

Inflows and SWP+CVP Exports Evaluated

- Monthly averages calculated 2000 - 2012 for:
 - Calaveras R., Cosumnes R., San Joaquin R., Sacramento R., Yolo+Lisbon, Mokelumne R., CVP+SWP Exports
- Simple statistics and Histograms prepared to allow discussion for selecting low flow, and high flow month/year
 - Only using May-October, simple statistics calculated
 - Previous calculations used Annual Statistics (see chart below)

Monthly Average Flows Using **Annual** Statistics

	Sac	SJR	Exp
Mean	16263	2615	8599
St Dev	5481	2716	2727
Max	41397	16101	11498
Min	7923	599	1680
Median	15755	1668	9461
30Sep2010	<u>16450.6</u>	<u>1713.4</u>	<u>10403.2</u>

Descriptive Statistics May – October 2000 – 2012

<i>SJR</i>		<i>SAC R.</i>		<i>CVP+SWP</i>			
Mean	3035.0	Mean	16953.0	Mean	7361.9		
Standard Error	416.6	Standard Error	848.8	Standard Error	378.4		
Median	1872.4	Median	15403.8	Median	8158.4		
Mode	2991.0	Mode	14332.6	Mode	3222.3		
Standard Deviation	3818.1	Standard Deviation	7779.4	Standard Deviation	3467.7		
Range	26182.2	Range	44880.9	Range	10202.6		
Minimum	525.4	Minimum	7923.5	Minimum	1294.9		
Maximum	26707.6	Maximum	52804.4	Maximum	11497.5		
Count	84.0	Count	84.0	Count	84.0		
<i>CALAVERAS</i>		<i>COSUMNES</i>		<i>MOKELUMNE</i>		<i>YOLO+LIS</i>	
Mean	47.1	Mean	180.3	Mean	384.5	Mean	234.0
Standard Error	3.4	Standard Error	37.4	Standard Error	63.4	Standard Error	46.7
Median	40.1	Median	41.1	Median	135.5	Median	200.0
Mode	37.5	Mode	401.0	Mode	0.0	Mode	200.0
Standard Deviation	31.1	Standard Deviation	342.4	Standard Deviation	581.2	Standard Deviation	427.9
Range	128.6	Range	1585.2	Range	2789.9	Range	3249.0
Minimum	7.5	Minimum	2.7	Minimum	0.0	Minimum	-73.1
Maximum	136.1	Maximum	1587.9	Maximum	2789.9	Maximum	3175.9
Count	84.0	Count	84.0	Count	84.0	Count	84.0

Candidates for Low Flow and High Flow Month/Year Selections (from May - October Flows)

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High Flow

		CALAVERAS	COSUMNES	MOKELUMNE	YOLO+LIS	SJR	SAC R.	CVP+SWP
May	2011	47	1352	2327	546	12942	36065	3290
June	2011	103	947	1786	655	10529	41397	9676
July	2011	136	265	2361	185	8664	21556	11204
September	2011	22	41	725	237	4331	21054	11237

Low Flow

		CALAVERAS	COSUMNES	MOKELUMNE	YOLO+LIS	SJR	SAC R.	CVP+SWP
May	2008	34	244	161	194	2748	8819	1658
June	2008	40	67	45	235	1145	11120	1680
July	2008	44	15	29	135	896	12403	5620
August	2008	43	5	32	71	866	10831	5208
September	2008	32	3	33	110	801	10461	4930
October	2008	9	12	83	11	1006	7923	4290
October	2009	12	23	537	114	1803	9688	5950

Monthly Average Inflow/Export Values in CFS for September, 2010

Calaveras R.	Cosumnes R.	San Joaquin R.	Sacramento R.	Yolo+Lisbon	Mokelumne R.	CVP+SWP Exports
21	13	1713	16451	158	163	10403

Structures – Gate and Barrier Positions

	Delta Cross Channel	Head Old River Barrier	Old River Barrier	Middle River Barrier	Grant Line Barrier
October 2008	Open	Closed part mo.	Closed	Closed	Closed
September 2010	Open	Open	Closed	Closed	Closed
June 2011	Closed	Open	Closed part mo.	Closed part mo.	Closed

Note: Sept. 2008 HORB is open, so may be a better choice, more representative of current/future conditions

Source Volumes Monthly Averaged

Locations: D4, D11, D12, D14A, D15, D22, D24, Three Mile Sl.

