

# **Sacramento River Temperature Task Group Meeting**

**March 26, 2015**

**1:00 pm**

**Conference Line: 877-718-6527**

**Pass code: 1954134**

## **Agenda**

1. Introductions
2. Fishery update
3. Hydrology & Operations update
  - a. Daily CVP Water Supply Report \*\*\*
4. Discussion -- March Sacramento River Temperature Model runs outlined in Section 6.b of the January TUC Order \*\*\*
5. Next meeting

\*\*\*handouts

UNITED STATES DEPARTMENT OF THE INTERIOR  
U.S. BUREAU OF RECLAMATION-CENTRAL VALLEY PROJECT-CALIFORNIA

**DAILY CVP WATER SUPPLY REPORT**

MARCH 25, 2015

RUN DATE: March 26, 2015

RESERVOIR RELEASES IN CUBIC FEET/SECOND

RESERVOIR	DAM	WY 2014	WY 2015	15 YR MEDIAN
TRINITY	LEWISTON	289	314	300
SACRAMENTO	KESWICK	3,077	2,750	3,806
FEATHER	OROVILLE (SWP)	800	800	1,750
AMERICAN	NIMBUS	541	684	1,500
STANISLAUS	GOODWIN	428	1,435	454
SAN JOAQUIN	FRIANT	141	195	250

STORAGE IN MAJOR RESERVOIRS IN THOUSANDS OF ACRE-FEET

RESERVOIR	CAPACITY	15 YR AVG	WY 2014	WY 2015	% OF 15 YR AVG
TRINITY	2,448	1,755	1,293	1,184	67
SHASTA	4,552	3,532	2,086	2,672	76
OROVILLE (SWP)	3,538	2,357	1,627	1,787	76
FOLSOM	977	609	409	573	94
NEW MELONES	2,420	1,544	1,048	574	37
FED. SAN LUIS	966	800	470	396	49
MILLERTON	520	355	169	204	58
TOT. N. CVP	11,360	8,240	5,306	5,399	66

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

RESERVOIR	CURRENT WY 2015	DRIEST WY 1977	WETTEST WY 1983	15 YR AVG	% OF 15 YR AVG
TRINITY	744	73	1,162	533	139
SHASTA	2,547	1,351	6,574	2,855	89
FOLSOM	577	189	3,355	1,012	57
NEW MELONES	201	0	1,089	353	57
MILLERTON	85	107	1,529	383	22

ACCUMULATED PRECIPITATION FOR WATER YEAR TO DATE IN INCHES

RESERVOIR	CURRENT WY 2015	DRIEST WY 1977	WETTEST WY 1983	AVG (N YRS)	% OF AVG	LAST 24 HRS
TRINITY AT FISH HATCHERY	23.52	8.94	47.73	26.38 ( 53 )	89	0.00
SACRAMENTO AT SHASTA DAM	46.03	10.78	96.82	50.96 ( 58 )	90	0.00
AMERICAN AT BLUE CANYON	38.86	15.20	91.33	53.02 ( 40 )	73	0.00
STANISLAUS AT NEW MELONES	15.20	0.00	41.10	22.04 ( 37 )	69	0.00
SAN JOAQUIN AT HUNTINGTON LK	11.40	10.50	72.30	33.21 ( 40 )	34	0.00

## **Summary of Results – 6(2) Analysis March 2015**

Pursuant to the requirements of Order and State Water Board Order WR 90-5, and the January 2015 TUC Order, Reclamation has included three temperature model run scenarios for review by the Board: (a) Reclamation's current forecasted operations based on March 90% exceedance forecast, (b) the fisheries agencies' preferred operations and (c) an operation for which temperature management and flow stability are the overriding objectives for operations in Water Year 2015 without consideration for contract deliveries and other demands for water from Shasta Reservoir.

Reclamation's temperature model of our March Operations Forecast, 6b (1) is based on a 90 percent exceedance Operation Outlook Forecast (monthly flows, reservoir release, and end of month reservoir storage). The temperature profiles used for Shasta, Trinity, and Whiskeytown were taken on March 10, 2015. The meteorological inputs were derived from a database of 86 years of meteorological data (1920-2005).

