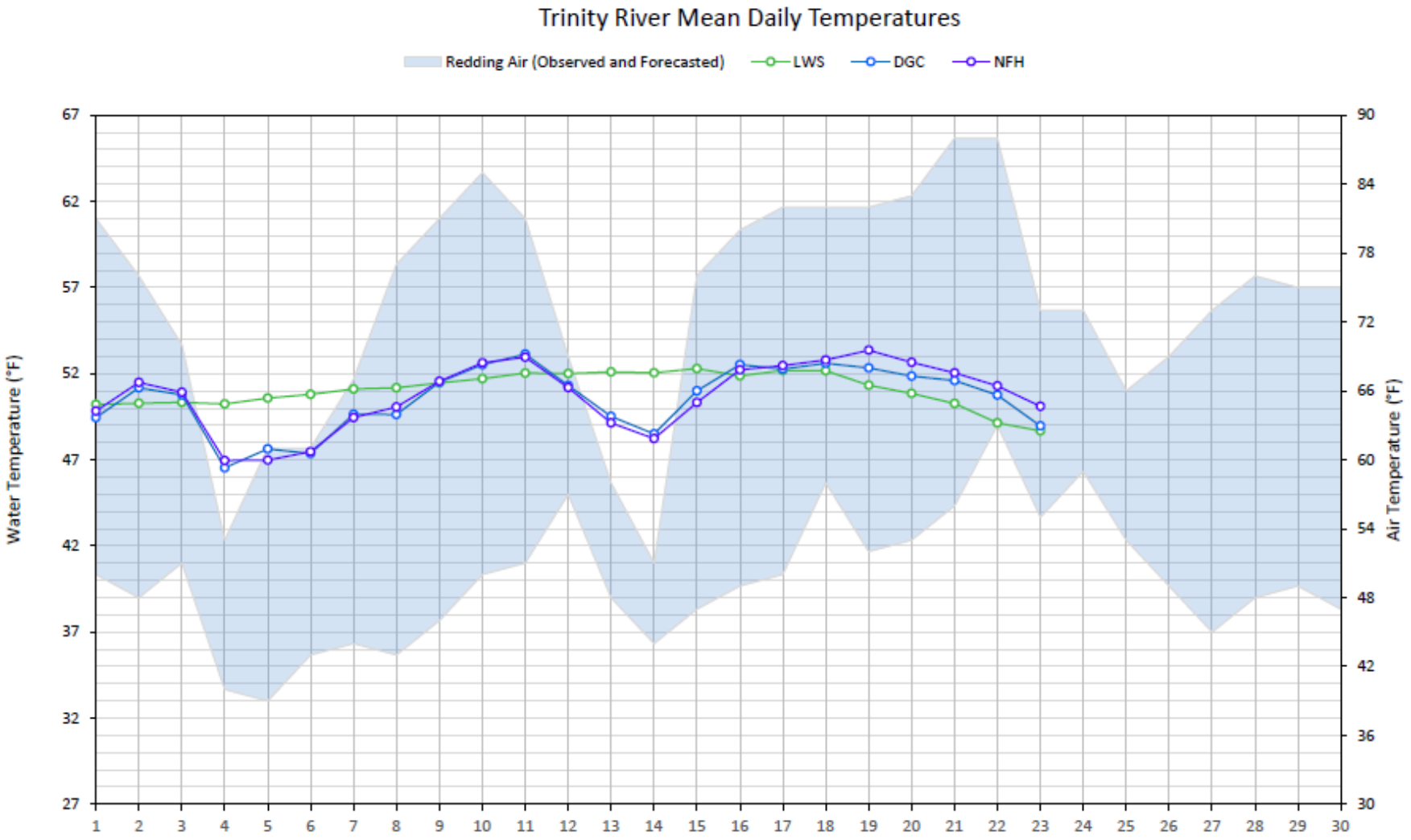
Station Details

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	CCR	53.5	05/14/2023	TBD

Notes: [1] Distances are approximate



Trinity River Mean Daily Temperatures

This figure shows the mean Trinity River daily temperatures in degrees Fahrenheit at stations 1.1, 19, and 38 miles downstream of Lewiston Dam for the past 25 days. It also includes a shaded area depicting observed and forecasted air temperatures in degrees Fahrenheit in Redding California.

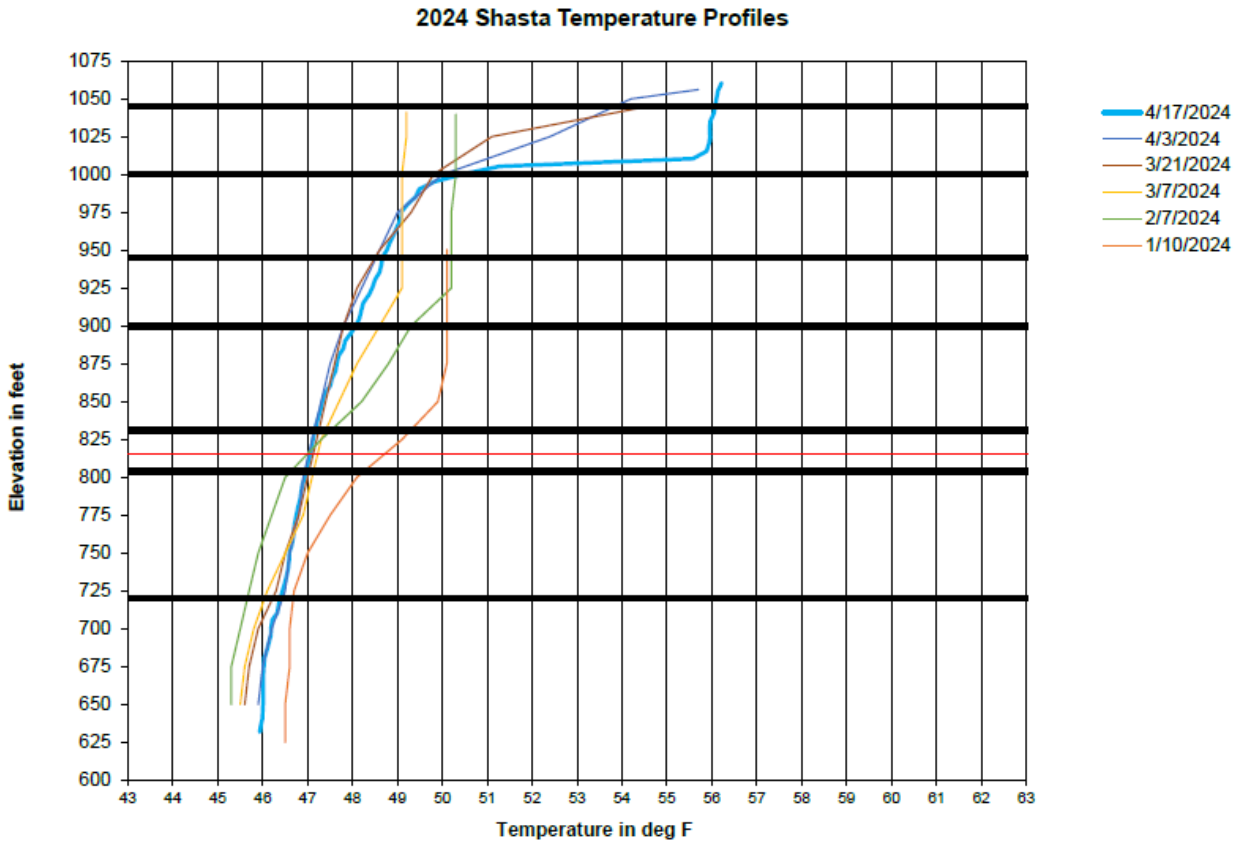
Station Details

Code	Body of Water	Location[1]
LWS	Trinity River	1.1 miles downstream of Lewiston Dam
DGC	Trinity River	19 miles downstream of Lewiston Dam
NFH	Trinity River	38 miles downstream of Lewiston Dam