Statistics calculated in EXCEL

Low Flow

October 2008	FROM-SAC	FROM-AG	FROM-CAL	FROM-DDIABLO	FROM-EAST	FROM-MTZ	FROM-SJR	FROM-SRWWTWP	FROM-YOLO
Mean	81.7	3.9	0.0	0.1	0.0	11.3	0.1	1.8	1.0
Standard Error	3.1	0.2	0.0	0.0	0.0	3.2	0.0	0.1	0.0
Median	85.0	3.8	0.0	0.1	0.0	7.5	0.1	1.8	1.0
Mode	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
Standard Deviation	8.8	0.6	0.0	0.1	0.0	9.1	0.0	0.3	0.1
Minimum	68.5	3.0	0.0	0.0	0.0	0.7	0.0	1.4	0.9
Maximum	93.0	4.9	0.0	0.2	0.1	25.4	0.1	2.2	1.1
Count	8.0	8.0	7.0	7.0	8.0	8.0	8.0	7.0	7.0

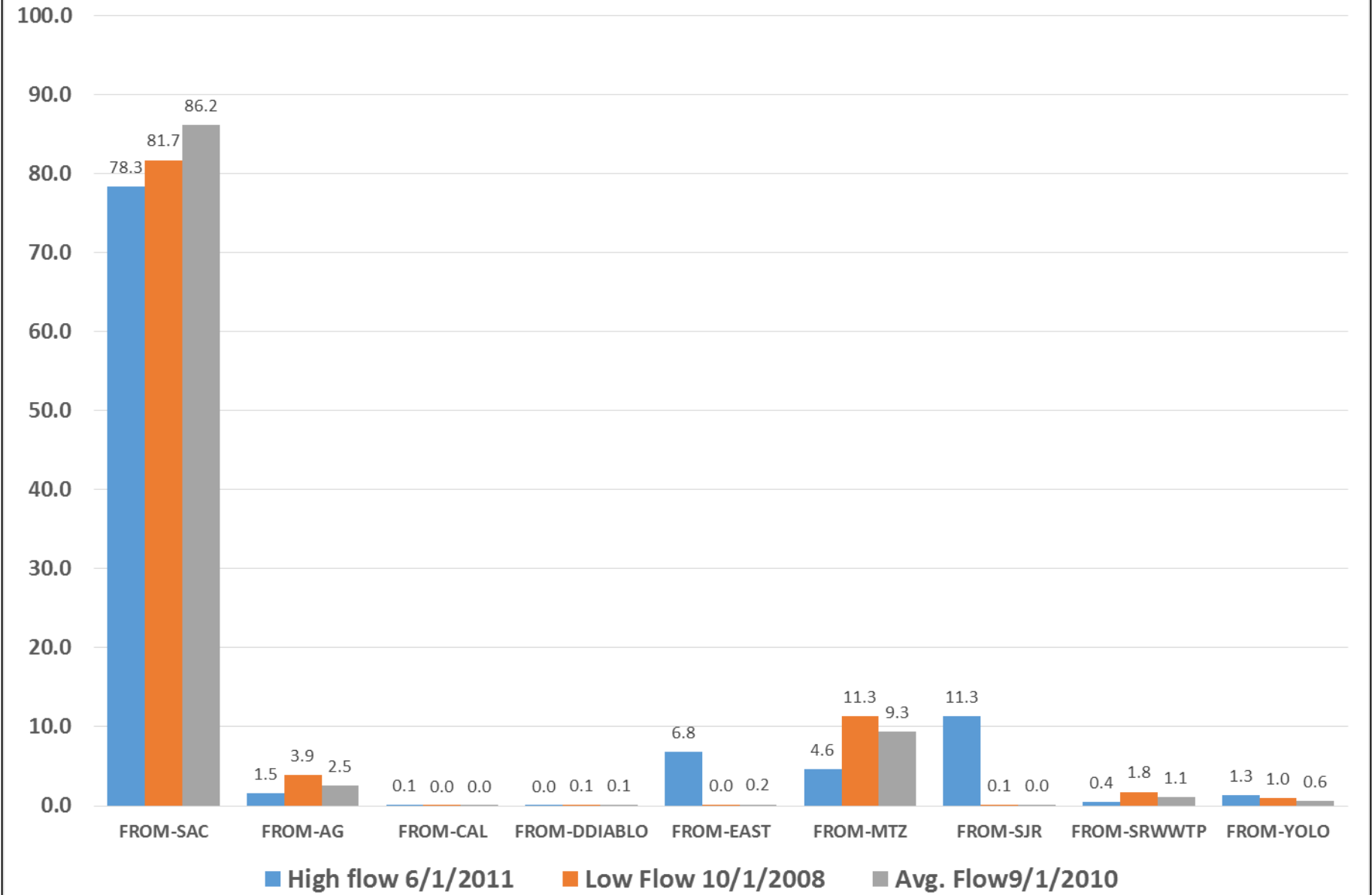
High Flow

