



Sacramento River Temperature Task Group Meeting Packet

December 6, 2024

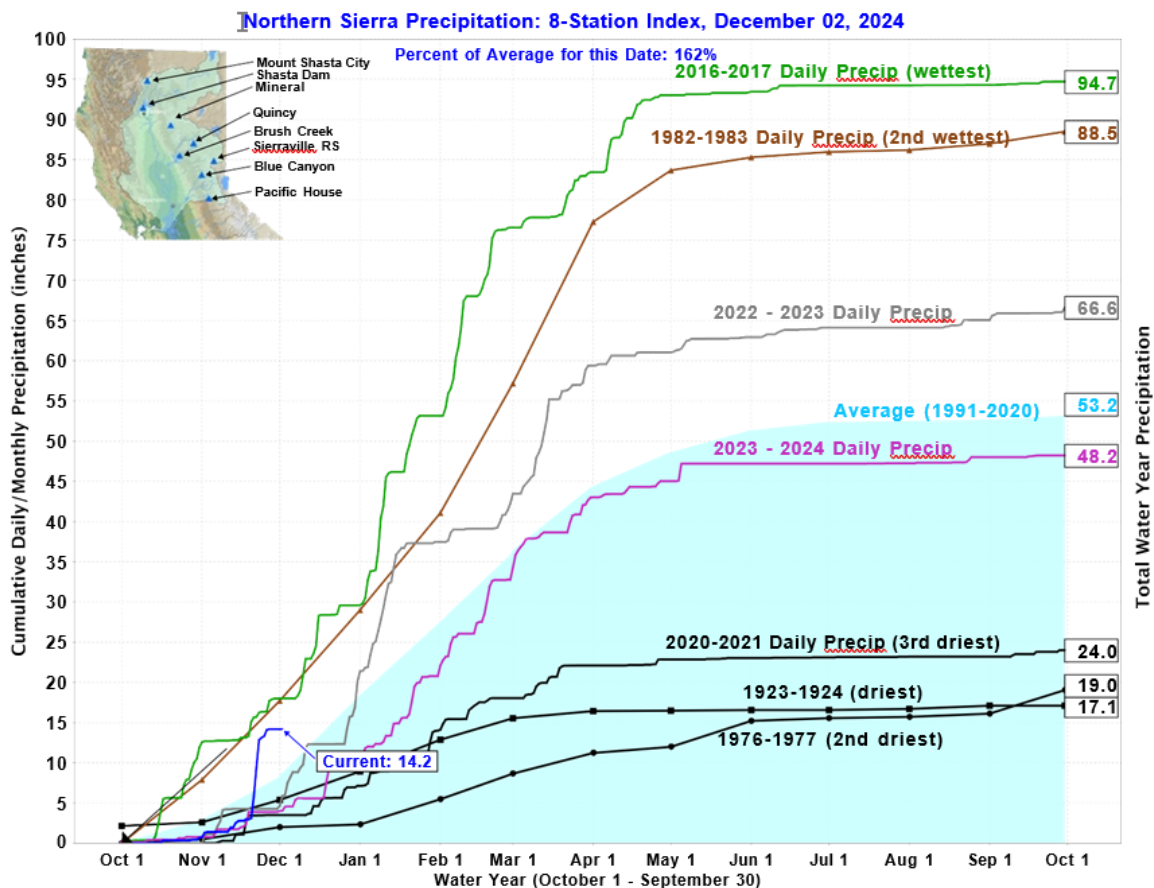


Figure 1: Northern Sierra Precipitation: 8-Station Index, December 2, 2024

This figure shows a line graph precipitation at the Northern Sierra 8-station Index. The graph includes the current cumulative daily and monthly precipitation, 14.2 (162% 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), 2022-2023 (66.6), 2023-2024 (48.2), 2020-2021 (24.0 3rd driest), 1976-1977 (19.0 2nd driest), and 1923-1924 (17.1 driest).

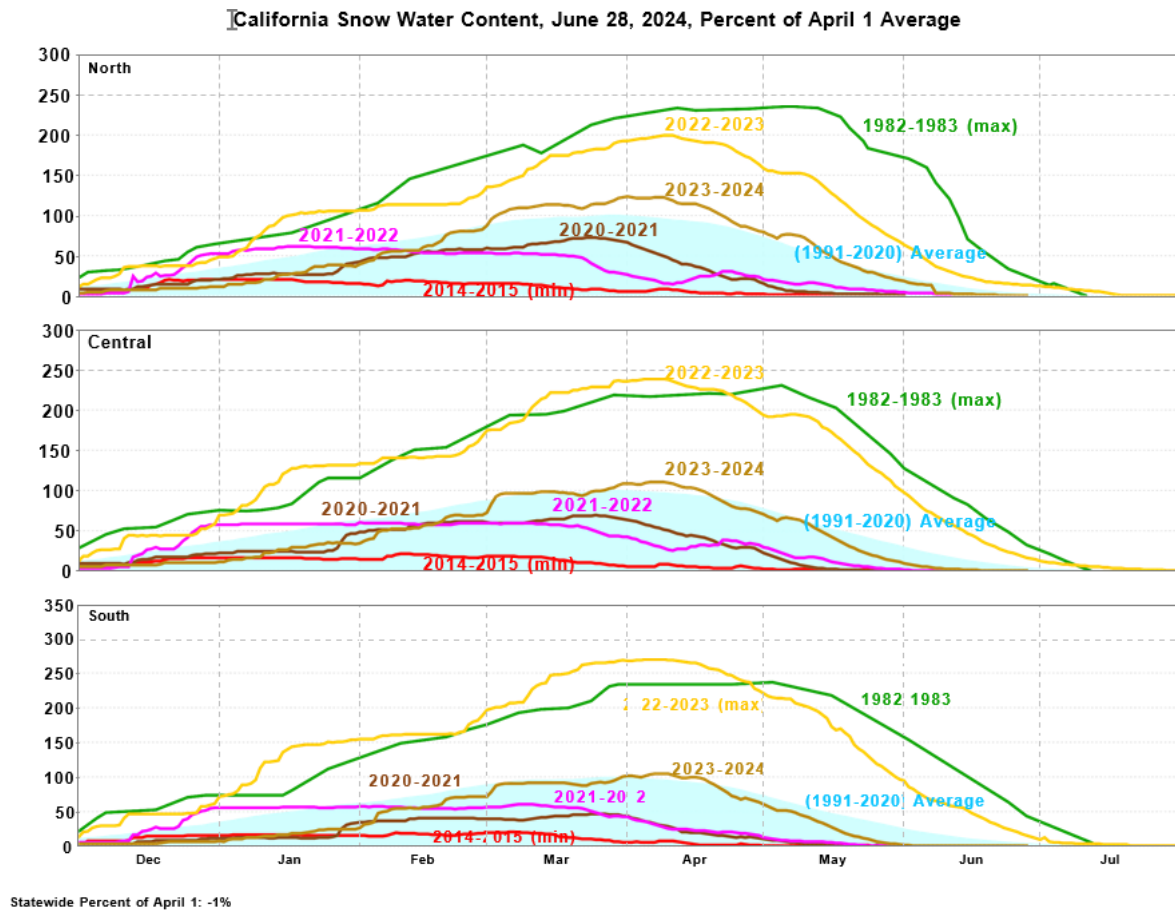


Figure: 2: California Snow Water Content, June 28, 2024, Percent of April 1 Average

This figure is three line graphs showing the percent snow water content for North, Central, and Southern California, respectively. The graph also shows 1991-2020 average, 1982-1983 (max), 2014-2015 (minimum), 2020-2021, 2021-2022, 2022-2023, and 2023-2024.

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

December 1, 2024

Table 1: Reservoir Releases in Cubic Feet/Second

Reservoir	Dam	WY 2024	WY 2025	15 Yr Median
Trinity	Lewiston	300	311	310
Sacramento	Keswick	5,144	4,223	4,223
Feather	Oroville(SWP)	1,750	1,750	1,750
American	Nimbus	2,018	2,076	1,870
Stanislaus	Goodwin	203	202	204
San Joaquin	Friant	201	430	375

Table 2: Storage in Major Reservoirs in Thousands of Acre-Feet

Reservoir	Capacity	15 Yr Avg	WY 2024	WY 2025	% of 15 Yr Avg
Trinity	2,448	1,279	1,210	1,661	130
Shasta	4,552	2,333	3,072	2,772	119
Folsom	977	382	481	330	86
New Melones	2,420	1,309	1,940	1,820	139
Fed. San Luis	966	404	710	421	104
Total North CVP	11,363	5,707	7,413	7,004	123
Millerton	521	253	184	208	82
Oroville (SWP)	3,425	1,524	2,328	1,906	125

Table 3: Accumulated Inflow for Water Year to Date in Thousands of Acre-Feet

Reservoir	Current WY 2025	WY 1977	WY 1983	15 Yr Avg	% of 15 Yr Avg
Trinity	78	19	103	56	139
Shasta	610	472	666	471	130
Folsom	107	84	508	146	73
New Melones	71	N/A	228	76	93
Millerton	83	53	275	110	76

Table 4: Accumulated Precipitation for Water Year to Date in Inches

Reservoir	Current WY 2025	WY 1977	WY 1983	Average (N Years)	% of Average	Last 24 Hours
Trinity at Fish Hatchery	11.64	1.22	11.16	6.35 (64)	183	0.00
Sacramento at Shasta Dam	19.08	1.63	15.64	11.16 (69)	171	0.00
American at Blue Canyon	14.35	3.19	25.39	11.80 (50)	122	0.00
Stanislaus at New Melones	2.83	---	11.20	4.57 (47)	62	0.00
San Joaquin at Huntington Lk	4.06	1.80	19.80	6.29 (51)	65	0.06

Table 5: Sacramento River Station Temperature Summary Report

Date	MDW T TCD ¹	MDW T SHD	MDW T SPP ¹	MDW T KWK	MDW T SAC ²	MDW T CCR	MDW T BSF	MDW T BND	MDW T RBD	MDW T IGO	MDW T LWS	MDW T DGC ³	MDW T NFH	MDR Shasta Genera- -tion	MDR Sprin g Creek PP	MDR Keswic k Total	MDA T RDD	MDA T BSF	MDA T RDB
Oct	51.5	50.8	55.2	52.2	52.5	53.0	54.0	54.6	55.5	55.0	48.1	51.0	54.1	5400	1078	6882	69.4	63.0	66.2
11/01	52.0	52.0	53.7	52.3	52.2	52.4	52.5	52.5	52.9	51.9	46.7	47.9	49.2	4961	1102	6611	49.5	48.8	50.4
11/02	52.0	52.0 ^A	53.7	52.4	52.4	52.7	53.0	52.9	53.1	52.4	46.8	48.0	49.8	5553	1032	6601	54.5	52.7	54.6
11/03	52.3	52.3 ^A	53.5	52.5	52.5	52.8	52.9	52.9	53.5	52.0	46.5	48.2	50.0	6238	1084	6634	55.5	53.8	56.3
11/04	52.3	52.3	53.5	52.4	52.5	52.9	53.0	52.9	53.3	52.2	46.3	47.4	49.3	4928	1113	6641	62.5	56.7	59.3
11/05	52.5	52.5	53.2	52.4	52.4	52.8	52.9	52.9	53.3	52.1	46.4	47.3	48.9	5067	415	6408	58.0	57.0	58.2
11/06	53.3	53.3	53.3	52.3	52.3	52.5	52.3	52.1	52.5	51.3	46.3	46.2	48.0	4537	1116	6408	61.5	57.0	58.0
11/07	52.1	52.1 ^B	53.2	52.6	52.6	52.8	52.5	52.0	52.2	51.2	46.4	45.3	47.0	4873	1054	6212	58.5	49.9	53.9
11/08	52.6	52.6	53.2	52.9	52.8	53.1	52.8	52.3	52.5	50.8	46.6	45.3	46.4	5300	1049	6103	53.0	47.5	50.8
11/09	52.6	52.6	53.2	52.4	52.5	52.7	52.6	52.3	52.6	50.9	46.5	45.6	46.1	6005	467	5910	52.0	47.5	51.4
11/10	52.9	52.9	53.1	52.6	52.6	52.9	52.8	N/A ^C	52.8	51.3	46.5	46.6	48.1	4477	1106	5708	54.5	50.5	54.8
11/11	52.8	52.8	53.3	52.7	52.6	52.9	52.5	N/A ^C	53.2	51.5	46.5	47.4	48.5	4059	1139	5508	53.0	53.1	55.1
11/12	53.6	53.3	53.2	52.8	52.8	53.2	53.2	N/A ^C	53.0	51.2	46.5	46.9	48.9	4528	722	5361	53.5	50.2	50.9
11/13	53.5	52.8	53.6	52.7	52.6	52.6	52.7	N/A ^C	53.1	51.3	46.5	47.4	48.4	4740	45	5115	52.0	51.5	51.6
11/14	53.6	52.9	53.3	52.8	52.8	53.0	53.0	N/A ^C	52.8	51.8	46.5	46.9	48.2	4796	44	4909	50.5	50.8	51.7
11/15	53.7	53.0	53.4	52.6	52.5	52.4	52.3	N/A ^C	52.4	50.8	46.3	46.0	47.2	4771	44	4748	49.0	45.2	48.6
11/16	53.6	52.9	53.3	52.4	52.3	52.1	51.7	N/A ^C	51.4	50.3	46.1	44.9	45.7	4790	44	4588	49.0	46.5	47.4
11/17	53.7	53.0	53.1	52.5	52.4	52.4	52.2	N/A ^C	51.5	51.0	46.2	45.4	46.0	4382	44	4349	48.5	47.6	49.0
11/18	54.0	53.2	53.2	52.5	52.2	52.0	51.7	N/A ^C	51.4	50.3	45.9	44.4	45.4	3681	46	4394	44.5	42.5	47.0
11/19	53.8	53.1	53.3	52.4	52.0	51.3	50.9	N/A ^C	50.2	50.1	45.8	43.7	43.9	4076	52	4336	39.5	38.4	40.6
11/20	53.5	52.9	53.3	52.3	51.7	51.1	50.6	N/A ^C	49.6	49.5	45.6	41.2 ^A	42.6	4144	4663	4204	47.0	47.2	49.0
11/21	53.6	53.2	53.0	52.5	51.3	51.7	49.4	N/A ^C	49.8	50.2	45.4	42.1	41.8	3356	482	4211	49.5	49.5	51.2

Date	MDW T TCD ¹	MDW T SHD	MDW T SPP ¹	MDW T KWK	MDW T SAC ²	MDW T CCR	MDW T BSF	MDW T BND	MDW T RBD	MDW T IGO	MDW T LWS	MDW T DGC ³	MDW T NFH	MDR Shasta Genera -tion	MDR Sprin g Creek PP	MDR Keswic k Total	MDA T RDD	MDA T BSF	MDA T RDB
11/22	54.4	54.4	53.0	52.5	52.0	52.4	51.3	N/A ^C	50.7	51.7	45.4	44.1	44.0	2176	1031	4209	52.5	54.3	54.8
11/23	53.6	53.8	52.8	52.6	52.5	52.8	52.1	N/A ^C	52.2	51.3	45.2	44.9	45.5	3278	424	4203	53.0	52.2	53.3
11/24	53.3	52.8	52.4	52.7	52.5	52.5	51.3	N/A ^C	51.2	50.6	44.8	44.7	45.3	3735	137	4201	49.0	48.3	48.0
11/25	53.4	52.9	53.1	53.1	52.8	52.8	52.1	N/A ^C	51.3	50.7	44.6	45.1	45.7	3013	671	4202	50.0	49.5	51.1
11/26	53.0	52.6	52.4	52.9	52.8	53.1	52.3	N/A ^C	52.0	50.7	44.3	45.2	46.3	3112	905	4206	50.0	48.8	51.5
11/27	53.1	52.6	52.8	52.3	52.1	52.1	50.8	N/A ^C	51.2	49.1	44.1	43.8	44.9	3006	1222	4203	48.5	42.8	46.2
11/28	52.7	52.3	52.0	52.1	51.9	51.7	50.1	N/A ^C	49.4	48.7	43.9	42.5	43.3	3968	131	4201	47.0	40.7	45.0
11/29	52.5	52.0	51.9	51.8	51.6	51.4	49.9	N/A ^C	48.8	48.4	43.8	41.8	42.3	3726	137	4202	47.5	40.3	44.3
11/30	52.4	51.7	51.7	51.5	51.4	51.2	49.7	N/A ^C	48.5	48.3	43.7	41.6	42.0	4007	150	4202	47.5	40.1	43.1
Nov	53.3	52.8	53.1	52.5	52.3	52.4	51.9	52.5	51.7	50.8	45.7	45.3	46.3	4309	722	5093	51.4	48.7	50.9
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	129283	21671	152788	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	256428	42984	303049	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.