Water Right Temperature Control Points

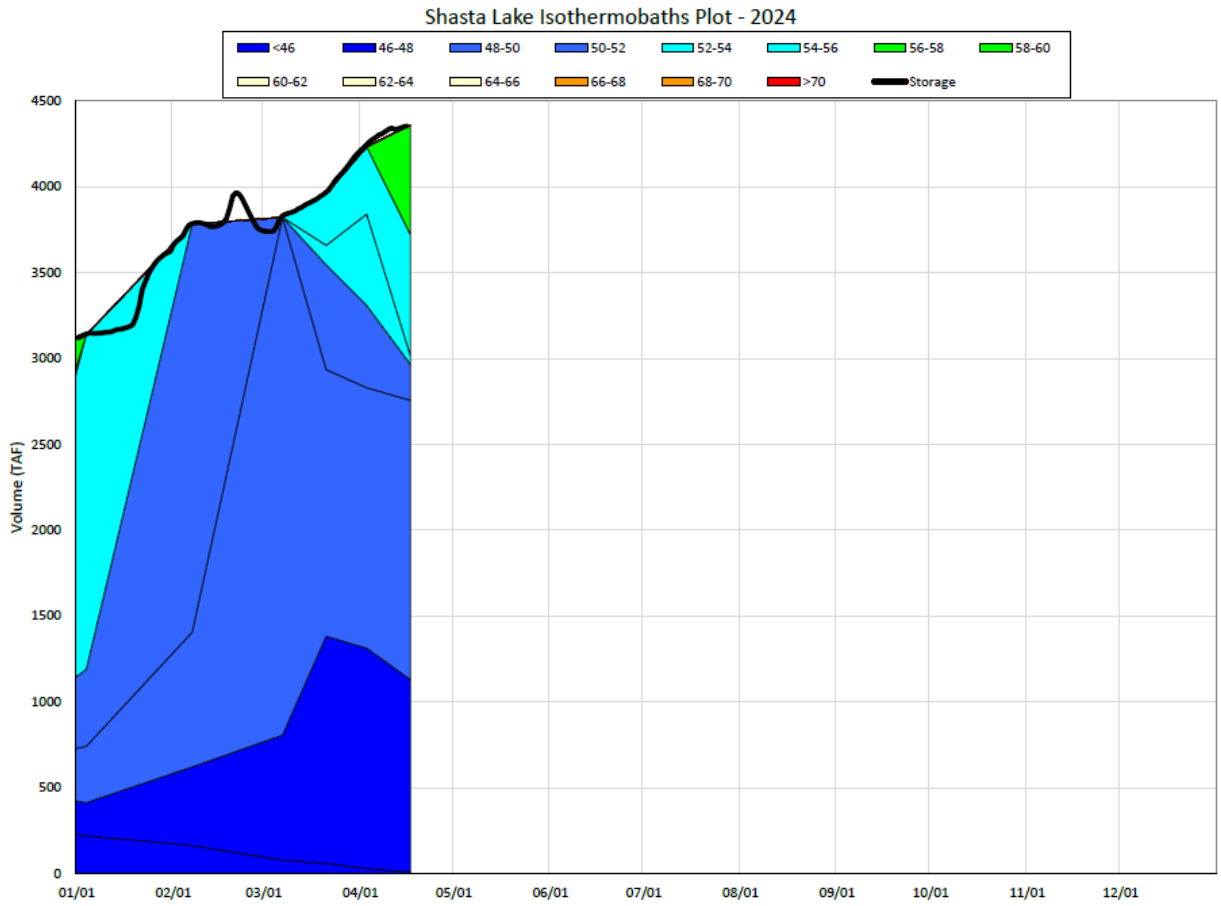
River	Point	Temp (˚F)	Begin Date	End Date
N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A

Notes: [1] Distances are approximate



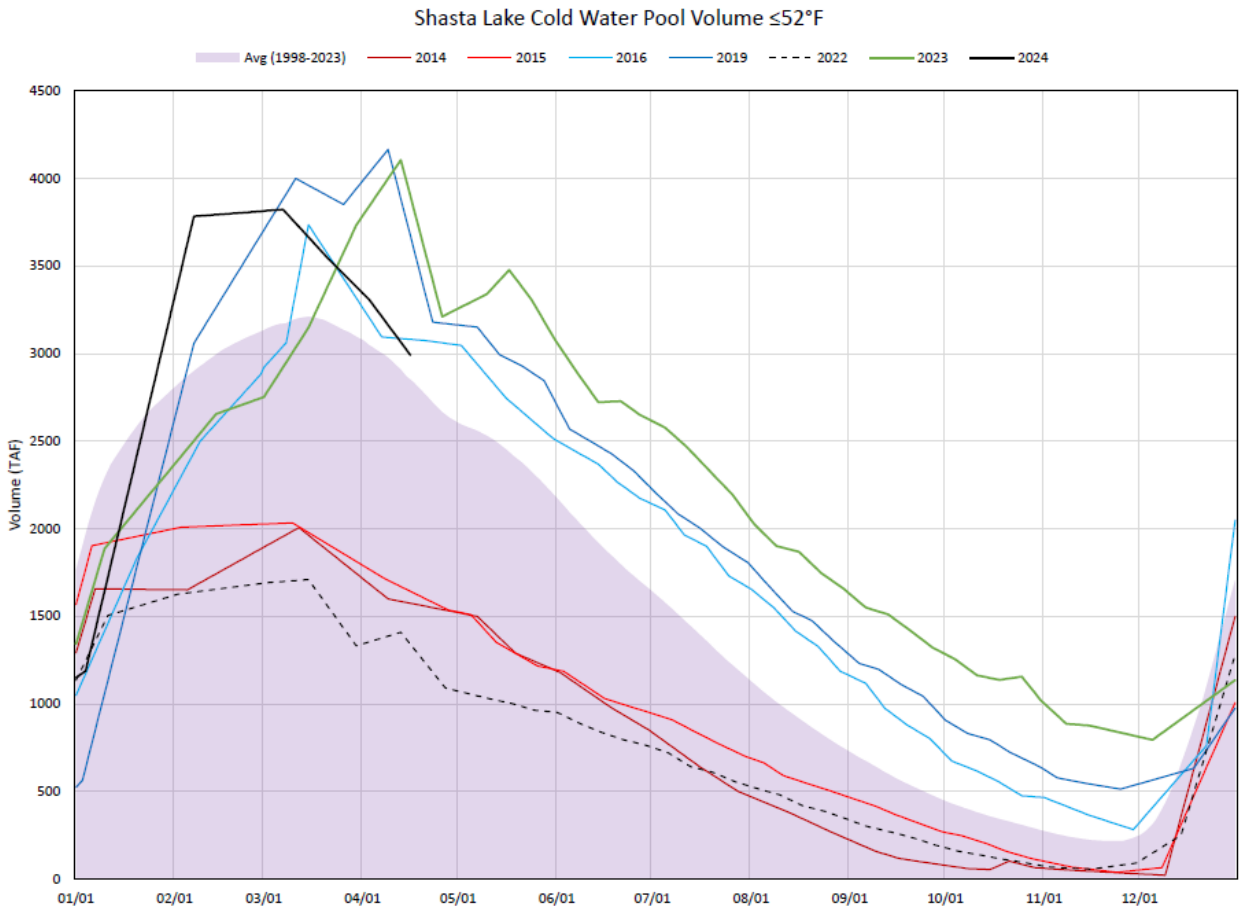
2024 Shasta Temperature Profiles

This figure is a multiple line graph showing Shasta Lake temperature profiles from 01/10-04/17 with lake elevation 600-1075' and lake temperatures from 43-63 degrees Fahrenheit.



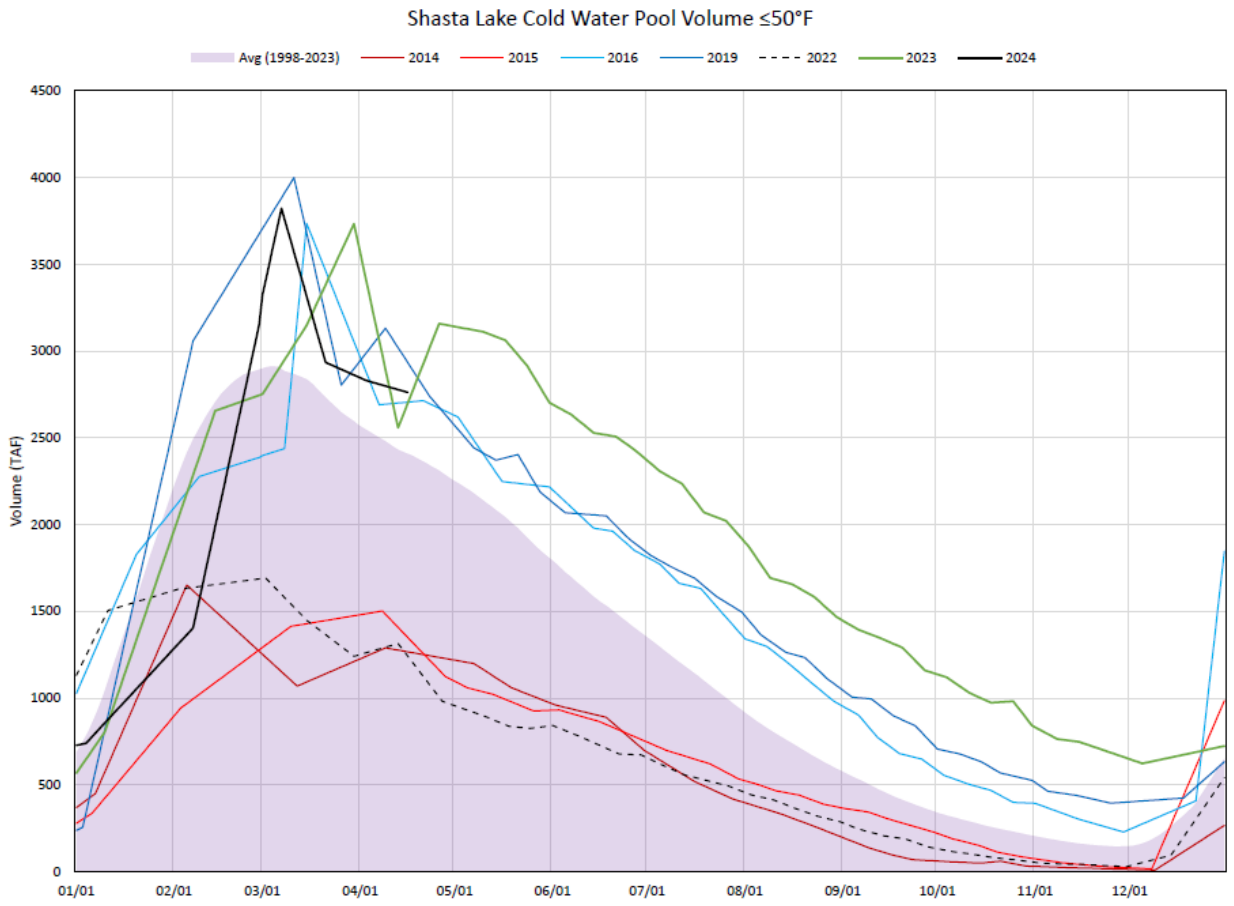
Shasta Lake Isothermobaths Plot - 2024

This figure is a chart showing Shasta Lake Isothermobaths with volume in Thousand Acre-Feet from 0-4500; with dates 01/01-12/01.