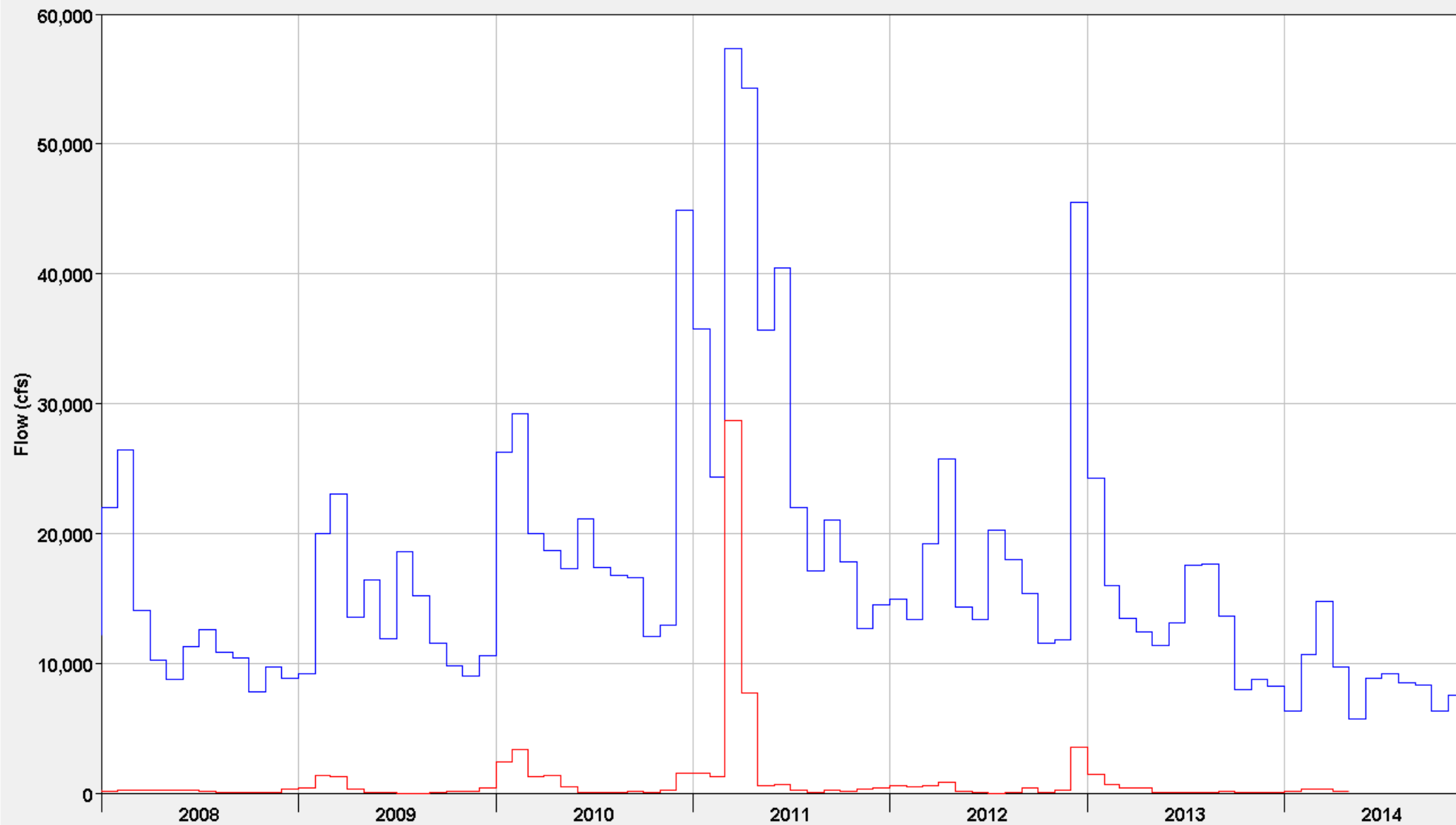
June 2011	FROM-SAC	FROM-AG	FROM-CAL	FROM-DDIABLO	FROM-EAST	FROM-MTZ	FROM-SJR	FROM-SRWWTWP	FROM-YOLO
Mean	78.31	1.54	0.09	0.01	6.83	4.63	11.33	0.44	1.29
Standard Error	4.91	0.28	0.03	0.01	1.79	1.36	3.03	0.03	0.25
Median	78.25	1.51	0.11	0.00	6.88	3.34	11.42	0.41	1.14
Mode	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
Standard Deviation	13.89	0.80	0.07	0.01	5.05	3.83	8.58	0.08	0.65
Minimum	60.83	0.54	0.00	0.00	0.10	0.14	0.14	0.35	0.61
Maximum	96.16	2.66	0.17	0.04	13.43	10.07	22.18	0.55	2.51
Count	8.00	8.00	7.00	7.00	8.00	8.00	8.00	7.00	7.00