The Reclamation's temperature model run provides a balance of operations within the Central Valley Project. There is a reasonable storage at Shasta and Folsom and the Sacramento River flows at Wilkins Slough is manageable. There is minimal CVP pumping at the Tracy Pumping Plant. This operation also balances out the COA within the system. With this year's Shasta storage, the temperature compliance point is set at 56 degrees at Clear Creek.

The second scenario is labeled the Salmonid Plan, 6b (2). This scenario was submitted to Reclamation on March 17, 2015. In this temperature model run, Shasta storage is higher in September, but Folsom storage reaches dead pool by July. Wilkins Slough is at un-manageable stage with the river potentially running about 450 cfs in May. This model run would result to no Delta pumping at Tracy with no summertime water available for public safety and M&I in the south delta. This operation would also create COA debt for Reclamation. In this study the compliance point would also be 56 degrees at Clear Creek. This scenario does show that there is more cold water available in the fall.

The third scenario is labeled as the "temperature optimal" plan from the SWRCB, 6b (3). This plan was also submitted on March 17, 2015. In this temperature model run, Shasta storage also increases but the Folsom storage drops to dead pool later in the year (November 2015). The Wilkins Slough problems continue in this model run, it also runs the river to very low levels. This run produces similar concerns to the salmonid plan where there is no CVP export in the Delta with the same impacts as the previous plan. The COA also develops a debt to Reclamation. In this study the compliance point is also set at 56 degrees at Clear Creek. This scenario also shows an increase in the cold water pool available for the fall temperature operations.

For this submittal, Reclamation has added a fourth scenario, 6b (4). In this scenario Reclamation took the base temperature operation from 6b (1) and increased the temperature target at Shasta by one degree. This study had no effect to the broader system operations as compared to the base forecast run 6b (1). However this study indicates that temperature compliance at Clear Creek would exceed 56 degrees several times for short periods through the summer. This scenario stretches out the temperature seasonal temperature actions similar to the 6b (3) scenario, but does not create the other detrimental system effects identified with 6b (2) and 6b (3).

## Scenario Differences

	6 b (1) Reclamation	6 b (2) Salmonid Plan	6 b (3) "Temp Optimal" (SWCB Scenario)
	Keswick (cfs)	Keswick (cfs)	Keswick (cfs)
April	5600	3250	3250
May	7589	5000	6000
June	8549	8000	8500
July	9234	8000	9000
August	7593	8000	8500
September	5000	6000	6000
October	4061	5500	5500
November	3389	5000	3389
December	3250	5000	3250
January	3250	3250	3250
February	3250	3250	3250

6 b (4) 53 deg target at Shasta Reclamation
Keswick (cfs)
5600
7589
8549
9234
7593
5000
4061
9989
3250
3250
3250

	6 b (1) Reclamation	6 b (2) Salmonid Plan	6 b (3) "Temp Optimal" (SWCB Scenario)
	Wilkins Slough	Wilkins Slough	Wilkins Slough
April	3800	453	453
May	3800	1211	2211
June	3800	3141	3641
July	3800	2206	3206
August	3800	3987	4487
September	3800	5050	5050
October	3500	4939	4939
November	3500	5110	3500
December	3500	5988	4238

6 b (4) 53 deg target at Shasta Reclamation
Wilkins Slough
3800
3800
3800
3800
3800
3800
3800
3500
3500
3500

EOS volume below 56	<b>199</b>	<b>399</b>	<b>256</b>
1st side gate ops	July 26	Aug 18	Aug 10
Side gate ops	Sept 11	Oct 22	Sept 17