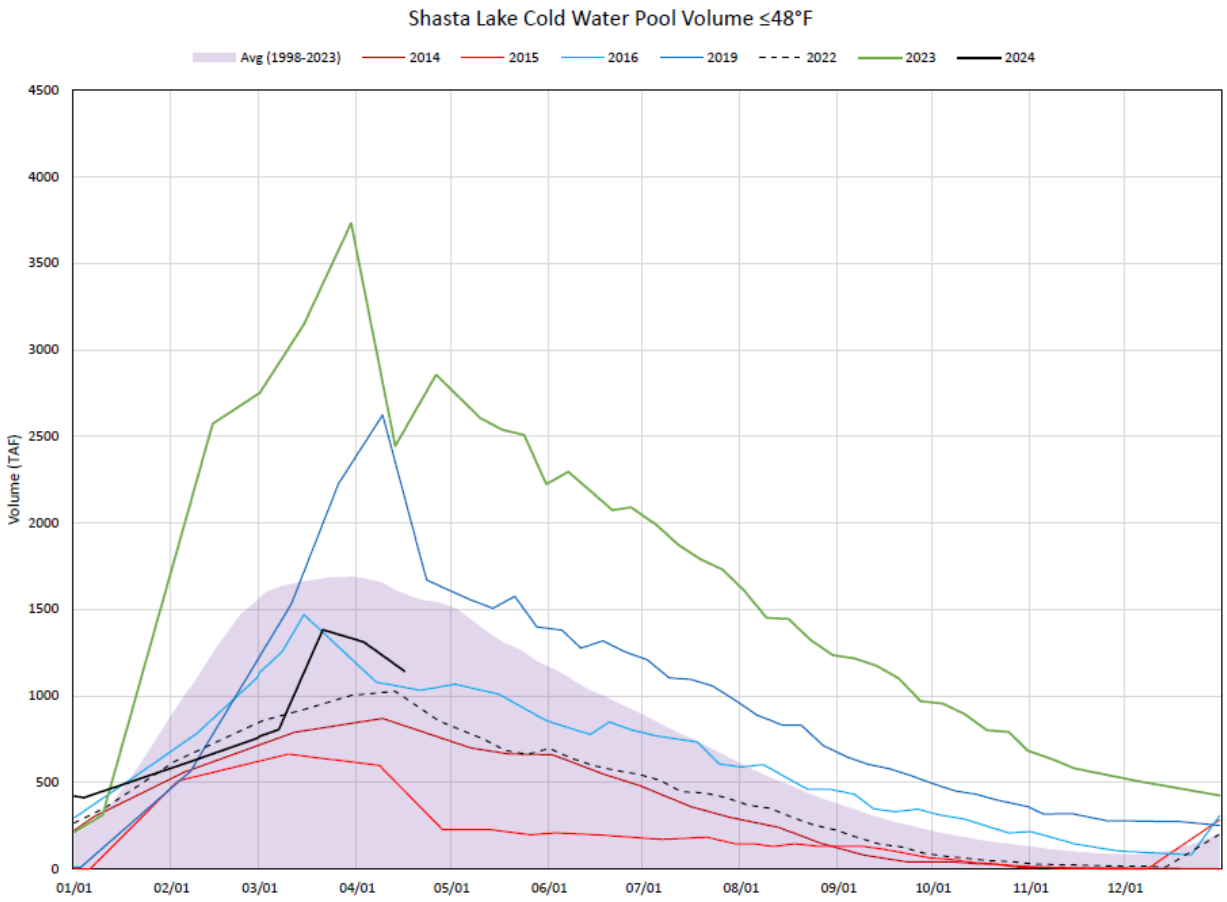
Shasta Lake Cold Water Pool Volume ≤52°F

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.



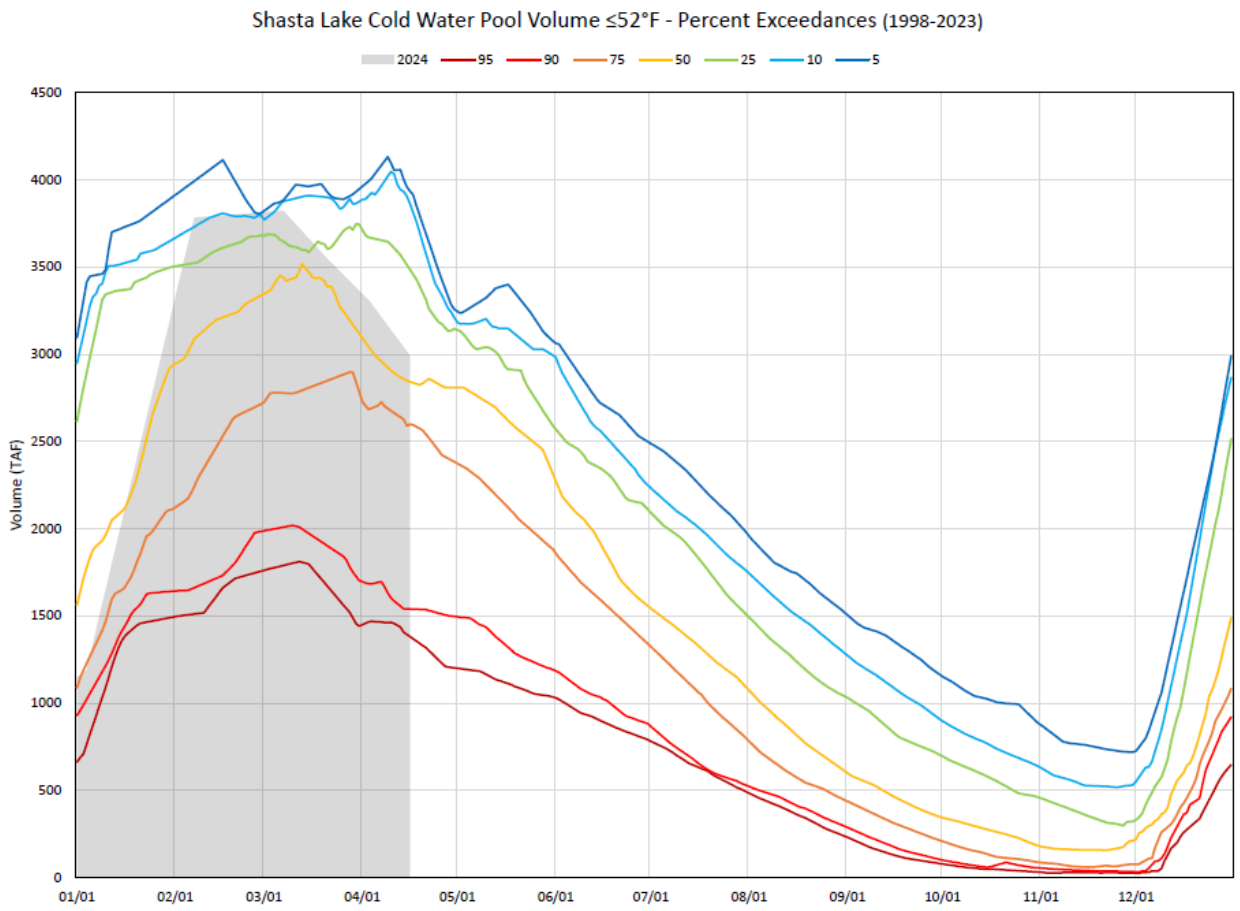
Shasta Lake Cold Water Pool Volume ≤50°F

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.



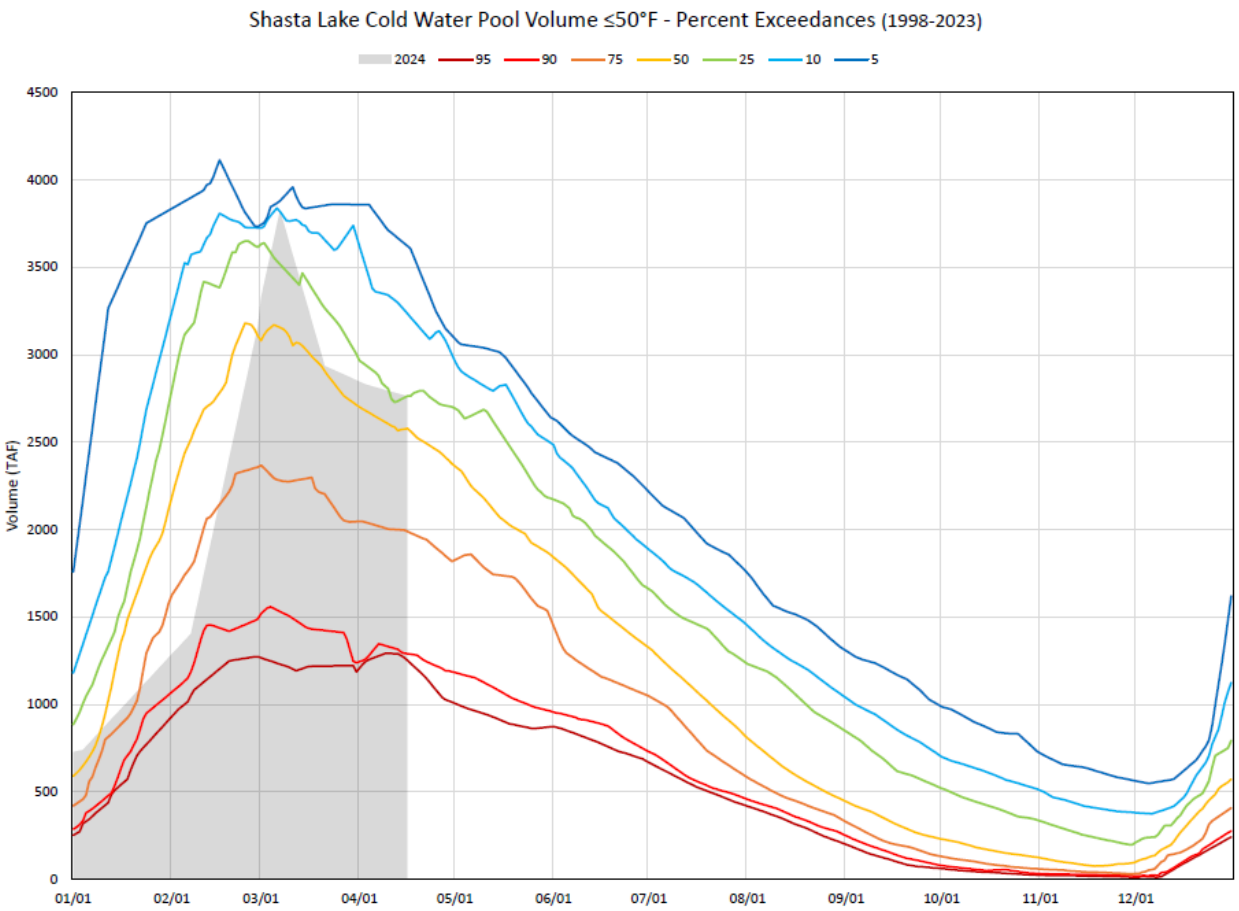
Shasta Lake Cold Water Pool Volume ≤48°F

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.



