

# 2012 Dayflow Update/Correction

(Kate Le and Brad Tom, DWR, Chris Enright, DSC, June 2012)

## USGS Flow Stations and BBID 1997-2010 Data Sets

In March 2012, DWR staff did a comprehensive update to the Dayflow data sets for water years 1997-2010.

Dayflow data sets are created using the data that are available at the time, and some of it is preliminary. Data providers eventually update their data sets, but not all at the same time. Semi-annually DWR staff tries to update Dayflow data sets using updated input data. In this particular update, the USGS flow stations (i.e. Sacramento River, San Joaquin River, Cosumnes, and Yolo Bypass) were the primary focus. In addition, BBID parameter (Byron-Bethany Irrigation District) was also in need of adjustment in its computational scheme for double accounting since it was accounted for in the monthly consumptive use values of Table 3 of the *Dayflow Documentation*, thus DWR staff took this opportunity to conduct a comprehensive update from 1997-2010.

Figures 1-14 show USGS flow data for several station between 1997 and 2010. The original “provisional” data is shown along with the updated “final” data. The difference is generally small and should not alter any conclusion that was made using the “provisional” data sets. A tabular summary is also provided in Tables 1 and 2. Table 1 lists from 1997-2010 by year which USGS flow stations have updated data indicated by the highlight to easily identify change and no change data sets. Table 2 is a summary for the same period and by year with the maximum percent difference and the average percent difference highlighted to easily identify the changes and amount of the changes. Overall, the annual average change for all periods and flow stations that had changes was **less than 6.5 percent**. The maximum percent difference ranged between 6 % (see 2007 at Sac R) and 26% (see 2006 at Sac R).

As stated in the 2010 Dayflow metadata, DWR will adjust BBID because it was double counted in the Dayflow computational scheme of Gross Channel Depletion (GCD). Also, DWR used this opportunity to go back and adjust BBID for the period of 1997-2010. Figures 15 and 16 show that BBID daily pumping is typically higher (i.e. greater than 50 cfs) in the summer months (i.e. June – September) and lowest (i.e. less than 50 cfs) in the late Fall and Winter periods. Table 4 is a summary of the annual average BBID pumping from WY1997 – WY2010. The largest annually average BBID pumping was in 1997 (i.e. 45 cfs) and lowest was in 2005 (i.e. 27 cfs). Overall, BBID annual average pumping is low and the annual average over 13 years is 35 cfs.

## WY 2006 and 2007 Data Corrections

A discrepancy was discovered recently between the individual Dayflow output flat files and the “AllYearsExcel” file for water years 2006 and 2007 posted on the Dayflow website. The problem was due to an older version of HTML files posted for WY 2006 and 2007. The only two stations that show differences between the older and newer set was Yolo Bypass and Sacramento River. A summary matrix of the percent difference for each water year and for each station is shown in Table 3. Supplemental plots to the table are provided in Figures 17-19. Overall, Sacramento River flow differences were small in both water years compared to Yolo Bypass. However, the daily difference relative to the total amount of flow for that day should be put into context to get a better perspective for those concerned about the overall impact of the discrepancy.

## Final Thoughts

We updated and corrected the Dayflow data set for period 1997-2010 and WY2006/2007, respectively. Dayflow data users need to use the UPDATED DAYFLOW data set of 1997-2010 that is now available at the Dayflow website <http://www.water.ca.gov/dayflow/output/Output.cfm> . There are also changes to the output format and availability hereafter. The “all years” Excel file will no longer be available. Creating this file was an error-prone process. We strive to make Dayflow as accurate as possible using our limited resources. To achieve this, we found it necessary to eliminate as many potential sources of error as possible. Annual dayflow text output will continue to be available along with the accompanied metadata as single yearly file. Users who wish to obtain an “all years” file will need to compile that on their own.

As a reminder, Dayflow is intended to estimate a Delta Outflow Index, a non -tidal estimate of net flow out of the Delta. This important flow parameter requires estimation because there is no direct measurement at the downstream boundary of the Delta, nominally at Chipps Island.

While we strive and try our best to provide users with the most updated and correct data, we cannot guarantee mistakes will not be made because of the manual processing involved with Dayflow. We will promise to address, fix, and provide transparency to the best of our ability. There are talks of improving Dayflow to better manage and facilitate the communication and dissemination of data among key players along with finding a new home for Dayflow at this time. If you are interested in participating to share your thoughts, please contact Kate Le at [kle@water.ca.gov](mailto:kle@water.ca.gov).

# Table 1

USGS Stations Differences Matrix for WY 1997-2010											
WY	SAC	SJR	COSUMNES	YOLO BYPASS	Notation:						
1997	N	N	Y	Y	Y= there is a difference in flows between older and newer version						
1998	N	N	Y	Y	N=no difference in flows between older and newer version						
1999	N	N	N	N							
2000	N	N	N	N							
2001	N	N	N	N							
2002	N	Y	Y	Y							
2003	N	N	N	N							
2004	N	N	N	N							
2005	N	N	N	N							
2006	Y	N	N	N							
2007	Y	N	N	N							
2008	N	N	N	N							
2009	N	N	N	N							
2010	N	Y	N	Y							

## Table 2

USGS Percent Difference Matrix of (Max / Avg) for WY 1997-2010						
WY	SAC	SJR	COSUMNES	YOLO BYPASS		
1997	N	N	16.6/3.8	26.4/4.8		
1998	N	N	17.8/2.9	21.3		
1999	N	N	N	6.9		
2000	N	N	N	N		
2001	N	N	N	N		
2002	N	11.1/3.9	11.1/3.4	0.3/0.1		
2003	N	N	N	N		
2004	N	N	N	N		
2005	N	N	N	N		
2006	26/3.1	N	N	N		
2007	6.3/1.1	N	N	N		
2008	N	N	N	N		
2009	N	N	N	N		
2010	N	11.4/6.2	N	14.3/6.4		

# Table 3

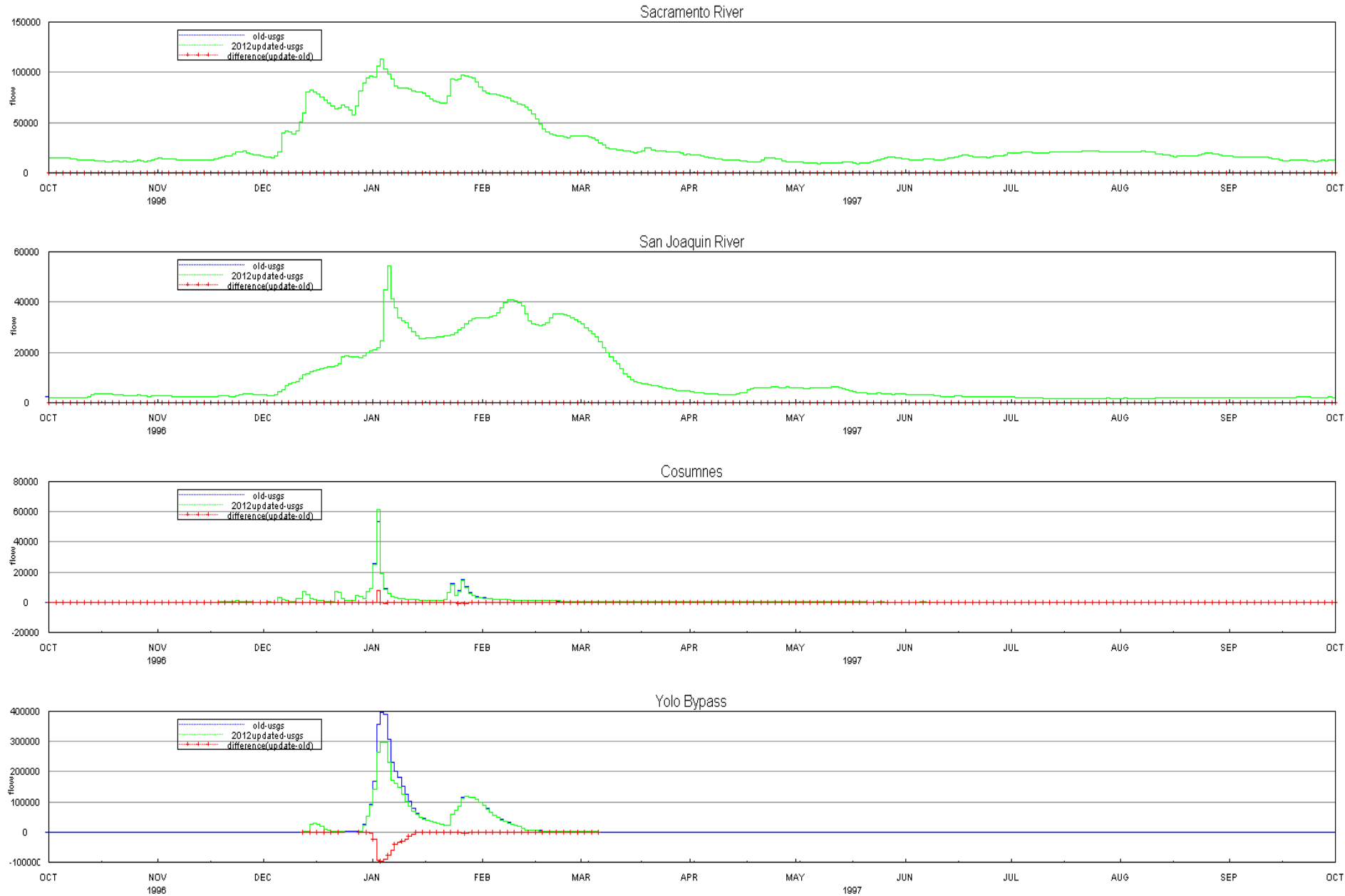
Percent Difference Matrix of (Max / Avg) for WY 2006 & 2007 (Individual flat file vs Excel AllYears data sets)											
		<b><u>WY2006</u></b>									
	SAC % DIFF		YOLO % DIFF								
MAX	26		356								
AVG	3.1		47.7								
		<b><u>WY2007</u></b>									
	SAC % DIFF										
MAX	6.9										
AVG	1.1										

