

Stanislaus River Operations Group

DRAFT Meeting Notes

Date 28 April 2010

Attendees

Liz Vasquez, Randi Field, Liz Kiteck, Rachel Barnett-Johnson, John Hannon, and Carol Nicolos, USBR; Barb Byrne, NMFS; J.D. Wikert and Nick Hindman, FWS; Andy Chu, DWR; Kari Kyler (phone), SWRCB; and Tim Heyne (phone), DFG.

Handouts

- Agenda
- NMFS OCAP Biological Opinion: Reasonable and Prudent Alternatives Ref.
- Graph; Chinook Salmon Count
- New Melones Lake Daily Operations, Run Date: April 28, 2010
- Tulloch Reservoir Daily Operations, Run date: April 28, 2010
- Goodwin Reservoir Daily Operations, Run date: April 28, 2010
- New Melones - Stanislaus River Basin
- Goodwin Dam Discharge; 3/24/2010 – 4/28/2010
- Reservoir Storage; End of Month
- Proposed Goodwin Releases for May 2010
- Orange Blossom Bridge Temperatures through April 28, 2010
- Estimated Knights Ferry Temperatures through April 28, 2010
- Preliminary – Stanislaus River April 50% Exceedence Outlook
- Preliminary – Stanislaus River April 90% Exceedence Outlook
- January Temp Relationship between Orange Blossom and Knights Ferry
- February Temp Relationship between Orange Blossom and Knights Ferry
- March Temp Relationship between Orange Blossom and Knights Ferry
- April Temp Relationship between Orange Blossom and Knights Ferry
- May Temp Relationship between Orange Blossom and Knights Ferry
- Evaluation of Historical New Melones Water Supply and Runoff Forecasts
- Historical Water Year Types applied to IPO and NMFS methods

Agenda Items/Announcements:

River 2D project is ongoing, with one more field study to take place at the end of May; open invitation to those who would like to come out and see Reclamation is doing.

FWS is trying to develop projects that will build floodplain habitats. This is in an attempt to increase the survival of the juveniles leaving the river and to make the ecosystem closer to what it was historically.

On May 7th there will be kayak trip from Knight's Ferry to Honolulu Bar organized by FWS if anyone has a kayak and wants to join.

Gravel Augmentation:

The Biological Opinion requires Reclamation submit a gravel plan to NMFS by June 2010. It was requested that a NMFS representative be available to help with the AFRP work plan. The deadline of summer 2011 to begin gravel augmentation in the Stanislaus system is a reasonable deadline. A question was raised about the units used in the wording of the BO; in places it uses 50,000 yd³ and in another place uses 50,000 tons. Clarification will be presented to the group at the next meeting by NMFS. Honolulu Bar should be included in the gravel plan as it will include a gravel augmentation component in the restoration project.

A Notice of Intent is on the street for the Lover's Leap restoration project including approximately one mile of riparian shoreline. If everything runs smoothly the project could be started as early as next summer, but a more realistic time frame is a summer of 2012 start date.

Screw Trap:

Screw trap data suggest that pulses of fish correlate with pulses of water in the Stanislaus system. The numbers are low possibly because the escapement is low. FWS had not seen a specific report on the size of fish being reported. On the chart there were drops in the flow possibly from old data as it is highly unlikely that the flows reduced to 0 at any point.

There has been discussion with Fish and Game about doing "pit-tagging" in the Stanislaus to determine some point source mortality. It would be beneficial to locate the hot spots. The target is to begin next year and it is hoped to tag at least 1,000 fish. The tags cost approximately \$3.00 - \$4.00 each and have their own "fingerprint" which will ensure no duplication. It is hoped to be able to get funding through the AFRP process.

Otolith Project:

Currently we are looking at reconstructing the size of juvenile fish that leave the Stanislaus system, then survive to adulthood, and return to the Stanislaus River to spawn. The objective is to determine what size the fish are when they leave their natal river. Reclamation and FWS is continuing with the study. The data has an error margin of +/- 2 weeks. The current study used the 2000 year for out migration and years 2001, 2002 and 2003 for returns. More information will be available to the group at the May meeting.

Operations Summary:

New Melones Lake has had an approximate increase of 1,300 AF over the past month (very small increase, even with the recent rain events). Tulloch should begin to see spring fill so its elevation will begin to increase. The snowpack is not looking good for New Melones or the Stanislaus and yearly precipitation has been between 70 and 90% of average.

Goodwin releases started the prior 30 days at 200 cfs as per the RPA flow schedule. Releases were then increased to 1,350 cfs and lowered to 1,000 cfs around the 10th until April 28, the date of the meeting. There are two Tri-dam gauges on the canals that measure diversion flows. Goodwin releases for May will hold at 1,000 cfs through the

15th then drop to 800 cfs; it will then releases will drop to 200 cfs. During the scheduled operation on the Stanislaus the flows will increase to mid-flow range for the survey. FWS stated that a slower operational ramp down might have riparian habitat benefits. Cottonwood and willows can grow root tips at about an inch a day and if the water drops faster than that the trees may be unable to take root and establish in an area. NMFS will check on the optimal ramp down for riparian vegetation recruitment.

Reclamation maintained that operations when possible should follow the flow schedule in the BiOp and unless otherwise directed that would be the ramp-down schedule used.

The 90% Exceedence Forecast for the end of September at New Melones is at 841,000 AF which is approximately 35% of capacity; in other words very low.

Temps:

Orange Blossom Bridge is experiencing large daily swings in average air temperature, causing it to be within .3° of the 7-day maximum criterion.

Knights Ferry hasn't been able to reach the target threshold consistently for approximately two months. The temperature leaving New Melones is approximately 51° which gives only a 1° buffer for temperatures between New Melones and Knights Ferry.

Simulated maximum mean six-hour temperature simulation from 1 April to the end of December indicates problems during the April/May timeline and again at the end of September to November (50% hydrology). The 90% forecast shows a similar trend with slightly less of a problem in the summer and more of a problem in late fall.

The preliminary temperature outlook indicates Knight's Ferry target temperature of 52° for May and Orange Blossom Bridge's target of 55° will both be exceeded during the next 30 days. Reclamation will be sending NMFS notification of the temperature exceedences that may occur in May.

Next Meeting

Date: Wednesday, 19 May 2010

Location: Central Valley Operations Office
3310 El Camino Ave.
Sacramento, CA 95821

Room: 302

Time: 1300

Notes by: Carol Nicolos and Liz Vasquez

AGENDA
Stanislaus Operations Group
April 28, 2010
Central Valley Operations Office, 3310 El Camino Avenue, Room 300, Sacramento, CA
95821
1:00 PM to 3:00 PM
Telecon Number 1-866-757-8460
Participant Code #9068008