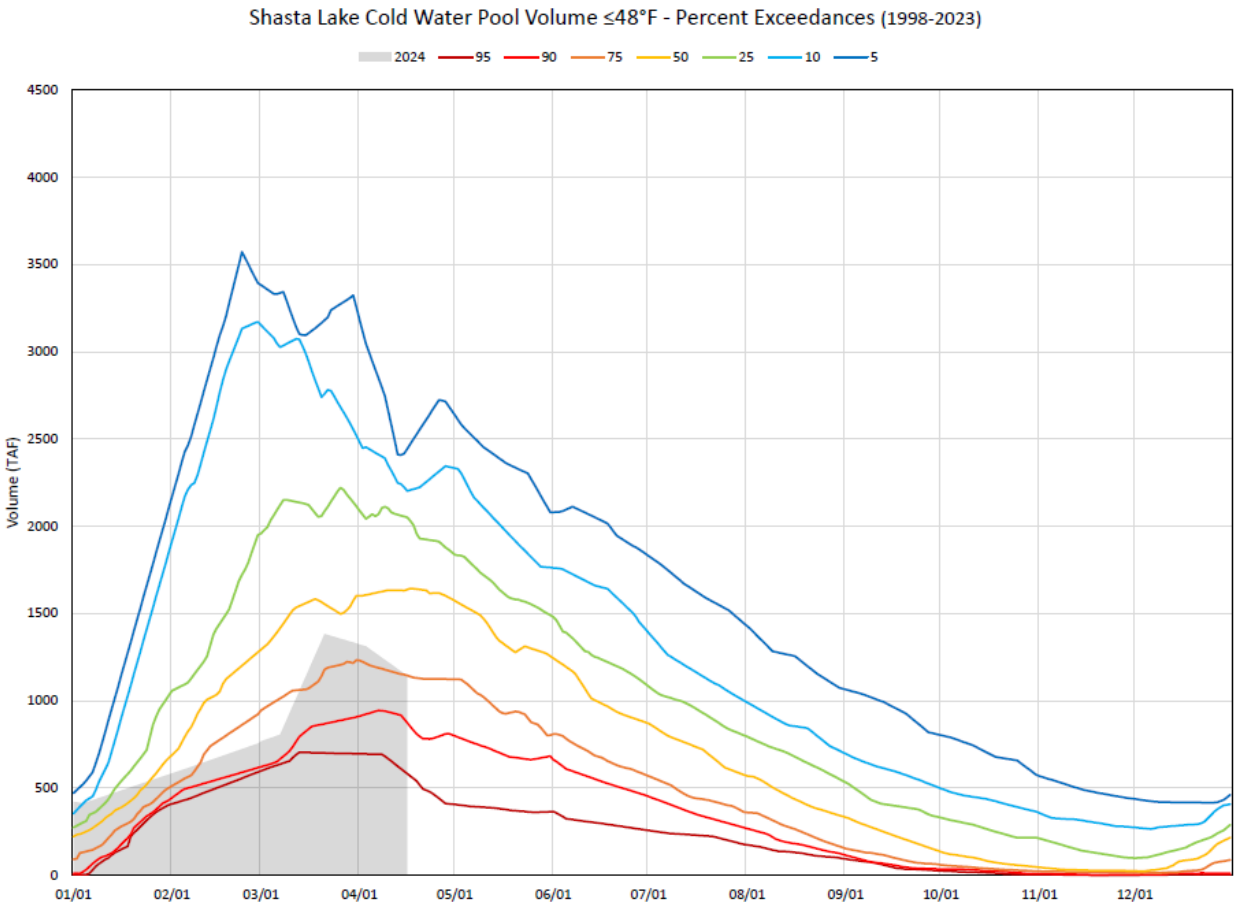
Shasta Lake Cold Water Pool Volume ≤52°F - Percent Exceedances (1998-2023)

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.



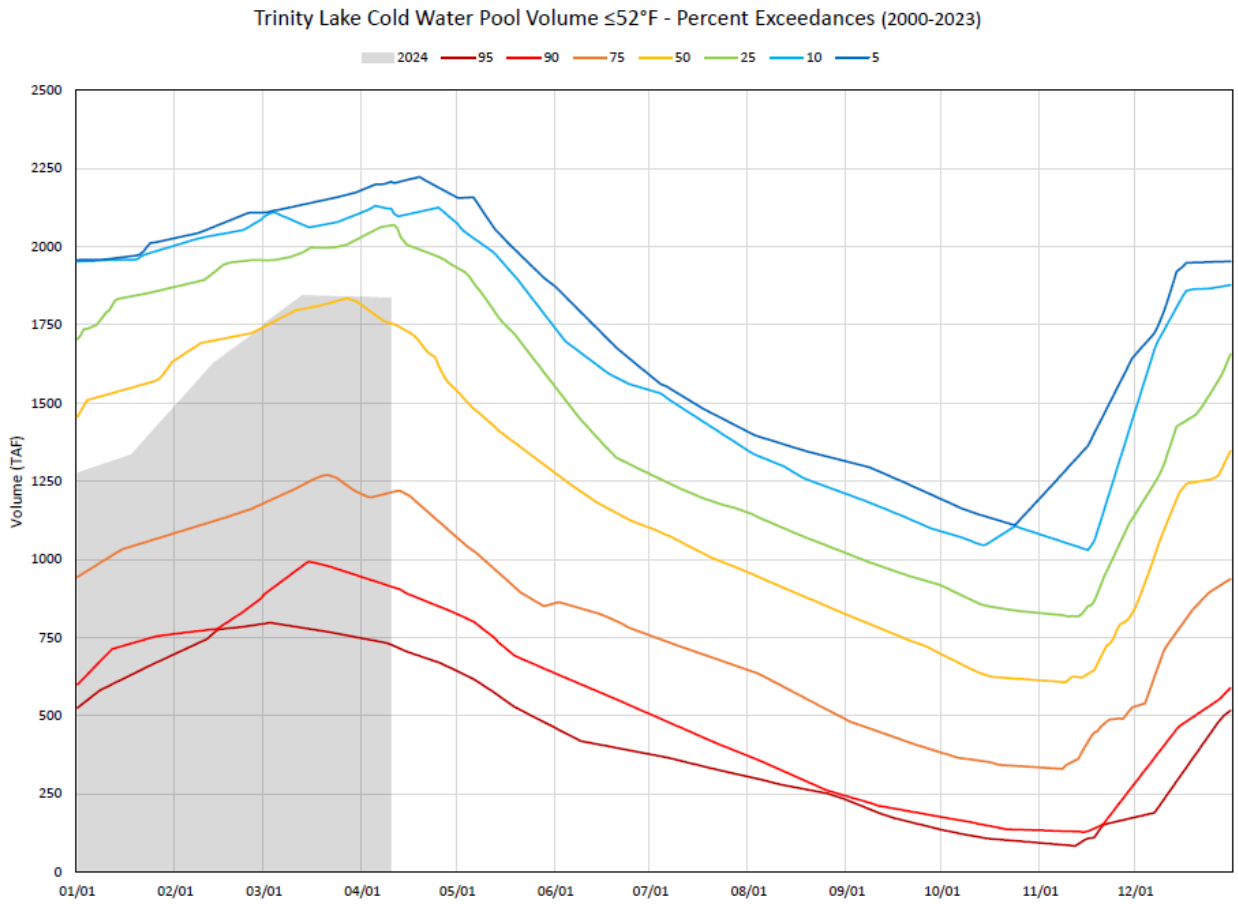
Shasta Lake Cold Water Pool Volume ≤50°F - Percent Exceedances (1998-2023)

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.