Average Flow

September 2010	FROM-SAC	FROM-AG	FROM-CAL	FROM-DDIABLO	FROM-EAST	FROM-MTZ	FROM-SJR	FROM-SRWWTWP	FROM-YOLO
Mean	86.2	2.5	0.0	0.1	0.2	9.3	0.0	1.1	0.6
Standard Error	2.3	0.2	0.0	0.0	0.0	2.3	0.0	0.0	0.1
Median	86.0	2.4	0.0	0.1	0.2	8.8	0.1	1.1	0.3
Mode	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
Standard Deviation	6.4	0.6	0.0	0.1	0.1	6.4	0.0	0.1	0.4
Minimum	78.0	1.7	0.0	0.0	0.0	0.4	0.0	1.0	0.3
Maximum	95.5	3.4	0.0	0.2	0.3	17.7	0.1	1.2	1.2
Count	8.0	8.0	7.0	7.0	8.0	8.0	8.0	7.0	7.0

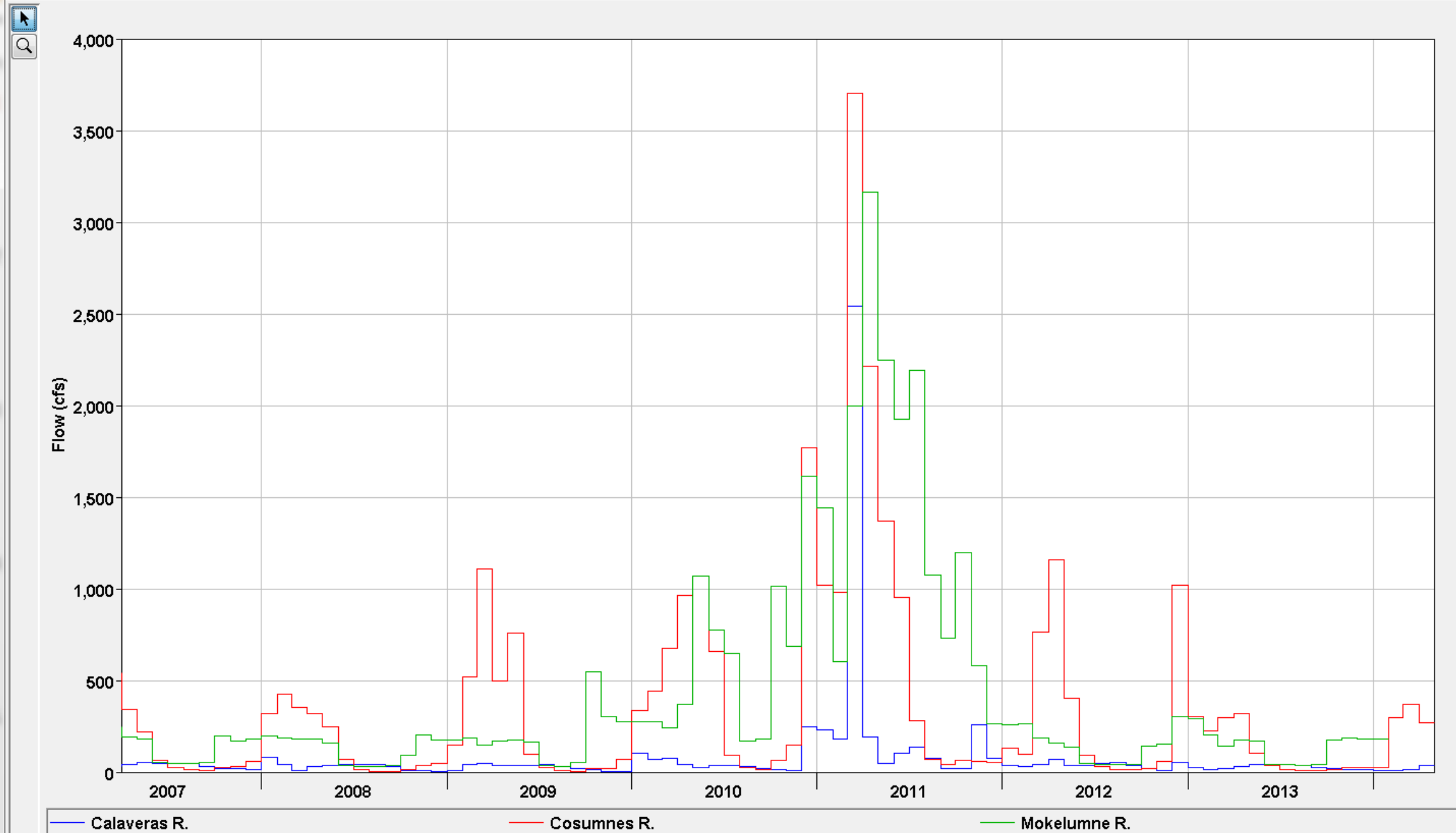
Confluence Source Volumes (DSM2)