RPA Action

Agenda Items

Announcements

Fishery and Restoration Updates

Section 11.2.1.3

Fish Monitoring and Reporting

-Escapement Survey

-Caswell screw trap

Action III.2.1

Gravel Augmentation

Stanislaus Operations Summary

Action III.1.2

Temperature Criterion

Action III.1.3

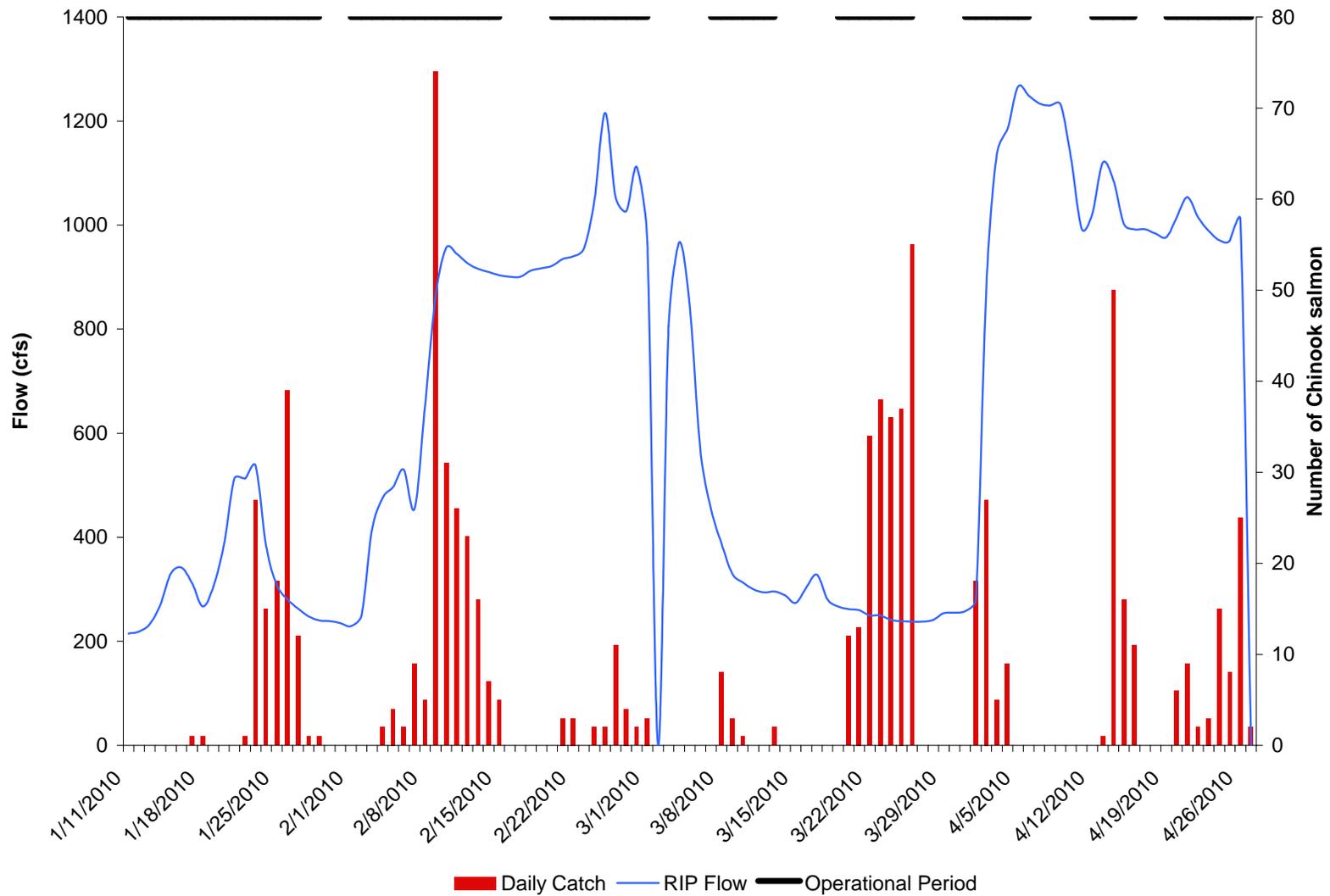
Minimum Flow

Action IV.2.1

San Joaquin Inflow Export Ratio and VAMP

NMFS OCAP Biological Opinion: Reasonable and Prudent Alternatives (RPAs) References

ACTION ID	PAGE #	RPA NAME
Section 11.2.1.3	584	Monitoring and Reporting: (e) Adult escapement and juvenile monitoring for steelhead on the Stanislaus River
Action III.1.1	581-583,620	Establish Stanislaus Operational Group (SOG) for Real-Time Operational Decision-Making
Action III.1.2	620-621	Provide Cold Water Releases to Maintain Suitable Steelhead Temperatures.
Action III.1.3	622-625, Appendix 2-E	Operate the East Side Division Dams to Meet the Minimum Flows, as Measured at Goodwin Dam.
Action III.2.1	626	Increase and Improve Quality of Spawning Habitat with addition of 50,000 Cubic Yards of Gravel by 2014 and with a Minimum Addition of 8,000 Cubic Yards per Year for the Duration of the Project Actions.
Action III.2.2	627	Conduct Floodplain Restoration and Inundation in Winter or Spring to Inundate Steelhead Juvenile Rearing Habitat on One- to Three- Year Schedule.
Action III.2.3	627	Restore Freshwater Migratory Habitat for Juvenile Steelhead by Implementing Projects to Increase Floodplain Connectivity and to Reduce Predation Risk During Migration.
Action III.2.4	628	Evaluate Fish Passage at New Melones, Tulloch, and Goodwin Dams
Action IV.2.1	641	Phase I: Interim Operations in 2010-2011: Reclamation shall increase its releases at Goodwin Reservoir, if necessary, in order to meet the flows required at Vernalis



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

APRIL 2010

NEW MELONES LAKE DAILY OPERATIONS

RUN DATE: April 28, 2010

DAY	ELEV	STORAGE		COMPUTED* INFLOW C.F.S.	POWER	RELEASE - C.F.S.		EVAPORATION		PRECIP INCHES
		1000 ACRE-FEET IN LAKE	CHANGE			SPILL	OUTLET	C.F.S.	INCHES	
		1,267.4								
1	976.52	1,265.2	-2.2	1,157	2,231	0	0	22	.08	.00
2	976.17	1,262.3	-2.9	1,135	2,564	0	0	46	.17	.00
3	975.94	1,260.4	-1.9	1,050	1,983	0	0	35	.13	.31
4	975.70	1,258.4	-2.0	1,359	2,355	0	0	11	.04	.00
5	975.47	1,256.5	-1.9	1,842	2,788	0	0	19	.07	1.22
6	975.12	1,253.6	-2.9	1,244	2,691	0	0	22	.08	.02
7	974.74	1,250.4	-3.2	1,313	2,864	0	0	40	.15	.00
8	974.48	1,248.3	-2.2	1,188	2,242	0	0	32	.12	.00
9	974.37	1,247.3	-0.9	1,444	1,872	0	0	32	.12	.00
10	974.24	1,246.3	-1.1	1,334	1,845	0	0	32	.12	.00
11	974.24	1,246.3	+0.0	1,587	1,563	0	0	24	.09	.00
12	974.34	1,247.1	+0.8	2,633	2,057	0	0	158	.59	1.50
13	974.43	1,247.8	+0.7	2,063	1,641	0	0	46	.17	.72
14	974.70	1,250.1	+2.2	1,479	326	0	0	24	.09	.00
15	974.80	1,250.9	+0.8	1,643	1,158	0	0	67	.25	.00
16	975.01	1,252.6	+1.7	1,769	872	0	0	19	.07	.00
17	975.13	1,253.6	+1.0	1,433	889	0	0	40	.15	.00
18	975.09	1,253.3	-0.3	1,753	1,851	0	0	70	.26	.00
19	975.03	1,252.8	-0.5	1,819	2,033	0	0	38	.14	.00
20	975.26	1,254.7	+1.9	2,748	1,775	0	0	8	.03	1.11
21	975.54	1,257.1	+2.3	2,759	1,562	0	0	22	.08	.06
22	975.73	1,258.6	+1.6	2,422	1,619	0	0	5	.02	.42
23	976.14	1,262.1	+3.4	2,435	698	0	0	14	.05	.01
24	976.49	1,265.0	+2.9	2,413	903	0	0	35	.13	.00
25	976.66	1,266.4	+1.4	2,455	1,657	0	0	81	.30	.00
26	976.61	1,266.0	-0.4	2,147	2,298	0	0	60	.22	.00
27	976.97	1,269.0	+3.0	2,402	812	0	0	73	.27	.00
TOTALS			+1.3	49,026	47,149	0	0	1,075	3.99	5.37
ACRE-FEET			+1,300	97,243	93,520	0	0	2,132		

COMMENTS:

* COMPUTED INFLOW IS THE SUM OF CHANGE IN STORAGE, RELEASES AND EVAPORATION.

SUMMARY

POWER	RELEASE (ACRE-FEET)	OUTLET	PRECIPITATION
SPILL	93,520	0	THIS MONTH = 5.37
TOTAL	0	93,520	JULY 1, 2009 TO DATE = 33.71