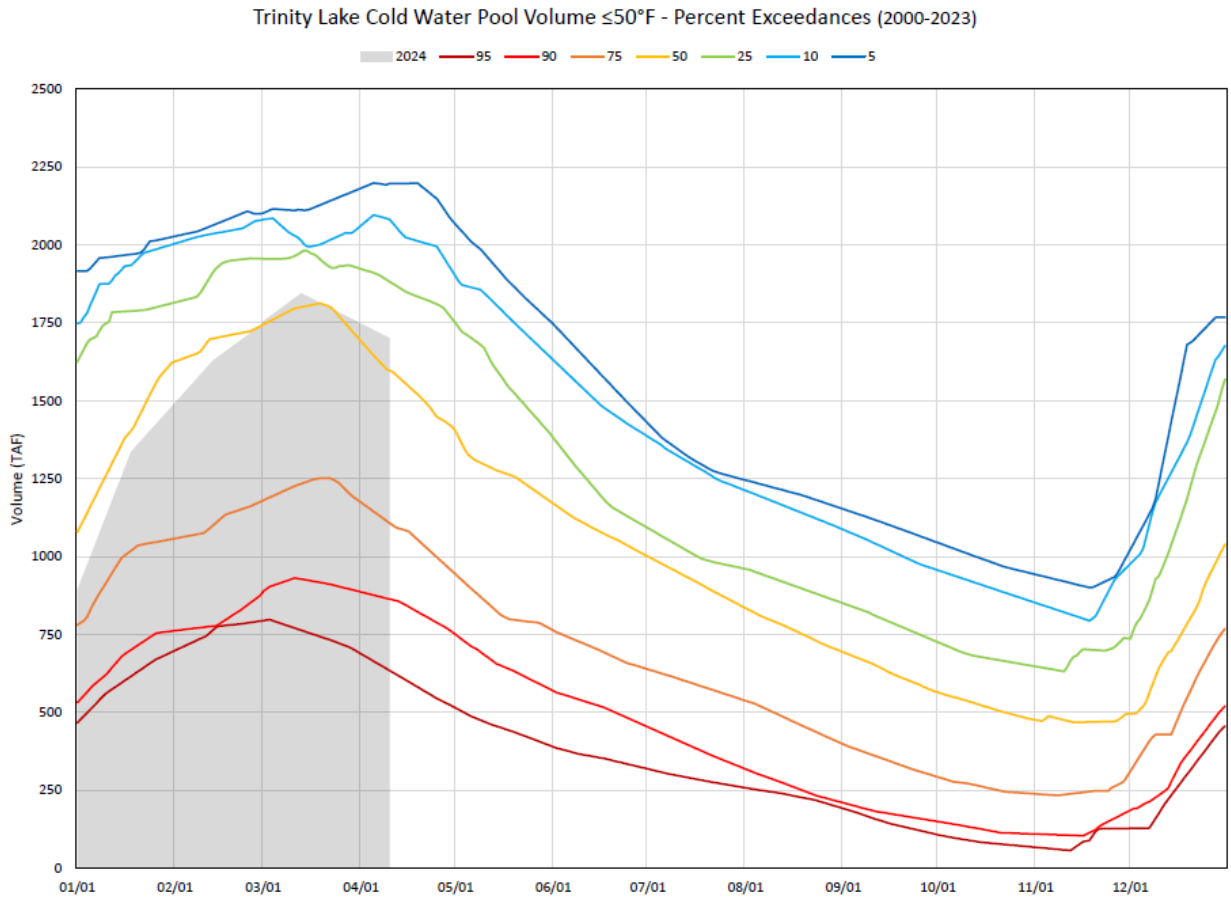
Shasta Lake Cold Water Pool Volume ≤48°F - Percent Exceedances (1998-2023)

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.



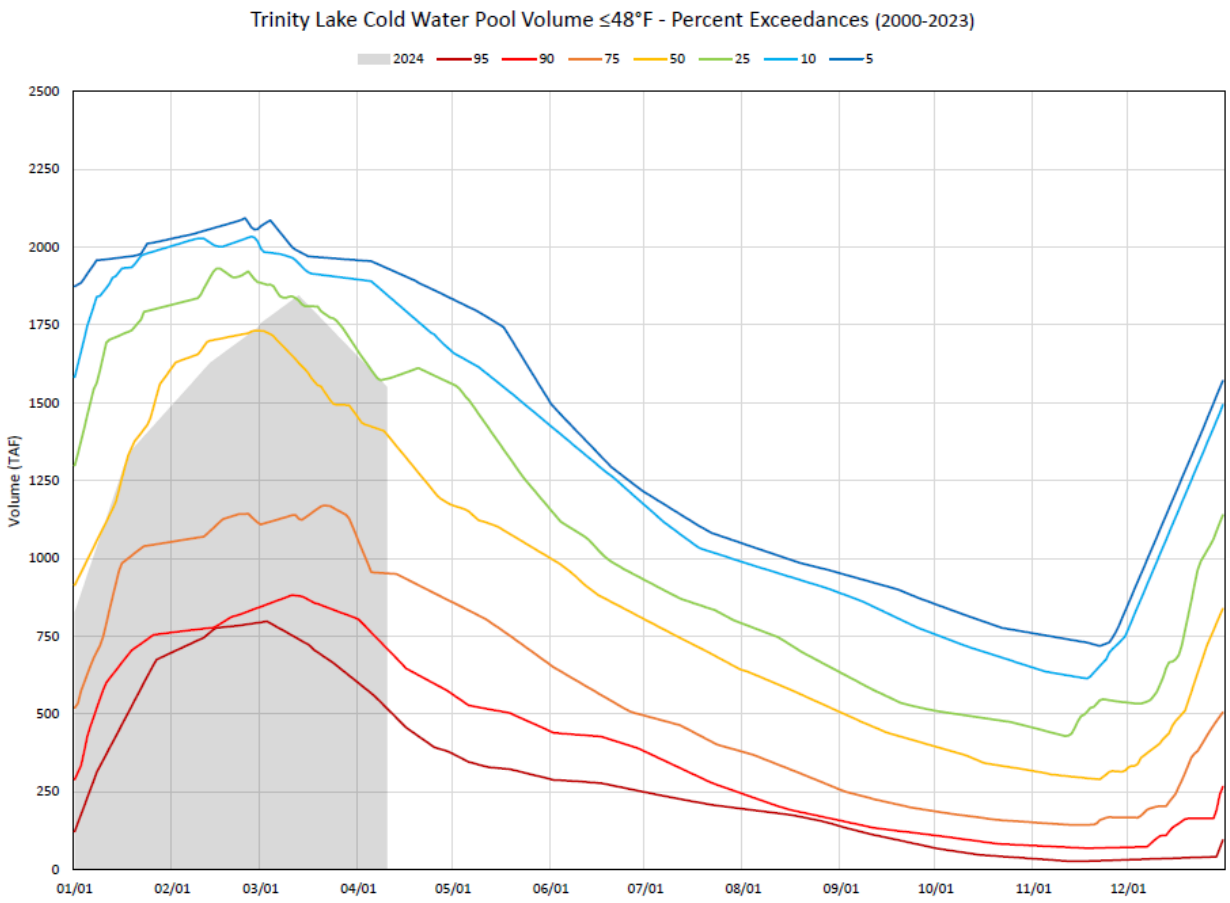
Trinity Lake Cold Water Pool Volume ≤52°F - Percent Exceedances (1998-2023)

This figure is a line graph showing Trinity Lake Cold Water Pool Volume less than or equal to 52 degrees Fahrenheit as percent exceedances from 01/01 to 12/01.



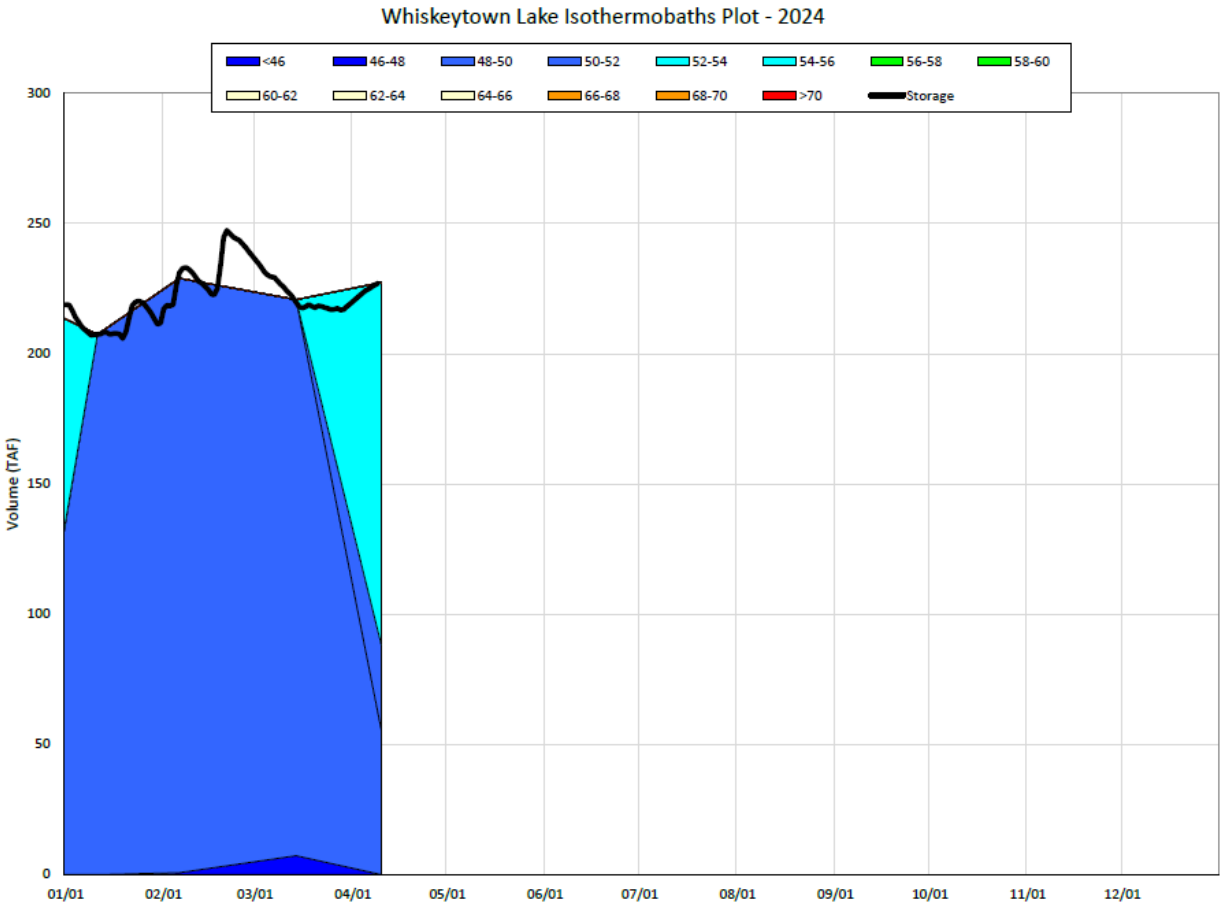
Trinity Lake Cold Water Pool Volume ≤50°F - Percent Exceedances (1998-2023)

This figure is a line graph showing Trinity Lake Cold Water Pool Volume less than or equal to 50 degrees Fahrenheit as percent exceedances from 01/01 to 12/01.