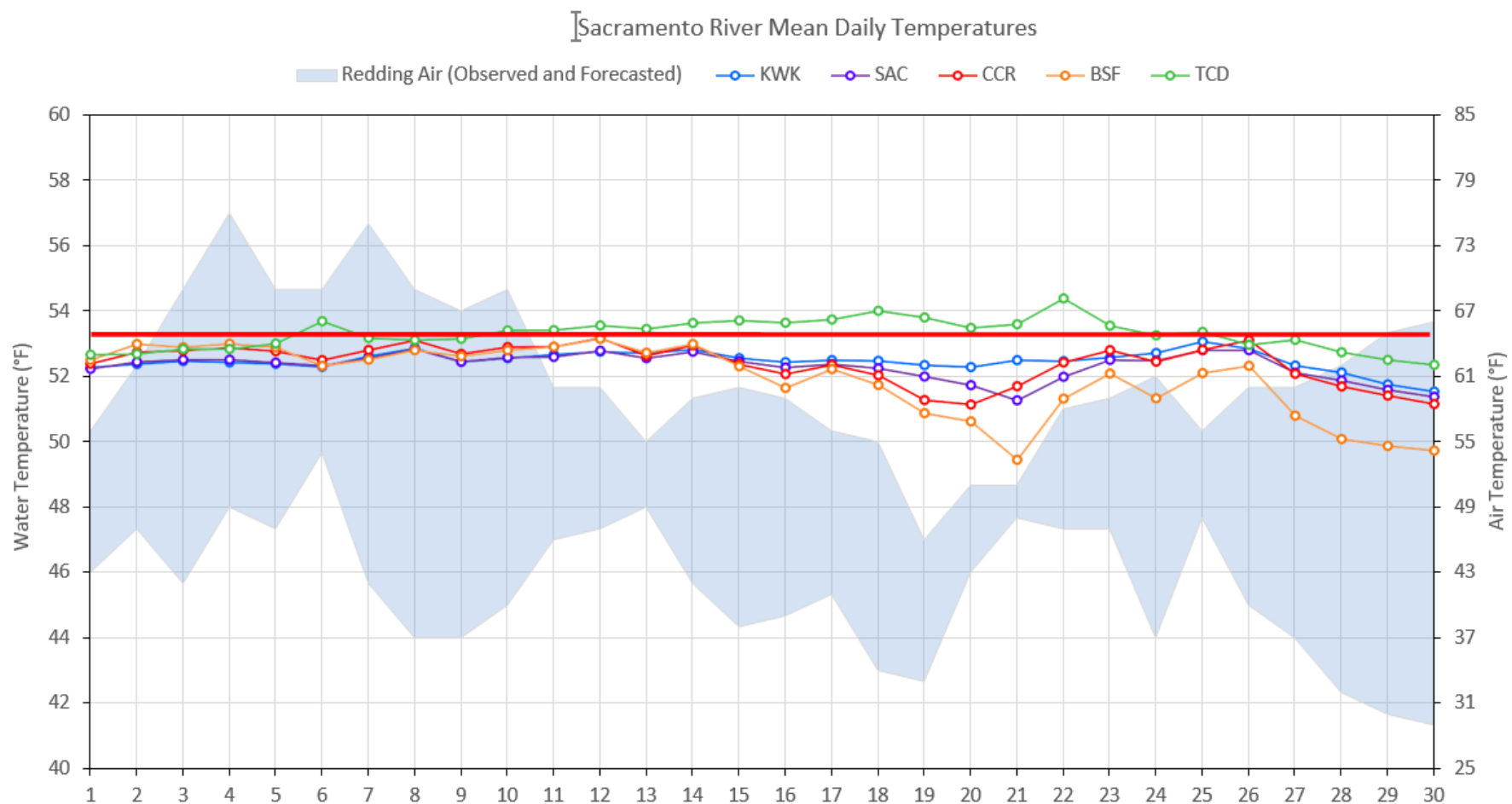


Figure 3: Sacramento River Mean Daily Temperatures

This figure shows mean Sacramento River daily temperatures in degrees Fahrenheit at Shasta Power Plant and various stations 0.8, 4.8, 9.7, 25, 34, 41, and 58 miles downstream of Keswick Dam for the past 30 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	05/24/2024	TBD

Notes: ¹ Distances are approximate

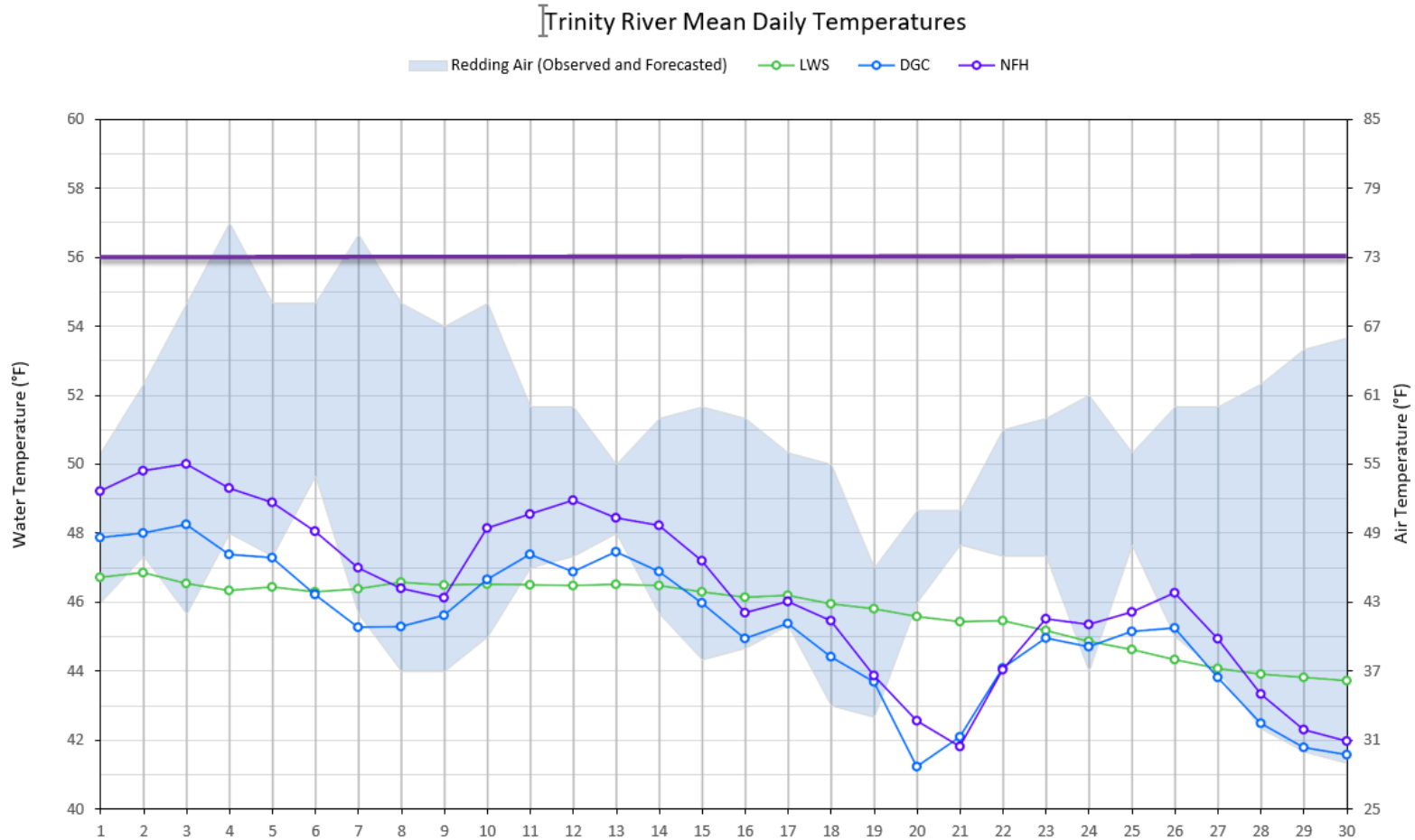


Figure 4: Trinity River Mean Daily Temperatures

This figure shows mean Trinity River daily temperatures in degrees Fahrenheit at Shasta Power Plant and various stations 0.8, 4.8, 9.7, 25, 34, 41, and 58 miles downstream of Keswick Dam for the past 30 days. It also includes a shaded area depicting observed and forecasted air temperatures in degrees Fahrenheit in Redding, California.

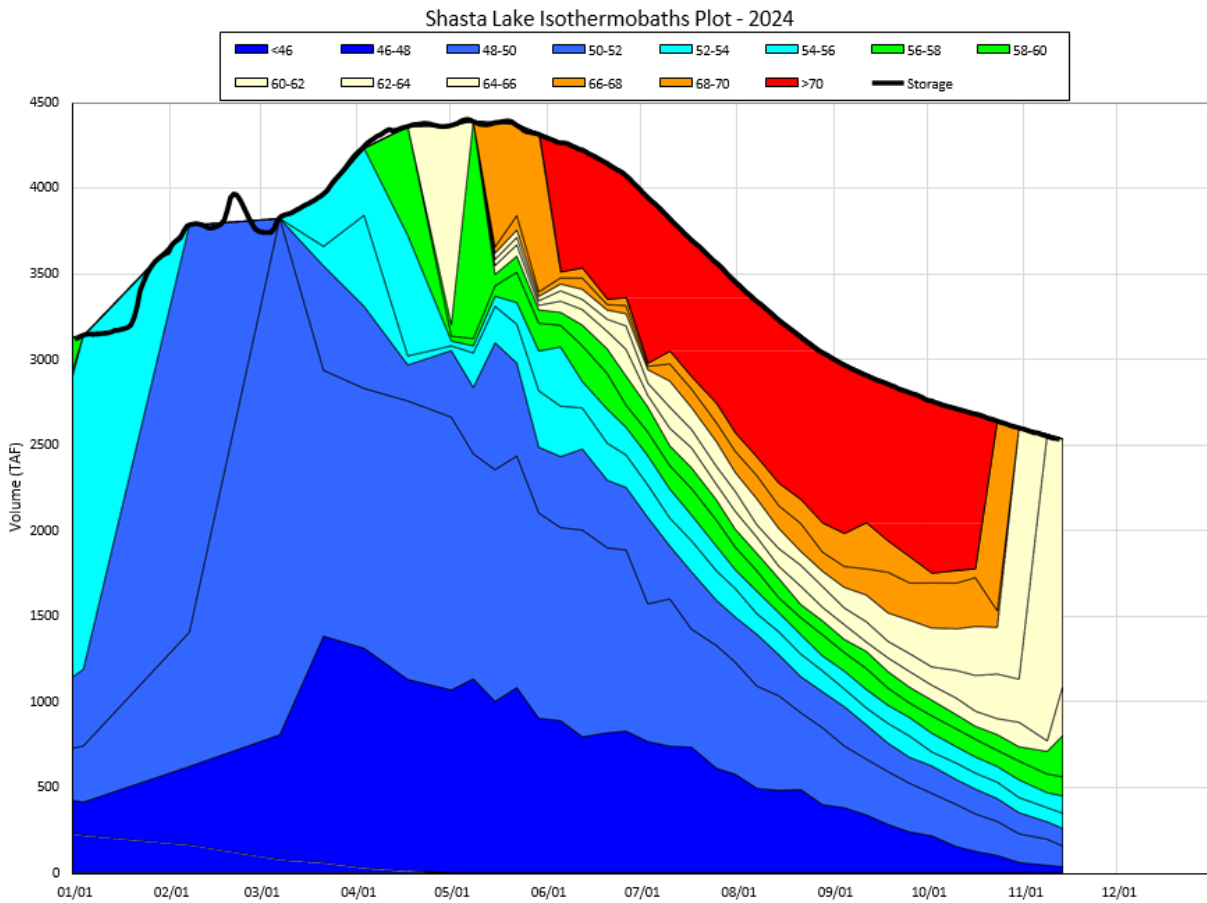


Figure 5: Shasta Lake Isothermobaths Plot - 2024

This is a chart showing Shasta Lake Isothermobaths with volume in Thousand Acre-Feet from 0-4500; with dates 1/01-12/01.

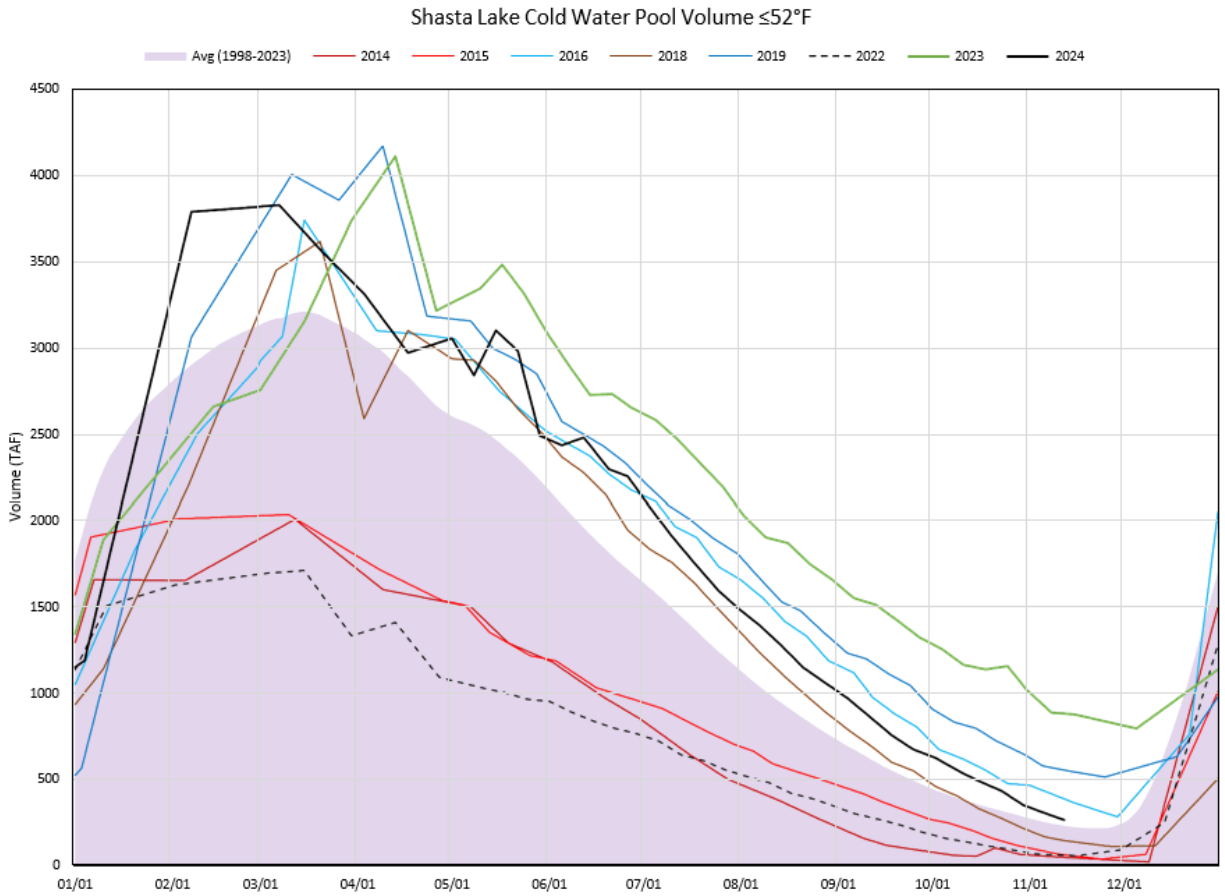


Figure 6: Shasta Lake Cold Water Pool Volume $\leq 52^{\circ}\text{F}$

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.

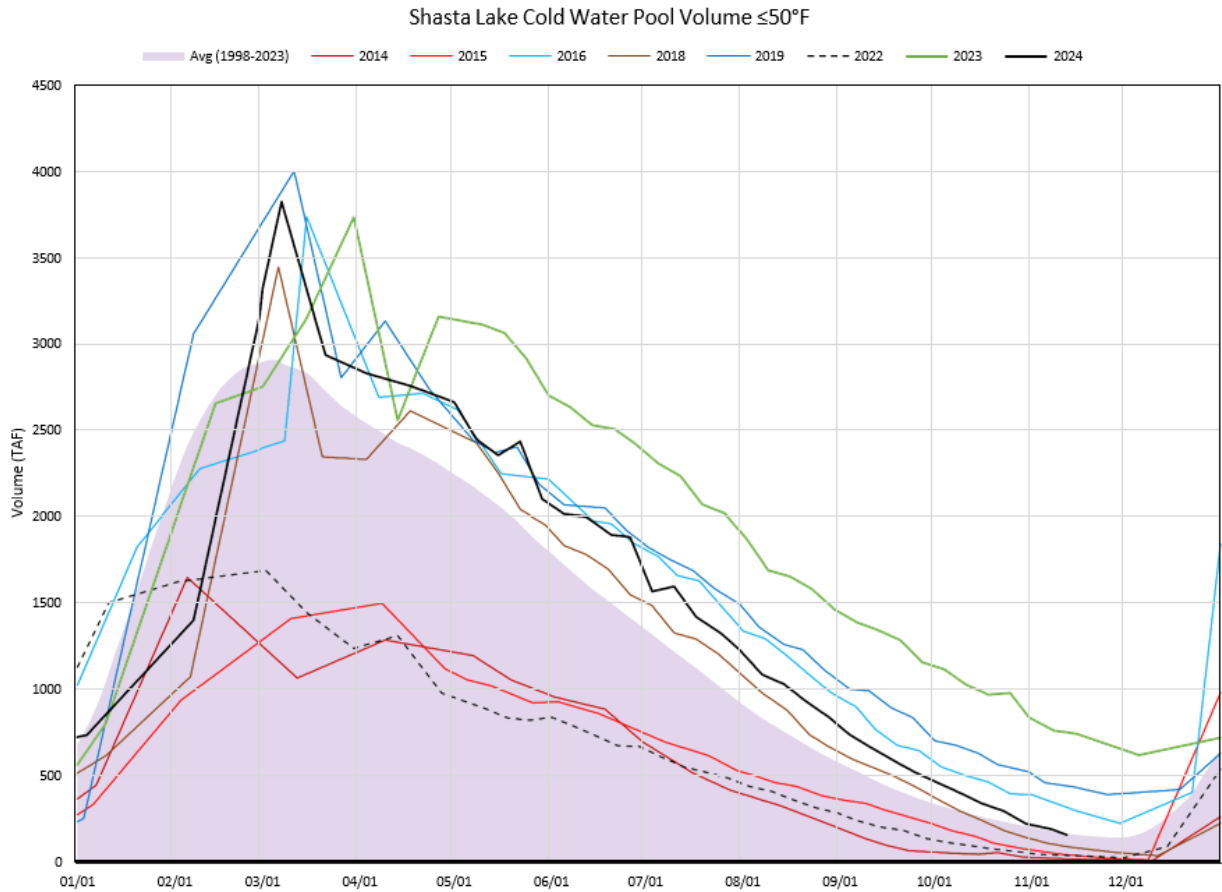


Figure 7: Shasta Lake Cold Water Pool Volume $\leq 50^{\circ}\text{F}$

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.

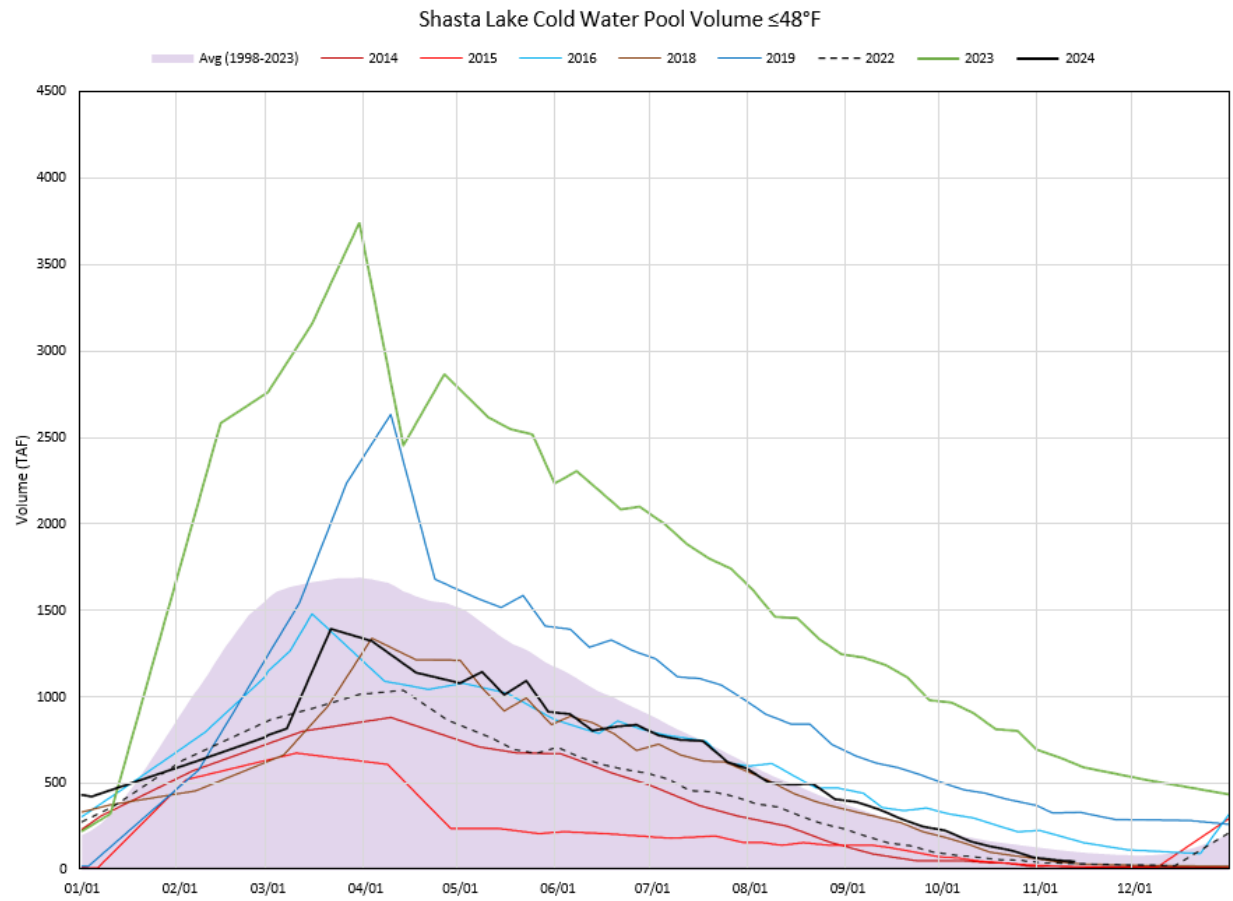


Figure 8: Shasta Lake Cold Water Pool Volume $\leq 48^{\circ}\text{F}$

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.