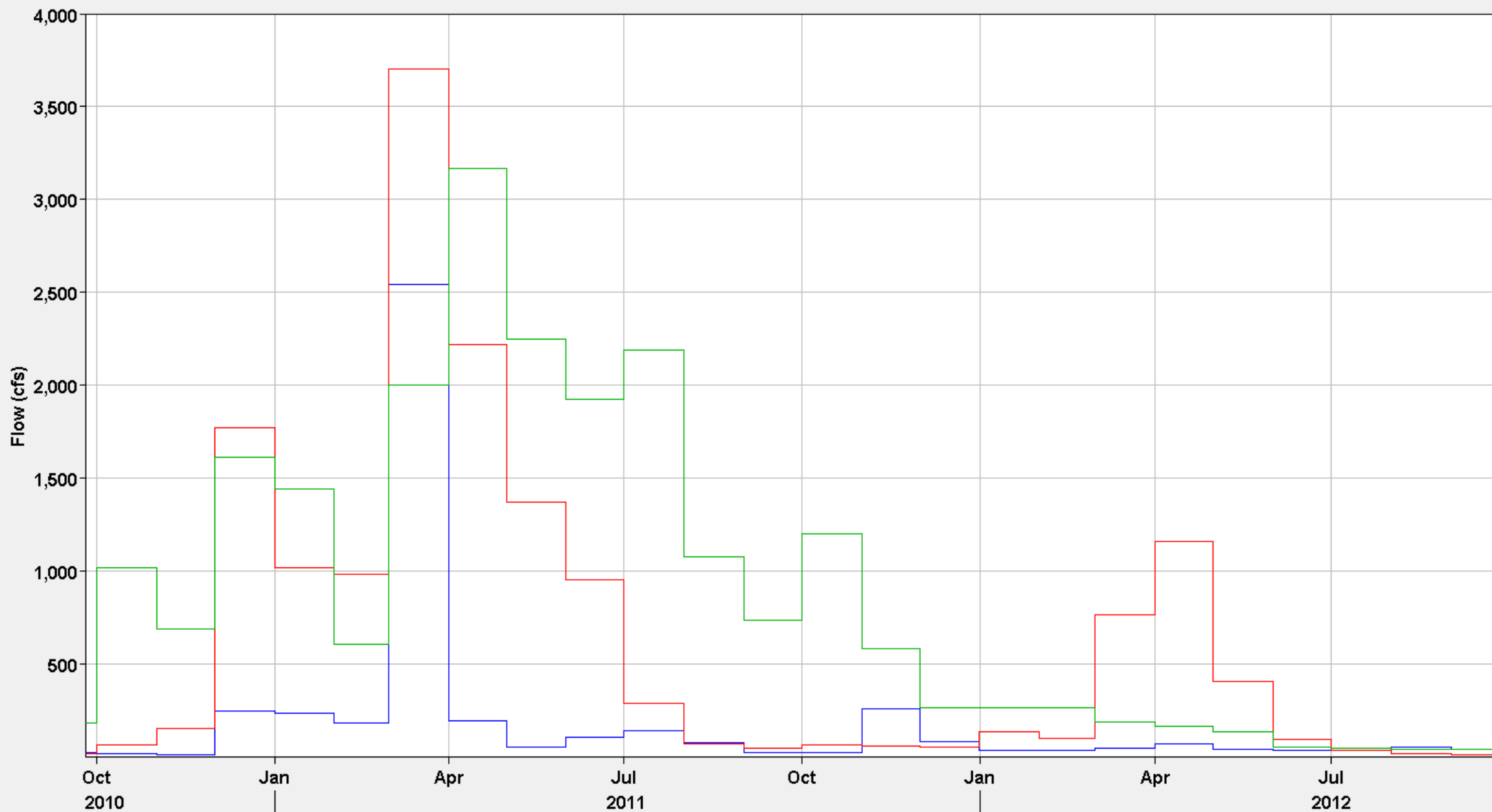




Freeport - Sacramento R.