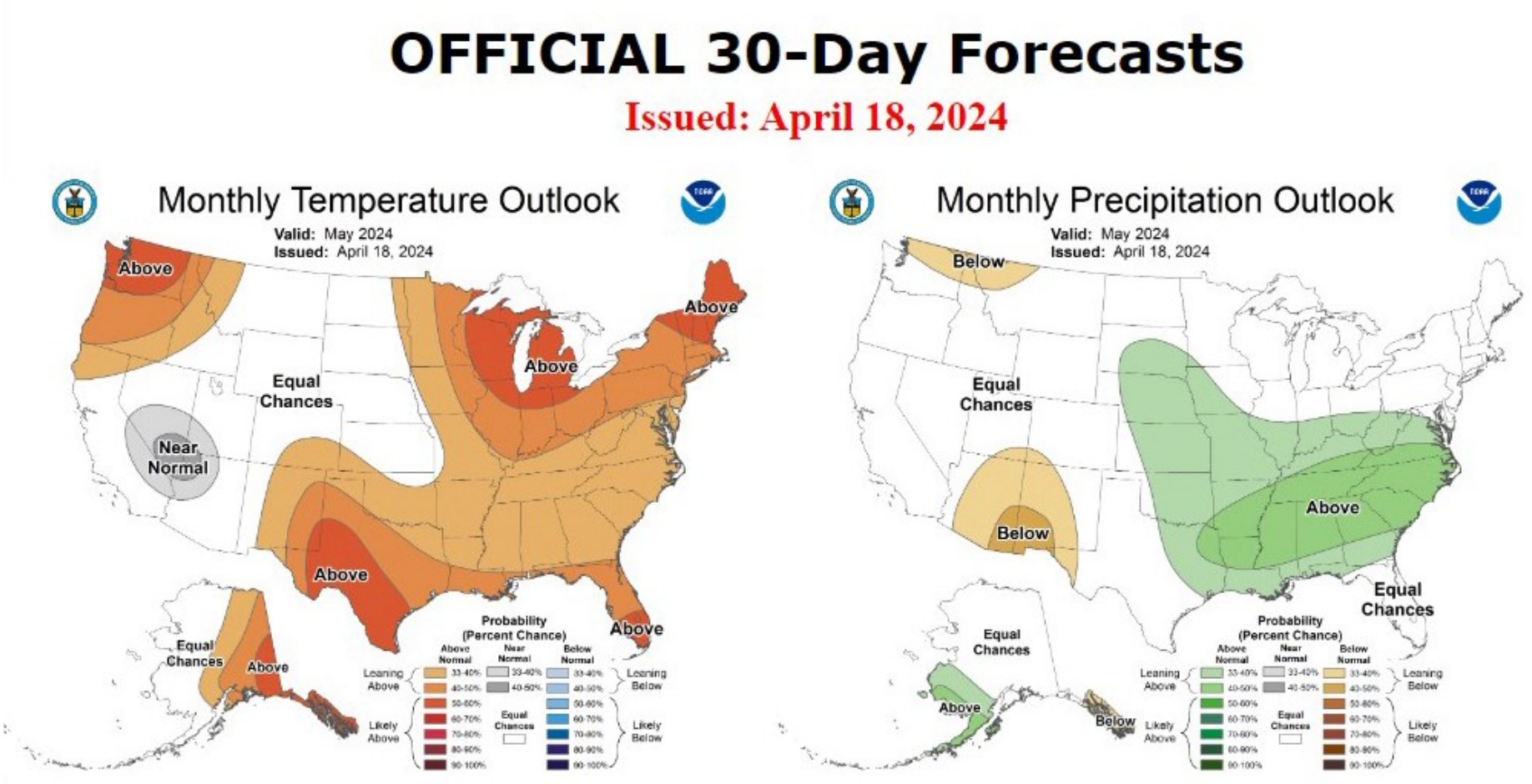
Trinity Lake Cold Water Pool Volume ≤48°F - Percent Exceedances (1998-2023)

This figure is a line graph showing Trinity Lake Cold Water Pool Volume less than or equal to 48 degrees Fahrenheit as percent exceedances from 01/01 to 12/01.



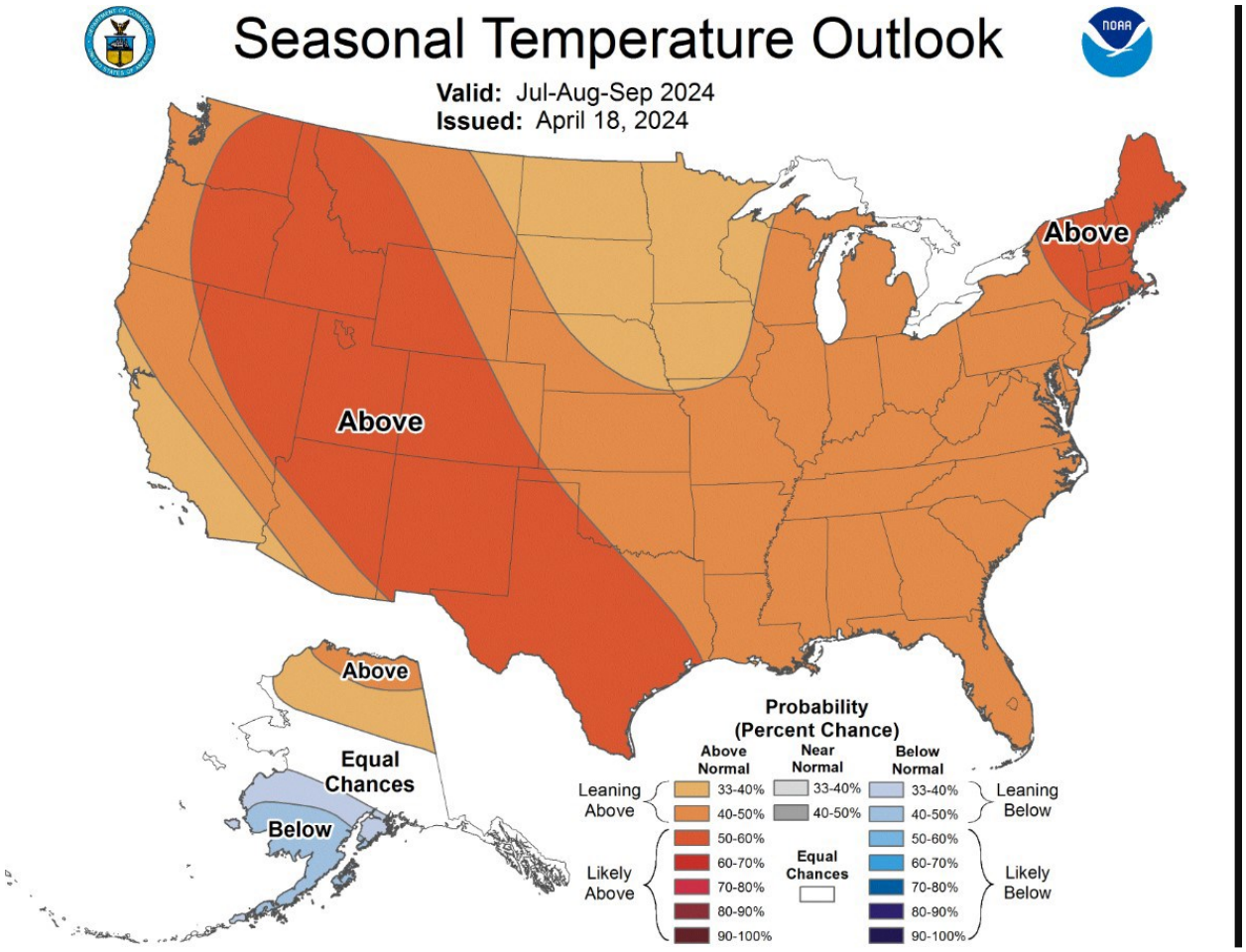
Whiskeytown Lake Isothermobaths Plot – 2024

This figure is a chart showing Whiskeytown Lake Isothermobaths with volume in Thousand Acre-Feet from 0-300; with dates 01/01-12/01.



Official Monthly Temperature and Precipitation Outlook

The first figure shows a monthly temperature outlook with the percent probability of near normal, below, or above normal temperatures for all of the United States. The figure is valid for May 2024 and was issued on April 18, 2024. The second figure shows a seasonal precipitation outlook with the percent probability of near normal, below, or above normal temperatures for all of the United States. The figure is valid for Mayl 2024 and was issued on April 18, 2024.



Seasonal Temperature Outlook

This figure shows a seasonal temperature outlook with the percent probability of near normal, below, or above normal temperatures for all of the United States. The figure is valid from July to September 2024 and was issued on April 18, 2024.