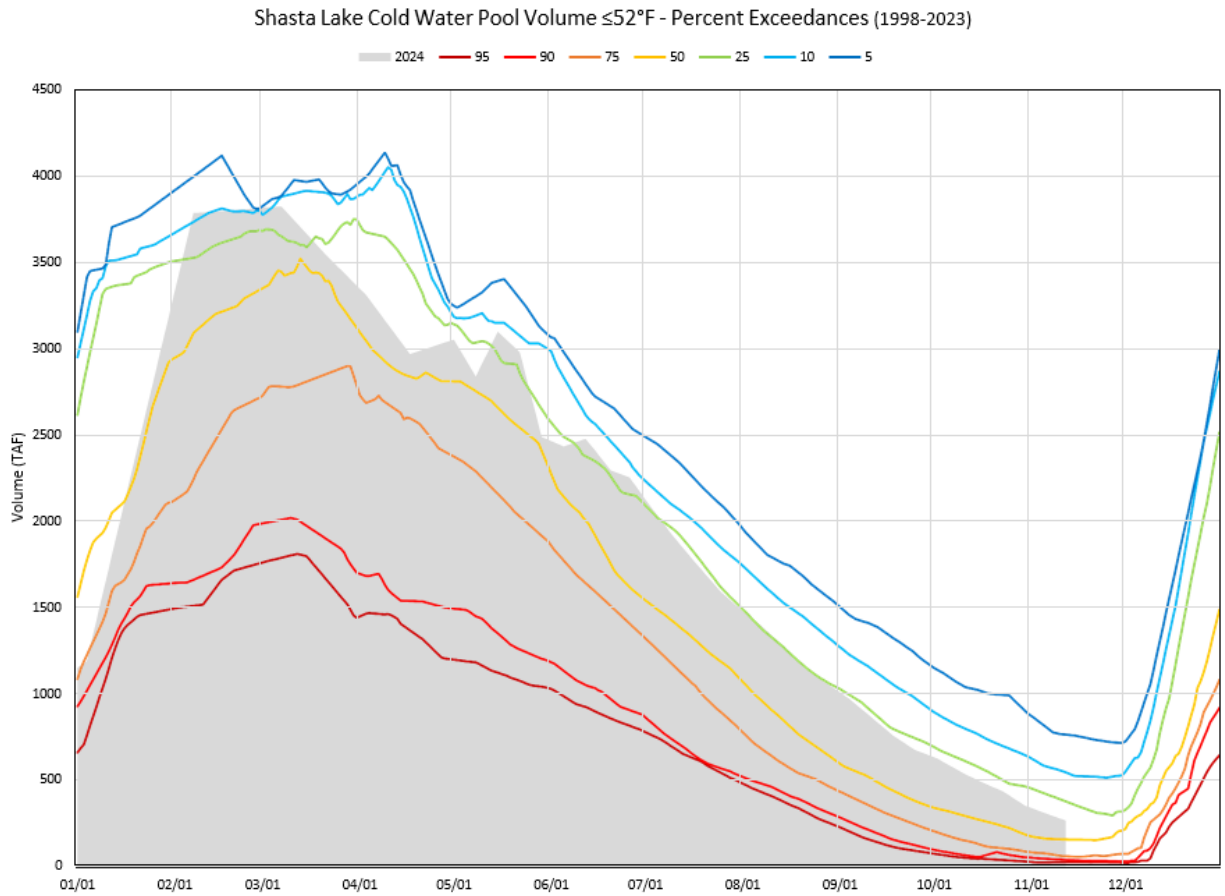


Figure 9: Shasta Lake Cold Water Pool Volume $\leq 52^{\circ}\text{F}$ - Percent Exceedances (1998-2022)

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.

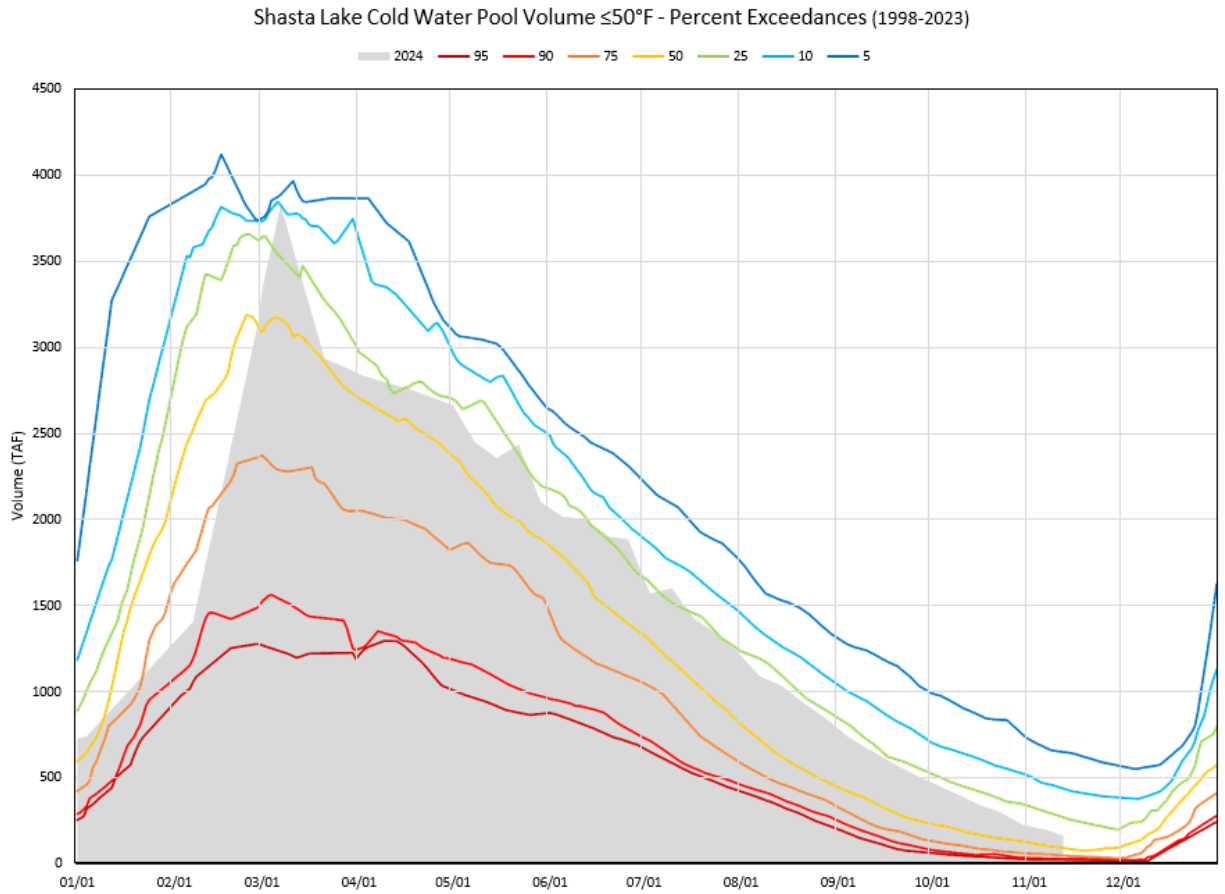


Figure 10: Shasta Lake Cold Water Pool Volume $\leq 50^{\circ}\text{F}$ - Percent Exceedances (1998-2023)

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.

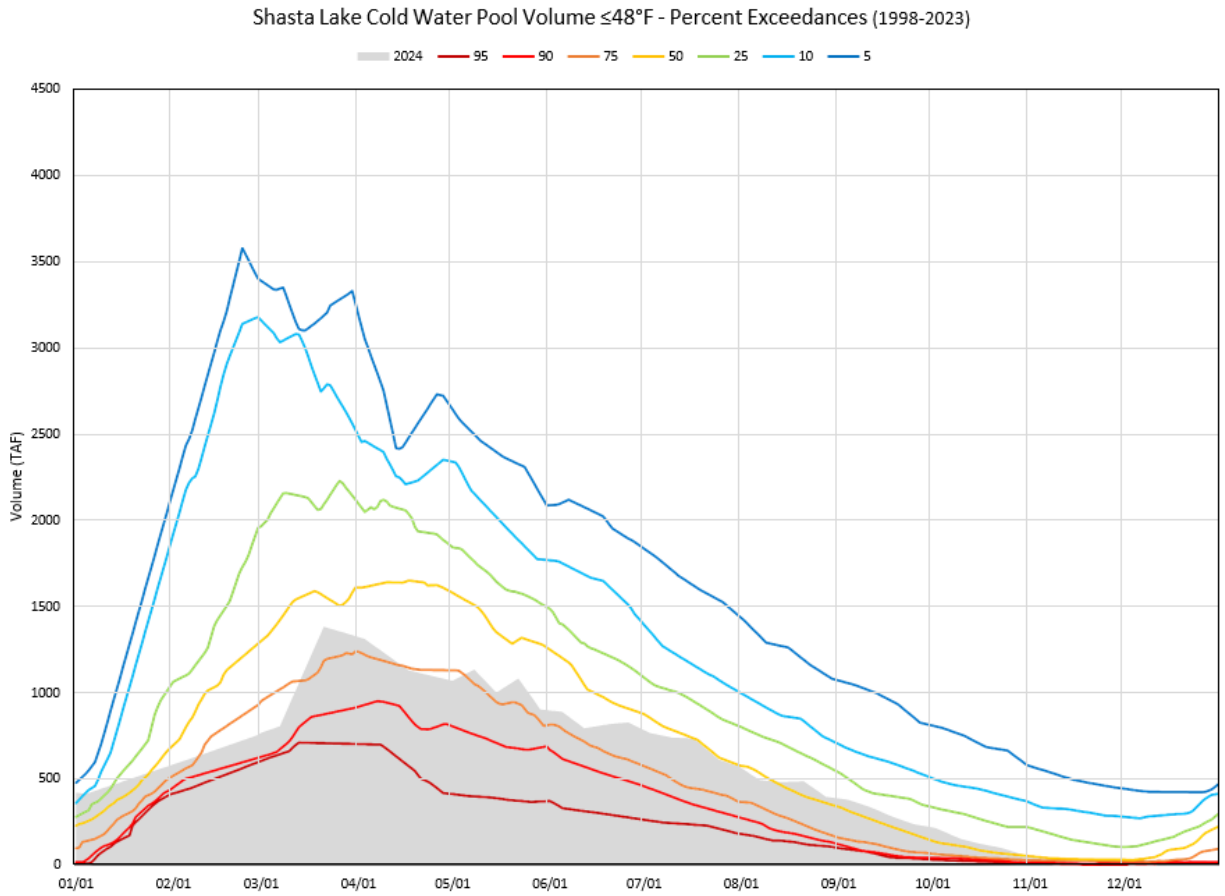


Figure 11: Shasta Lake Cold Water Pool Volume $\leq 48^{\circ}\text{F}$ - Percent Exceedances (1998-2023)

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.

Table 6: Shasta Lake Cold Water Pool Comparison by Year for November 13, 2024

Year	Change (TAF) ≤52°F	Change (TAF) ≤50°F	Change (TAF) ≤48°F	Change (TAF) Abs. Average	Percent Change ≤52°F	Percent Change≤50°F	Percent Change≤48°F	Percent Change Abs. Average
1998	-91	-119	-32	81	-34	-73	-89	65
1999	113	153	198	155	42	94	544	227
2000	-57	-65	-9	44	-22	-40	-26	29
2001	-165	-89	10	88	-62	-55	28	49
2002	-27	16	61	35	-10	10	168	62
2003	-4	-63	-16	28	-1	-39	-45	28
2004	-190	-115	-11	105	-72	-70	-30	57
2005	-180	-110	-11	100	-68	-68	-29	55
2006	24	64	91	60	9	40	251	100
2007	-220	-126	-8	118	-83	-77	-22	61
2008	-226	-133	-16	125	-85	-82	-45	71
2009	-202	-109	-3	105	-76	-67	-8	50
2010	153	85	78	105	58	52	215	108
2011	280	268	285	278	106	165	785	352
2012	38	89	114	81	14	55	315	128
2013	-155	-78	19	84	-59	-48	53	53
2014	-217	-139	-29	128	-82	-86	-80	82
2015	-202	-115	-31	116	-76	-71	-84	77
2016	122	159	124	135	46	98	341	162
2017	169	180	215	188	64	111	592	255
2018	-119	-68	-12	66	-45	-42	-33	40

Year	Change (TAF) ≤52°F	Change (TAF) ≤50°F	Change (TAF) ≤48°F	Change (TAF) Abs. Average	Percent Change ≤52°F	Percent Change≤50°F	Percent Change≤48°F	Percent Change Abs. Average
2019	289	283	283	285	109	174	780	354
2020	-162	-110	-25	99	-61	-68	-68	65
2021	-241	-144	-36	141	-91	-89	-100	93
2022	-205	-119	-12	112	-77	-73	-34	62
2023	616	593	567	592	232	364	1560	719
2024	0	0	0	0	0	0	0	0

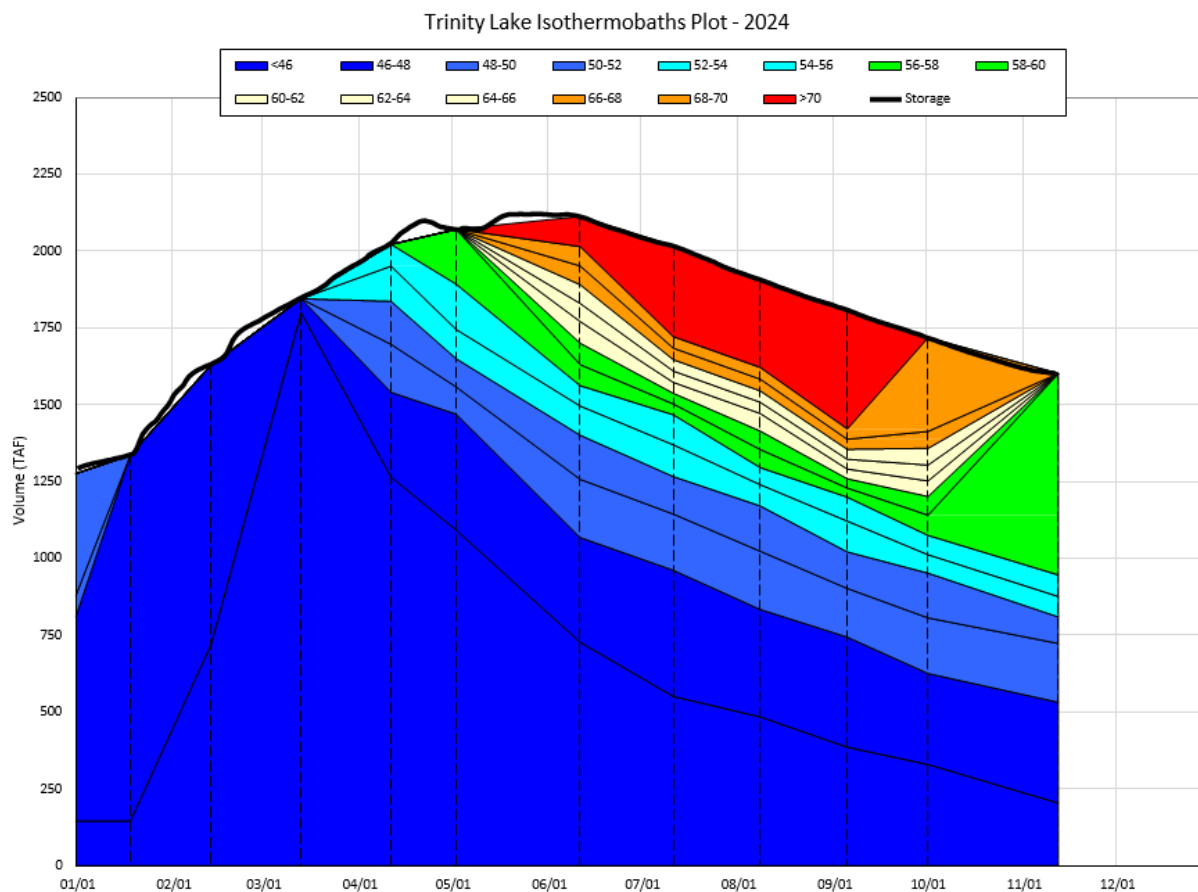


Figure 12: Trinity Lake Isothermobaths Plot - 2024

This figure is a chart showing Trinity Lake Isothermobaths with volume in Thousand Acre-Feet from 0-2500; with dates 1/01-12/01.