# Table 4

<b><u>WY</u></b>	<b><u>Yearly BBID Avg Pumping (cfs)</u></b>
1997	45
1998	33
1999	40
2000	43
2001	41
2002	37
2003	31
2004	32
2005	27
2006	24
2007	36
2008	34
2009	30
2010	37
<b>1997-2010</b>	<b>35</b>

# Figure 1: Water Year 1997

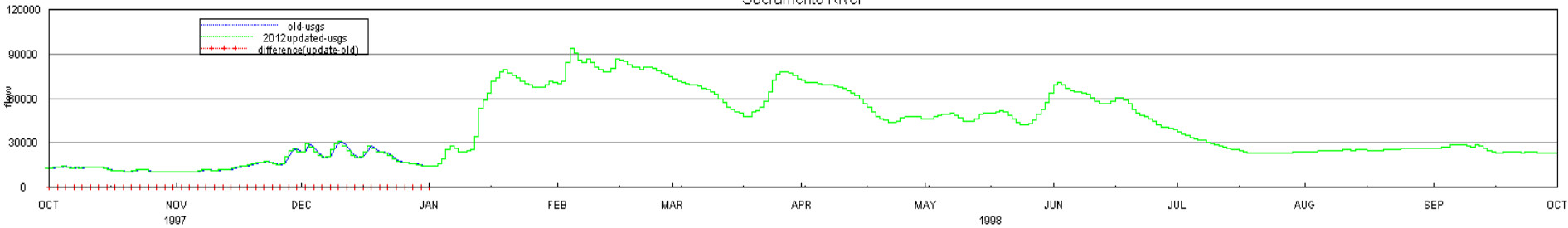
## USGS Stations: Flow Comparison of Old vs Updated



