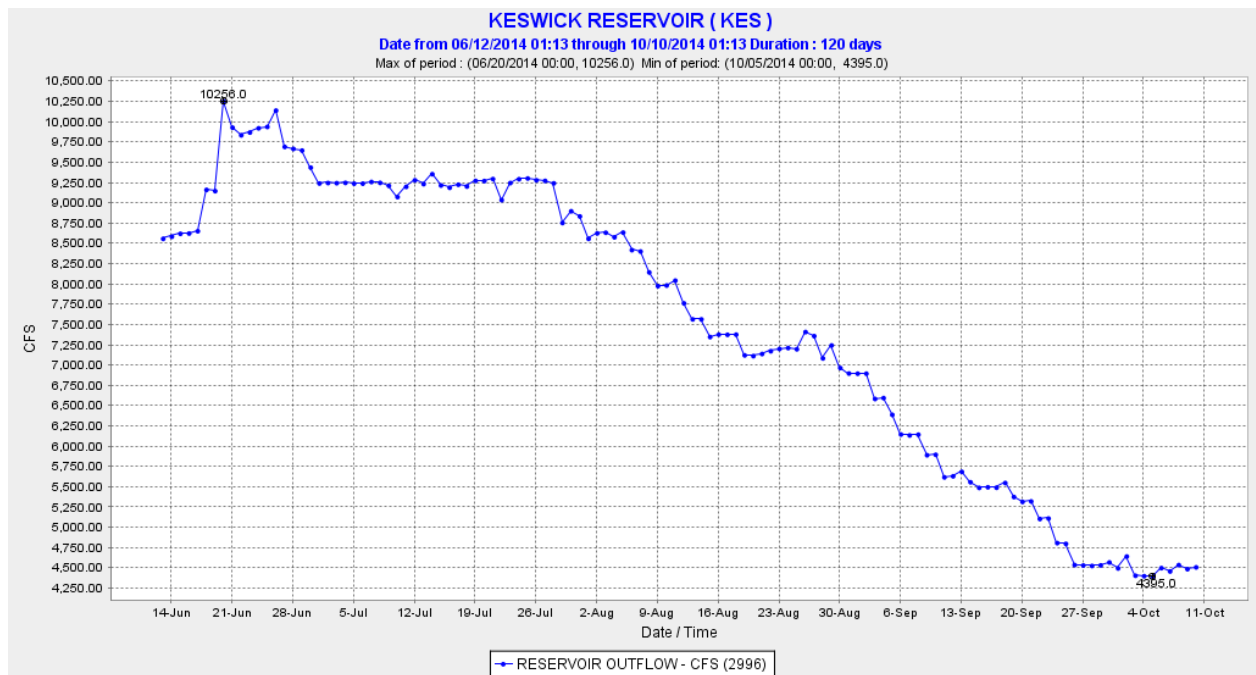


Demise of Winter Run in Summer 2014

Winter-run Chinook salmon were decimated in the upper Sacramento River last summer below Lake Shasta. The cold water pool ran out in late summer, leading to high water temperatures in the Sacramento River. However, blaming the drought only tells half the story. There was also a man-made part: water deliveries to contractors from May through September from Shasta's cold water pool were over 1 million acre-ft¹. Outflows from Shasta often exceeded minimum fish protection levels to meet delivery demands (3000-5000 cfs). So not only did the Bureau of Reclamation run out of cold water, it ran out of water period, and much of the spawning habitat was covered by water that was too shallow or even by no water at all². Conclusion: reed dewatering was probably biggest factor with water temperature a close second. Water temperatures in the spawning beds, already high because of high release temperatures at the Lake, likely got too warm from exposure to sun in shallow riffles. Low flows, lack of fry rearing habitat, and poor migration conditions were probably also factors.

It was not a good idea to provide a 75% allocation to the Sacramento River contractors.

The following graphs from the California Data Exchange Center show how the cold water pool ran out about August 30, just as deliveries to exchange contractors (and thus flows) were ramping down. With less water moving downstream, the already too-warm water heated up faster; with less water covering redds and emerging juveniles, water and fish alike heated up faster in the sun.