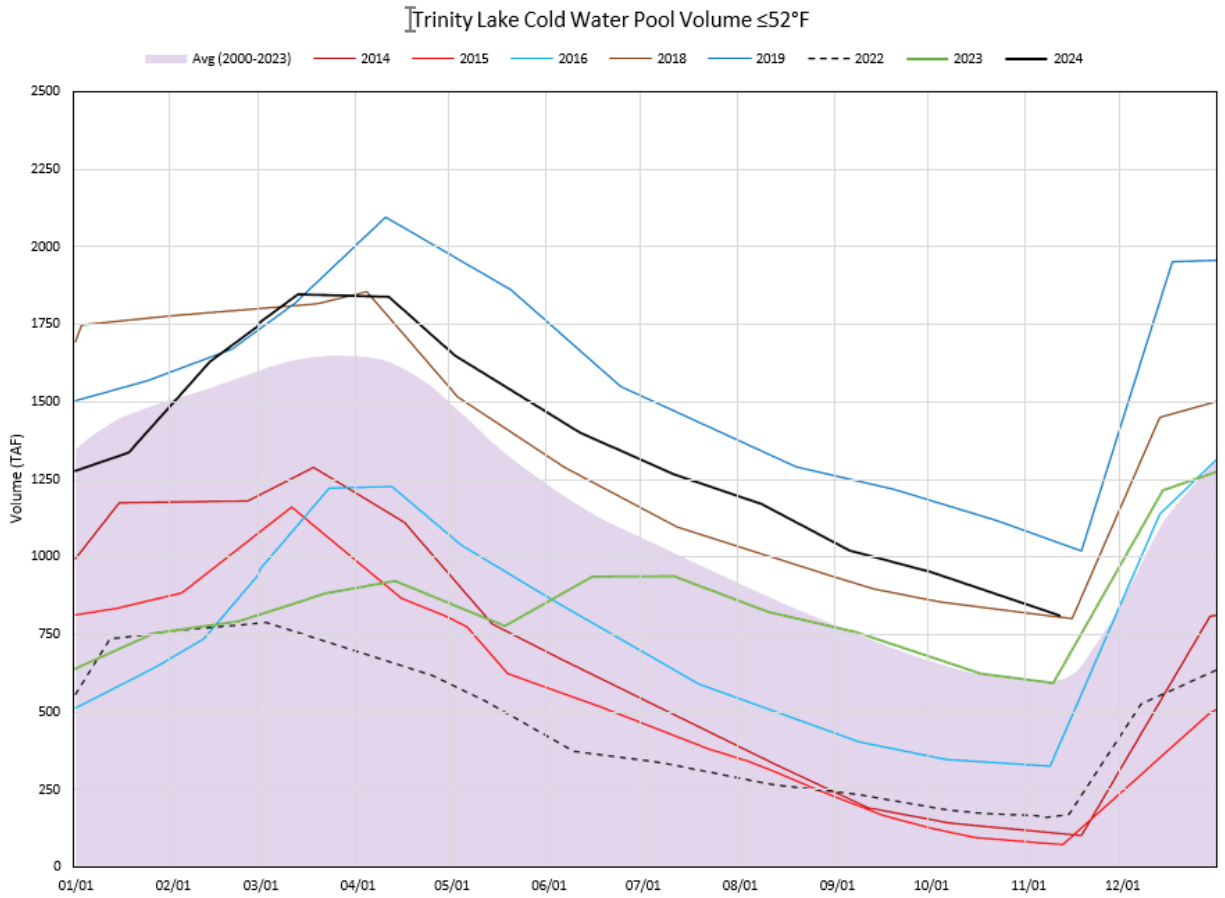


Figure 13: Trinity Lake Cold Water Pool Volume $\leq 52^{\circ}\text{F}$

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

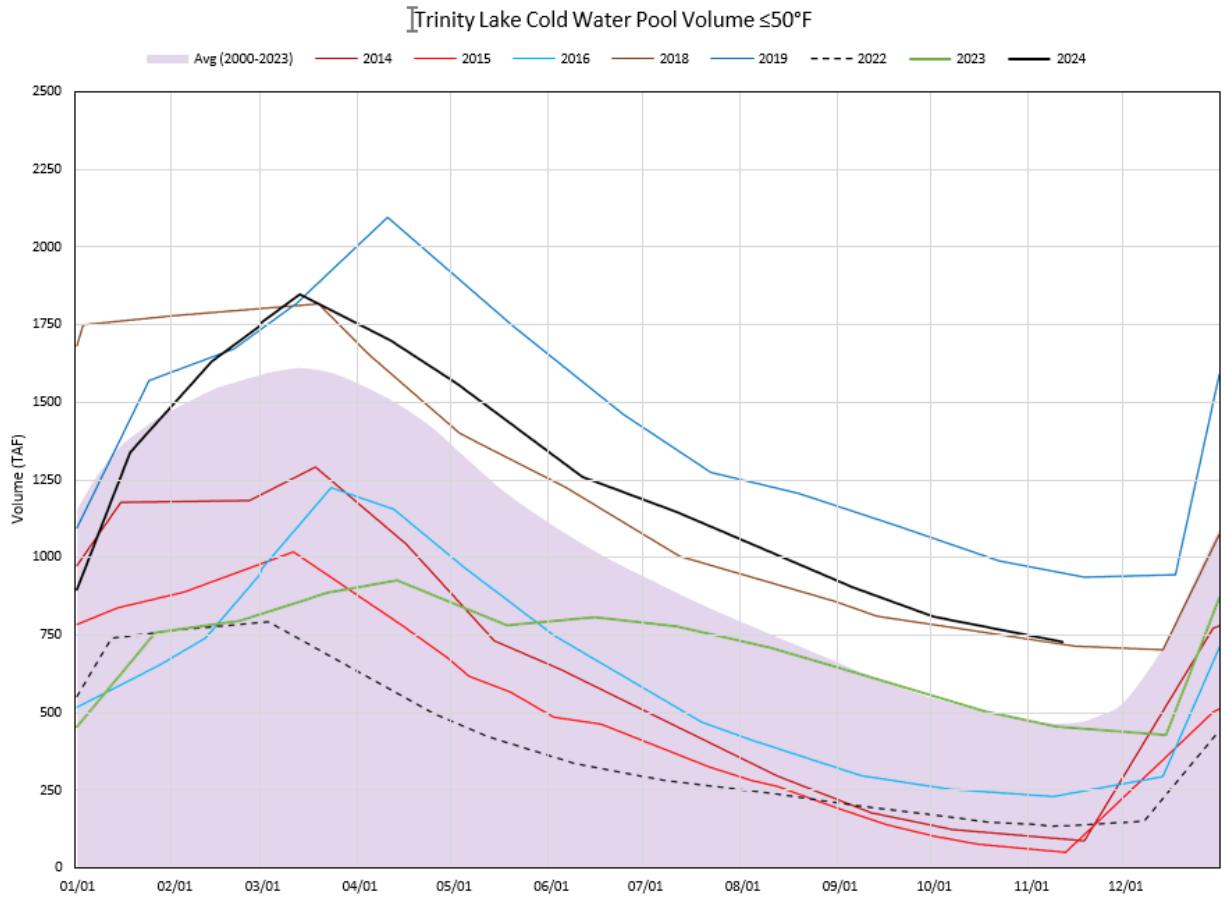


Figure 14 Trinity Lake Cold Water Pool Volume $\leq 50^{\circ}\text{F}$

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

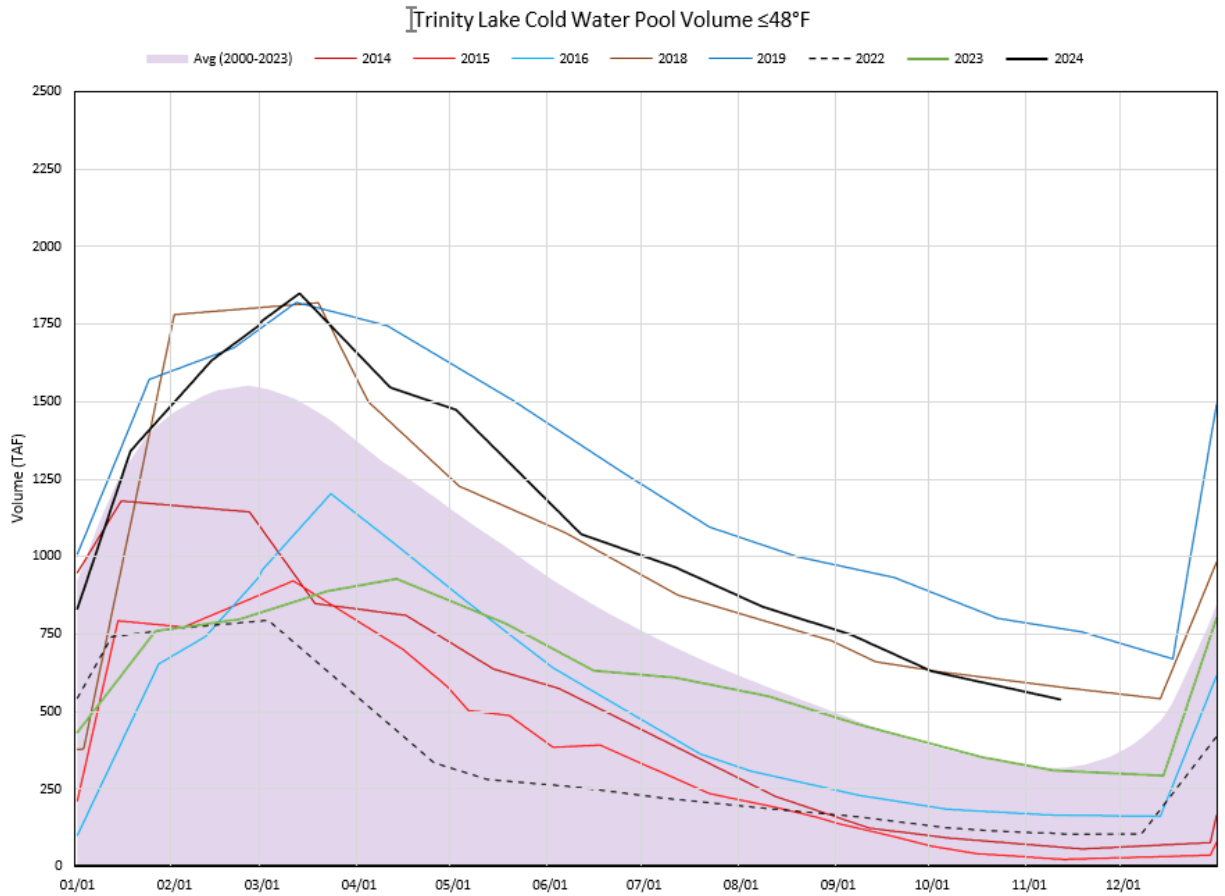


Figure 15: Trinity Lake Cold Water Pool Volume $\leq 48^{\circ}\text{F}$

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

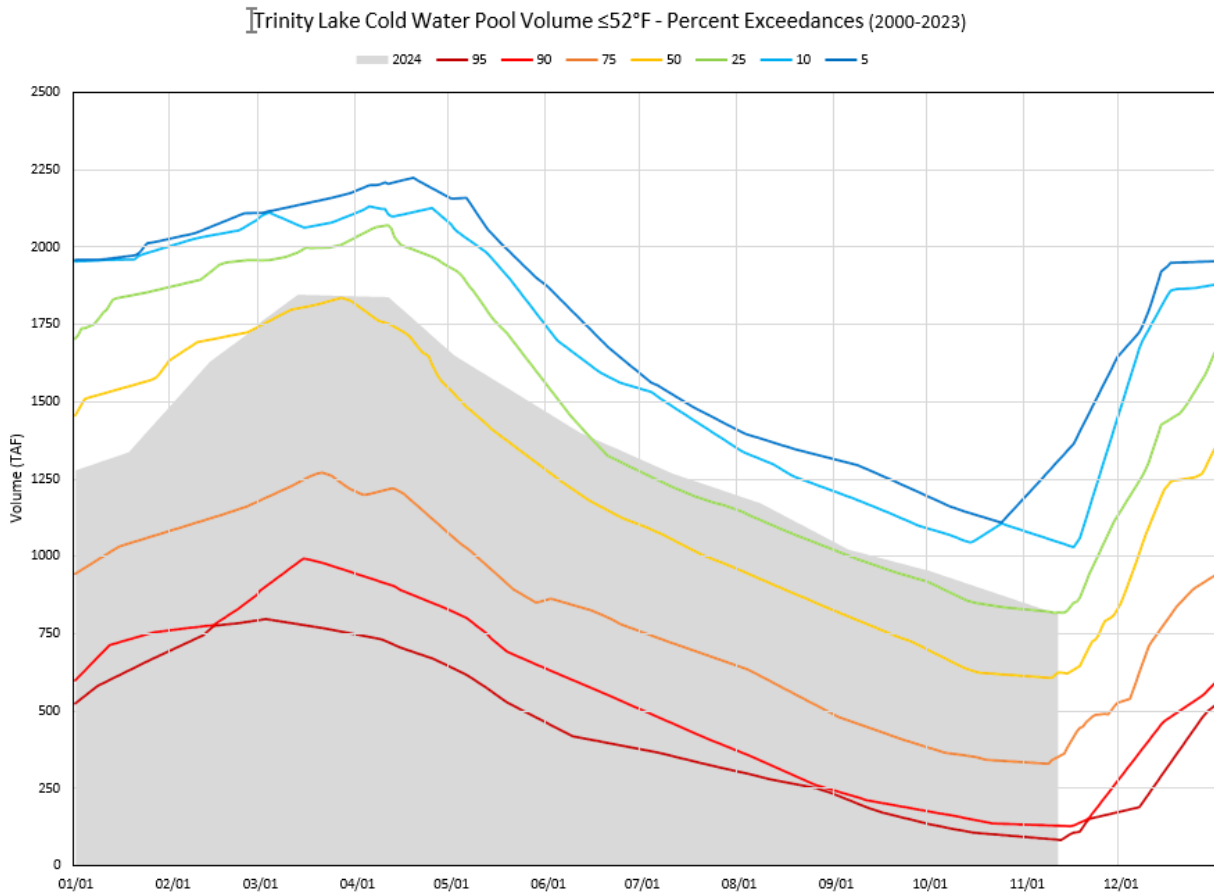


Figure 16: Trinity Lake Cold Water Pool Volume $\leq 52^{\circ}\text{F}$ - Percent Exceedances (1998-2023)

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.

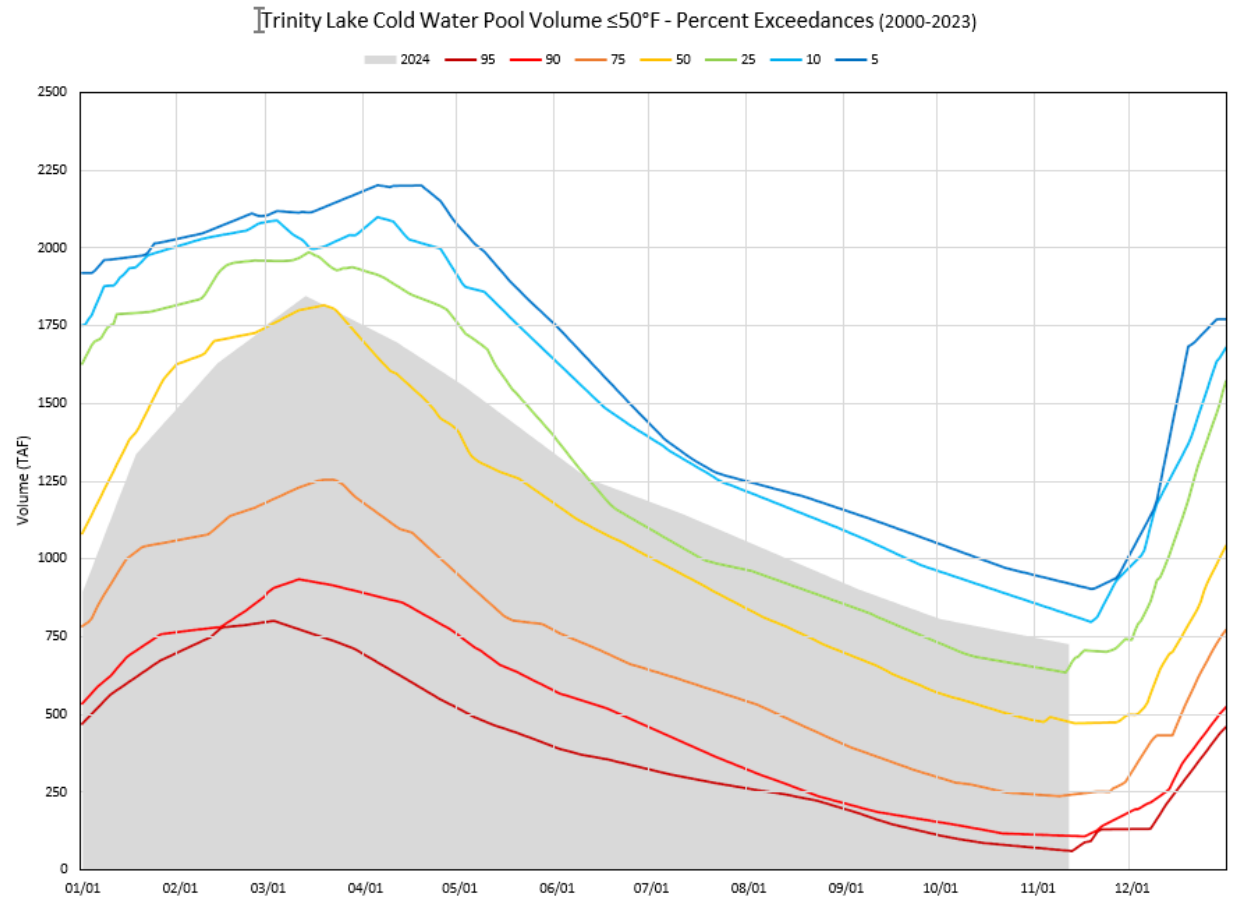


Figure 17: Trinity Lake Cold Water Pool Volume $\leq 50^{\circ}\text{F}$ - Percent Exceedances (1998-2023)

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.

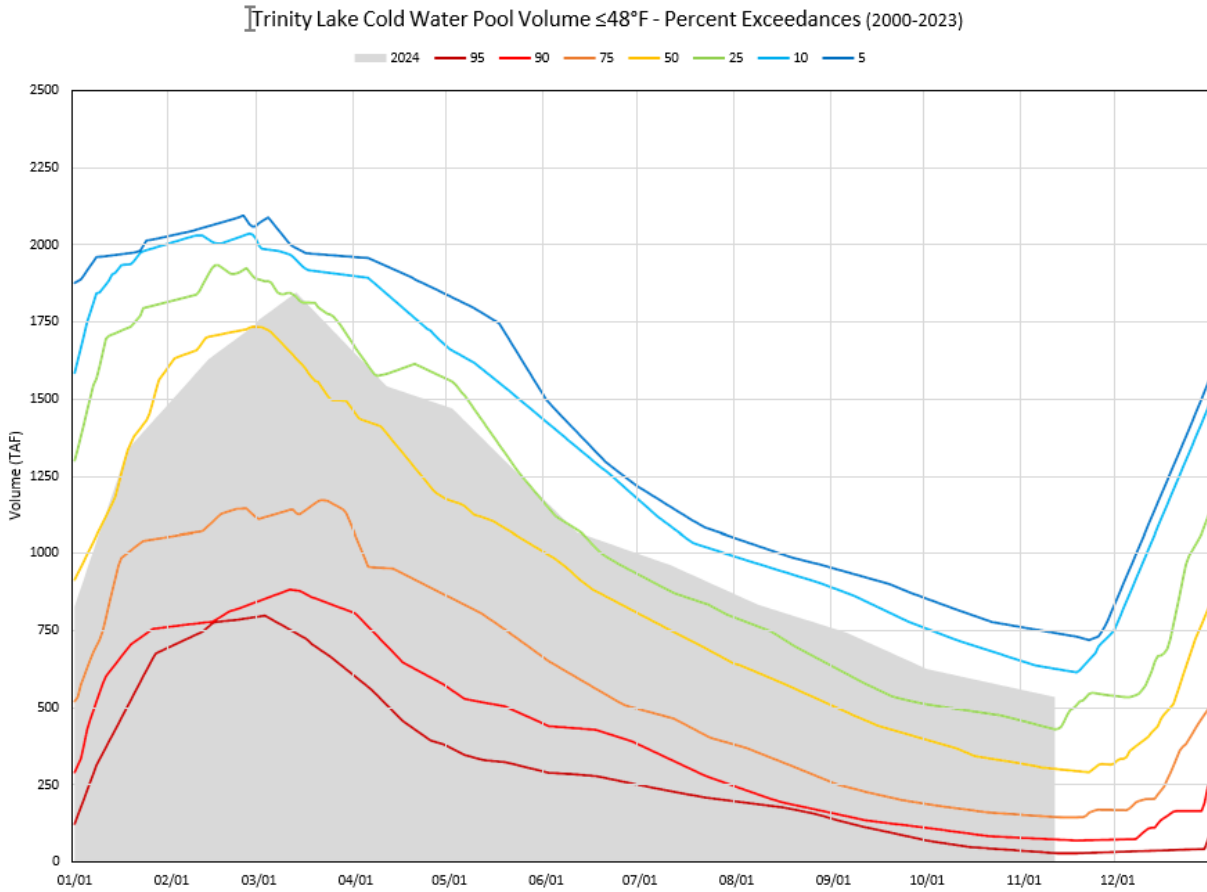


Figure 18: Trinity Lake Cold Water Pool Volume $\leq 48^{\circ}\text{F}$ - Percent Exceedances (1998-2023)

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.