<b>305</b>
Aug 23
Oct 20

90%

**Storages**

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

		Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	
Trinity		1147	1192	1158	967	847	740	634	575	544	512	496	503	540
	Elev.	2275	2272	2251	2237	2223	2207	2198	2193	2187	2184	2185	2192	
Whiskeytown		207	206	238	238	238	238	230	206	206	206	206	206	
	Elev.	1199	1209	1209	1209	1209	1209	1207	1199	1199	1199	1199	1199	
Shasta		2613	2752	2649	2377	2067	1666	1366	1204	1181	1226	1297	1418	1619
	Elev.	996	992	978	961	937	916	903	901	905	910	920	934	
Folsom		564	600	621	625	494	325	246	222	209	204	207	222	233
	Elev.	428	431	431	416	391	377	372	369	368	369	372	374	
New Melones		606	583	518	424	349	268	188	132	118	126	133	137	144
	Elev.	874	861	840	822	799	771	747	740	744	748	749	753	
San Luis		357	385	372	299	207	94	17	65	156	205	345	566	587
	Elev.	480	470	450	420	375	333	335	357	386	421	462	460	
Total		5717	5556	4930	4201	3331	2690	2428	2413	2479	2684	3052	3328	

**State End of the Month Reservoir Storage (TAF)**

Oroville		1735	1783	1785	1656	1465	1223	1049	989	982	894	894	979	1134
	Elev.	761	761	748	726	696	672	662	661	647	647	661	684	
San Luis		936	904	803	675	482	246	89	48	70	208	351	523	487
Total San Luis (TAF)		1293	1290	1175	974	689	340	106	113	226	413	696	1089	1074

**Monthly River Releases (TAF/cfs)**

Trinity	TAF	18	32	180	47	28	28	27	23	18	18	18	17
	cfs	300	540	2,924	783	450	450	450	373	300	300	300	300
Clear Creek	TAF	11	13	13	9	7	5	9	11	10	11	11	10
	cfs	175	218	216	150	120	85	150	175	175	175	175	175
Sacramento	TAF	200	333	467	509	568	467	297	250	202	200	200	180
	cfs	3250	5600	7589	8549	9234	7593	5000	4061	3389	3250	3250	3250
American	TAF	31	30	42	145	180	98	42	49	48	49	49	94
	cfs	500	500	687	2444	2933	1600	706	800	800	800	800	1692
Stanislaus	TAF	17	27	24	9	9	9	9	35	12	13	16	17
	cfs	280	460	384	150	150	150	150	577	200	206	261	309
Feather	TAF	49	48	49	77	141	108	88	55	48	49	49	44
	cfs	800	800	800	1300	2300	1750	1480	900	800	800	800	800

**Trinity Diversions (TAF)**

	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb
Carr PP	0	38	22	77	78	77	32	15	28	19	6	1
Spring Crk. PP	10	8	15	70	70	70	30	30	19	12	3	3

**Delta Summary (TAF)**

	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb
Tracy	80	45	31	25	25	25	107	133	67	157	229	45
USBR Banks	0	0	0	0	0	0	0	0	0	0	0	0
Contra Costa	3.5	8.7	8.7	8.7	8.0	8.3	8.7	3.5	4.3	4.7	4.7	3.5
Total USBR	84	53	39	34	33	33	116	137	71	162	234	49
State Export	90	45	31	35	35	35	31	60	157	170	215	38
Total Export	174	98	70	69	68	68	147	197	228	332	449	87
COA Balance	0	0	-11	-8	-10	-9	-4	-3	-4	-8	-8	-20