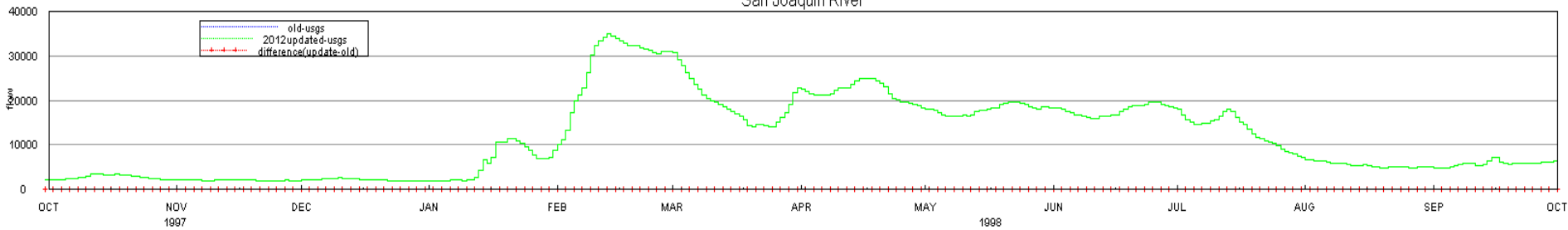
# Figure 2: Water Year 1998

## USGS Stations: Flow Comparison of Old vs Updated

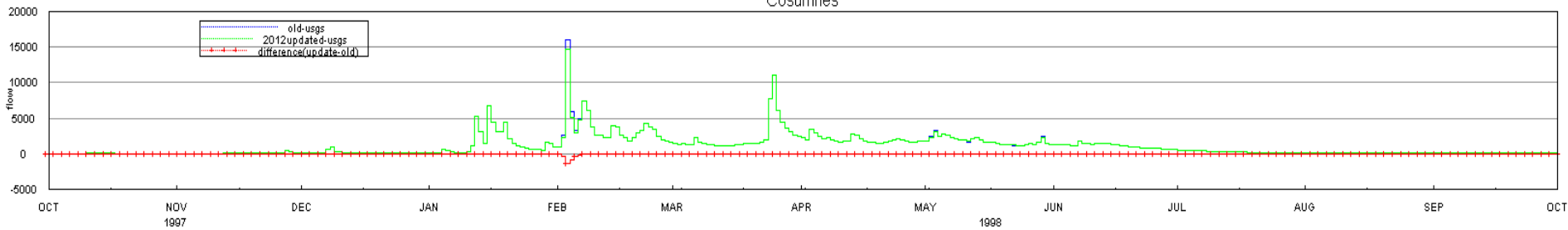
### Sacramento River



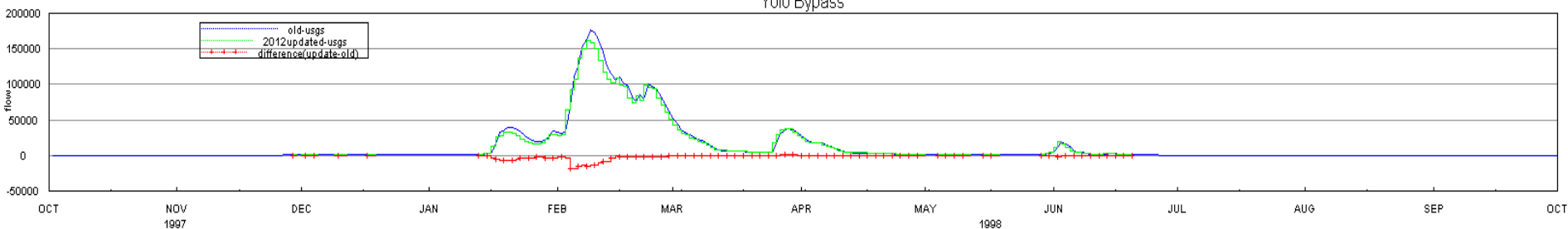
### San Joaquin River



### Cosumnes

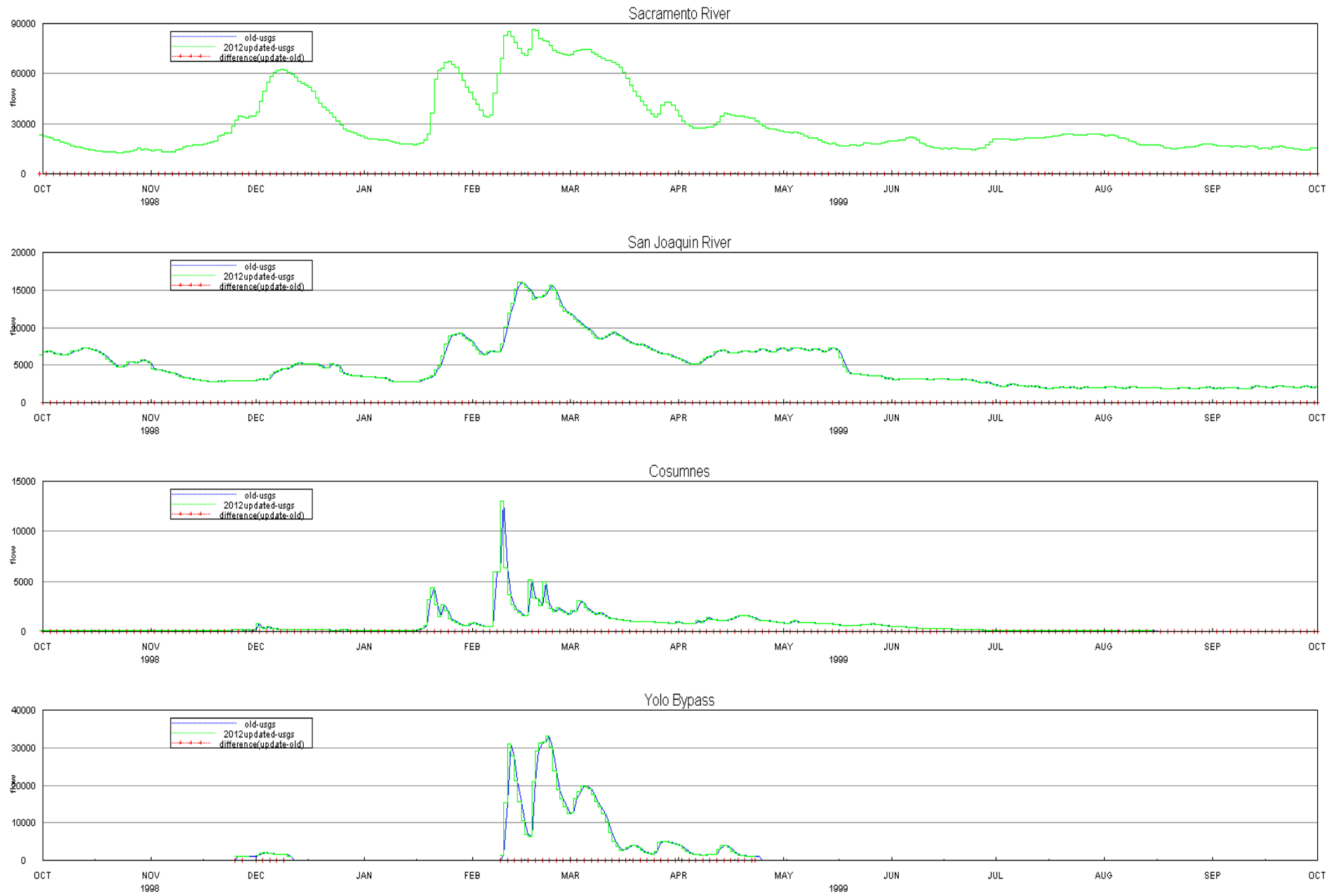


### Yolo Bypass



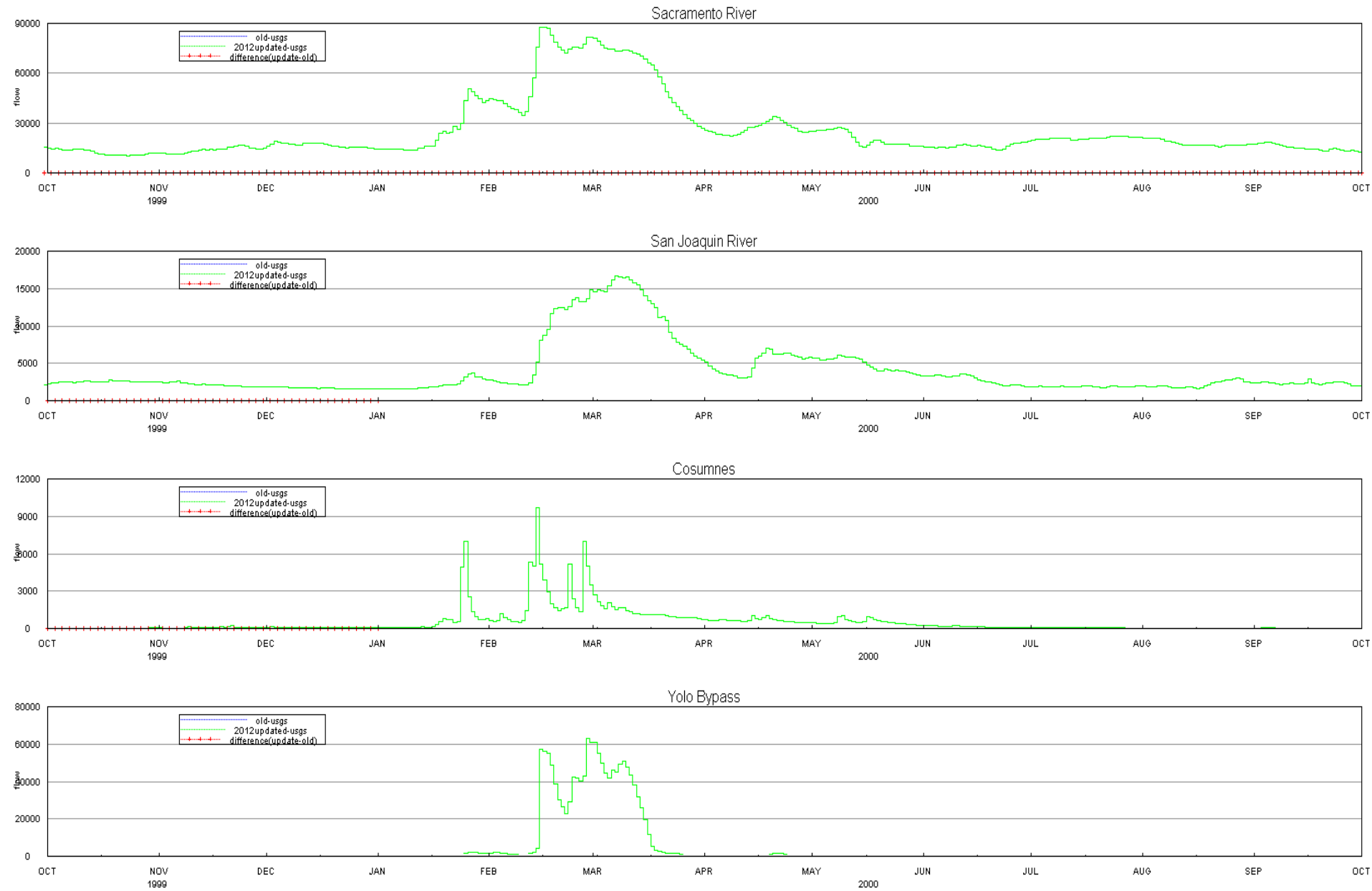