Estimated CVP Operations 50% Exceedance

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

Facility	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar
Trinity	1958	1987	2031	2008	1913	1802	1683	1633	1620	1635	1698	1804	1878
Trinity Elev.	N/A	2340	2343	2341	2335	2327	2318	2314	2313	2314	2319	2327	2332
Whiskeytown	219	238	238	238	238	238	238	206	206	206	206	206	206
Whiskeytown Elev.	N/A	1209	1209	1209	1209	1209	1209	1199	1199	1199	1199	1199	1199
Shasta	4194	4425	4300	4088	3629	3268	3044	2968	3002	3131	3463	3786	4046
Shasta Elev.	N/A	1063	1058	1051	1034	1019	1010	1006	1008	1013	1027	1040	1049
Folsom	708	830	948	950	769	618	558	516	490	480	509	550	739
Folsom Elev.	N/A	452	463	464	446	430	424	418	415	414	418	423	443
New Melones	2008	1958	2005	2027	1970	1915	1872	1822	1833	1851	1886	1943	2023
New Melones Elev.	N/A	1048	1053	1055	1050	1045	1040	1036	1037	1038	1042	1047	1054
San Luis	783	661	500	367	258	212	264	337	494	638	833	986	996
Total	9870	10099	10022	9678	8778	8053	7660	7481	7645	7940	8595	9274	9887

State End of the Month Reservoir Storage (TAF)

Facility	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar
Oroville	3109	3315	3536	3407	2894	2416	2005	1791	1725	1740	1897	2248	2631
Oroville Elev.	864	886	900	892	857	819	783	762	755	757	773	805	837
State San Luis	522	475	366	316	478	637	863	980	1062	1062	1063	1062	1061
Total San Luis (TAF)	1305	1136	866	683	736	850	1127	1317	1556	1700	1895	2049	2058
Total San Luis Elev.	N/A	466	439	419	425	437	465	483	504	516	532	545	545

Monthly River Releases (TAF/cfs)

Facility	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar
Trinity (TAF)	161	215	107	45	53	52	23	18	18	18	17	18
Trinity (cfs)	2,700	3,500	1,800	735	857	870	373	300	300	300	300	300
Clear Creek (TAF)	12	18	14	9	9	9	12	12	12	12	11	22
Clear Creek (cfs)	200	291	242	150	150	150	200	200	200	200	200	363
Sacramento (TAF)	428	615	535	738	615	476	369	283	277	277	444	615
Sacramento (cfs)	7200	10000	9000	12000	10000	8000	6000	4750	4500	4500	8000	10000
American (TAF)	238	277	226	280	249	147	123	119	123	123	222	123
American (cfs)	4000	4500	3800	4554	4056	2473	2000	2000	2000	2000	4000	2000

Facility	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar
Stanislaus (TAF)	91	76	54	15	15	15	39	12	12	13	13	12
Stanislaus (cfs)	1537	1242	900	250	250	250	635	200	200	219	229	200
Feather (TAF)	295	108	190	486	486	497	242	104	108	108	97	65
Feather (cfs)	4960	1750	3200	7900	7900	8350	3930	1750	1750	1750	1750	1065

Trinity Diversions (TAF)

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

Delta Summary (TAF)

Facility	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar
Tracy	57	138	252	269	260	260	213	243	200	245	240	112
USBR Banks	0	0	0	18	18	18	0	0	0	0	0	0
Contra Costa	12.7	12.7	9.8	11.1	12.7	14.0	14.0	16.0	18.0	14.0	14.0	12.7
Total USBR	70	151	262	298	291	292	227	259	218	259	254	125
State Export	62	38	160	406	403	395	250	271	132	132	103	94
Total Export	132	189	422	704	694	687	477	530	350	391	357	219
COA Balance	0	0	0	0	0	1	0	0	0	0	0	0
Vernalis (TAF)	291	279	204	80	71	74	117	99	103	118	237	249
Vernalis (cfs)	4899	4543	3421	1307	1161	1242	1904	1662	1680	1927	4263	4055
Old/Middle River calc.	-98	-912	-4,510	-8,821	-8,757	-8,923	-5,708	-6,702	-4,218	-4,620	-3,622	-1,504
Computed DOI	38174	19993	9581	8004	6539	7497	7499	4976	12640	17178	29465	31331
Excess Outflow	23197	8849	0	0	0	0	0	471	8134	11176	18064	19927

Facility	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar
% Export/Inflow	5%	11%	35%	47%	51%	51%	44%	58%	29%	27%	18%	10%
% Export/inflow std.	35%	35%	35%	65%	65%	65%	65%	65%	65%	65%	45%	35%

Hydrology

Statistic	Trinity	Shasta	Folsom	New Melones
Water Year Inflow (TAF)	1505	5,876	2,535	1147
Year to Date + Forecasted % of mean	125%	106%	93%	109%

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)

Facility	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar
Trinity	1958	1987	2031	2014	1908	1786	1656	1634	1630	1651	1662	1699	1765
Trinity Elev.	N/A	2340	2343	2342	2335	2326	2316	2314	2314	2315	2316	2319	2324
Whiskeytown	219	238	238	238	238	238	238	206	206	206	206	206	206
Whiskeytown Elev.	N/A	1209	1209	1209	1209	1209	1209	1199	1199	1199	1199	1199	1199
Shasta	4194	4425	4195	3779	3225	2800	2547	2452	2462	2534	2605	2760	3030
Shasta Elev.	N/A	1063	1055	1040	1017	999	987	982	982	986	989	997	1009
Folsom	708	830	944	901	653	467	427	375	329	300	286	313	409
Folsom Elev.	N/A	452	463	459	434	412	407	399	392	387	385	389	404
New Melones	2008	1948	1933	1949	1887	1828	1781	1717	1724	1731	1736	1738	1758
New Melones Elev.	N/A	1047	1046	1048	1042	1036	1032	1026	1026	1027	1027	1028	1030
San Luis	783	667	525	358	248	204	200	215	285	461	633	594	551
Total	9870	10095	9867	9239	8160	7323	6849	6599	6634	6883	7128	7309	7718

State End of the Month Reservoir Storage (TAF)

Facility	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar
Oroville	3109	3416	3492	3373	2807	2290	1856	1699	1583	1539	1576	1664	1835
Oroville Elev.	N/A	892	897	890	850	809	769	753	740	735	739	749	767
State San Luis	522	444	311	170	365	540	799	782	830	864	893	901	971
Total San Luis (TAF)	1305	1111	836	528	614	743	1000	996	1114	1325	1526	1495	1523
Total San Luis Elev.	N/A	464	436	401	411	426	453	452	464	484	502	499	501

Monthly River Releases (TAF/cfs)

Facility	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar
Trinity (TAF)	161	215	107	45	53	52	23	18	18	18	17	18
Trinity (cfs)	2,700	3,500	1,800	735	857	870	373	300	300	300	300	300
Clear Creek (TAF)	12	18	14	9	9	9	12	12	12	12	11	22
Clear Creek (cfs)	200	291	242	150	150	150	200	200	200	200	200	363
Sacramento (TAF)	428	615	669	815	645	476	338	238	246	246	222	246
Sacramento (cfs)	7200	10000	11250	13250	10500	8000	5500	4000	4000	4000	4000	4000
American (TAF)	238	184	191	338	272	119	92	89	92	77	76	77
American (cfs)	4000	3000	3218	5500	4432	2001	1502	1500	1500	1250	1370	1250

Facility	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar
Stanislaus (TAF)	91	76	22	15	15	15	48	12	12	14	13	12
Stanislaus (cfs)	1537	1242	363	250	250	250	774	200	200	226	229	200
Feather (TAF)	143	172	140	495	464	488	184	104	108	77	111	108
Feather (cfs)	2400	2800	2350	8050	7550	8200	3000	1750	1750	1250	2000	1750

Trinity Diversions (TAF)

Diversion Facility	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar
Carr PP	N/A	0	4	12	80	81	80	8	6	1	1	1	1
Spring Creek PP	N/A	0	0	0	70	70	70	30	0	0	0	0	0

Delta Summary (TAF)

Facility	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar
Tracy	57	138	194	262	250	202	152	154	230	220	44	55
USBR Banks	0	0	0	15	15	15	0	0	0	0	0	0
Contra Costa	12.0	12.0	10.0	11.0	12.0	13.0	14.0	14.0	14.0	13.0	14.0	12.0
Total USBR	69	150	204	288	277	230	166	168	244	233	58	67
State Export	62	37	49	414	411	395	151	221	160	160	111	183
Total Export	132	187	253	702	688	625	317	389	404	393	169	250
COA Balance	0	0	0	0	0	0	0	0	0	0	1	-1
Vernalis (TAF)	279	226	82	54	52	57	107	74	75	77	83	98
Vernalis (cfs)	4698	3683	1372	884	852	956	1734	1242	1225	1251	1489	1599
Old/Middle River calc.	-179	-1,278	-3,247	-8,985	-8,824	-8,249	-3,780	-5,066	-5,099	-4,950	-2,263	-3,002
Computed DOI	30745	14592	7884	8004	6539	7497	7499	4505	7564	7890	11400	11403
Excess Outflow	15767	4831	0	0	0	0	0	0	3058	1887	0	0

Facility	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar
% Export/Inflow	6%	14%	26%	47%	51%	50%	35%	53%	43%	46%	20%	26%
% Export/inflow std.	35%	35%	35%	65%	65%	65%	65%	65%	65%	65%	45%	35%

Hydrology

Statistic	Trinity	Shasta	Folsom	New Melones
Water Year Inflow (TAF)	1485	5,616	2,328	1023
Year to Date + Forecasted % of mean	123%	101%	86%	97%

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

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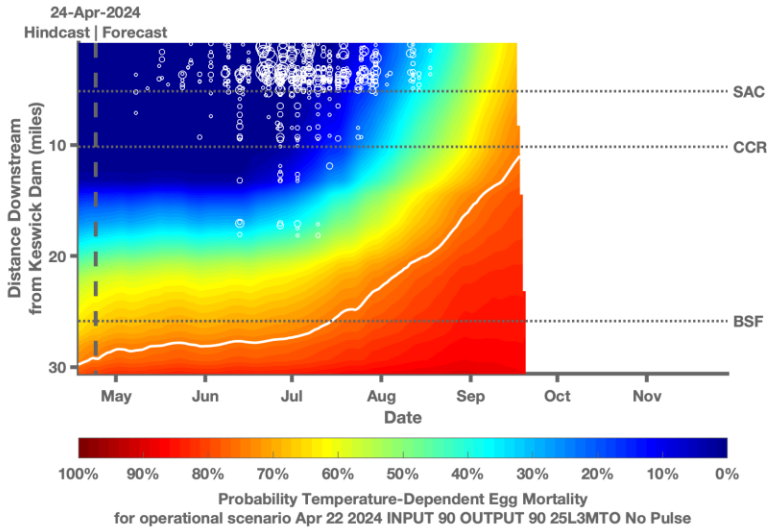
CVP releases or export values represent monthly averages.