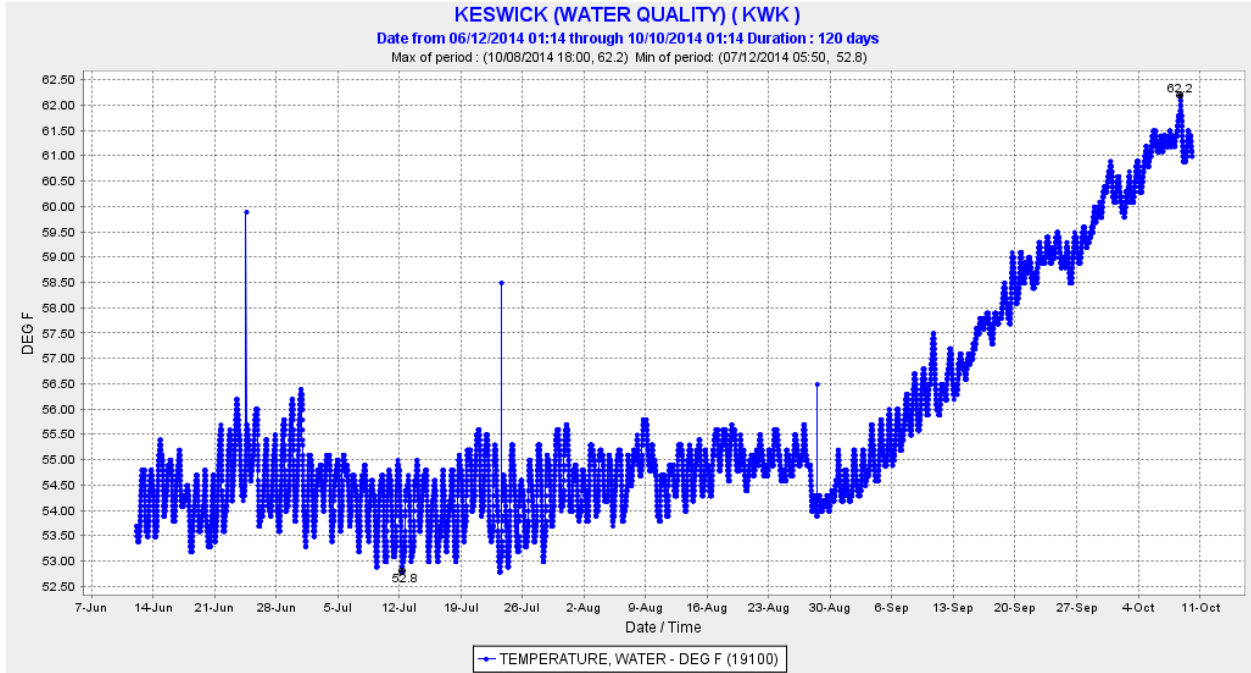
¹ http://www.usbr.gov/mp/cvo/vungvari/table_28_2014.pdf

²

<http://www.calfish.org/ProgramsData/ConservationandManagement/CDFWUpperSacRiverBasinSalmonidMonitoring.aspx>

FIGURE 1. SUMMER 2014 SHASTA RELEASES.

FIGURE 2. THE COLD WATER POOL IN SHASTA RESERVOIR WAS GONE BY THE END OF



AUGUST.

MONTHLY DELIVERIES IN SACRAMENTO VALLEY IN 2014.