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

APRIL 2010

TULLOCH RESERVOIR DAILY OPERATIONS

RUN DATE: 04/28/2010

DAY	ELEV	STORAGE		COMPUTED* INFLOW C.F.S.	NEW MELONES RELEASE	RELEASE - C.F.S.			EVAP C.F.S. (1)
		ACRE-FEET RES.	CHANGE			POWER	SPILL	OUTLET	
		56,127							
1	500.47	55,812	-315	2,407	2,231	1,841	0	722	3
2	500.77	56,138	+326	2,839	2,564	1,841	72	756	6
3	499.96	55,260	-878	2,263	1,983	1,839	0	862	5
4	499.87	55,164	-96	2,649	2,355	1,836	0	860	1
5	501.04	56,431	+1,267	3,213	2,788	1,840	0	732	2
6	502.00	57,490	+1,059	2,935	2,691	1,847	0	551	3
7	503.40	59,066	+1,576	3,103	2,864	1,855	0	447	6
8	503.68	59,385	+319	2,476	2,242	1,865	0	446	4
9	503.48	59,157	-228	1,985	1,872	1,862	94	140	4
10	503.18	58,815	-342	1,845	1,845	1,860	153	0	4
11	502.85	58,442	-373	1,612	1,563	1,741	56	0	3
12	504.10	59,866	+1,424	2,380	2,057	1,640	0	0	22
13	504.97	60,872	+1,006	1,878	1,641	1,365	0	0	6
14	503.38	59,043	-1,829	382	326	1,301	0	0	3
15	503.22	58,861	-182	1,237	1,158	1,320	0	0	9
16	502.63	58,196	-665	914	872	1,246	0	0	3
17	501.64	57,093	-1,103	933	889	1,484	0	0	5
18	502.36	57,893	+800	1,900	1,851	1,488	0	0	9
19	503.30	58,952	+1,059	2,043	2,033	1,504	0	0	5
20	504.00	59,750	+798	1,964	1,775	1,561	0	0	1
21	504.21	59,993	+243	1,693	1,562	1,567	0	0	3
22	504.33	60,132	+139	1,599	1,619	1,528	0	0	1
23	503.30	58,952	-1,180	873	698	1,466	0	0	2
24	502.46	58,005	-947	958	903	1,430	0	0	5
25	503.12	58,747	+742	1,714	1,657	1,329	0	0	11
26	504.63	60,479	+1,732	2,074	2,298	1,193	0	0	8
27	505.15	61,083	+604	1,522	812	1,207	0	0	10
TOTALS			+4,956	51,391	47,149	42,856	375	5,516	144
ACRE-FEET			+4,956	101,934	93,520	85,005	744	10,941	286

*COMPUTED INFLOW IS SUM OF CHANGE IN STORAGE, RELEASES, AND EVAPORATION.

SUMMARY
RELEASE (ACRE-FEET)

POWER	85,005	OUTLET	10,941
SPILL	744	TOTAL	96,690

OAKDALE IRRIGATION DISTRICT
 SOUTH SAN JOAQUIN IRRIGATION DISTRICT
 TRI DAMS PROJECT-CALIFORNIA

APRIL 2010

GOODWIN RESERVOIR DAILY OPERATIONS

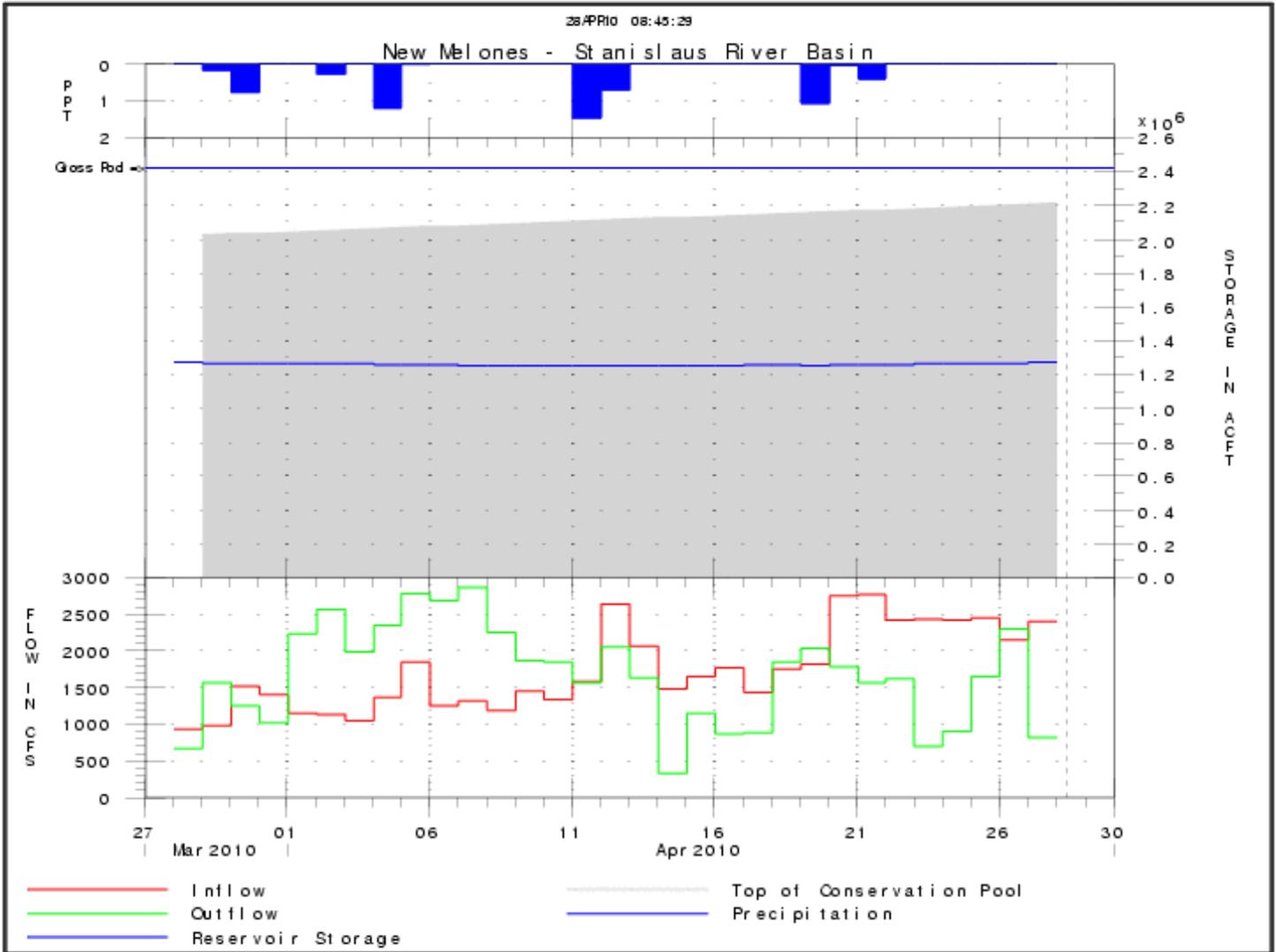
RUN DATE: April 28, 2010

DAY	ELEV	STORAGE		TULLOCH	RIVER		RELEASE - C.F.S.	
		ACRE-FEET RES.	CHANGE		RELEASE	OUTLET	SPILL	JOINT MAIN
		550						
1	360.66	583	+33	2,563	0	1,274	926	219
2	360.66	583	+0	2,669	0	1,354	929	214
3	360.66	583	+0	2,701	0	1,355	930	214
4	360.66	583	+0	2,696	0	1,359	919	215
5	360.66	583	+0	2,572	0	1,365	840	170
6	360.66	583	+0	2,398	0	1,353	799	74
7	360.66	583	+0	2,302	0	1,356	779	0
8	360.66	583	+0	2,311	0	1,358	785	0
9	360.52	573	-10	2,096	0	1,170	812	75
10	360.49	571	-2	2,013	0	1,005	872	154
11	360.49	571	+0	1,797	0	1,006	625	161
12	360.55	576	+5	1,640	0	1,014	446	164
13	360.49	571	-5	1,365	0	1,006	254	130
14	360.52	573	+2	1,301	0	999	223	103
15	360.52	573	+0	1,320	0	1,007	219	105
16	360.52	573	+0	1,246	0	1,022	109	91
17	360.52	573	+0	1,484	0	1,006	375	91
18	360.52	573	+0	1,488	0	1,008	376	91
19	360.52	573	+0	1,504	0	1,007	385	91
20	360.52	573	+0	1,561	0	1,010	446	91
21	360.49	571	-2	1,567	0	1,004	464	81
22	360.52	573	+2	1,528	0	1,000	458	58
23	360.52	573	+0	1,466	0	1,006	390	54
24	360.55	576	+3	1,430	0	1,007	351	54
25	360.52	573	-3	1,329	0	1,008	275	43
26	360.52	573	+0	1,193	0	1,004	148	34
27	360.49	571	-2	1,207	0	1,003	149	50
TOTALS			+21	48,747	0	30,066	14,284	2,827
ACRE-FEET			+21	96,690	0	59,636	28,332	5,607

JOINT MAIN OPERATED BY SSJID AND OID.
 SOUTH MAIN OPERATED BY OID.