# Figure 3: Water Year 1999

## USGS Stations: Flow Comparison of Old vs Updated



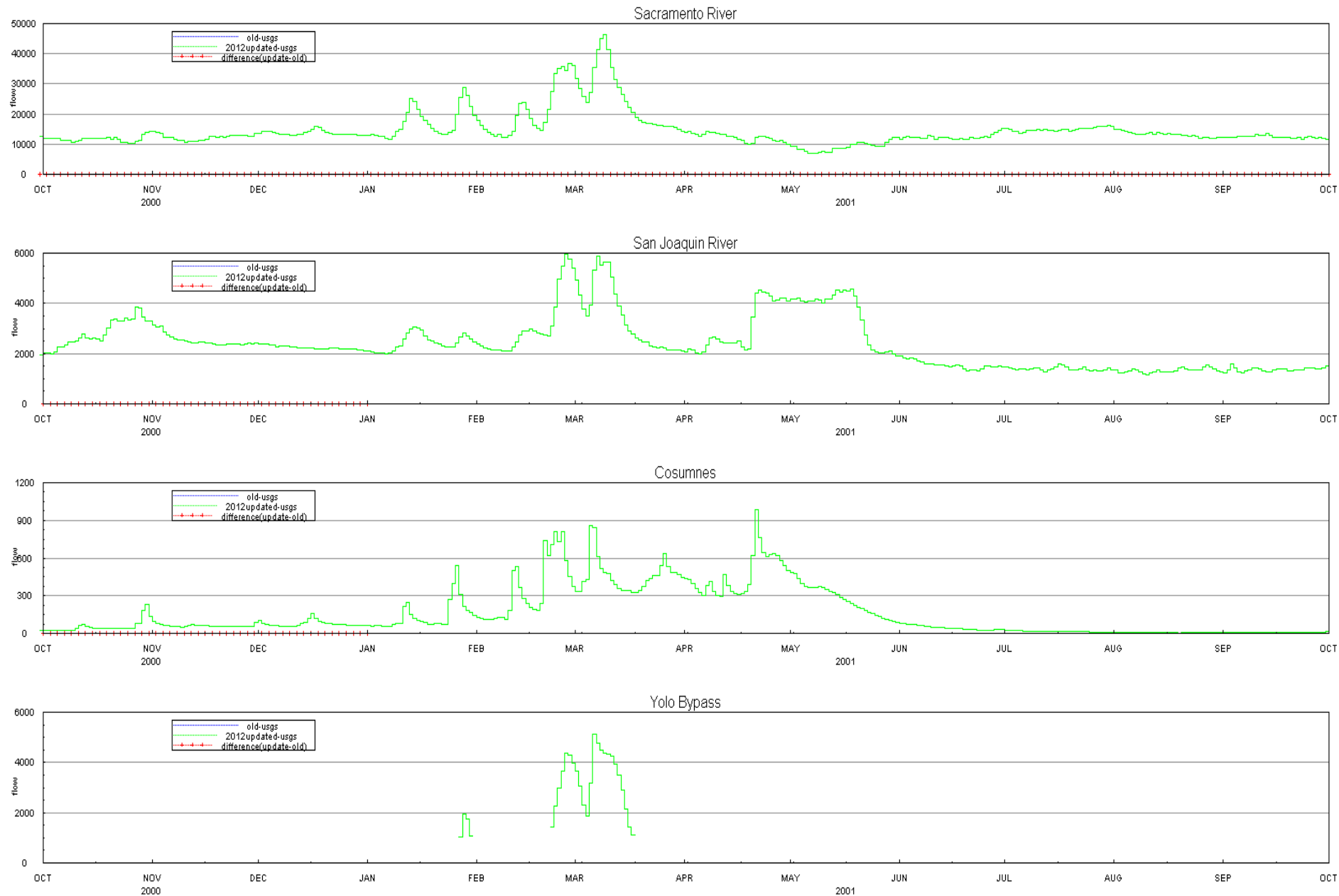
# Figure 4: Water Year 2000

## USGS Stations: Flow Comparison of Old vs Updated



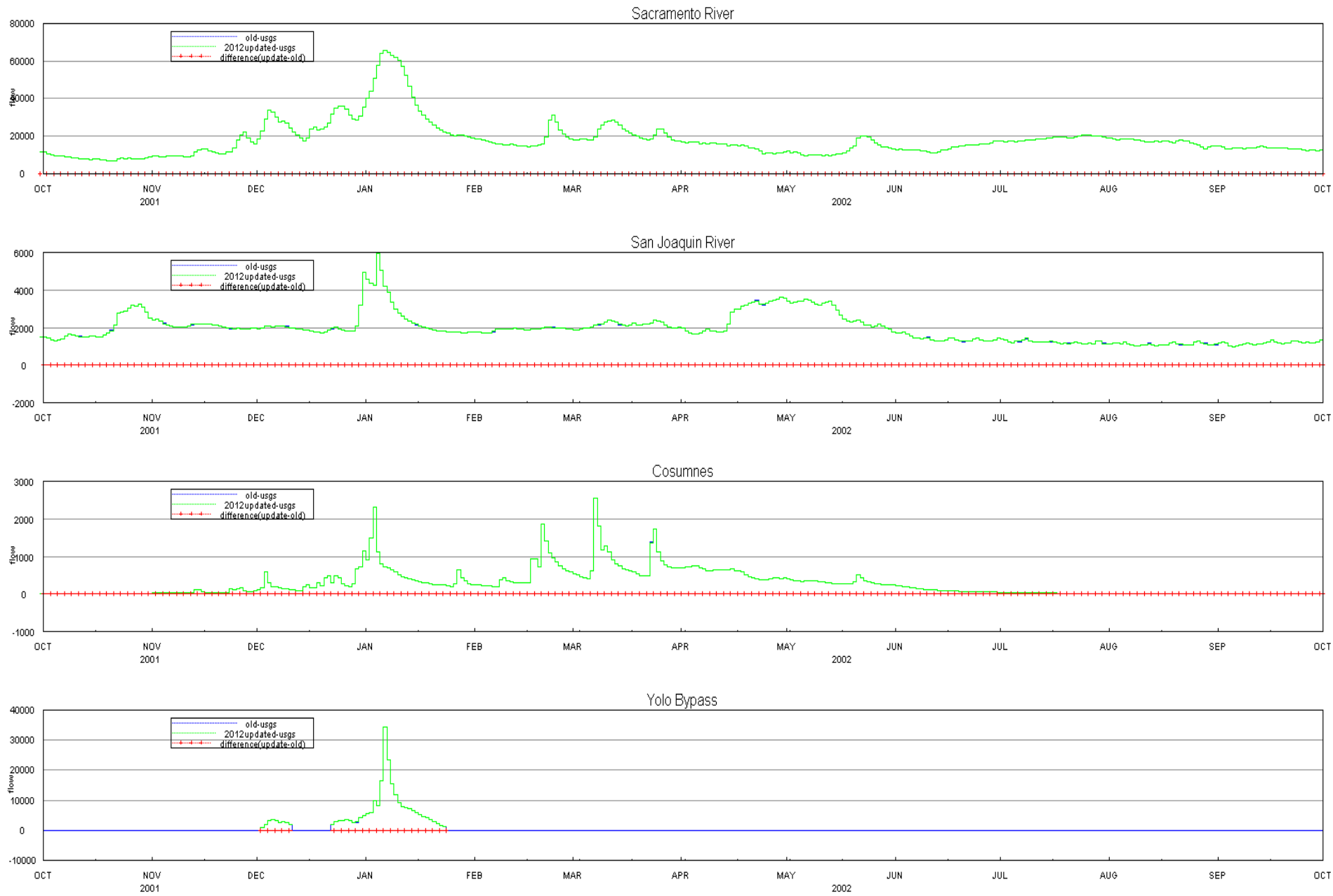
# Figure 5: Water Year 2001

## USGS Stations: Flow Comparison of Old vs Updated



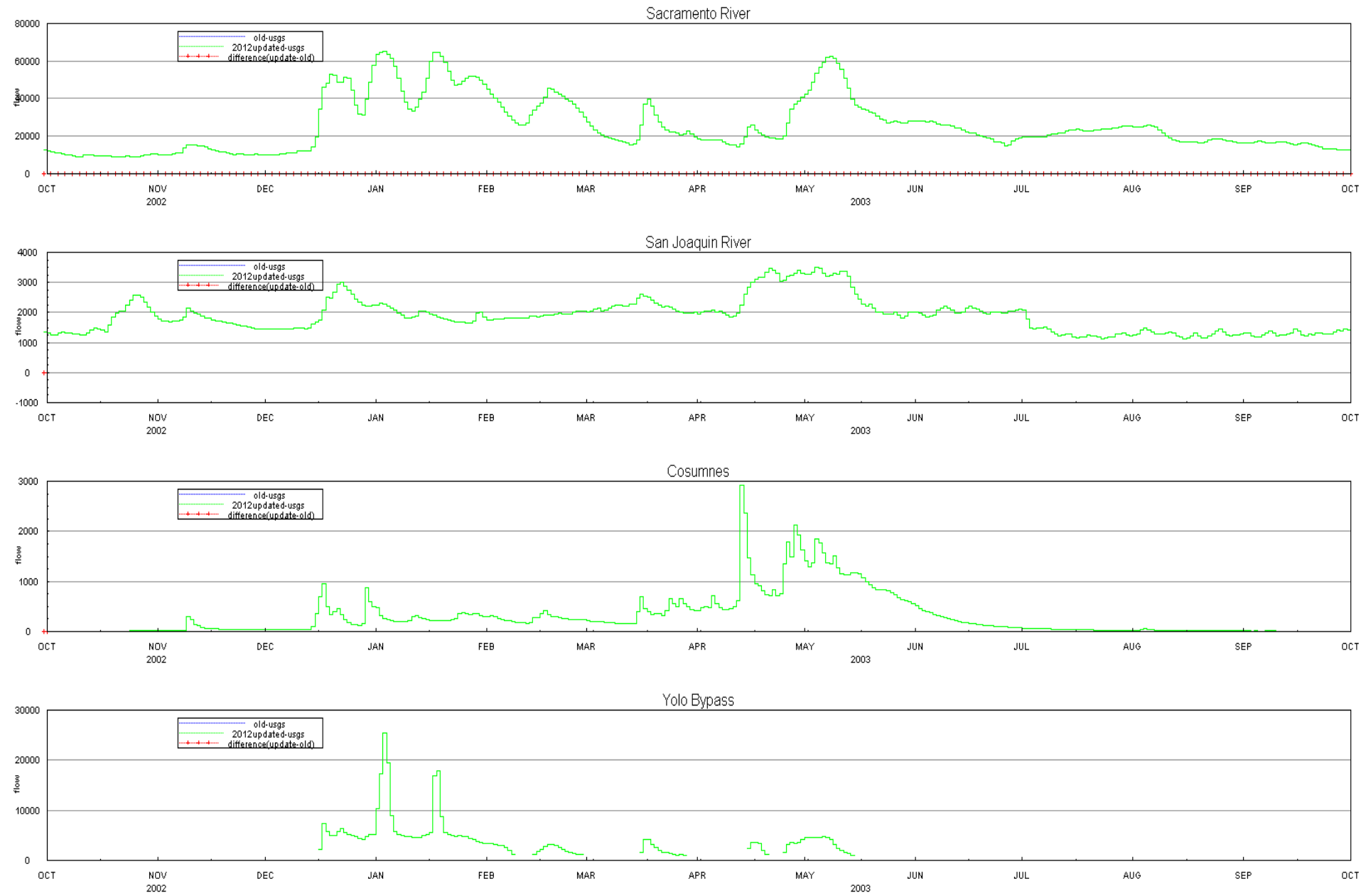