Table 7: Trinity Lake Cold Water Pool Comparison by Year for November 12, 2024

Year	Change (TAF) $\leq 52^{\circ}\text{F}$	Change (TAF) $\leq 50^{\circ}\text{F}$	Change (TAF) $\leq 48^{\circ}\text{F}$	Change (TAF) Abs. Average	Percent Change $\leq 52^{\circ}\text{F}$	Percent Change $\leq 50^{\circ}\text{F}$	Percent Change $\leq 48^{\circ}\text{F}$	Percent Change Abs. Average
2000	-78	-196	-236	170	-10	-27	-44	27
2001	-293	-296	-243	277	-36	-41	-45	41
2002	-253	-253	-180	229	-31	-35	-34	33
2003	-113	-250	-284	216	-14	-34	-53	34
2004	-303	-346	-328	326	-37	-48	-61	49
2005	24	-69	-182	92	3	-9	-34	16
2006	583	-36	-30	216	72	-5	-6	27
2007	-180	-168	-95	148	-22	-23	-18	21
2008	-539	-532	-408	493	-66	-73	-76	72
2009	-475	-470	-394	446	-58	-65	-74	66
2010	-37	-106	-144	96	-5	-15	-27	15
2011	236	106	21	121	29	15	4	16
2012	61	80	143	95	8	11	27	15
2013	-358	-363	-290	337	-44	-50	-54	49
2014	-701	-635	-477	604	-86	-88	-89	88
2015	-736	-677	-516	643	-91	-93	-97	94
2016	-415	-493	-373	427	-51	-68	-70	63
2017	11	-113	-134	86	1	-16	-25	14
2018	-5	-8	40	18	-1	-1	8	3
2019	233	222	229	228	29	31	43	34
2020	-193	-195	-188	192	-24	-27	-35	29
2021	-663	-602	-447	571	-82	-83	-84	83
2022	-644	-593	-434	557	-79	-82	-81	81
2023	-182	-275	-230	229	-22	-38	-43	34
2024	0	0	0	0	0	0	0	0

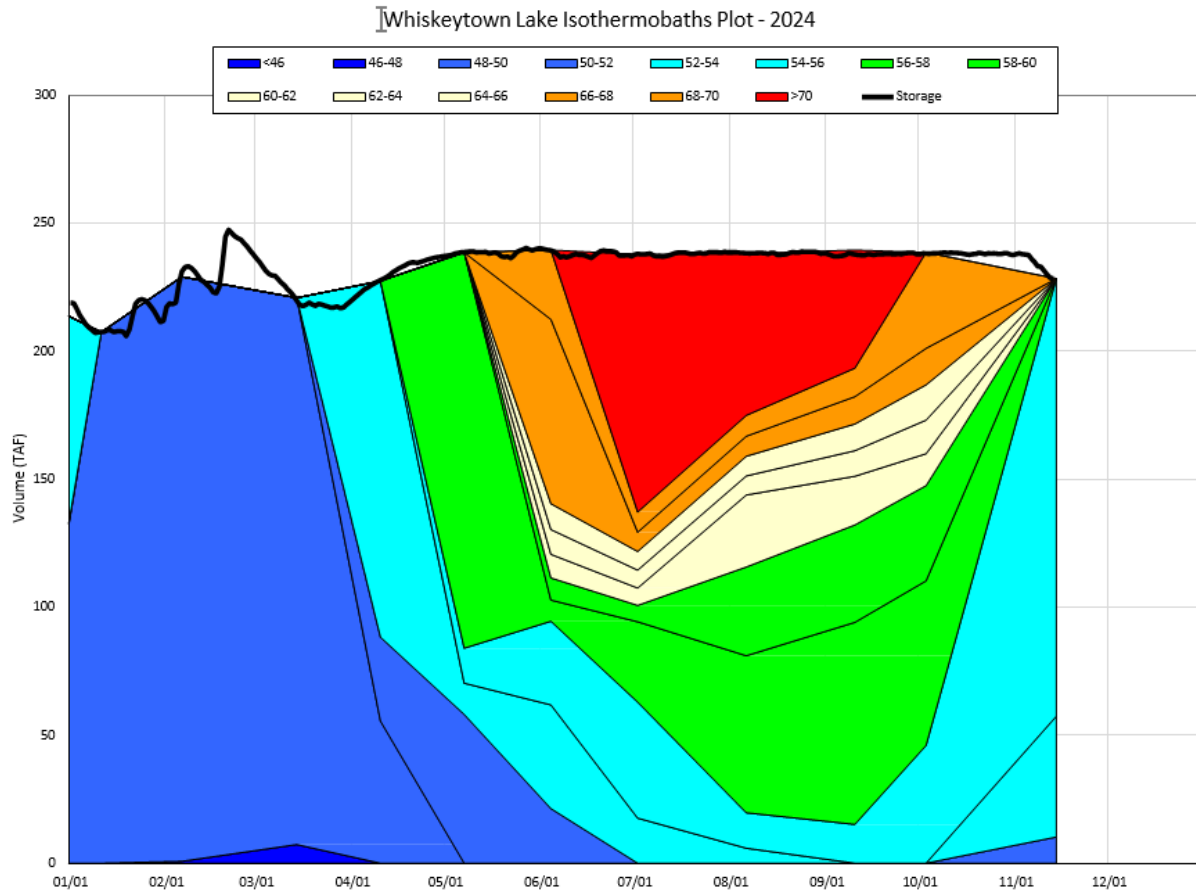


Figure 19: Whiskeytown Lake Isothermobaths Plot - 2024

This figure is a chart showing Whiskeytown Lake Isothermobaths with volume in Thousand Acre-Feet from 0-300; with dates 1/01-12/01.

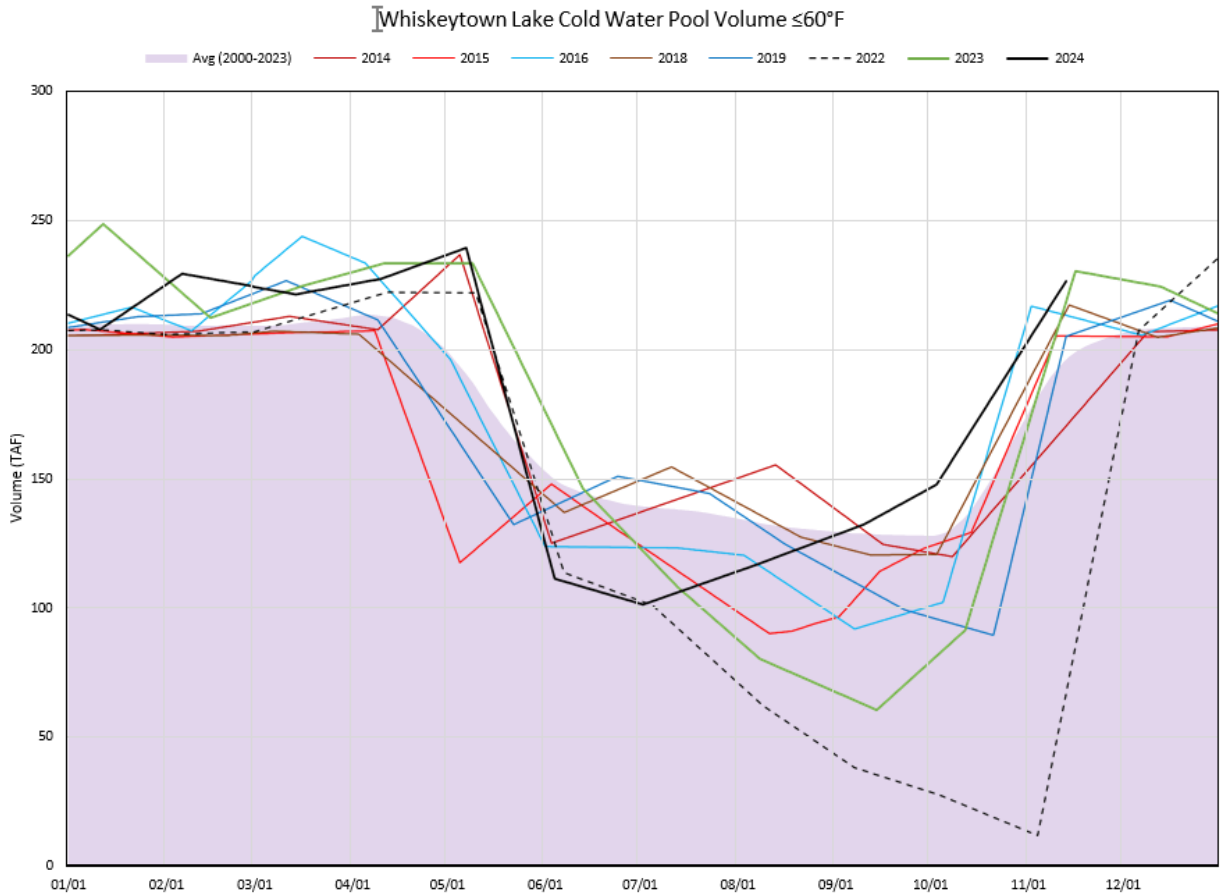


Figure 20: Whiskeytown Lake Cold Water Pool Volume $\leq 60^{\circ}\text{F}$

This figure is a line graph showing Whiskeytown Lake Cold Water Pool Volume equal to or less than 60 degrees Fahrenheit from 01/01 to 12/01.

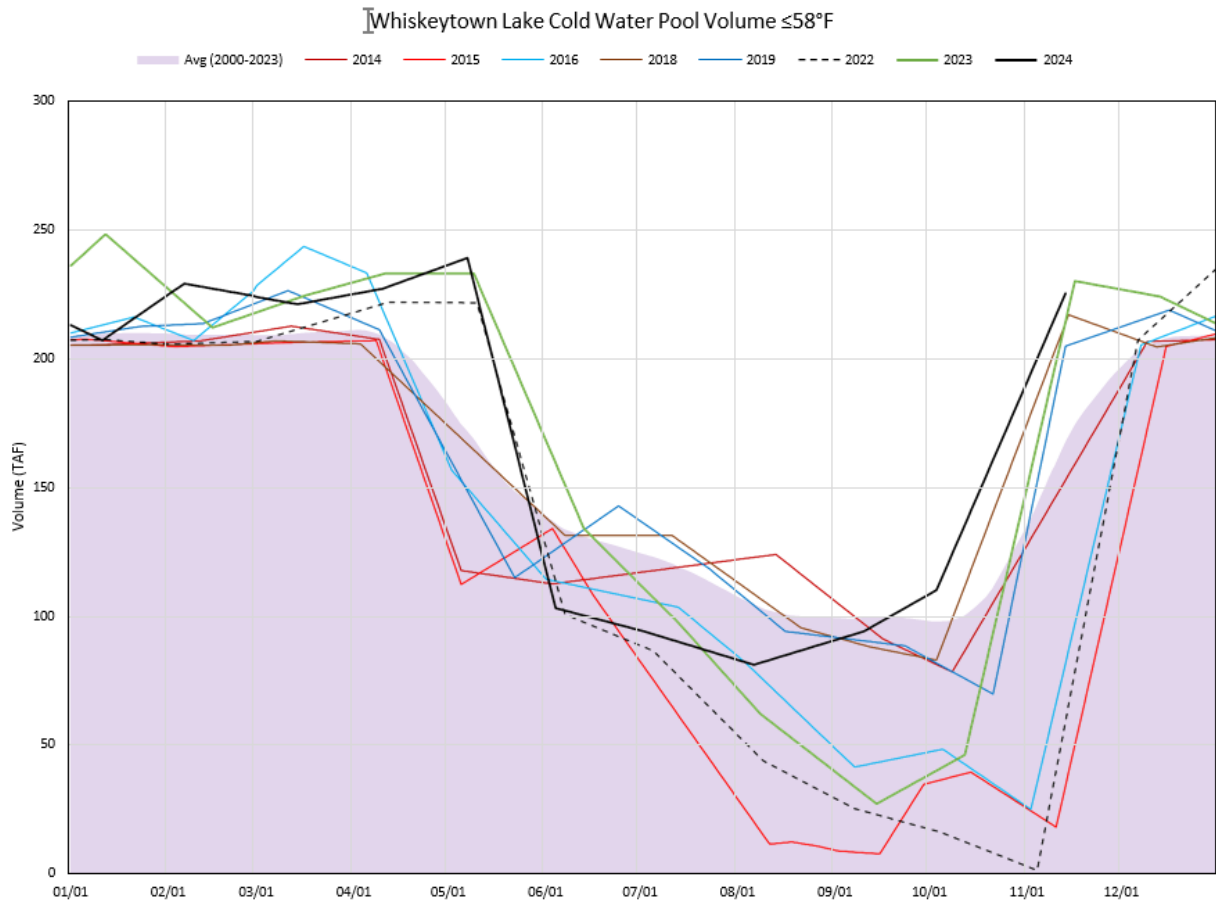


Figure 21: Whiskeytown Lake Cold Water Pool Volume $\leq 58^{\circ}\text{F}$

This figure is a line graph showing Whiskeytown Lake Cold Water Pool Volume equal to or less than 58 degrees Fahrenheit from 01/01 to 12/01.

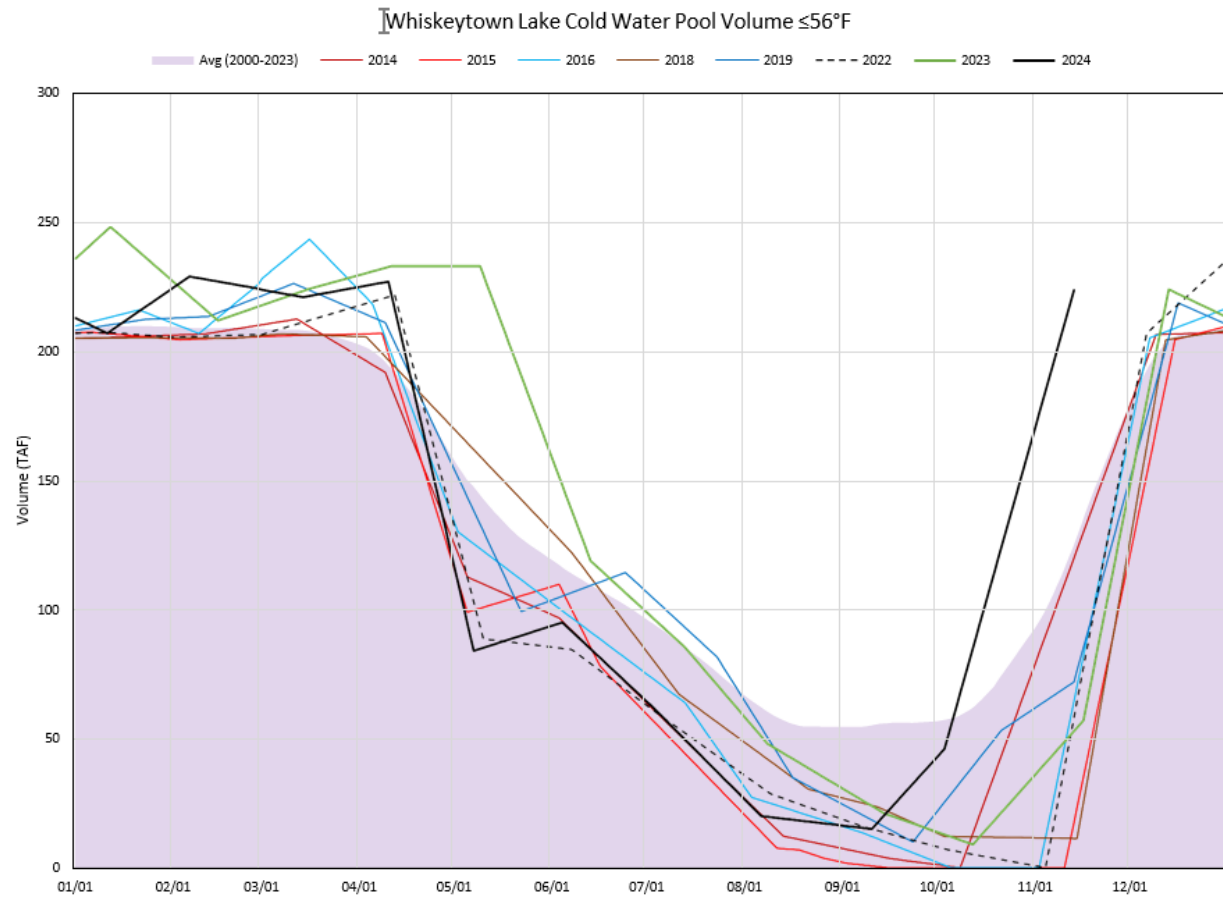


Figure 22: Whiskeytown Lake Cold Water Pool Volume $\leq 56^{\circ}\text{F}$

This figure is a line graph showing Whiskeytown Lake Cold Water Pool Volume equal to or less than 56 degrees Fahrenheit from 01/01 to 12/01.