Yolo Bypass+Lisbon Toe Drain

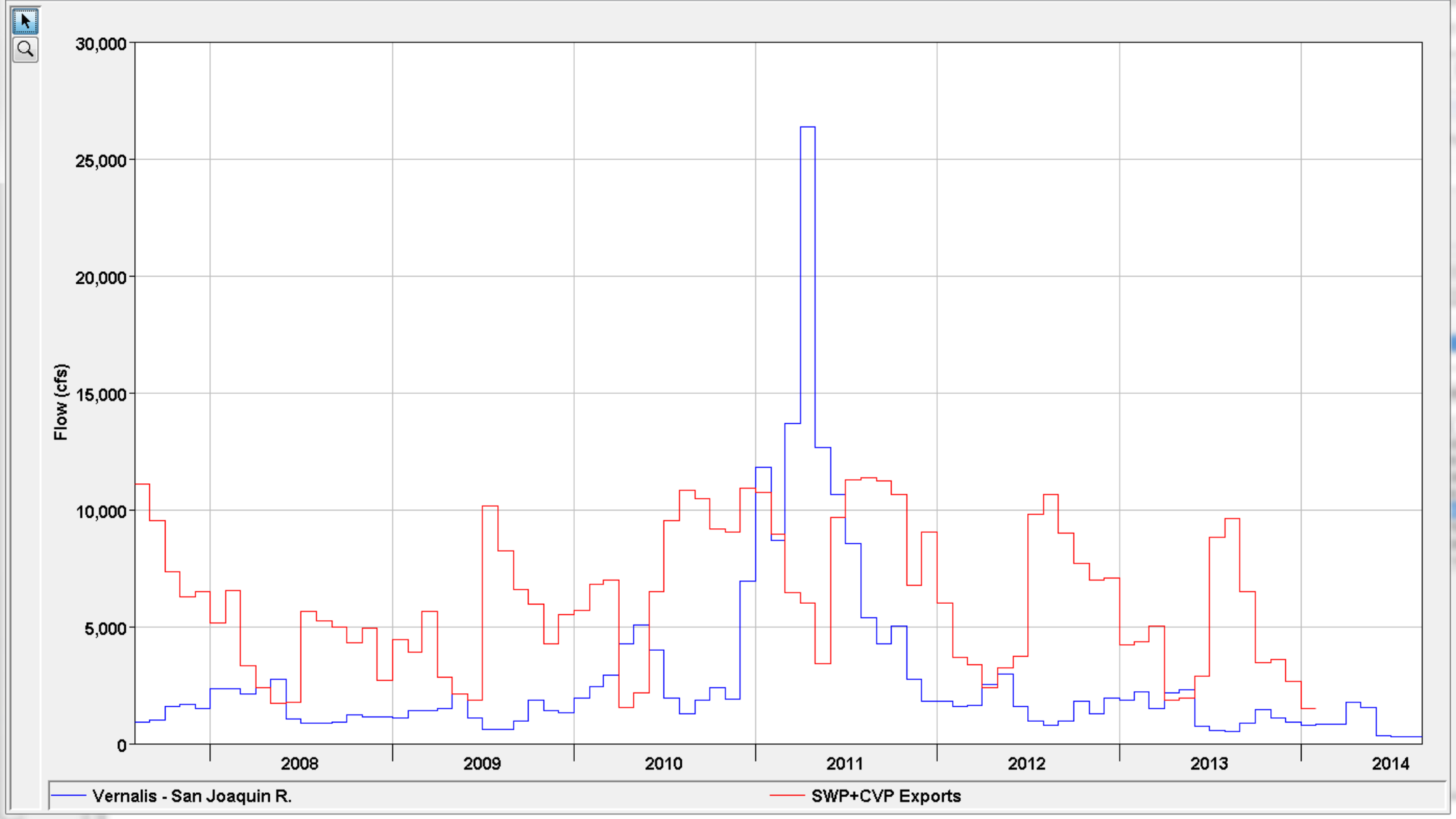




— Calaveras R.

— Cosumnes R.

— Mokelumne R.



Monthly Statistics calculated from all months 2000 - 2013

			CALAVERAS	COSUMNES	MOKELUMNE			
		Mean	118	413	1747			
		St Dev	342	687	7442			
		Median	41	119	180			
		Max	3014	5292	74640			
		Min	0.5	3	0.0			
Calaveras				COSUMNES			MOKELUMNE	
<i>Bin</i>	<i>Frequency</i>		<i>Bin</i>	<i>Frequency</i>		<i>Bin</i>	<i>Frequency</i>	
50	112		50	58		50	53	
100	26		100	23		100	4	
150	13		150	9		150	4	
200	3		200	3		200	33	
300	6		400	25		400	23	
500	1		500	8		600	9	
750	2		750	11		800	9	
1000	2		1000	10		1000	6	
1250	0		1250	9		2000	14	
1500	2		1500	3		4000	4	
1750	0		1750	3		6000	2	
2000	0		2000	2		8000	2	
3000	1		2250	1		10000	0	
4000	1		4000	3		20000	0	
More	0		5000	0		40000	5	
			6000	1		60000	0	
			More	0		More	1	