# Figure 6: Water Year 2002

## USGS Stations: Flow Comparison of Old vs Updated



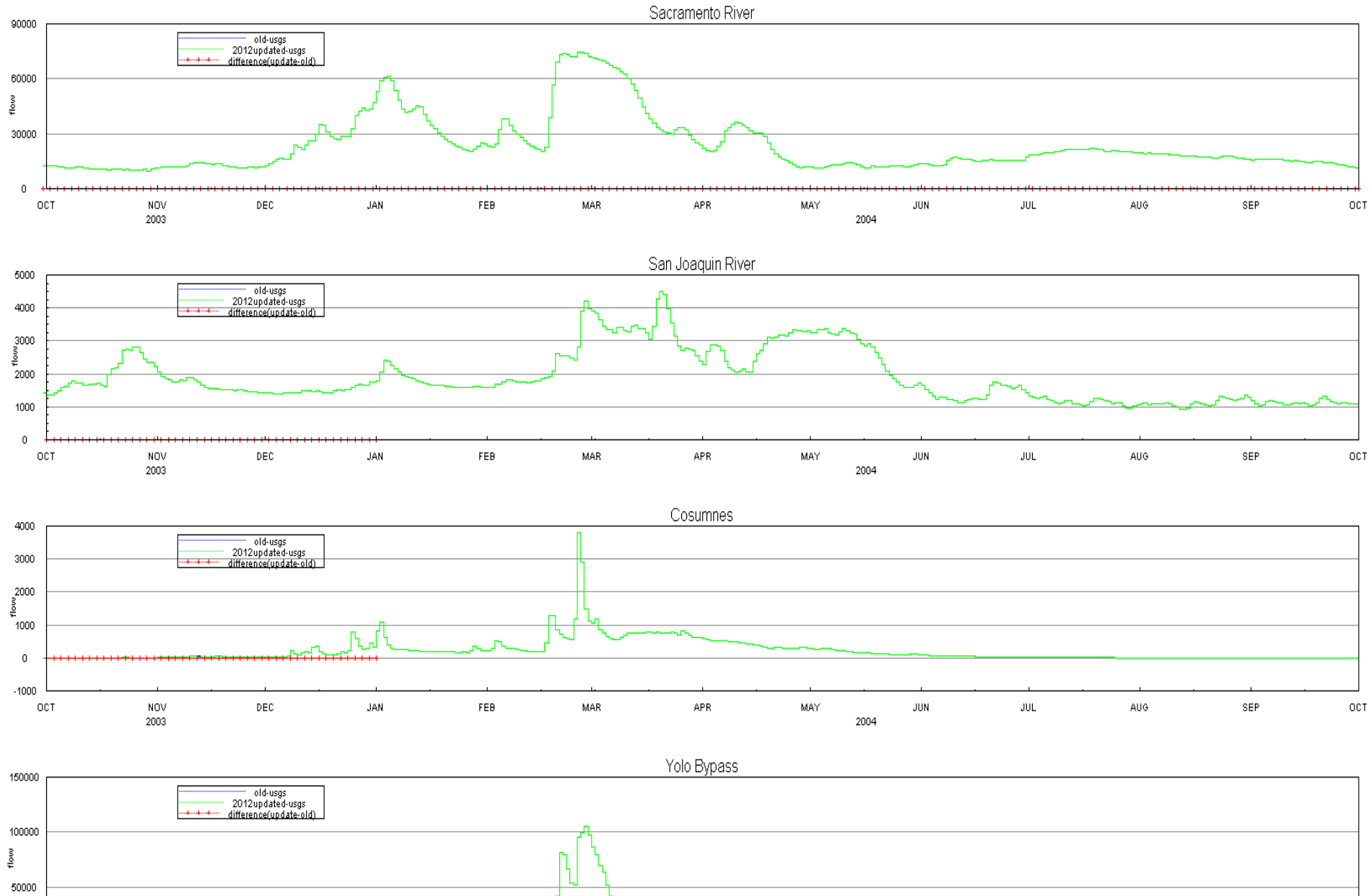
# Figure 7: Water Year 2003

## USGS Stations: Flow Comparison of Old vs Updated



# Figure 8: Water Year 2004

## USGS Stations: Flow Comparison of Old vs Updated



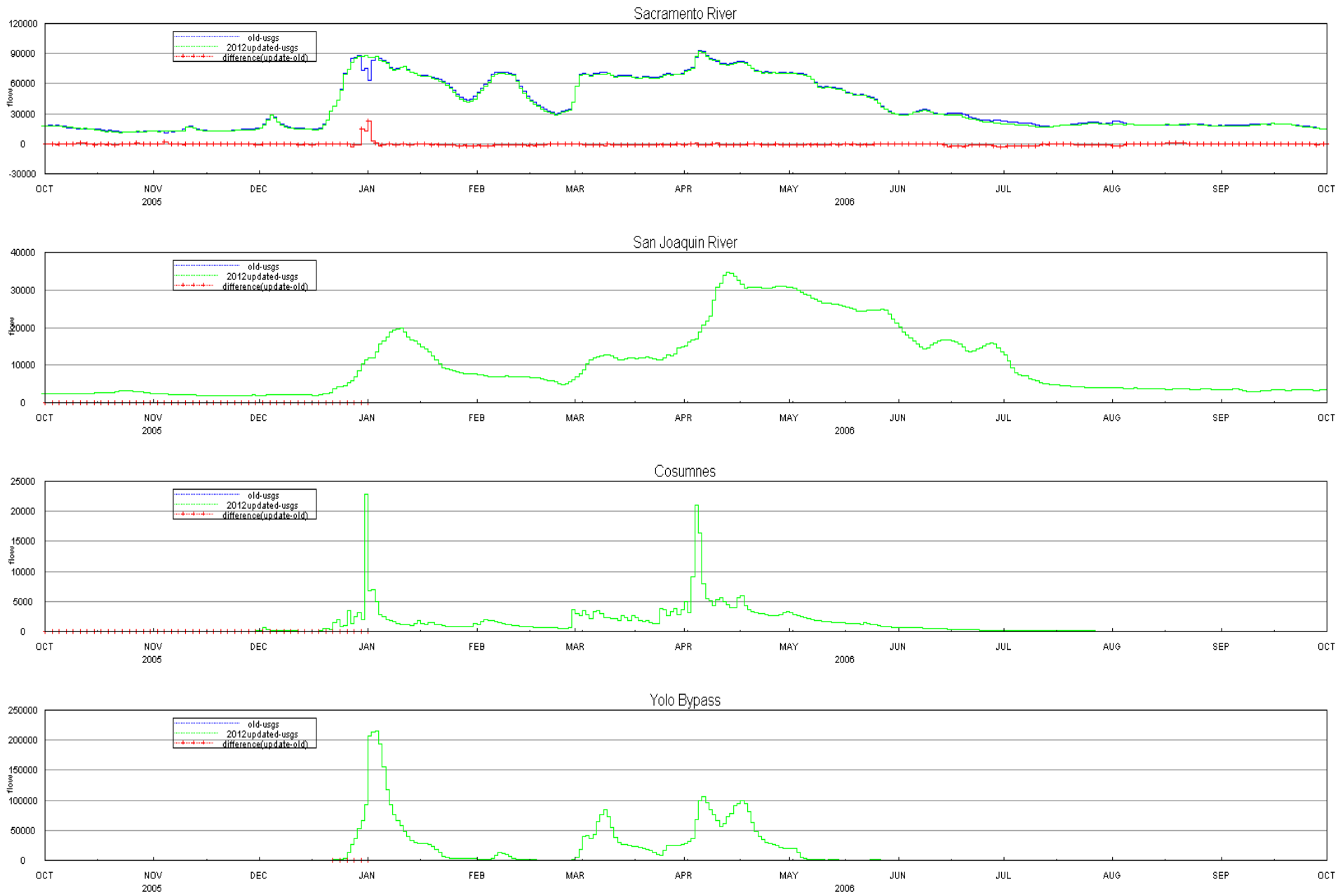