SUMMARY
 RELEASE (ACRE-FEET)

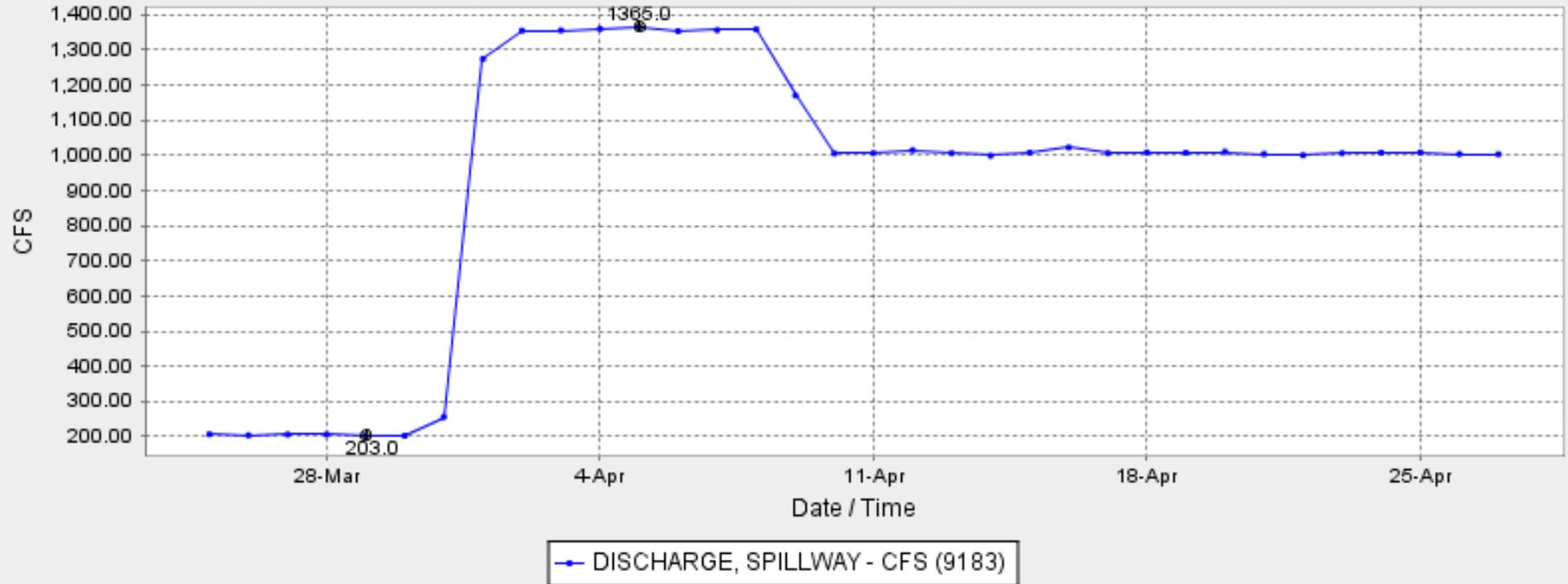
JOINT MAIN CANAL	28,332	OUTLET	0
SOUTH MAIN CANAL	5,607	SPILL	59,636
		TOTAL	93,575



GOODWIN DAM (GDW)

Date from 03/24/2010 09:26 through 04/28/2010 09:26 Duration : 35 days

Max of period : (04/05/2010 00:00, 1365.0) Min of period: (03/29/2010 00:00, 203.0)



Storages

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

		Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar
Trinity	1303	1461	1447	1402	1288	1190	1115	1100	1085	1096	1131	1211	1324
	Elev.	2300	2299	2295	2285	2275	2268	2266	2264	2266	2269	2277	2288
Whiskeytown	214	238	238	238	238	238	237	206	206	206	206	206	206
	Elev.	1209	1209	1209	1209	1209	1209	1199	1199	1199	1199	1199	1199
Shasta	3869	4108	4037	3618	3067	2685	2494	2330	2320	2450	2645	2997	3437
	Elev.	1052	1049	1033	1011	993	984	976	975	982	991	1008	1026
Folsom	562	698	786	726	573	494	452	380	297	251	271	347	495
	Elev.	439	448	442	425	416	410	400	387	378	382	395	416
New Melones	1267	1232	1199	1130	1029	919	841	818	829	843	856	881	912
	Elev.	972	968	960	946	931	919	915	917	919	922	925	930
San Luis	881	727	484	282	130	41	170	292	482	704	794	815	777
	Elev.	504	481	442	400	353	358	375	406	441	461	468	472
Total		8464	8190	7396	6324	5566	5308	5126	5220	5550	5902	6456	7151

Monthly River Releases (TAF/cfs)

Trinity	TAF	32	258	126	68	28	27	23	18	18	18	17	18
	cfs	540	4,189	2,120	1,102	450	450	373	300	300	300	300	300
Clear Creek	TAF	12	12	9	7	5	9	12	12	12	12	11	12
	cfs	200	200	150	120	85	150	200	200	200	200	200	200
Sacramento	TAF	268	461	684	784	599	387	400	268	200	200	180	200
	cfs	4500	7500	11500	12750	9750	6500	6500	4500	3250	3250	3250	3250
American	TAF	89	108	159	220	145	104	108	124	108	92	86	92
	cfs	1500	1750	2678	3574	2365	1750	1750	2090	1750	1500	1550	1500
Stanislaus	TAF	60	49	36	21	22	14	39	12	13	13	12	16
	cfs	1000	798	600	346	366	240	635	210	207	219	221	268

Trinity Diversions (TAF)

	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar
Carr PP	21	6	37	73	72	49	1	17	11	1	7	0
Spring Crk. PP	0	0	30	65	65	40	22	11	11	8	25	15

Delta Summary (TAF)

	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar
Tracy	48	49	180	260	260	256	255	252	263	134	100	130
USBR Banks	0	0	0	13	13	13	0	0	0	0	0	0
Contra Costa	6.4	6.4	6.4	4.9	5.6	6.4	7	8.4	9.2	9.2	7	7
Total USBR	54	56	186	278	279	275	262	260	272	143	107	137
Total Export	96	99	259	485	519	469	537	463	534	277	207	267
COA Balance	0	0	0	0	1	1	1	0	0	0	0	0

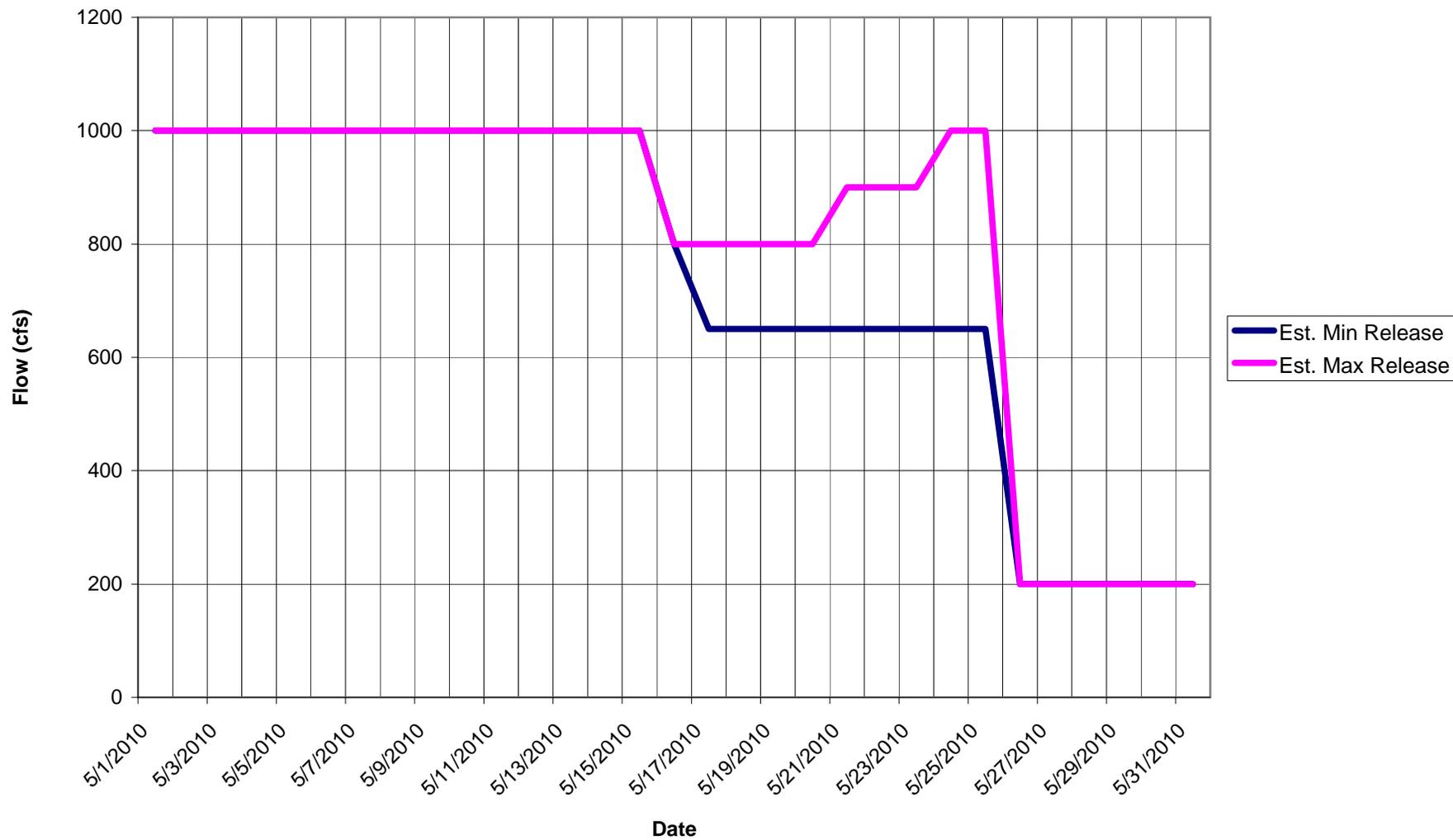
Old/Middle River Std.												
Old/Middle R. calc.	-91	-163	-2,921	-6,223	-6,650	-6,240	-6,511	-6,024	-6,727	-3,500	-2,794	-3,023