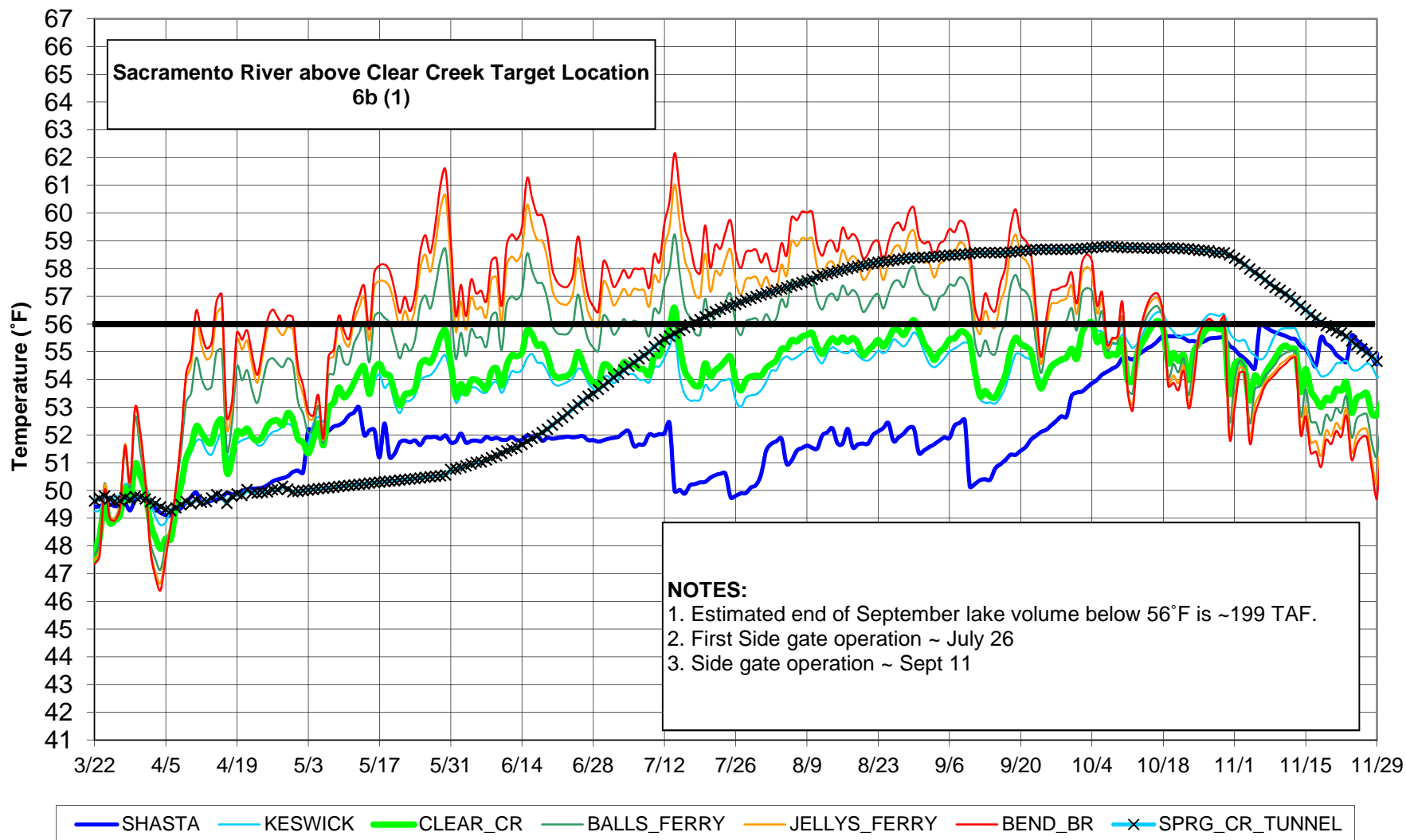
Old/Middle River Std.												
Old/Middle R. calc.	-2,316	-1,431	-1,072	-1,291	-1,250	-1,276	-2,293	-2,543	-3,197	-4,410	-5,829	-1,335

Computed DOI	5905	4085	4002	4001	3904	2993	3009	3497	3496	3497	4701	11400
Excess Outflow	1903	84	0	0	0	0	0	0	0	0	195	0
% Export/Inflow	32%	22%	15%	12%	11%	13%	29%	39%	47%	61%	65%	12%
% Export/Inflow std.	35%	35%	35%	35%	65%	65%	65%	65%	65%	65%	65%	45%

**Hydrology**

Water Year Inflow (TAF)	Trinity	830	Shasta	3,563	Folsom	867	New Melones	277
Year to Date + Forecasted % of mean	69%	64%	32%	26%				