# Figure 9: Water Year 2005

## USGS Stations: Flow Comparison of Old vs Updated



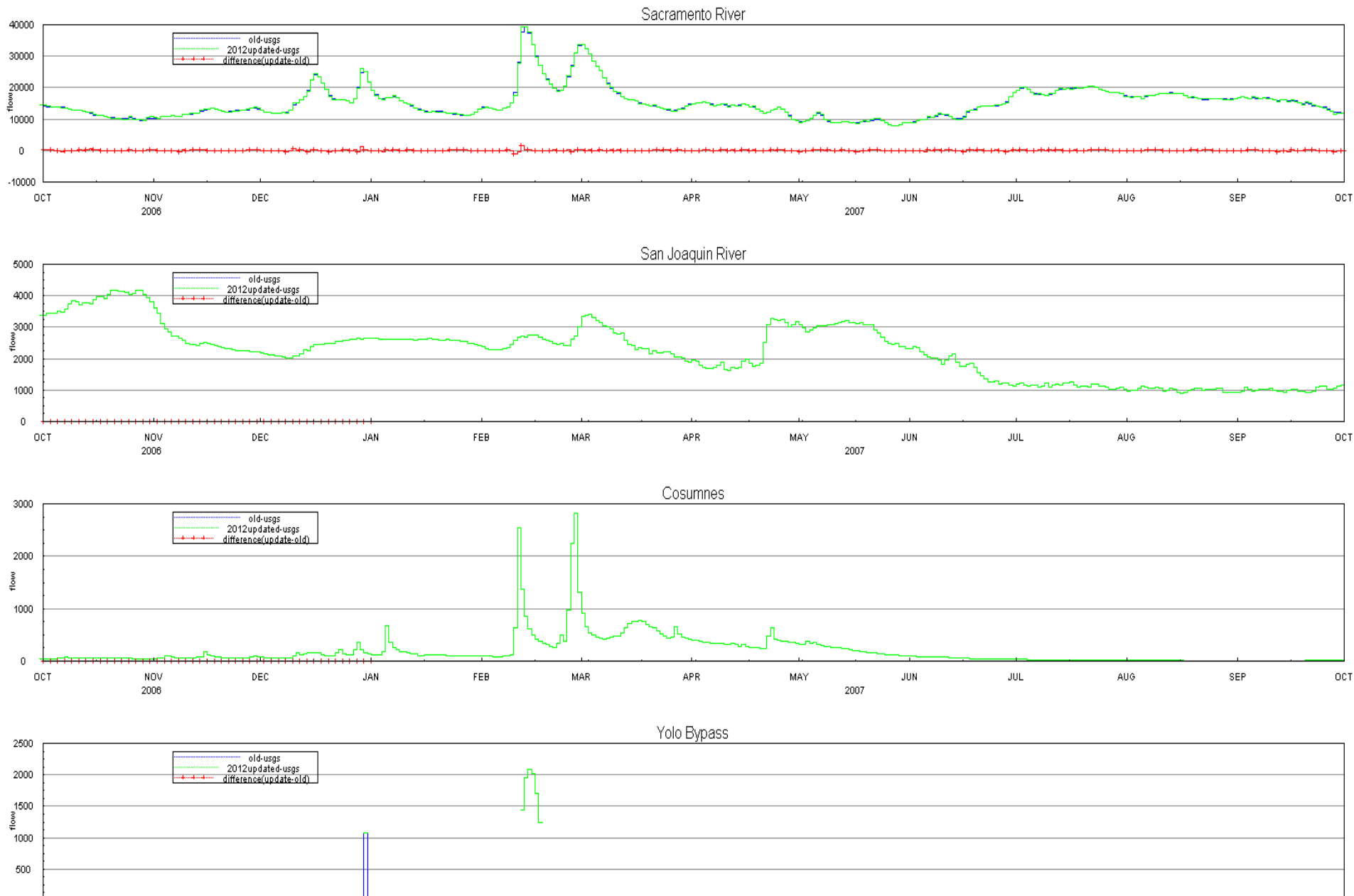
# Figure 10: Water Year 2006

## USGS Stations: Flow Comparison of Old vs Updated



# Figure 11: Water Year 2007

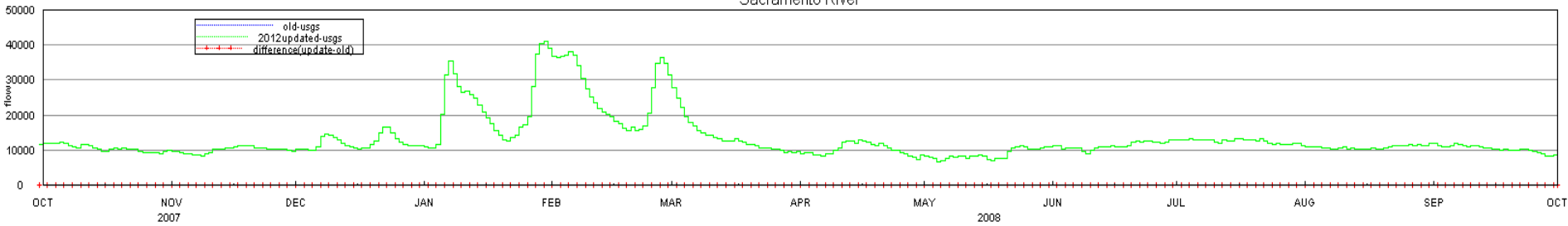
## USGS Stations: Flow Comparison of Old vs Updated