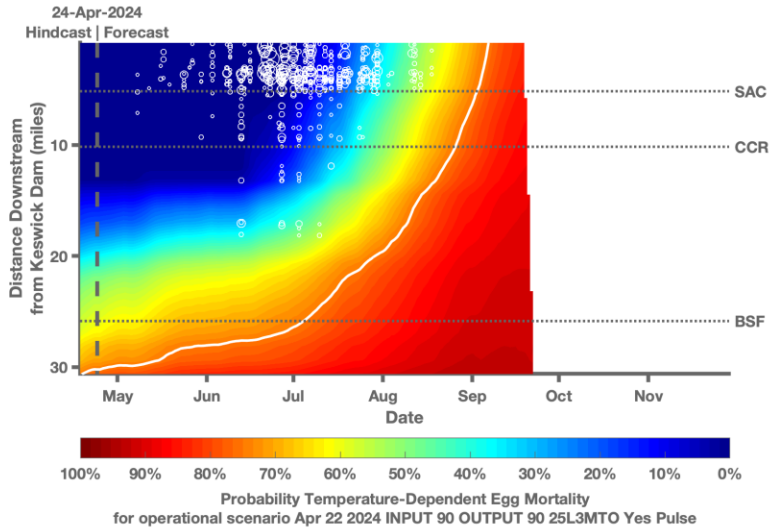
CVP Operations are updated monthly as new hydrology information is made available December through May.

Summary Document for Shasta/Keswick Operational Scenarios

Prepared by the Southwest Fisheries Science Center (SWFSC) on April 25th, 2024

Below are results for two USBR scenario ran April 24th, 2024. The scenario has hydrology (Input 90% exceedance) and air temperature (25% exceedance of L3MTO) as inputs. One scenario does not account for spring pulse-flow actions and the other scenario has a spring-pulse accounted for. Outputs from the scenarios 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 2024 temperature management season. Upstream temperature inputs into the RAFT model were from the USBR HEC-5Q model





Note: 2016-2022 redd disribution shown as white circles, scaled to the number of redds observed during the survey and 75% mortality contour shown. Reservoir model initiilzed on April 1, 2022

Estimated temperature-dependent egg mortality

The two figures show estimated temperature dependent egg mortality produced by the NMFS stage-independent temperature mortality model under the April 2024 scenarios. 2016-2022 redd distributions are used for all plots. Note: 2016-2022 redd distribution shown as white circles, scaled to the number of redds observed during the survey and 75% mortality contour shown.

Estimated temperature-dependent egg mortality under different scenarios assuming a 2016-2022 spatial and temporal redd distribution using output from the RAFT water temperature model.

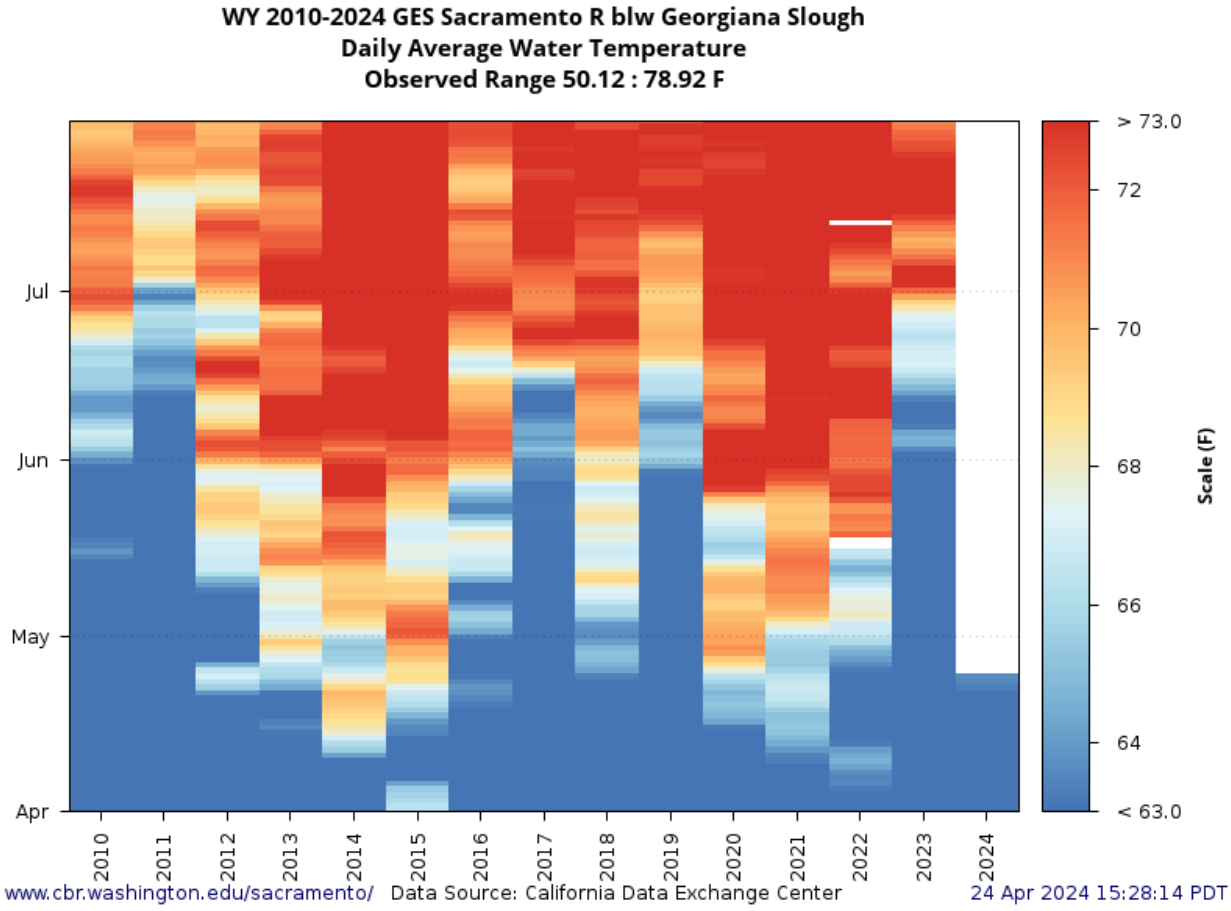
Scenario	Upstream input to RAFT Model	Mean (%)	Median (%)
Apr_24_2024_1090Prct_Scen_APR_22_2024_INPUT_90_OUTPUT_90_25L3MTO_No_Pulse	USBR HEC-5Q	8	5
Apr_24_2024_1090Prct_Scen_APR_22_2024_INPUT_90_OUTPUT_90_25L3MTO_Yes_Pulse USBR	USBR HEC-5Q	13	10

Reference: Martin, B. T., Pike, A., John, S. N., Hamda, N., Roberts, J., Lindley, S. T. and Danner, E. M. (2017), Phenomenological vs. biophysical models of thermal stress inaquatic eggs. Ecology Letters 20: 50–59. doi:10.1111/ele.12705

Delta Temperature Outlook

On April 11, 2024, USST and SRTTG representatives expressed support for a Spring Pulse scenario that consisted of three separate releases, beginning April 22nd and ending May 20th. There will be continued discussions and evaluations of the proposed scenarios as conditions change. One consideration is the effect of downstream water temperatures within the Delta on outmigrating salmonids, especially regarding the last pulse (May 20th). Historical temperature data can be used to assess possible temperature risks associated with a later outmigration this season (Figure 1).

SacPAS is a publicly accessible web-based service for accessing and evaluating monitoring data and environmental conditions. Here we used the River Conditions All Years Graph (available in the Data Queries & Alerts tab) to evaluate late spring and summer temperatures at Georgianna Slough. It appears water temperature at Georgianna Slough remains suitable for supporting later outmigration behaviors in wet years such as 2011, 2017, 2023 (Table 1). This temperature graphic can be generated for multiple Sacramento River and Delta locations by adjusting the query options.



SacPAS modeled heatmap of historical temperature at Georgianna Slough (2010 to 2024)

The figure is a heatmap showing the of historical temperature at Georgianna Slough between the months of April and July for the years of 2010 to 2024. It ranges in temperature from 63 to 73 degrees Fahrenheit.

Using SacPAS to create a custom query/heatmap:

- Navigate to the SacPAS website: https://www.cbr.washington.edu/sacramento
- Select the Data Queries & Alerts tab (top left)
- Scroll down to “River Conditions (CDEC)”
- Select “All Years Graph”
- Adjust location for your desired output “Sacramento River Basin” or “Delta”
- Adjust your temperature range or threshold
- Select the month range
- Scroll down and select the “Submit Query” button