### Sacramento River Modeled Temperature 2015 March 90%-Exceedance Outlook



90% Salmonid Plan

Storages

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

		Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb
Trinity	1147	1192	1162	975	855	748	642	538	520	507	503	510	546
	Elev.	2275	2272	2252	2238	2224	2209	2191	2188	2186	2185	2187	2193
Whiskeytown	207	206	238	238	238	238	238	230	206	206	206	206	206
	Elev.	1199	1209	1209	1209	1209	1209	1207	1199	1199	1199	1199	1199
Shasta	2613	2752	2785	2667	2389	2063	1736	1558	1433	1363	1315	1436	1637
	Elev.	996	998	992	979	961	941	929	921	915	912	921	935
Folsom	564	600	537	426	296	59	16	-6	-	-	-	-	-
	Elev.	428	421	407	386	313	271	-	-	-	-	-	-
New Melones	606	583	518	424	349	268	188	132	118	126	133	137	144
	Elev.	874	861	840	822	799	771	747	740	744	748	749	753
San Luis	357	385	327	224	107	-31	-132	-17					
	Elev.	480	463	438	401	342	--	--	345	390	436	476	473
<b>Total</b>		5717	5567	4953	4233	3345	2688	2435					

State End of the Month Reservoir Storage (TAF)

Oroville	1735	1783	1758	1630	1438	1196	1022	962	955	868	868	953	1107
	Elev.	761	759	745	723	692	668	658	657	643	643	657	680
San Luis	936	904	776	636	423	177	21	-24	-1	136	279	451	415
<b>Total San Luis (TAF)</b>		1293	1290	1103	860	530	147	-111	-41	161	444	835	1224

Monthly River Releases (TAF/cfs)

Trinity	TAF	18	32	180	47	28	28	27	23	18	18	18	17
	cfs	300	540	2,924	783	450	450	450	373	300	300	300	300
Clear Creek	TAF	11	13	13	9	7	5	9	11	10	11	11	10
	cfs	175	218	216	150	120	85	150	175	175	175	175	175
Sacramento	TAF	200	193	307	476	492	492	357	338	297	307	200	180
	cfs	3250	3250	5000	8000	8000	8000	6000	5500	5000	5000	3250	3250
American	TAF	31	114	158	145	249	67						
	cfs	500	1912	2576	2438	4053	1088	713	800	800	800	800	1600
Stanislaus	TAF	17	27	24	9	9	9	9	35	12	13	16	17
	cfs	280	460	384	150	150	150	150	577	200	206	261	309
Feather	TAF	49	74	49	77	141	108	88	55	48	49	49	44
	cfs	800	1252	800	1300	2300	1750	1480	900	800	800	800	800

Trinity Diversions (TAF)

	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb
Carr PP	0	34	18	77	78	77	77	2	9	7	6	2
Spring Crk. PP	10	4	11	70	70	70	75	17	0	0	3	4

Delta Summary (TAF)