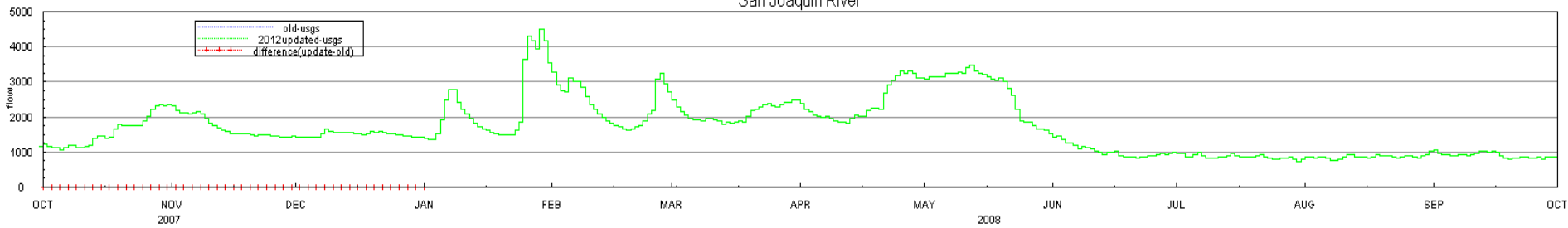
# Figure 12: Water Year 2008

## USGS Stations: Flow Comparison of Old vs Updated

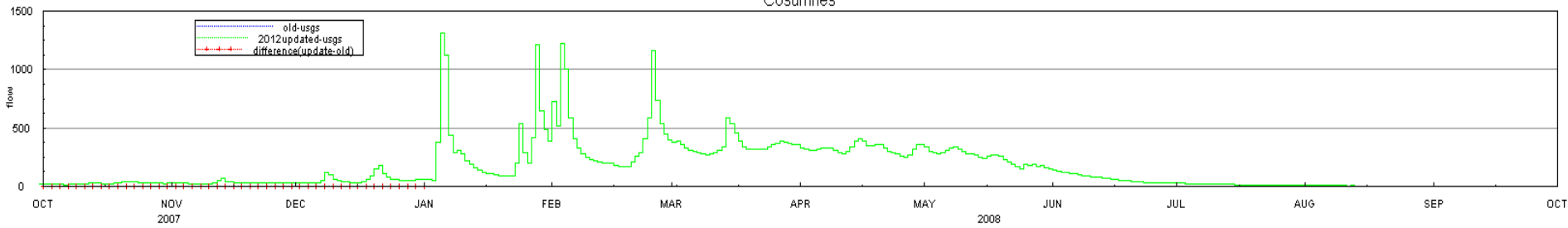
Sacramento River



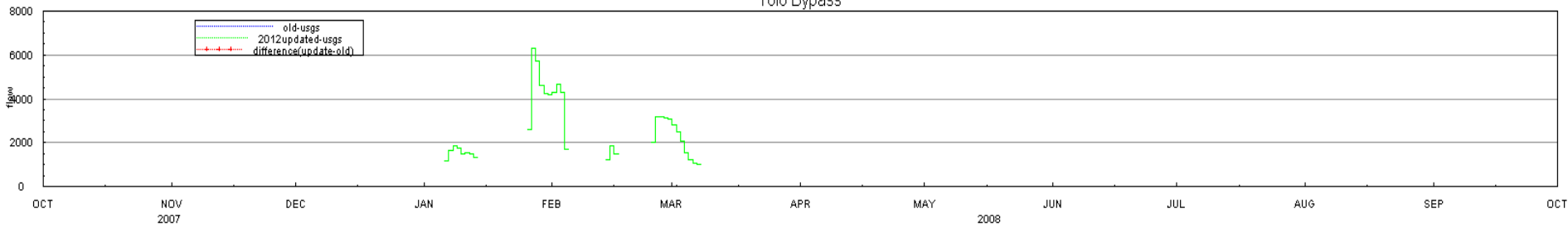
San Joaquin River



Cosumnes

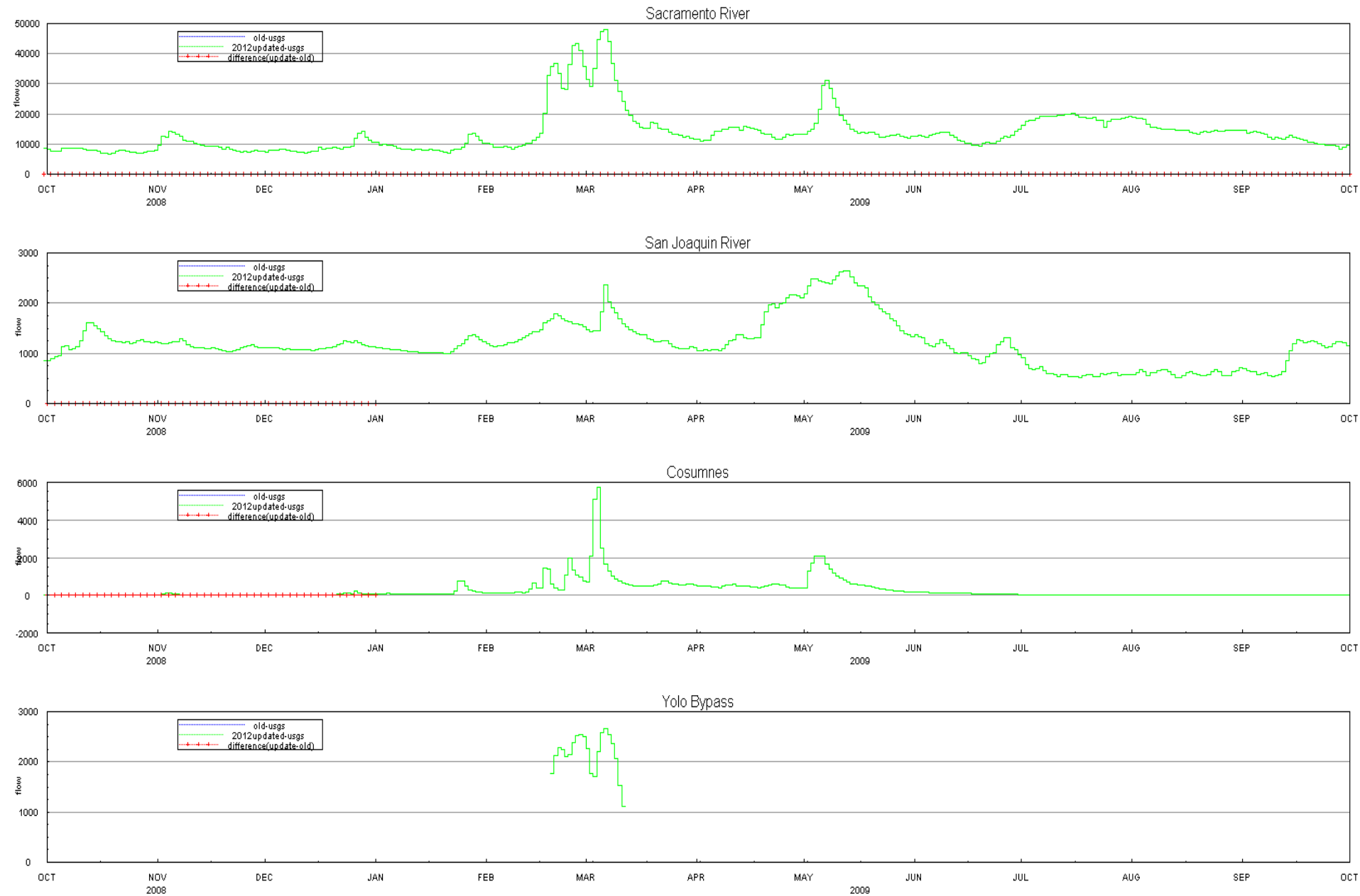


Yolo Bypass