Computed DOI	12641	8475	7396	4994	3497	3043	4620	4505	5580	11940	13003	14706
Excess Outflow	1530	130	0	0	0	34	618	0	1074	5938	1603	3302
% Export/Inflow	9%	12%	27%	47%	58%	62%	65%	64%	65%	28%	22%	21%
% Export/Inflow std.	35%	35%	35%	65%	65%	65%	65%	65%	65%	65%	45%	35%

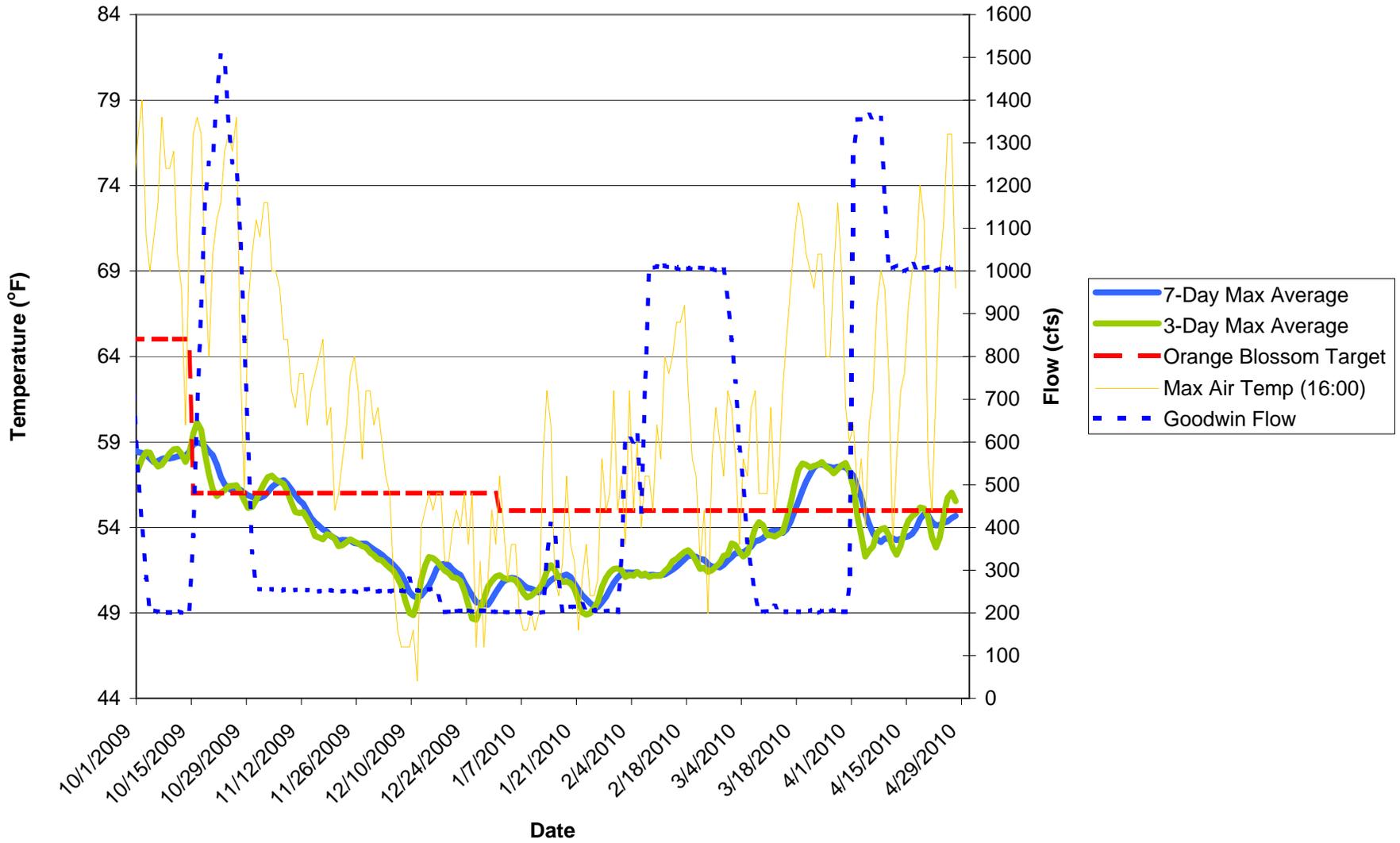
Hydrology

Water Year Inflow (TAF)	Clair Engle	Shasta	Folsom	New Melones
Year to Date + Forecasted % of mean	1156 96%	4,882 88%	1,655 61%	781 74%