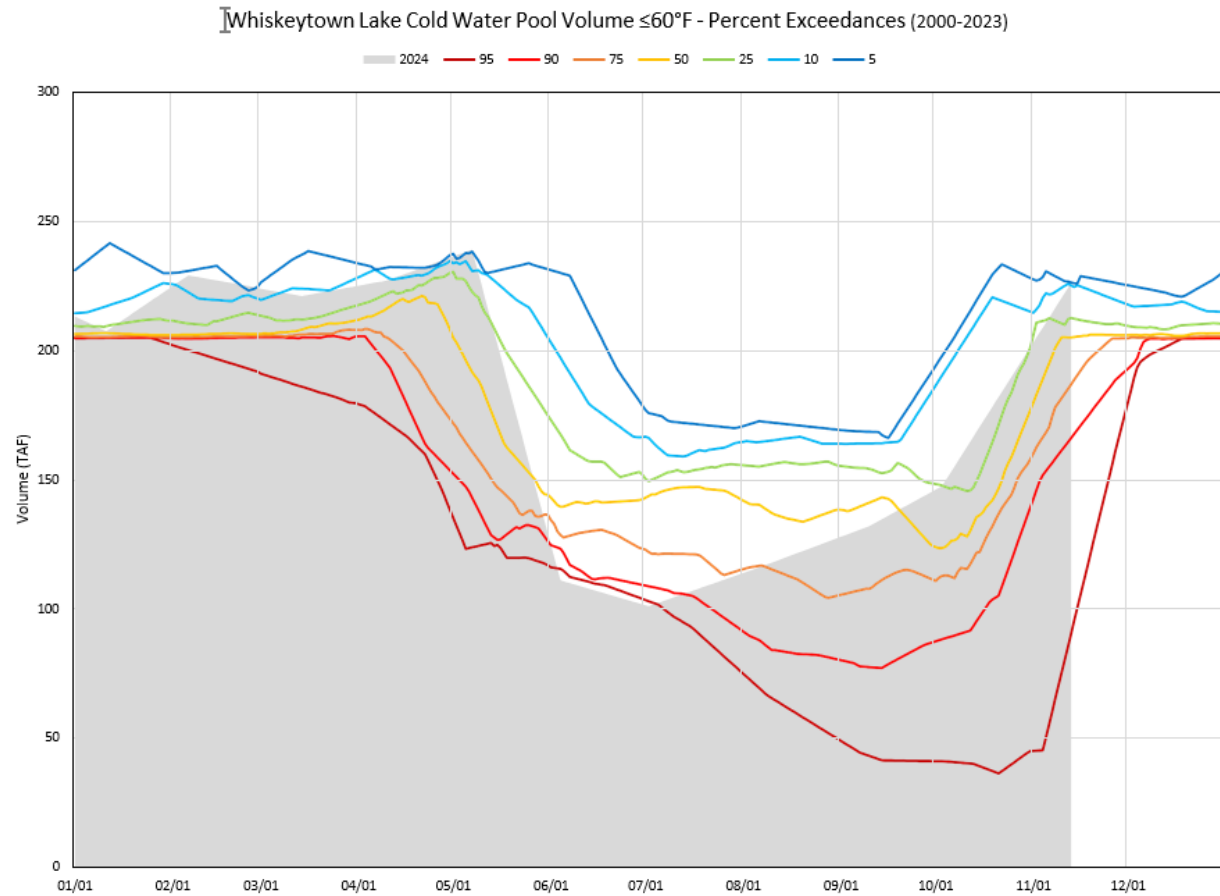


Figure 23: Whiskeytown Lake Cold Water Pool Volume $\leq 60^{\circ}\text{F}$ - Percent Exceedances (1998-2023)

This figure is a line graph showing Whiskeytown Lake Cold Water Pool Volume less than or equal to 60 degrees Fahrenheit as percent exceedances from 01/01 to 12/01.

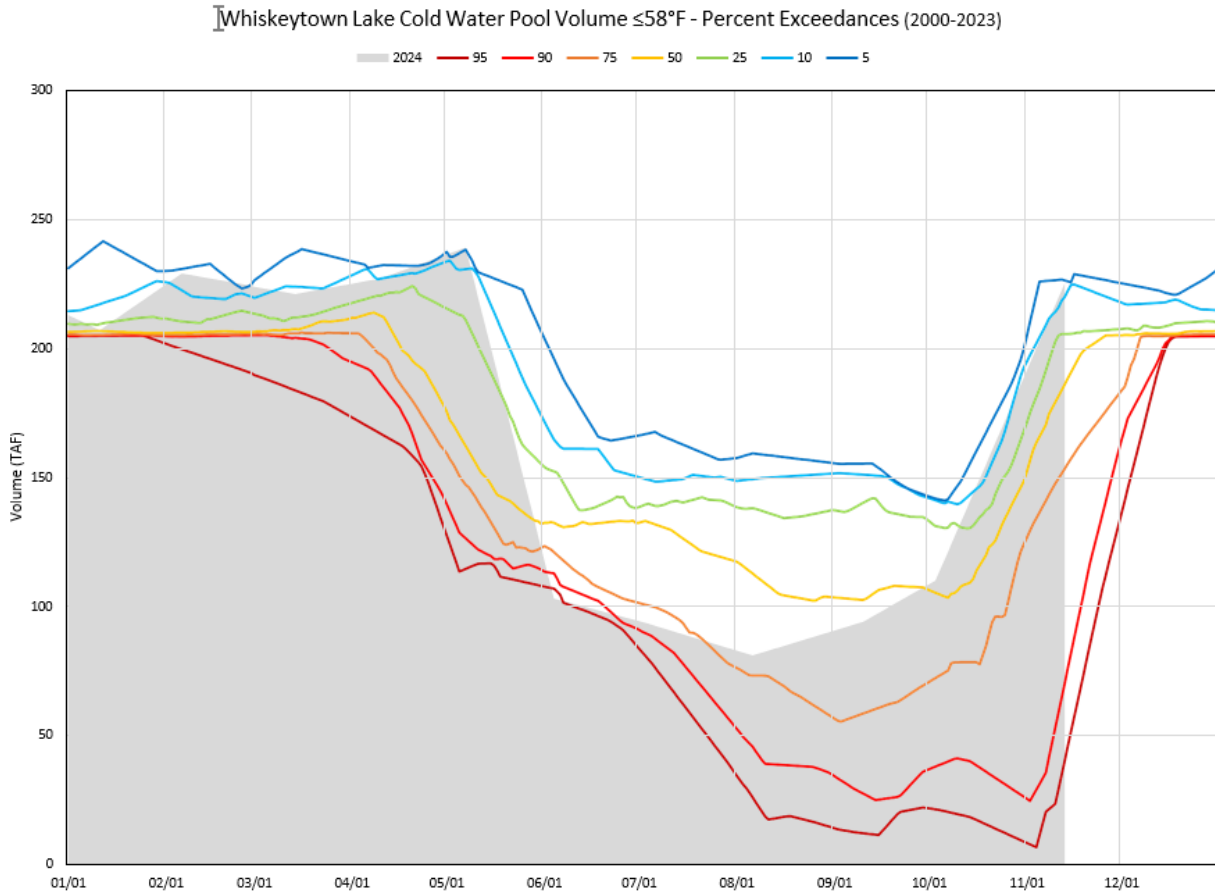


Figure 24: Whiskeytown Lake Cold Water Pool Volume $\leq 58^{\circ}\text{F}$ - Percent Exceedances (1998-2023)

This figure is a line graph showing Trinity Lake Cold Water Pool Volume less than or equal to 58 degrees Fahrenheit as percent exceedances from 01/01 to 12/01.

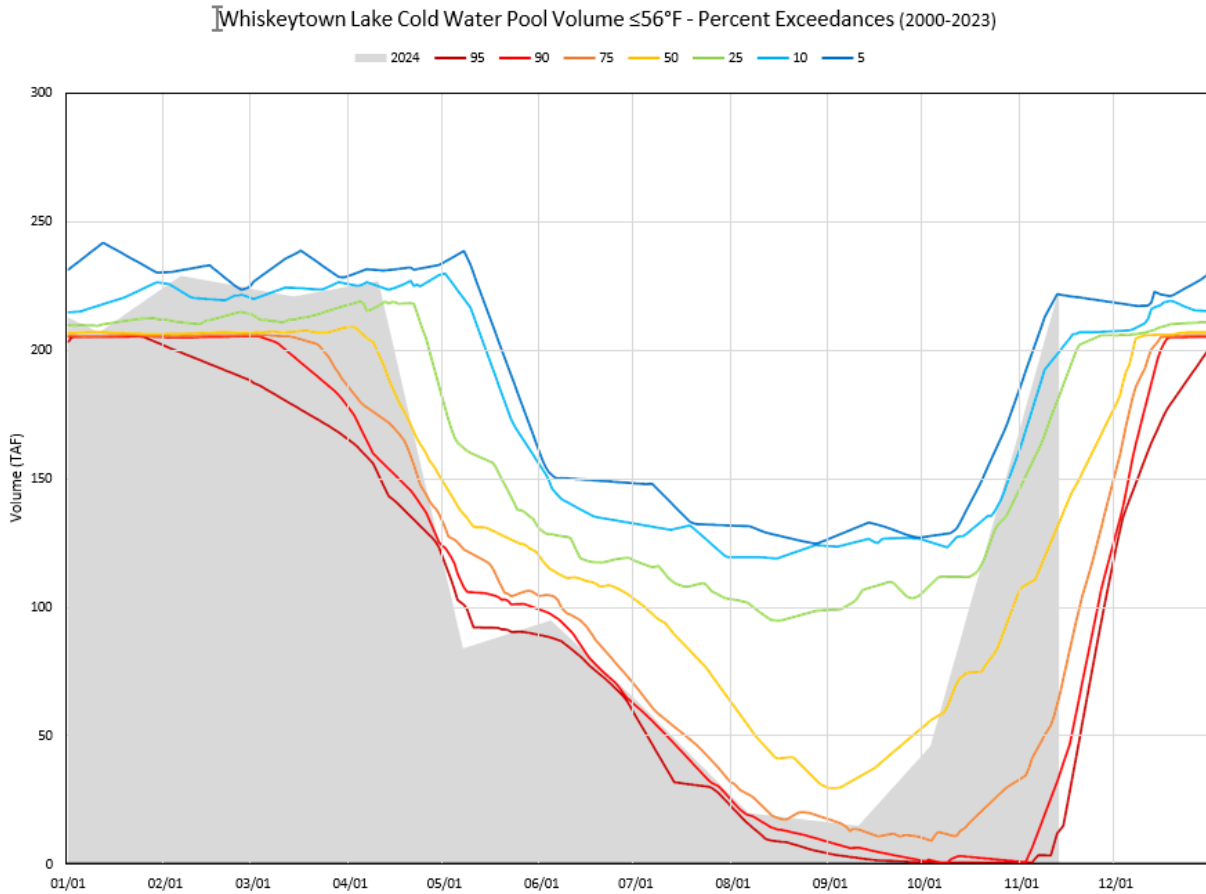


Figure 25: Whiskeytown Lake Cold Water Pool Volume $\leq 56^{\circ}\text{F}$ - Percent Exceedances (1998-2023)

This figure is a line graph showing Whiskeytown Lake Cold Water Pool Volume less than or equal to 56 degrees Fahrenheit as percent exceedances from 01/01 to 12/01.

Table 8: Whiskeytown Cold Water Pool Comparison by Year for November 12, 2024

Year	Change (TAF) ≤52°F	Change (TAF) ≤50°F	Change (TAF) ≤48°F	Change (TAF) Abs. Average	Percent Change ≤52°F	Percent Change ≤50°F	Percent Change ≤48°F	Percent Change Abs. Average
2000	-63.7	-65.9	-70.4	66.7	-28.2	-29.3	-31.5	29.6
2001	-33.5	-33.1	-33.4	33.4	-14.8	-14.7	-14.9	14.8
2002	-40.5	-42.0	-47.0	43.2	-17.9	-18.7	-21.0	19.2
2003	0.0	0.8	-99.2	33.4	0.0	0.4	-44.3	14.9
2004	0.5	1.4	3.0	1.6	0.2	0.6	1.3	0.7
2005	-19.8	-18.9	-164.5	67.7	-8.8	-8.4	-73.5	30.2
2006	-45.9	-46.0	-46.4	46.1	-20.3	-20.4	-20.8	20.5
2007	-20.6	-19.7	-135.1	58.5	-9.1	-8.8	-60.4	26.1
2008	-30.5	-30.3	-30.0	30.3	-13.5	-13.5	-13.4	13.5
2009	-49.4	-54.6	-80.7	61.5	-21.8	-24.2	-36.1	27.4
2010	-14.0	-128.8	-138.3	93.7	-6.2	-57.2	-61.8	41.7
2011	-20.3	-19.4	-17.9	19.2	-9.0	-8.6	-8.0	8.5
2012	-21.2	-127.7	-144.6	97.9	-9.4	-56.7	-64.7	43.6
2013	-1.6	-69.6	-74.5	48.6	-0.7	-30.9	-33.3	21.6
2014	-56.0	-72.5	-103.7	77.4	-24.8	-32.2	-46.4	34.4
2015	-21.2	-191.2	-206.1	139.5	-9.4	-84.9	-92.2	62.2
2016	-13.2	-143.7	-159.2	105.3	-5.8	-63.8	-71.2	46.9
2017	-16.6	-65.3	-69.6	50.5	-7.4	-29.0	-31.1	22.5
2018	-11.5	-11.5	-212.3	78.4	-5.1	-5.1	-94.9	35.0
2019	-21.3	-20.5	-151.7	64.5	-9.4	-9.1	-67.8	28.8
2020	-34.8	-36.0	-38.6	36.5	-15.4	-16.0	-17.2	16.2
2021	-17.4	-31.2	-35.7	28.1	-7.7	-13.9	-16.0	12.5
2022	-159.5	-166.1	-165.4	163.7	-70.6	-73.8	-74.0	72.8
2023	-8.0	-11.0	-170.8	63.2	-3.5	-4.9	-76.4	28.3
2024	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Estimated CVP Operations 50% Exceedance

Table 9: Storages – Federal End of the Month Storage/Elevation (TAF/Feet)

Facility	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct
Trinity	1620	1631	1670	1735	1847	1977	2101	2011	1911	1772	1632	1503	1421
Trinity Elev.	N/A	2314	2317	2322	2330	2339	2348	2342	2335	2325	2314	2303	2296
Whiskeytown	237	233	220	206	206	206	206	238	238	238	238	238	238
Whiskeytown Elev.	N/A	1207	1203	1199	1199	1199	1199	1209	1209	1209	1209	1209	1209
Shasta	2596	2664	2929	3348	3727	4145	4325	4295	4091	3643	3397	3183	3168
Shasta Elev.	N/A	992	1005	1023	1038	1053	1059	1058	1051	1034	1025	1016	1015
Folsom	401	373	363	408	560	749	895	959	960	736	638	616	539
Folsom Elev.	N/A	399	397	404	424	444	459	464	464	443	433	430	421
New Melones	1797	1799	1817	1851	1908	1988	1959	2024	2043	1966	1905	1858	1799
New Melones Elev.	N/A	1034	1035	1038	1044	1051	1049	1054	1056	1049	1044	1039	1034
San Luis	334	368	533	716	851	966	863	647	460	259	176	203	294
Total	6985	7068	7532	8263	9099	10030	10349	10173	9703	8614	7985	7601	7460

Table 10: State End of the Month Reservoir Storage (TAF)

Facility	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct
Oroville	1729	1644	1725	1909	2212	2593	2858	2954	2936	2565	2068	1740	1553
Oroville Elev.	N/A	747	755	774	802	834	854	861	860	832	789	757	737
State San Luis	727	797	848	1012	1062	1062	896	666	435	481	503	615	781
Total San Luis (TAF)	1061	1164	1382	1728	1913	2028	1759	1313	895	741	679	817	1075
Total San Luis Elev.	N/A	469	489	519	534	543	521	483	442	426	419	434	460

Table 11: Monthly River Releases (TAF/cfs)

Facility	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct
Trinity (TAF)	N/A	18	18	18	17	18	80	258	126	68	53	52	23
Trinity (cfs)	N/A	300	300	300	300	300	1,347	4,189	2,120	1,102	857	870	373
Clear Creek (TAF)	N/A	12	12	12	11	22	12	18	14	9	9	9	12
Clear Creek (cfs)	N/A	200	200	200	200	363	200	291	242	150	150	150	200
Sacramento (TAF)	N/A	268	246	246	333	430	357	461	535	738	516	476	307
Sacramento (cfs)	N/A	4500	4000	4000	6000	7000	6000	7500	9000	12000	8387	8000	5000
American (TAF)	N/A	121	123	108	111	123	280	400	220	342	197	119	157
American (cfs)	N/A	2041	2000	1750	2000	2000	4700	6500	3705	5571	3210	2000	2559

Facility	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct
Stanislaus (TAF)	N/A	12	12	14	13	12	91	76	22	15	15	15	48
Stanislaus (cfs)	N/A	200	200	226	229	200	1537	1242	363	250	250	250	774
Feather (TAF)	N/A	104	108	108	97	108	59	61	62	322	492	410	215
Feather (cfs)	N/A	1750	1750	1750	1750	1750	1000	1000	1050	5240	8000	6900	3500

Table 12: Trinity Diversions (TAF)

Diversion Facility	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct
Carr PP	N/A	1	0	0	0	0	0	46	68	89	90	79	70
Spring Creek PP	N/A	0	16	36	33	15	12	10	60	80	80	70	60

Table 13: Delta Summary (TAF)

Facility	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct
Tracy	N/A	149	250	243	233	229	54	55	200	258	267	255	260
USBR Banks	N/A	0	0	0	0	0	0	0	0	24	24	24	0
Contra Costa	N/A	16.0	18.0	14.0	14.0	12.7	12.7	12.7	9.8	11.1	12.7	14.0	14.0
Total USBR	N/A	165	268	257	247	242	66	68	210	293	304	293	274
State Export	N/A	251	205	165	148	155	36	38	113	412	411	397	373
Total Export	N/A	416	473	422	395	397	102	106	323	705	715	690	647
COA Balance	N/A	0	0	0	0	0	0	0	73	221	188	188	237
Vernalis (TAF)	N/A	99	103	119	237	249	255	279	96	80	71	74	126
Vernalis (cfs)	N/A	1662	1680	1934	4263	4055	4278	4543	1607	1307	1161	1242	2043
Old/Middle River calc.	N/A	- 5,226	- 5,759	-5,006	- 4,150	- 3,734	15	128	- 4,045	- 8,834	- 9,020	- 8,962	- 7,775
Computed DOI	N/A	4505	10785	21782	31806	28077	23180	20578	7531	6507	4002	5530	4002
Excess Outflow	N/A	0	6279	15779	20406	16674	11783	10834	0	0	0	2521	0
% Export/Inflow	N/A	54%	40%	24%	18%	18%	6%	6%	33%	51%	58%	57%	63%
% Export/inflow std.	N/A	65%	65%	65%	45%	35%	35%	35%	35%	65%	65%	65%	65%

Table 14: Hydrology

Statistic	Trinity	Shasta	Folsom	New Melones
Water Year Inflow (TAF)	1,040	5,061	2,562	1,018
Year to Date + Forecasted % of mean	86%	91%	94%	96%

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.

Temperature-Dependent Mortality

Water Year 2024 Winter-Run Chinook Temperature-Dependent Egg Mortality Estimate

Prepared by Southwest Fisheries Science Center (SWFSC), November 20th, 2024.

This summary provides hindcast estimates of temperature-dependent mortality (TDM) for water year 2024. River temperature was generated using the RAFT model with data assimilation and associated TDM estimates using the SWFSC stage-independent temperature egg mortality model.