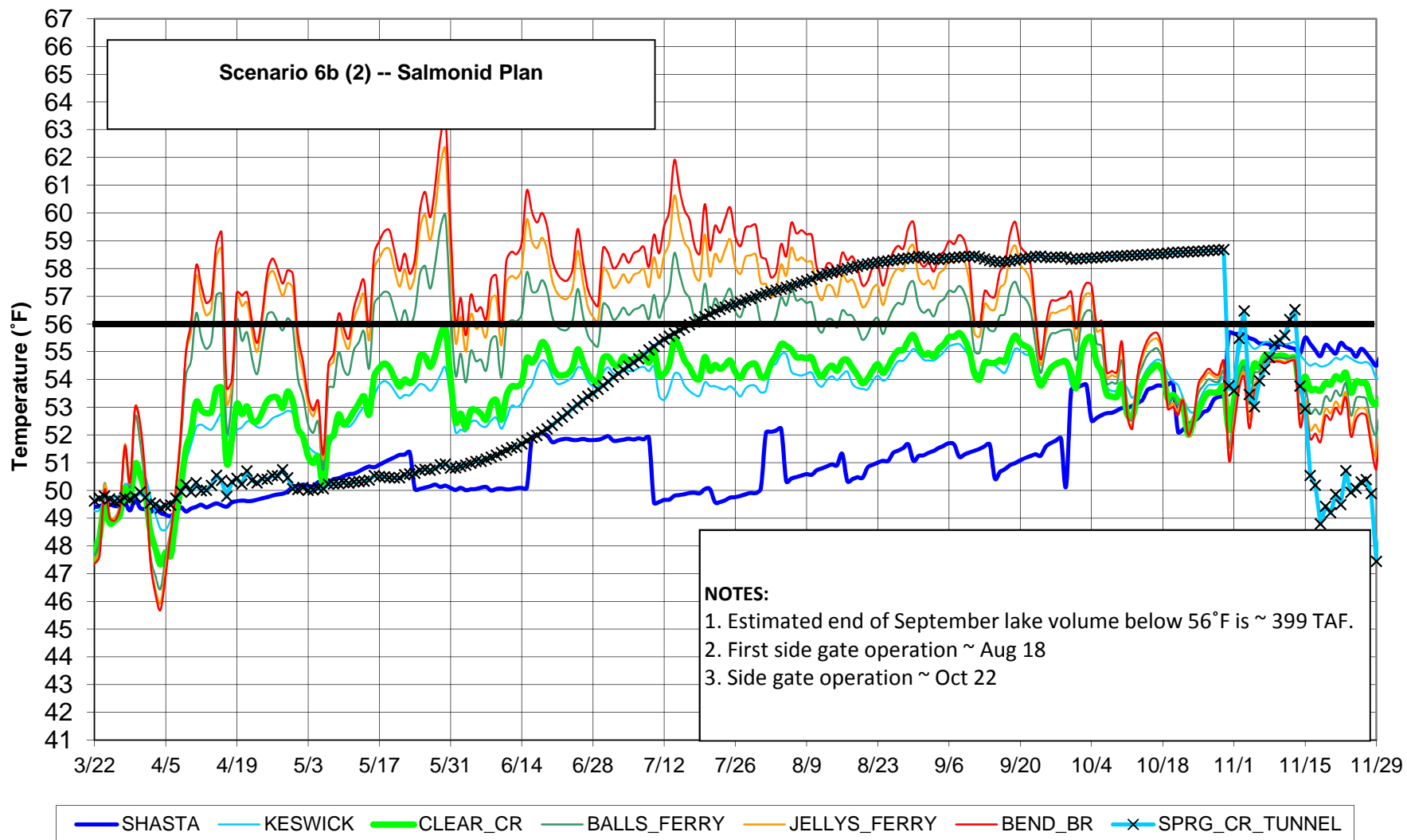
	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb
Tracy	80	0	0	0	0	0						
USBR Banks	0	0	0	0	0	0	0	0	0	0	0	0
Contra Costa	3.5	8.7	8.7	8.7	8.0	8.3	8.7	3.5	4.3	4.7	4.7	3.5
<b>Total USBR</b>	84	9	9	9	8	8						
State Export	90	18	18	15	25	35	25	60	157	170	215	38
<b>Total Export</b>	174	27	27	24	33	43						
COA Balance	0	0	-23	-37	-42	-37	-37	-37	-37	-42	-47	-58
<b>Old/Middle River Std.</b>												
Old/Middle R. calc.	-2,316	-506	-533	-709	-811	-963	-3,070	-3,646	-4,440	-5,763	-5,979	-1,335
<b>Computed DOI</b>	5905	4001	4002	4001	3904	2993	3009	3497	3496	3497	4506	11400
Excess Outflow	1903	0	0	0	0	0	0	0	0	0	0	0
% Export/Inflow	32%	5%	5%	3%	5%	8%						
% Export/Inflow std.	35%	35%	35%	35%	65%	65%	65%	65%	65%	65%	65%	45%

Hydrology

Water Year Inflow (TAF)	Trinity	830	Shasta	3,563	Folsom	867	New Melones	277
Year to Date + Forecasted % of mean		69%		64%		32%		26%