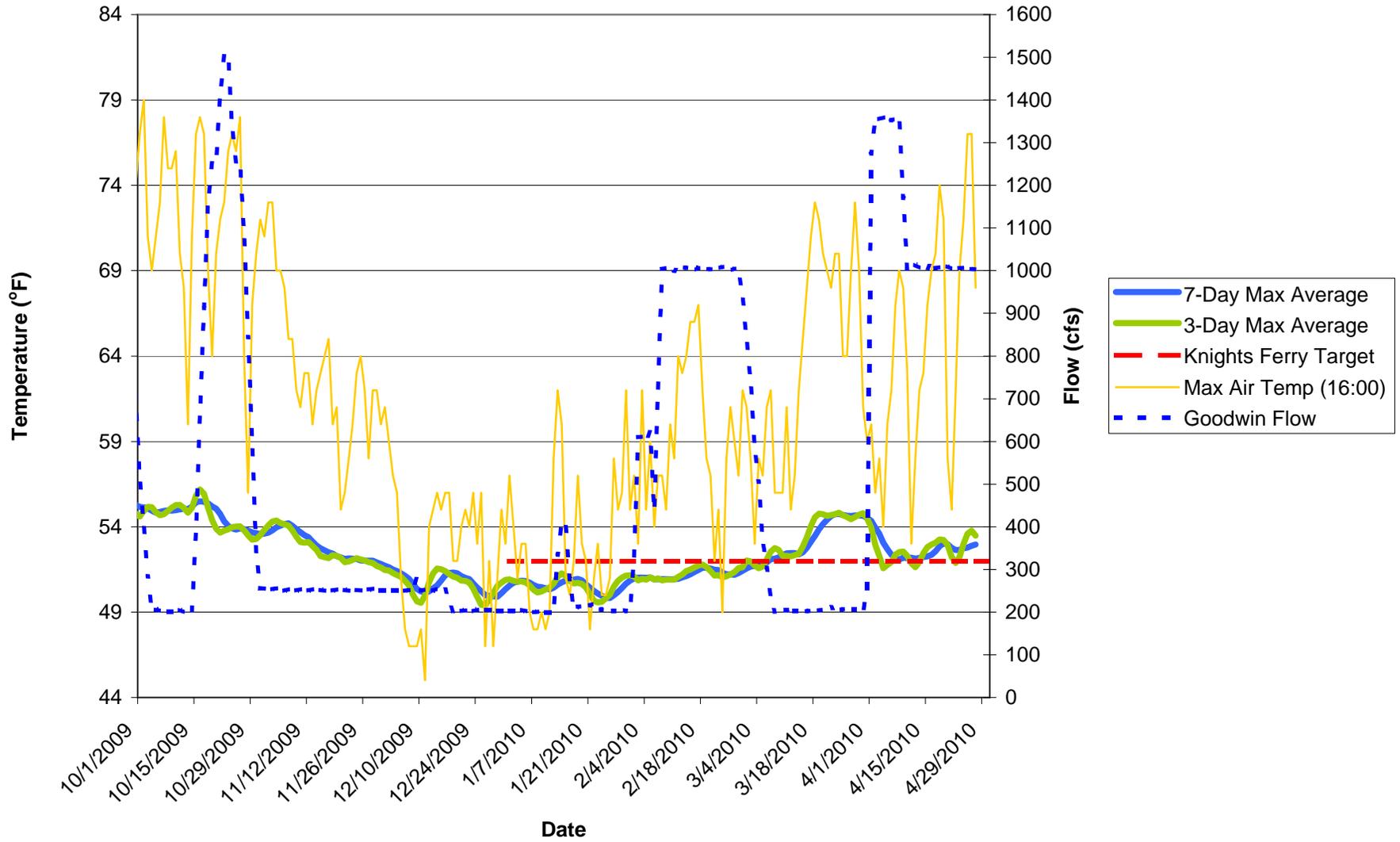
Proposed Goodwin Release May 2010



Orange Blossom Bridge Temperatures



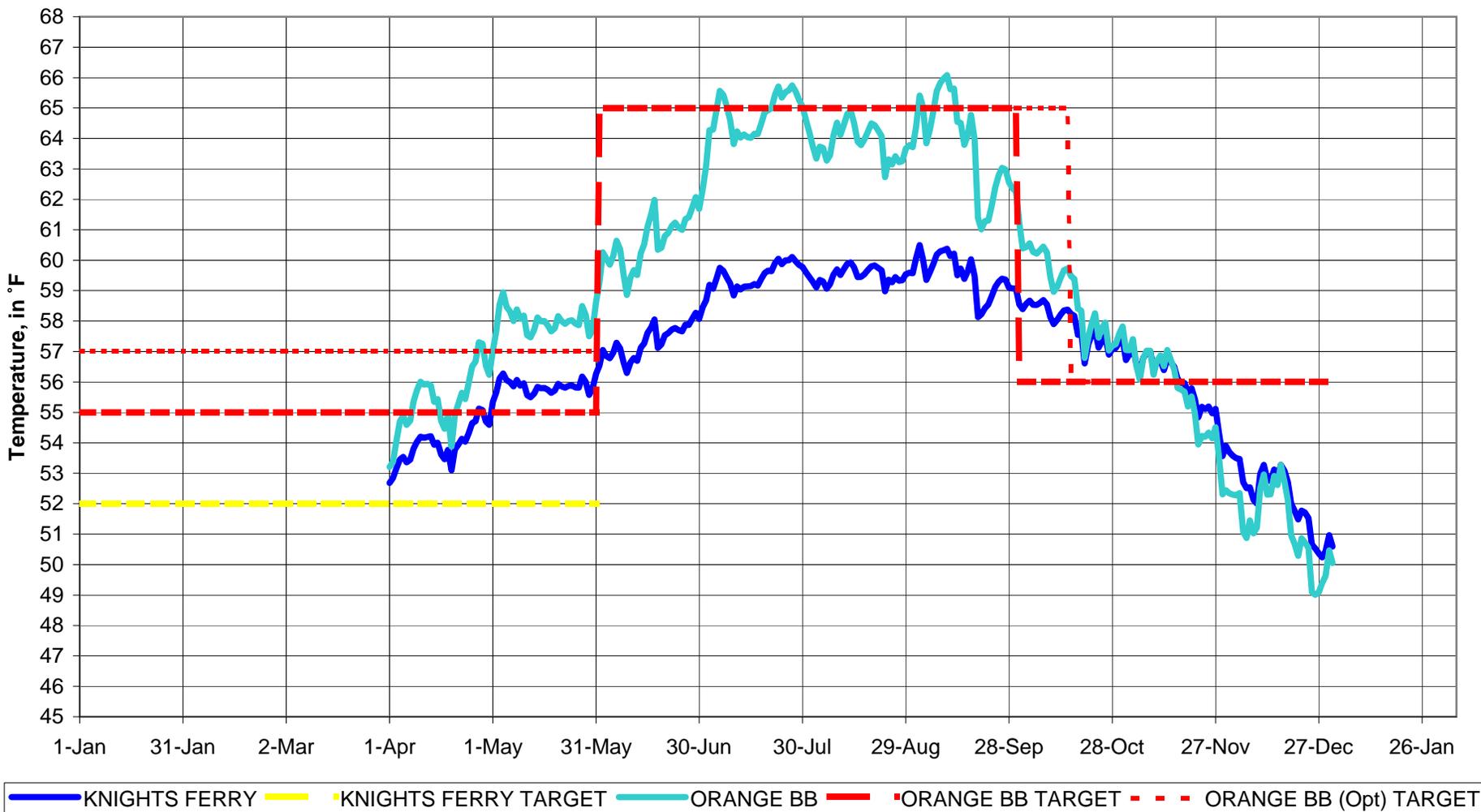
Estimated Knights Ferry Temperatures



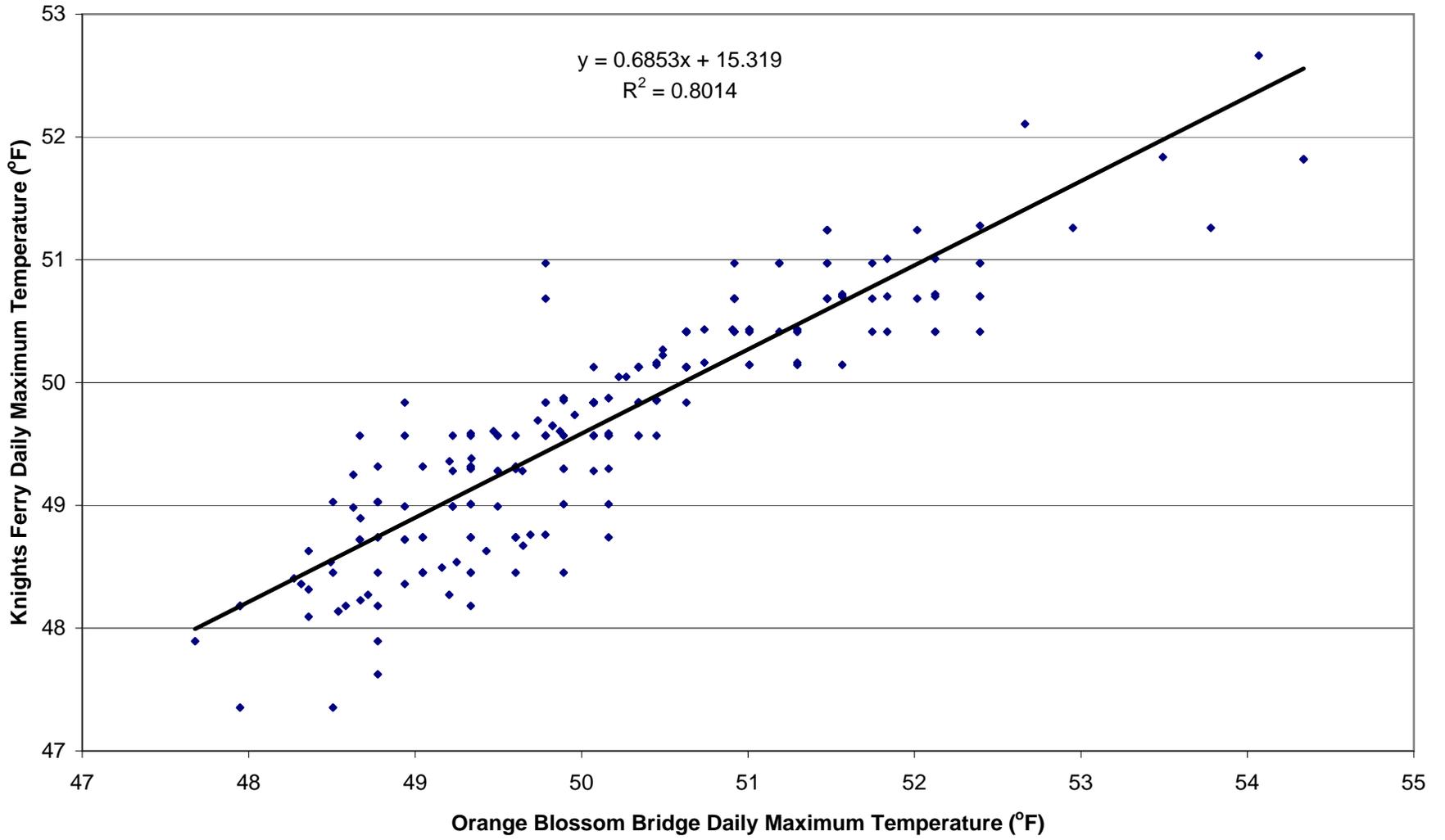
**Preliminary-Stanislaus River - 2010
 April 50%-Exceedence Outlook
 Maximum Mean 6-Hour Temperature**