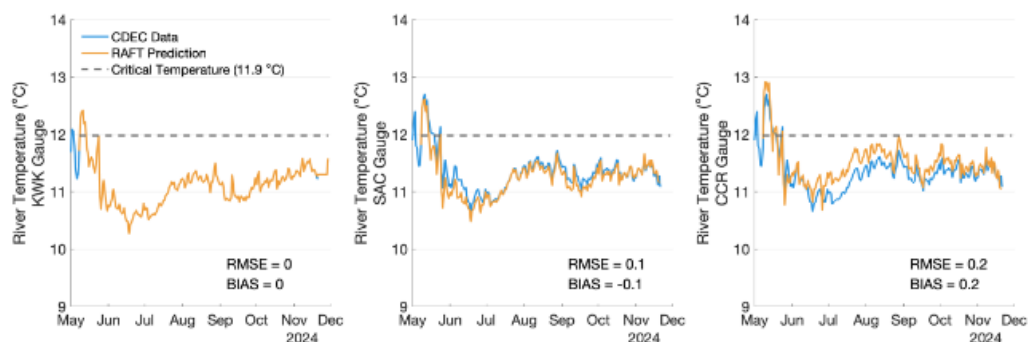


Figure 26: Differences in daily mean river temperature between CDEC data and the RAFT hindcast model at the KWK, SAC, and CCR gauge. Note: RAFT model error statistics, bias and root mean square error (RMSE), are displayed.

Figure 26 is a collection of three line graphs displaying CDEC data, RAFT prediction, and critical temperature for May to December 2024.

Table 15: Estimated TDM under the spatial and temporal redd distribution of 2024 using output from the RAFT model. TDM estimates were generated for the SWFSC stage-independent temperature mortality model by running the model under 1000 parameter sets. Mean values of TDM were then calculated from this output set.

Redd Distribution (years)	Mean Annual TDM (%)
2024	2

Biweekly Report

Preliminary daily estimates of passage, 90% confidence intervals, and fork length ranges of unmarked juvenile salmonids sampled at Red Bluff Diversion Dam for November 4, 2024 to November 17, 2024. Race designation was assigned using length-at-date criteria. This period represents 85.9% (SD=10.9%) of cumulative juvenile winter Chinook passage, based on the prior 22 years of data collection.

Please note that data contained in these reports is subject to revision as this data is preliminary and undergoing QA/QC procedures.

Table 16: Preliminary estimates of passage by brood-year (BY) and run for unmarked juvenile chinook salmon and steelhead trout captured by rotary-screw traps at Red Bluff Diversion Dam (RK931), Sacramento River, CA, for the dates listed below. Results include estimated passage, peak river discharge volume, water temperature, turbidity, and fork length (mm) range in parentheses. A dash (-) indicates that sampling was not conducted on that date.

Date	Discharge Volume (cfs)	Water Temp (°C)	Water Turbidity (NTU)	Estimated Passage BY24 Winter	Estimated Passage BY24 Spring	Estimated Passage BY23 Fall	Estimated Passage BY24 Late-Fall	Estimated Passage BY24 RBY
11/4/2024	7,756	7,756	2.9	1,369 (39 – 76)	2,043 (30 – 37)	38 (159)	1,038 (77 – 138)	38 (93)
11/5/2024	7,756	7,756	2.3	919 (42 – 74)	1,841 (30 – 38)	35 (149)	460 (77 – 139)	71 (86 – 97)
11/6/2024	7,563	7,563	2.7	1,315 (41 – 77)	798 (31 – 37)	0 (–)	501 (80 – 140)	0 (–)
11/7/2024	7,350	7,350	2.3	2,382 (39 – 76)	601 (29 – 34)	35 (149)	842 (79 – 138)	35 (70)
11/8/2024	7,311	7,311	2.5	2,683 (42 – 77)	544 (28 – 35)	102 (145 – 165)	712 (81 – 131)	34 (120)
11/9/2024	7,058	7,058	2.1	3,985 (42 – 78)	645 (30 – 35)	36 (155)	1,046 (79 – 140)	0 (–)
11/10/2024	6,978	6,978	2.2	3,538 (42 – 79)	607 (29 – 39)	0 (–)	706 (80 – 140)	0 (–)
11/11/2024	6,784	6,784	3.5	2,927 (43 – 79)	225 (31 – 34)	0 (–)	422 (81 – 130)	65 (113 – 130)
11/12/2024	6,655	6,655	2.6	4,105 (44 – 79)	218 (29 – 40)	0 (–)	318 (83 – 132)	0 (–)
11/13/2024	6,483	6,483	2.9	2,192 (44 – 79)	128 (31 – 33)	32 (152)	263 (81 – 133)	32 (104)
11/14/2024	6,289	6,289	3	906 (47 – 77)	97 (32 – 35)	0 (–)	96 (83 – 136)	33 (91)
11/15/2024	6,073	6,073	3	3,848 (42 – 82)	61 (32 – 40)	0 (–)	309 (88 – 132)	0 (–)

Date	Discharge Volume (cfs)	Water Temp (°C)	Water Turbidity (NTU)	Estimated Passage BY24 Winter	Estimated Passage BY24 Spring	Estimated Passage BY23 Fall	Estimated Passage BY24 Late-Fall	Estimated Passage BY24 RBY
11/16/2024	5,944	5,944	2.4	4,189 (42 – 82)	189 (30 – 36)	0 (–)	375 (83 – 139)	94 (77 – 87)
11/17/2024	5,706	5,706	2.1	2,829 (42 – 82)	31 (31)	0 (–)	407 (84 – 141)	0 (–)
Biweekly Total	N/A	N/A	N/A	37,187	8,028	278	7,495	402
Biweekly Lower 90% Confidence Interval	N/A	N/A	N/A	28,610	5,619	21	5,381	66
Biweekly Upper 90% Confidence Interval	N/A	N/A	N/A	45,764	10,437	535	9,609	738
Brood Year Total	N/A	N/A	N/A	385,945	46,877	2,874,892	27,598	38,317
Brood year Lower 90% Confidence Interval	N/A	N/A	N/A	295,815	35,175	1,322,011	16,565	18,506
Brood year Upper 90% Confidence Interval	N/A	N/A	N/A	476,075	58,579	4,427,770	38,631	58,129

Peak daily discharge values do not account for diversions at RBDD and only represent peak flows registered at the Bend Bridge Gauging station. More information is available on [the CDEC website](#).

Spring Chinook brood year total reflects subtraction of 120,440 length-at-date spring Chinook determined to be winter Chinook from genetic evaluations during the period of 10/16/2017 thru 11/18/2027.

Biweekly totals may be greater than the sum of the daily estimates presented in this table if sampling was not conducted on each day of the biweekly period. A dash (-) denotes those dates. To estimate daily passage for days that were not sampled, we impute missed sample days with the weekly mean value of days sampled within the week.

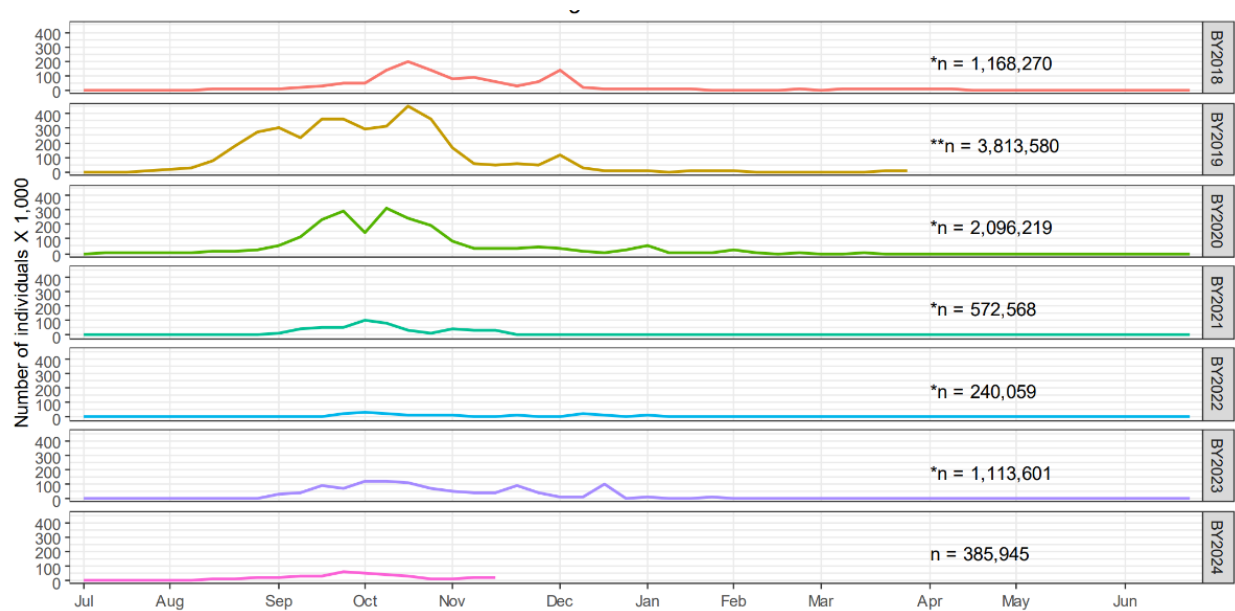


Figure 27: Weekly estimated passage of unmarked juvenile winter Chinook salmon at Red Bluff Diversion Dam (RK391) by brood-year (BY). Fish were sampled using rotary-screw traps for the period July 1, 2018 to present.

Figure 27 is a collection of seven line graphs showing the estimated passage of unmarked juvenile winter Chinook by brood year between July and June.

Winter Chinook passage value reflects addition of length-at-date spring Chinook determined to be winter Chinook from genetic analysis during brood years 2018 thru 2023.

Rotary-trapping/juvenile fish monitoring operations at the Red Bluff Diversion Dam were suspended from March 25, 2020, to June 30, 2020, to protect employee health and safety resulting from the Coronavirus/COVID-19 global pandemic.

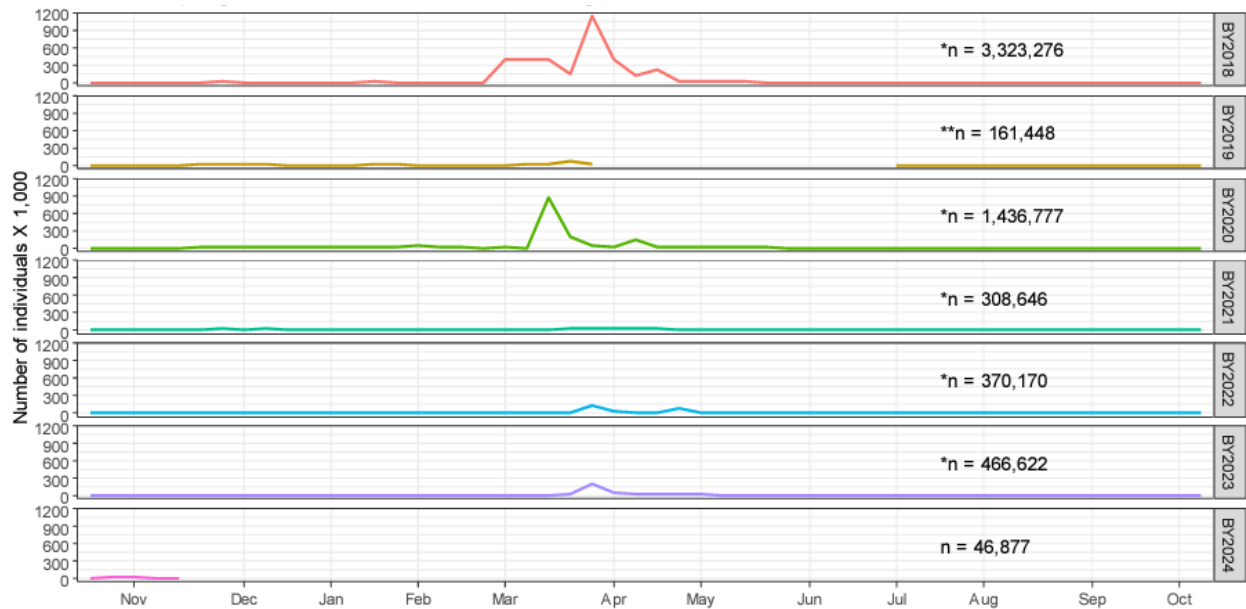


Figure 28: Weekly estimated passage of unmarked juvenile spring Chinook salmon at Red Bluff Diversion Dam (RK391) by brood-year (BY). Fish were sampled using rotary-screw traps for the period October 16, 2018 to present.

Figure 28 is a collection of seven line graphs showing the estimated passage of unmarked juvenile spring Chinook by brood year between November and October.

Spring Chinook passage value reflects subtraction of length-at-date spring Chinook determined to be winter Chinook from genetic analysis during brood years 2018 through 2023.

Rotary-trapping/juvenile fish monitoring operations at the Red Bluff Diversion Dam were suspended from March 25, 2020 to June 30, 2020, to protect employee health and safety resulting from the Coronavirus/COVID-19 global pandemic.

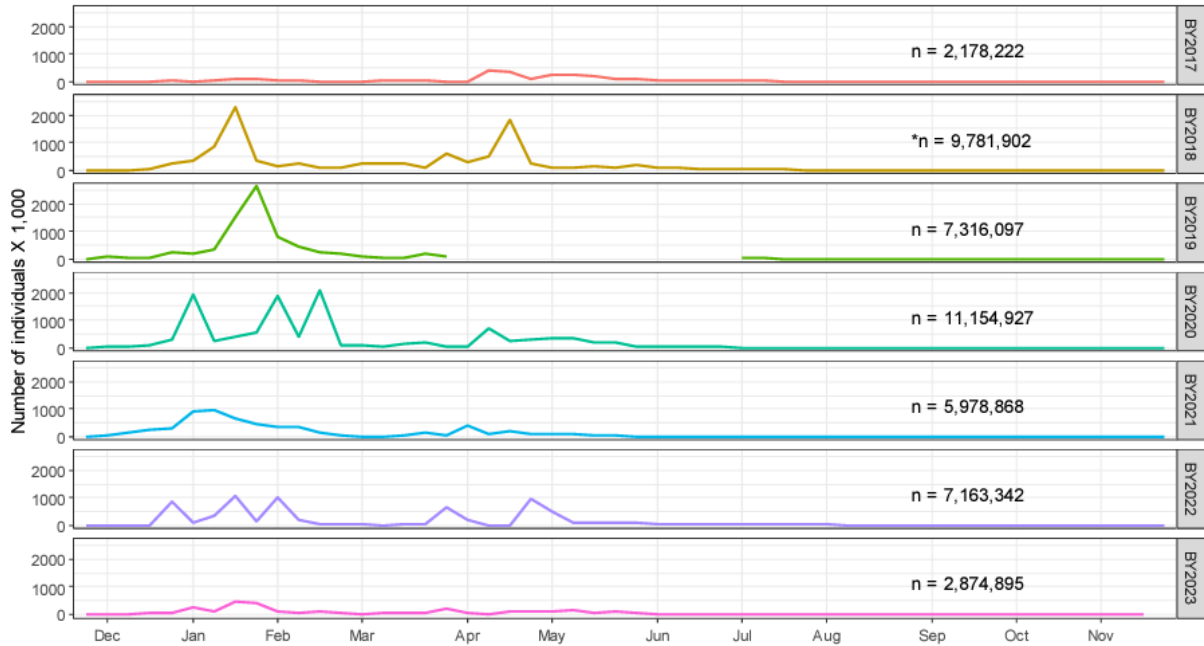


Figure 29: Weekly estimated passage of unmarked juvenile fall Chinook salmon at Red Bluff Diversion Dam (RK391) by brood-year (BY). Fish were sampled using rotary-screw traps for the period December 1, 2017 to present.

Figure 29 is a collection of seven line graphs showing the estimated passage of unmarked juvenile fall Chinook by brood year between December and November.

Rotary-trapping/juvenile fish monitoring operations at the Red Bluff Diversion Dam were suspended from March 25, 2020 to June 30, 2020, to protect employee health and safety resulting from the Coronavirus/COVID-19 global pandemic.

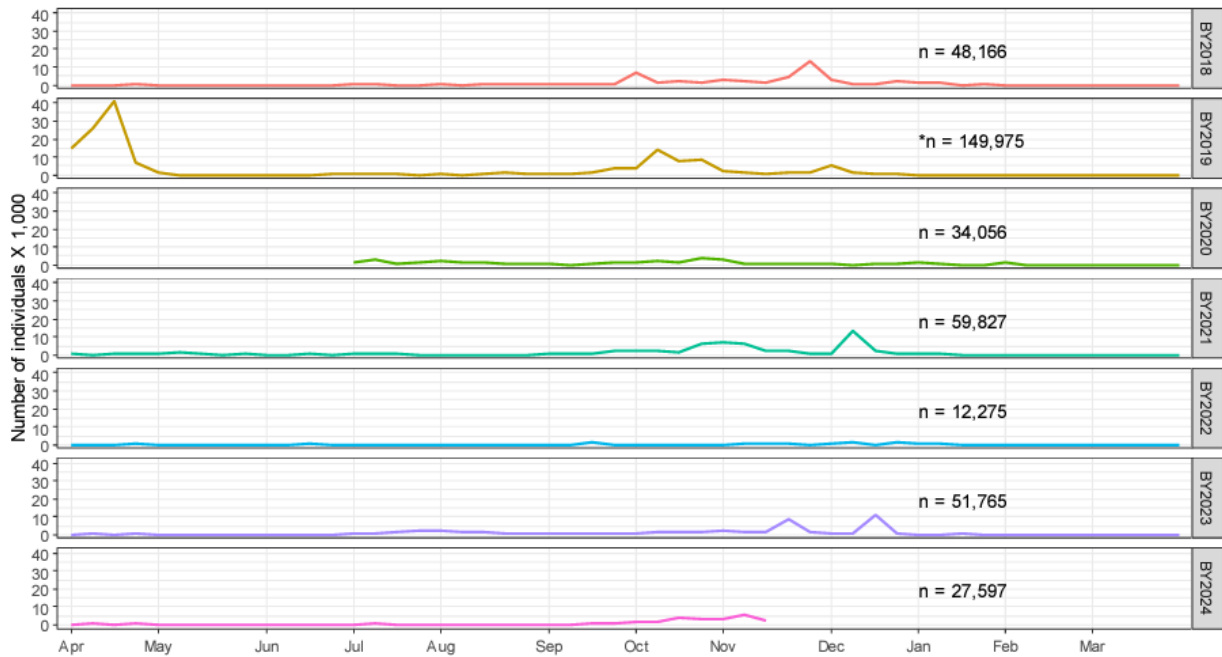


Figure 30. Weekly estimated passage of unmarked juvenile late fall Chinook salmon at Red Bluff Diversion Dam (RK391) by brood-year (BY). Fish were sampled using rotary-screw traps for the period April 1, 2018 to present.

Figure 30 is a collection of seven line graphs showing the estimated passage of unmarked juvenile late fall Chinook by brood year between April and March.