### Sacramento River Modeled Temperature 2015 March 90%-Exceedance Outlook



90% Temperature optimal SWCB scenario

Storages

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

		Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb
Trinity	1147	1192	1162	975	855	748	642	538	520	507	503	510	546
	Elev.	2275	2272	2252	2238	2224	2209	2191	2188	2186	2185	2187	2193
Whiskeytown	207	206	238	238	238	238	238	230	206	206	206	206	206
	Elev.	1199	1209	1209	1209	1209	1209	1207	1199	1199	1199	1199	1199
Shasta	2613	2752	2785	2606	2298	1911	1554	1377	1251	1278	1337	1458	1660
	Elev.	996	998	989	974	952	929	916	907	909	913	922	936
Folsom	564	600	537	487	386	210	196	172	159	58	-2		
	Elev.	428	421	415	401	369	366	360	356	312	BNDA	BNDA	BNDA
New Melones	606	583	518	424	349	268	188	132	118	126	133	137	144
	Elev.	874	861	840	822	799	771	747	740	744	748	749	753
San Luis	357	385	327	224	107	-31	-132	-17	163	308	511	744	764
	Elev.	480	463	438	401	342	--	--	345	390	431	472	470
<b>Total</b>		5717	5567	4953	4233	3345	2686	2431	2416	2482			

State End of the Month Reservoir Storage (TAF)

Oroville	1735	1783	1758	1630	1438	1196	1022	962	955	868	868	953	1107
	Elev.	761	759	745	723	692	668	658	657	643	643	657	680
San Luis	936	904	776	636	423	177	21	-24	-1	136	279	451	415
<b>Total San Luis (TAF)</b>		1293	1290	1103	860	530	147	-111	-41	161	444	1195	1180

Monthly River Releases (TAF/cfs)

Trinity	TAF	18	32	180	47	28	28	27	23	18	18	18	17
	cfs	300	540	2,924	783	450	450	450	373	300	300	300	300
Clear Creek	TAF	11	13	13	9	7	5	9	11	10	11	11	10
	cfs	175	218	216	150	120	85	150	175	175	175	175	175
Sacramento	TAF	200	193	369	506	553	523	357	338	202	200	200	180
	cfs	3250	3250	6000	8500	9000	8500	6000	5500	3389	3250	3250	3250
American	TAF	31	114	97	115	188	36	42	49	143			
	cfs	500	1912	1576	1938	3053	588	714	800	2408	1800	800	1600
Stanislaus	TAF	17	27	24	9	9	9	9	35	12	13	16	17
	cfs	280	460	384	150	150	150	150	577	200	206	261	309
Feather	TAF	49	74	49	77	141	108	88	55	48	49	49	44
	cfs	800	1252	800	1300	2300	1750	1480	900	800	800	800	800

Trinity Diversions (TAF)

	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb
Carr PP	0	34	18	77	78	77	77	2	9	7	6	2
Spring Crk. PP	10	4	11	70	70	70	75	17	0	0	3	4