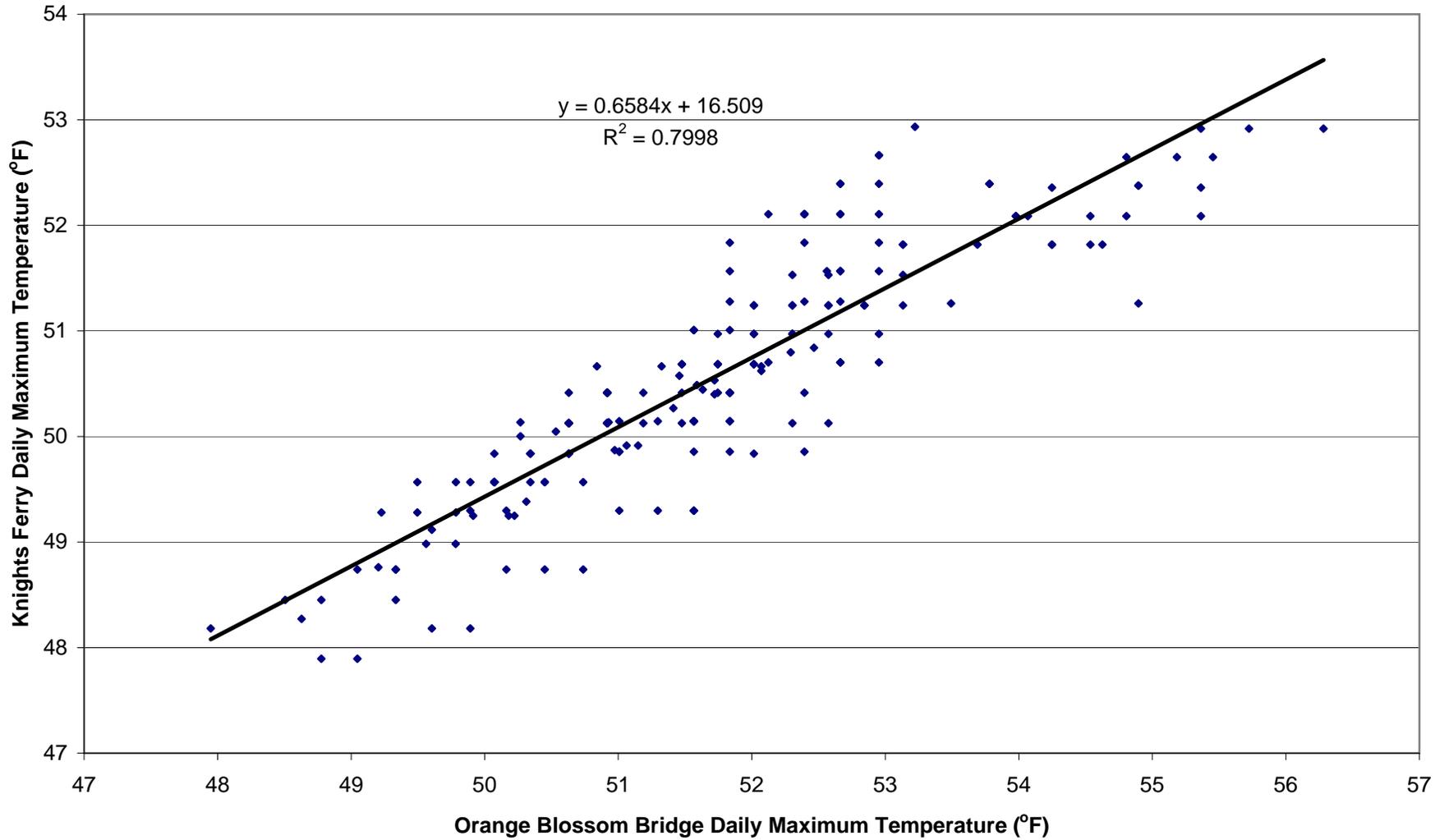
**Preliminary - Stanislaus River - 2010
April 90%-Exceedence Outlook
Maximum Mean 6-Hour Temperature**



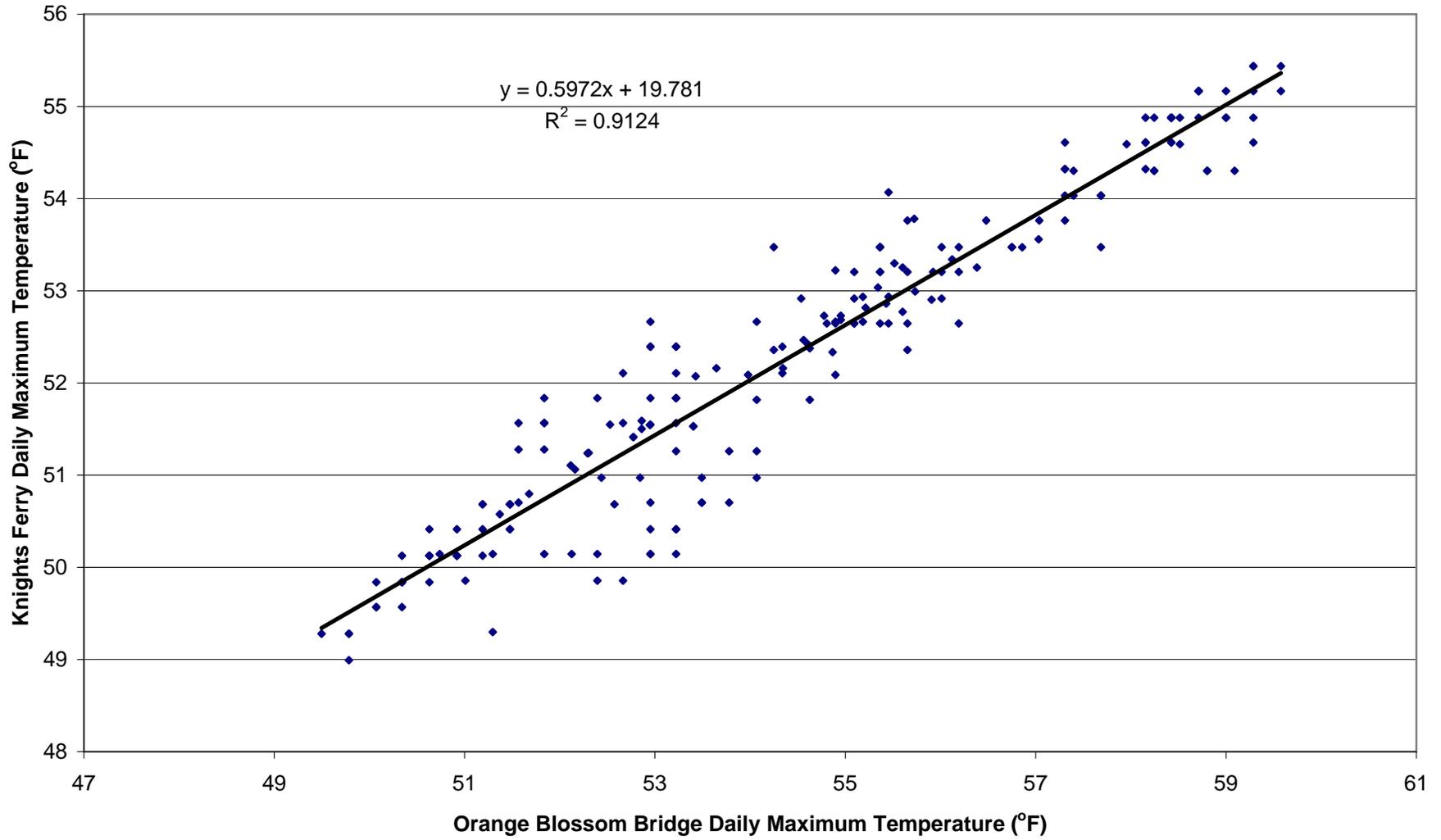
January
Temperature Relationship between Orange Blossom Bridge and Knights Ferry