Rotary-trapping/juvenile fish monitoring operations at the Red Bluff Diversion Dam were suspended from March 25, 2020 to June 30, 2020, to protect employee health and safety resulting from the Coronavirus/COVID-19 global pandemic.

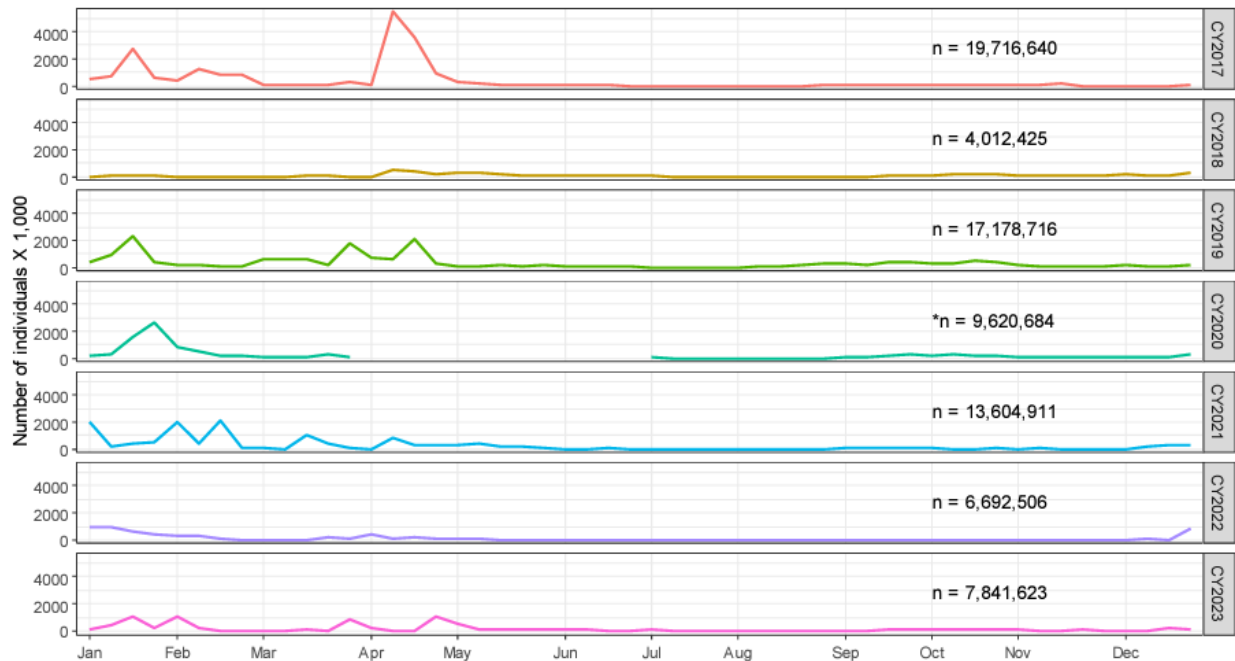


Figure 31: Weekly estimated passage of unmarked juvenile Chinook salmon at Red Bluff Diversion Dam (RK391) by calendar year (CY). Fish were sampled using rotary-screw traps for the period January 1, 2017 to December 31, 2023.

Figure 31 is a collection of seven line graphs showing the estimated passage of unmarked juvenile Chinook salmon by brood year between January and December.

Rotary-trapping/juvenile fish monitoring operations at the Red Bluff Diversion Dam were suspended from March 25, 2020 to June 30, 2020, to protect employee health and safety resulting from the Coronavirus/COVID-19 global pandemic.

November 2024 Update from Livingston Stone NFH, Kaitlin Dunham

All of the Keswick fish have been tanked. Most are out of the hatchery building now as well. They are healthy and growing well. The tagging trailer is set to arrive sometime in the middle of December to begin applying coded wire tags. Our water is staying remarkably clear despite this rain and is staying steadily around 52 degrees F.

November 2024 Update from Doug Killam, CDFW

The Draft estimate of Winter-run escapement in 2024 was 1,296 salmon that included 272 removed from the river during operations at the LSNFH hatchery and 1,024 in the river.

The 2024 run was comprised of 375 spawning in-river females. Overall hatchery fish comprised about 68% of the run, and grilse or 2 year-olds were also abundant and were around 33% of the run. This high number of grilse bodes well for the 2025 escapement numbers.

The most downstream spawning occurred not far below Redding in the river above Bonnyview Brg. This area experienced water temperatures (CCR) that were conducive to winter-run egg survival and TDM impacts were likely low this year. The majority of spawning took place upstream of this area where water temperatures were even cooler. Only one shallow winter-run redd was dewatered this year (1 of 375).



Monthly Temperature Outlook



Valid: December 2024
Issued: November 30, 2024

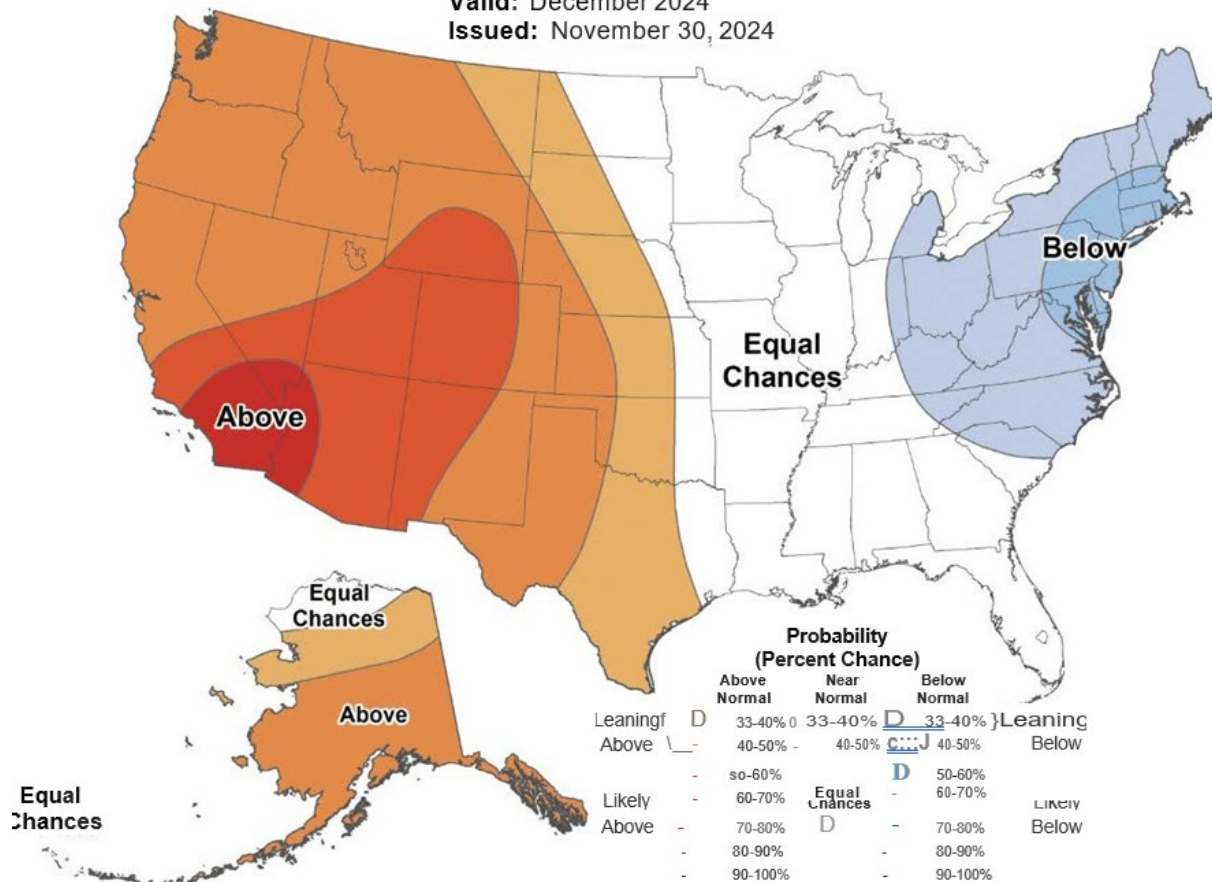


Figure 32: Monthly Temperature Outlook

This 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 December 2024 and was issued on November 30, 2024.



Monthly Precipitation Outlook



Valid: December 2024

Issued: November 30, 2024

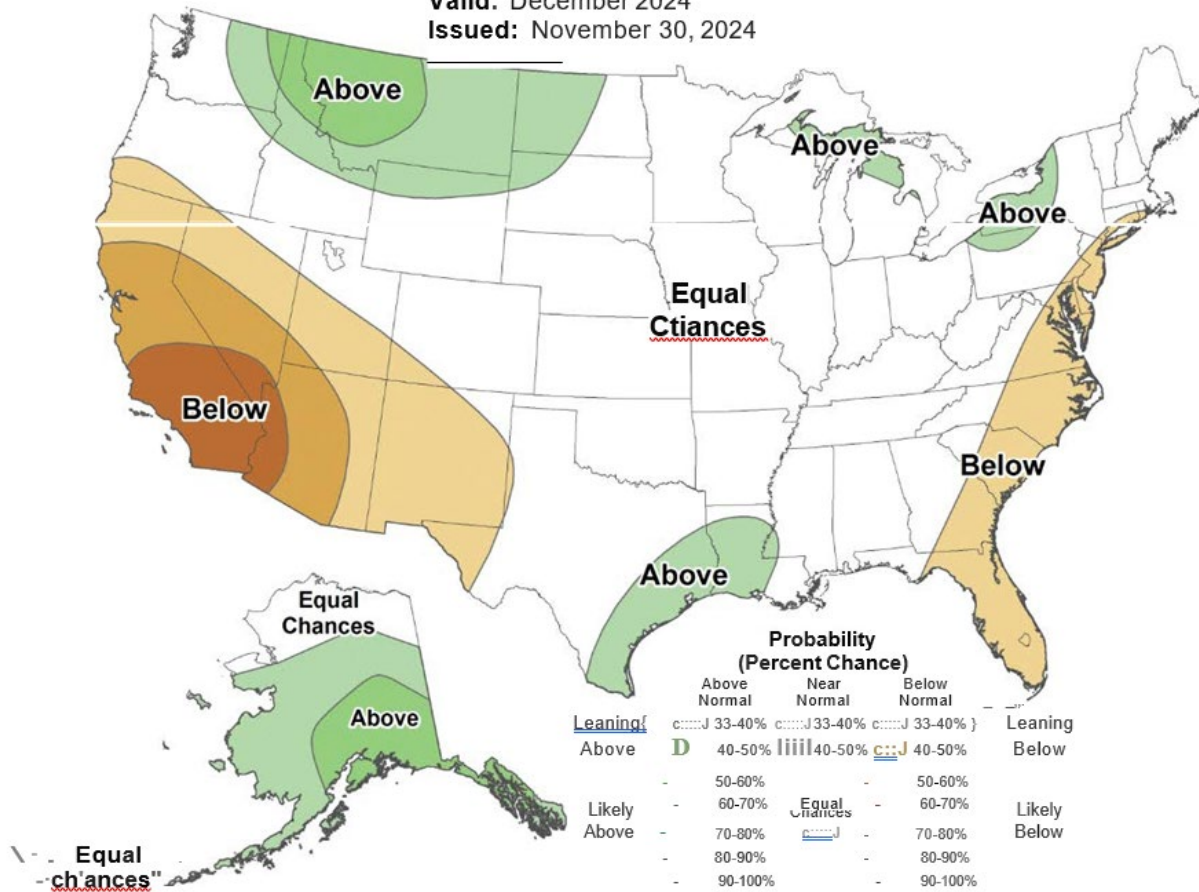


Figure 33: Monthly Precipitation Outlook

This figure shows a monthly precipitation outlook with the percent probability of near normal, below, or above normal precipitation for all of the United States. The figure is valid for December 2024 and was issued on November 30, 2024.



Seasonal Temperature Outlook



Valid: Jan-Feb-Mar 2025
Issued: November 21, 2024

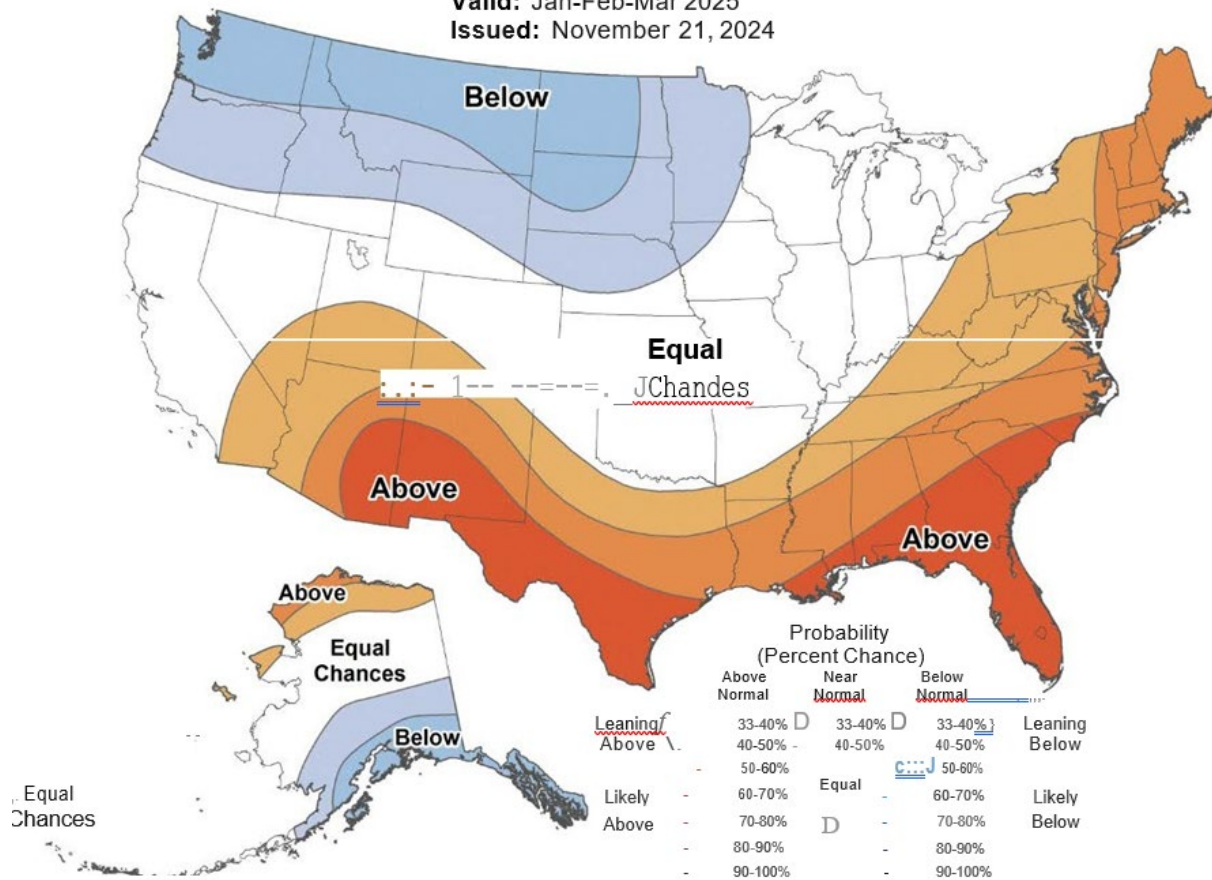


Figure 34: Seasonal Temperature Outlook

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 January to March 2025 and was issued on November 21, 2024.



Seasonal Precipitation Outlook



Valid: Jan-Feb-Mar 2025

Issued: November 21, 2024

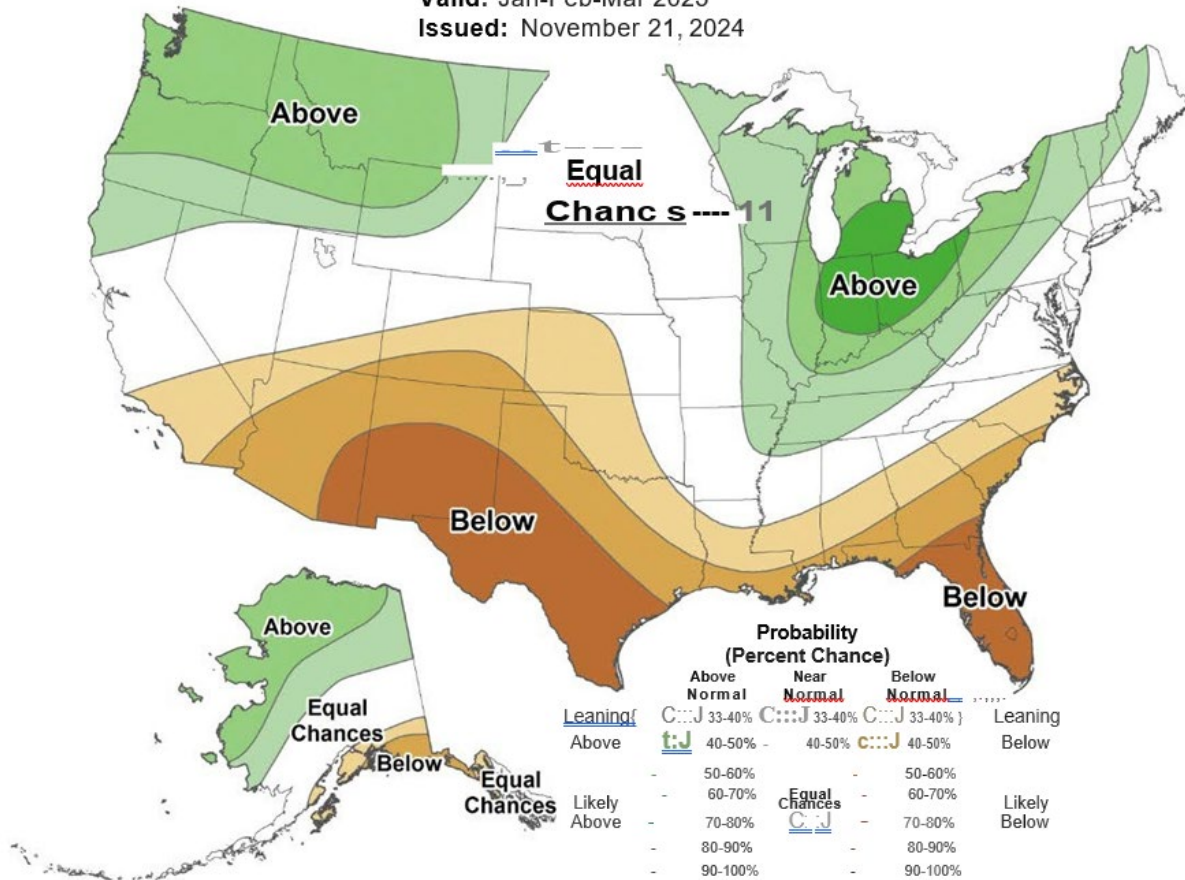


Figure 35: Seasonal Precipitation Outlook

This figure shows a seasonal precipitation outlook with the percent probability of near normal, below, or above normal precipitation for all of the United States. The figure is valid from January to March 2025 and was issued on November 21, 2024.