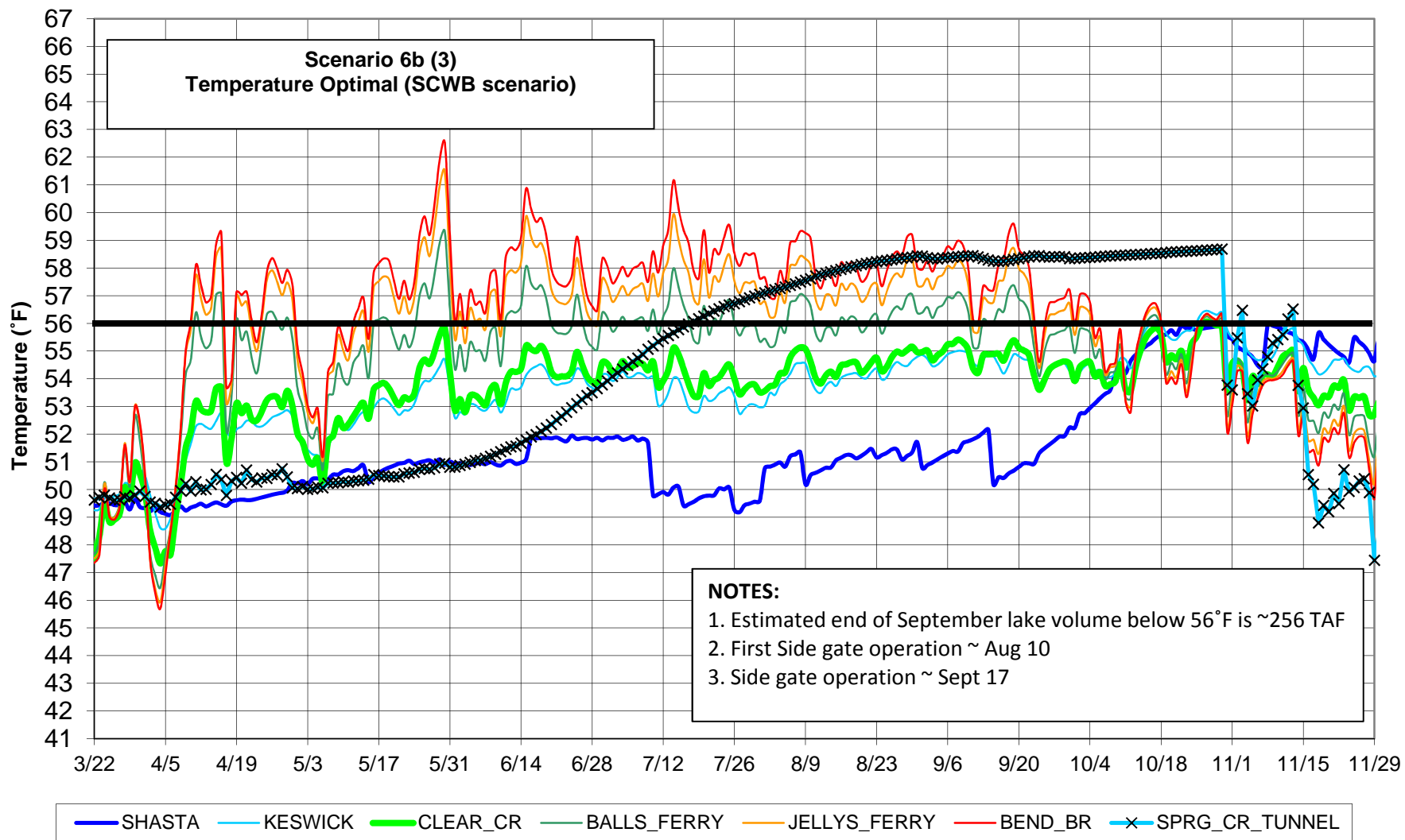
Delta Summary (TAF)

	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb
Tracy	80	0	0	0	0	0	173	221	163			
USBR Banks	0	0	0	0	0	0	0	0	0	0	0	0
Contra Costa	3.5	8.7	8.7	8.7	8.0	8.3	8.7	3.5	4.3	4.7	4.7	3.5
<b>Total USBR</b>	84	9	9	9	8	8	182	225	167			
State Export	90	18	18	15	25	35	25	60	157	170	215	38
<b>Total Export</b>	174	27	27	24	33	43	207	285	324			
COA Balance	0	0	-23	-37	-42	-37	-37	-37	-37	-42	-47	-58
<b>Old/Middle River Std.</b>												
Old/Middle R. calc.	-2,316	-506	-533	-709	-811	-963	-3,070	-3,646	-4,440	-5,199	-5,979	-1,335
<b>Computed DOI</b>	5905	4001	4002	4001	3904	2993	3009	3497	3496	3497	4506	11400
Excess Outflow	1903	0	0	0	0	0	0	0	0	0	0	0
% Export/Inflow	32%	5%	5%	3%	5%	8%	37%	48%	56%			
% Export/Inflow std.	35%	35%	35%	35%	65%	65%	65%	65%	65%	65%	65%	45%

Hydrology

Water Year Inflow (TAF)	Trinity	830	Shasta	3,563	Folsom	867	New Melones	277
Year to Date + Forecasted % of mean		69%		64%		32%		26%

### Sacramento River Modeled Temperature 2015 March 90%-Exceedance Outlook



**Sacramento River Modeled Temperature  
2015 March 90%-Exceedance Outlook  
53 degree target at Shasta**