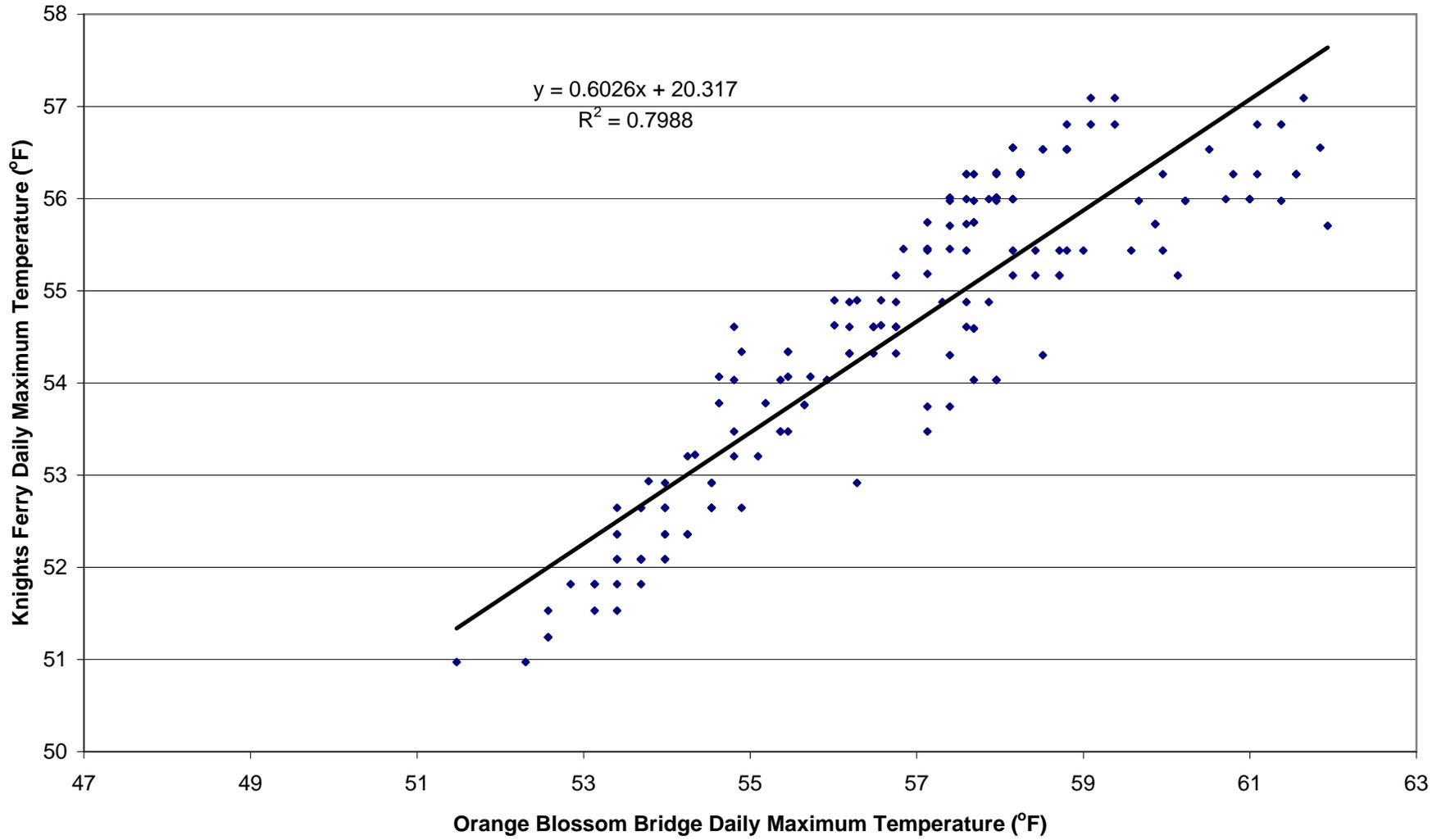
February
Temperature Relationship between Orange Blossom Bridge and Knights Ferry



March
Temperature Relationship between Orange Blossom Bridge and Knights Ferry



May
Temperature Relationship between Orange Blossom Bridge and Knights Ferry



Evaluation of Historical New Melones Water Supply and Runoff Forecasts

Purpose: Historical New Melones data is presented to understand the risk associated with using less conservative hydrologic runoff forecasts.

Background: See (3/17/2010) handout from NMFS “Table 1. Summary of how water year types are defined and updated in Reclamation’s Interim Plan of Operations and the NMFS OCAP Biological Opinion.”

Generalized Observations (from small sample, 8 years, of historical data):

- In this sample, 70% of the water year type designations result in the same minimum flow category, or result in the same release volume downstream regardless of forecast or flow category. The remaining 30% can be classified in two groups, the 90% IPO method which is less conservative on the drier/less storage condition, and the 50% NMFS method which is more liberal on the wetter/more storage condition.
- The proposed NMFS minimum flow categories using the 50% runoff forecast appears to be more protective to storage in the drier/less storage conditions. Estimated downstream loss/storage retention, in this condition, is approximately 40 TAF/yr.
- In years where there is little discrepancy between the actual and designated year type category, the proposed NMFS minimum flow categories using the 50% runoff forecast appears to be more liberal to downstream releases in the wet/more storage conditions. Estimated downstream gain/storage loss, in this condition, is approximately 20 TAF.
- Year 2007 exemplifies the situation where the actual water year type (Critical) is the most inconsistent with the designated category (NMFS Minimum Flow category Above Normal, due to high storage conditions). This particular year (Table 1 highlighted) would have yielded a downstream gain/storage loss of approximately 110 TAF in a Critical water year and at the beginning of a dry period.

Discussion:

Using the 50% runoff exceedance forecast early in the spring, especially in the month of March, poses a risk that forecasted water will not manifest as inflow into the reservoir. In the year 2007 example, the 50% forecasted inflow March-September was 579 TAF (the 90% forecasted inflow March-September was 385 TAF). The actual March-September inflow was 319 TAF.

The 1993 NMFS BO requirement (as applied to the Shasta and Trinity system) states to issue the spring allocation of deliverable water “based on a [sic] estimates of precipitation and runoff at least using conservative as 90 percent probability of exceedance”. The

Reclamation-CVO

rational for using the more conservative forecast is to “substantially reduce the risk of adverse temperature conditions” later in the season. The same reservoir dynamics and risks are applicable to New Melones Reservoir. It is likely that higher minimum flows in the spring and desired temperature objectives in the late summer/fall cannot both be achieved without a conscious compromise.

Table 1. Historical Water Year Types applied to IPO and NMFS methods

Final SJR Water Year Type	Month	End of February Storage (TAF)	IPO Categories (90%)	NMFS Min Flow Categories (50%)	Est. Absolute Storage Difference (TAF)	Loss/Gain to Storage (TAF)
Dry	Feb-02	1587	BN	BN	0	
Dry	Mar-02		BN	BN	0	
Dry	Apr-02		BN	BN	0	
Dry	May-02		BN	D	38	Loss
Below Normal	Jan-03		D	BN	0	
Below Normal	Feb-03	1427	D	D	0	
Below Normal	Mar-03		D	D	0	
Below Normal	Apr-03		D	D	0	
Below Normal	May-03		BN	D	38	Loss
Dry	Apr-04	1442	D	D	0	
Dry	Jun-04		D	D	0	
Wet	Jan-05		D	D	0	
Wet	Feb-05	1437	BN	BN	0	
Wet	Mar-05		BN	BN	0	
Wet	Apr-05		BN	AN	10	Gain
Wet	May-05		BN	AN	19	Loss
Wet	Jan-06		AN	W	8	Loss
Wet	Feb-06	2016	AN	W	7	Loss
Wet	Mar-06		AN	W	8	Loss
Wet	Apr-06		W	W	0	
Critical	Jan-07		BN	AN	0	
Critical	Feb-07	2001	BN	AN	0	
Critical	Mar-07		BN	AN	80	Loss
Critical	Apr-07		BN	AN	10	Loss
Critical	May-07		BN	AN	30	Loss
Critical	Feb-08	1531	D	BN	0	
Critical	Mar-08		BN	BN	0	
Critical	Apr-08		D	D	0	
Critical	May-08		D	D	0	
Below Normal	Feb-09	1208	C	D	0	
Below Normal	Mar-09		D	D	0	
Below Normal	Apr-09		D	D	0	
Below Normal	May-09		D	D	0	