Table 28

U. S. Department of Interior - Bureau of Reclamation
Central Valley Operations Office

Monthly Deliveries in AF	Sacramento River												
	2014												
Water Users	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Anderson-Cottonwood Irrigation District	0	0	0	7,416	17,645	14,526	15,360	14,986	13,243	0	0	0	83,176
Andreotti, Arnold, et al	0	0	0	0	462	436	397	342	0	0	0	0	1,637
Baber, Jack, et al	0	0	0	64	427	954	703	401	0	0	0	0	2,549
Carter Mutual Water Company	0	0	0	0	756	847	486	602	0	109	0	0	2,800
Conaway Preservation Group, LLC	0	0	0	0	1,833	438	3,699	429	1,119	2,914	0	0	10,432
Eastside Mutual Water Company	0	0	0	323	170	290	175	175	0	0	0	0	1,133
Forry, Laurie	0	0	0	75	85	117	94	91	53	0	0	0	515
Furlan Joint Venture (Area 1)	0	0	0	7	111	98	92	21	0	0	0	0	329
Furlan Joint Venture (Area 2)	0	0	0	0	0	0	0	0	0	0	0	0	0
Glenn-Colusa Irrigation District	0	0	0	14,848	127,415	133,617	132,052	97,589	26,542	17,481	0	0	549,544
Green Valley Corporation	0	0	0	0	81	11	99	134	24	0	0	0	349
Griffin & Prater Tenancy-in-Common	0	0	0	0	276	334	210	324	32	42	0	0	1,218
Henle Family Limited Partnership	0	0	0	18	247	171	152	72	0	0	0	0	660
Hiatt Family Trust	0	0	0	0	147	158	167	100	90	0	0	0	662
Hiatt Family Trust/Illicher Family Trust	0	0	0	0	161	94	86	82	0	0	0	0	423
Howald Farms, Inc.	0	0	0	132	283	333	325	181	0	38	0	0	1,292
Yolo Land Trust	0	0	0	0	0	72	4	61	36	0	0	0	173
Lomo Cold Storage	0	0	0	0	493	1,327	1,293	1,117	307	0	0	0	4,537
M & T, Inc.	0	0	0	54	1,396	1,910	1,724	1,287	1,161	900	0	0	8,432
Maxwell Irrigation District	0	0	0	0	0	0	0	0	0	2,865	0	0	2,865
MCM Properties, Inc.	0	0	0	0	70	104	85	43	0	0	0	0	302
Meridian Farms Water Company	0	0	0	672	4,348	5,208	5,297	4,001	1,147	0	0	0	20,673
Natomas Central Mutual Water Company	0	0	0	636	19,511	16,659	20,362	12,618	842	2,720	0	0	73,348
O'Brien, Janice	0	0	0	5	51	200	123	0	0	0	0	0	379
Oji Brothers Farm, Inc.	0	0	0	19	309	524	438	194	0	0	0	0	1,484
Oji, Mitsue, Family Partnership	0	0	0	59	668	646	528	124	0	0	0	0	2,025
Pelger Mutual Water Company	0	0	0	0	917	1,008	350	274	15	0	0	0	2,564
Pleasant Grove-Verona MWC	0	0	0	48	991	218	1,466	658	28	0	0	0	3,409
Princeton-Codora-Glenn Irrigation District	0	0	0	352	10,507	7,807	9,939	8,645	1,503	2,425	0	0	41,178
Provident Irrigation District	0	0	0	350	6,300	5,202	6,176	2,077	0	7,742	0	0	27,847
Rauf, Abdul & Tahmina	0	0	0	5	274	430	257	141	96	0	0	0	1,203
Reclamation District #1004	0	0	0	669	6,758	7,177	8,924	4,203	1,210	11,125	0	0	40,066
Reclamation District #108	0	0	0	2,220	31,295	27,463	30,223	19,727	6,343	5,063	0	0	122,334
Cranmore Farms (Reynen)	0	0	0	354	899	1,437	1,272	471	387	1,052	0	0	5,872
Richter Brothers, et al	0	0	0	47	404	400	287	111	0	0	0	0	1,249
River Garden Farms	0	0	0	223	3,243	3,172	2,921	2,654	421	0	0	0	12,634
Robert's Ditch Irrigation Company	0	0	0	103	88	24	0	0	0	0	0	0	215
Sacramento River Ranch, LLC	0	0	0	85	322	168	420	232	232	0	0	0	1,459
Sutter Mutual Water Company	0	0	0	6,048	30,749	32,065	37,828	27,620	5,114	7,729	0	0	147,153
Sycamore Family Trust	0	0	0	184	3,422	3,671	4,863	3,448	735	430	0	0	16,753
Tarke, Stephen	0	0	0	0	16	24	83	93	82	0	0	0	298
Tisdale Irrigation and Drainage Company	0	0	0	59	1,107	1,163	1,481	1,247	400	0	0	0	5,457
Knights Landing Investors, LLC	0	0	0	0	200	98	522	490	364	0	0	0	1,674
Otterson, Mike	0	0	0	17	145	157	55	57	0	0	0	0	431
Wilson Ranch Partnership	0	0	0	0	0	0	0	0	0	0	0	0	0
Windswept Land & Livestock	0	0	0	10	211	197	302	225	160	0	0	0	1,105
Total	0	0	0	35,102	274,793	270,955	291,320	207,347	61,686	62,635	0	0	1,203,838

* Delivery data is based on District turn-out readings and may include water in addition to water service contract deliveries.