Monthly Statistics calculated from all months 2000 - 2013

			RSAC155	YOLO-LIS+BYPASS
		Mean	20772	2315
		St Dev	12967	7736
		Median	17110	200
		Max	78348	59317
		Min	6344	-73
RSAC155				
Bin	Frequency		Yolo-Lisbon	
5000	0		Bin	Frequency
10000	15		0	6
15000	55		125	28
20000	41		250	61
25000	23		500	16
30000	11		1000	14
40000	7		5000	32
50000	7		10000	4
60000	6		20000	1
70000	3		30000	4
More	1		40000	1
			50000	0
			60000	2
			More	0

Monthly Statistics calculated from all months 2000 - 2013

		RSAN112	CVP+SWP		
	Mean	3400	7096		
	St Dev	4243	3088		
	Median	2097	7121		
	Max	28148	12000		
	Min	525	1295		
	RSAN112		CVP+SWP		
	<i>Bin</i>	<i>Frequency</i>	<i>Bin</i>	<i>Frequency</i>	
	500	0	1000	0	
	750	5	2000	11	
	1000	11	3000	12	
	2000	64	4000	13	
	3000	47	5000	13	
	4000	11	6000	14	
	5000	6	7000	19	
	10000	12	8000	12	
	20000	10	More	75	
	30000	3			
	More	0			