# Figure 13: Water Year 2009

## USGS Stations: Flow Comparison of Old vs Updated



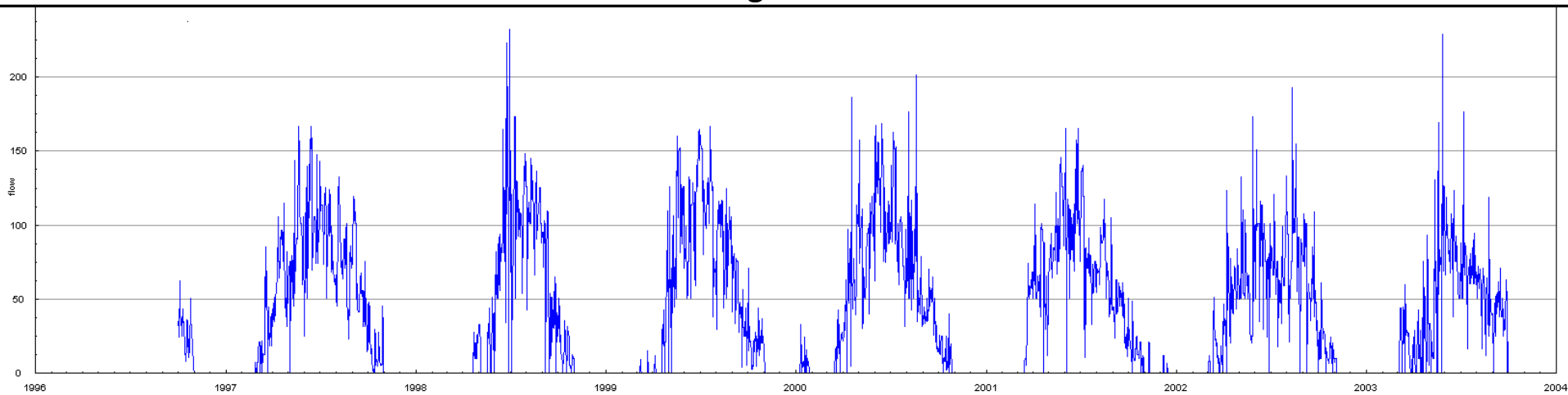
# Figure 14: Water Year 2010

## USGS Stations: Flow Comparison of Old vs Updated

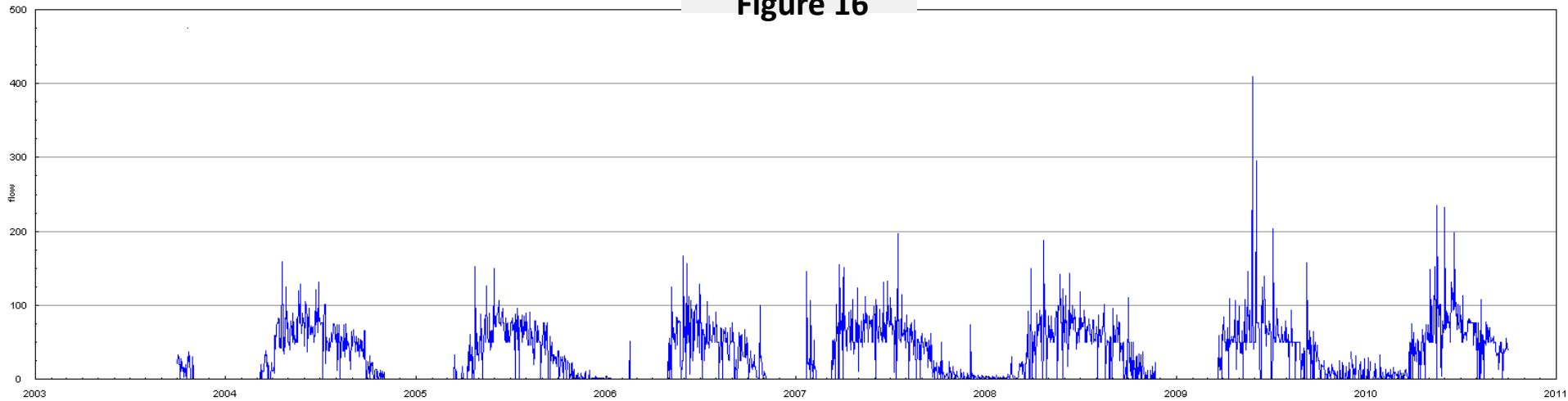


# BBID: Daily Pumping Between WY 1997 - 2010

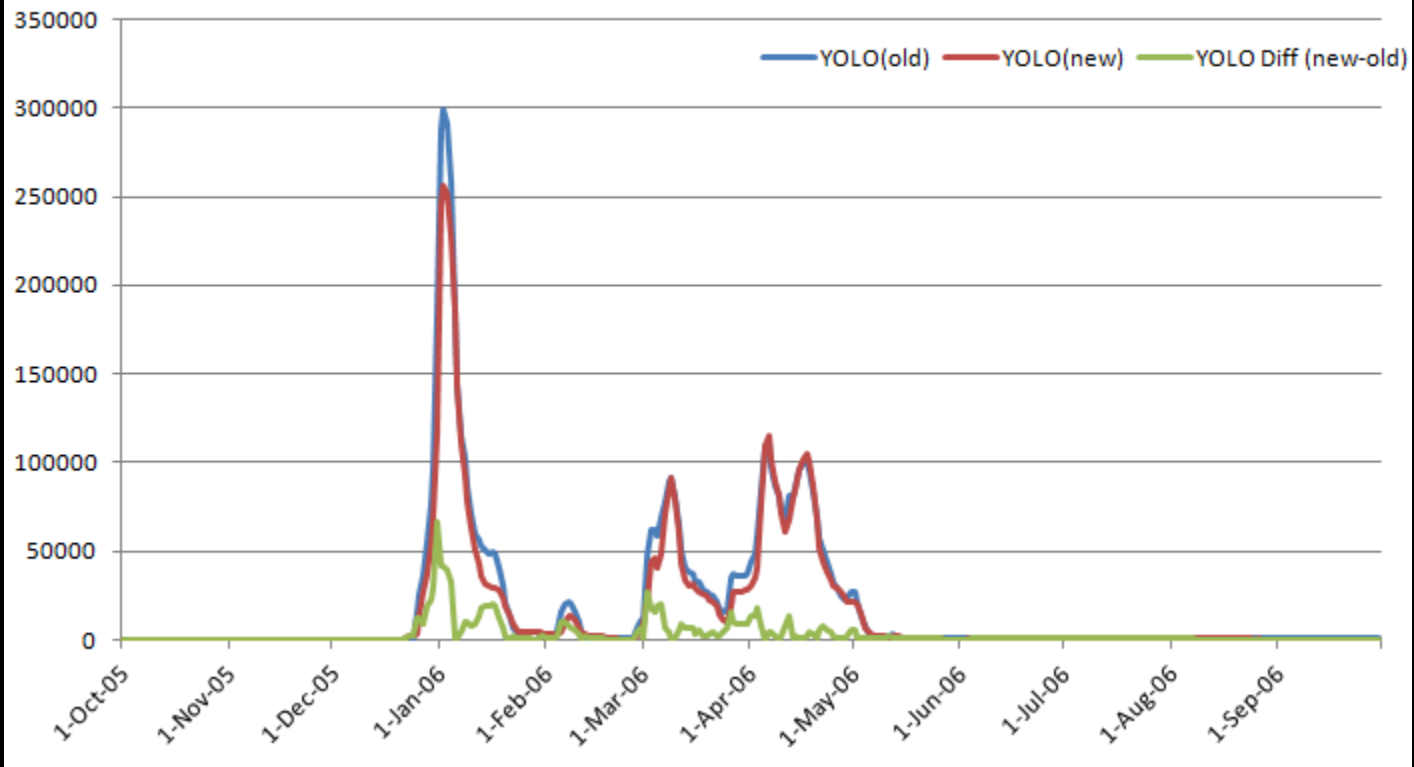
**Figure 15**



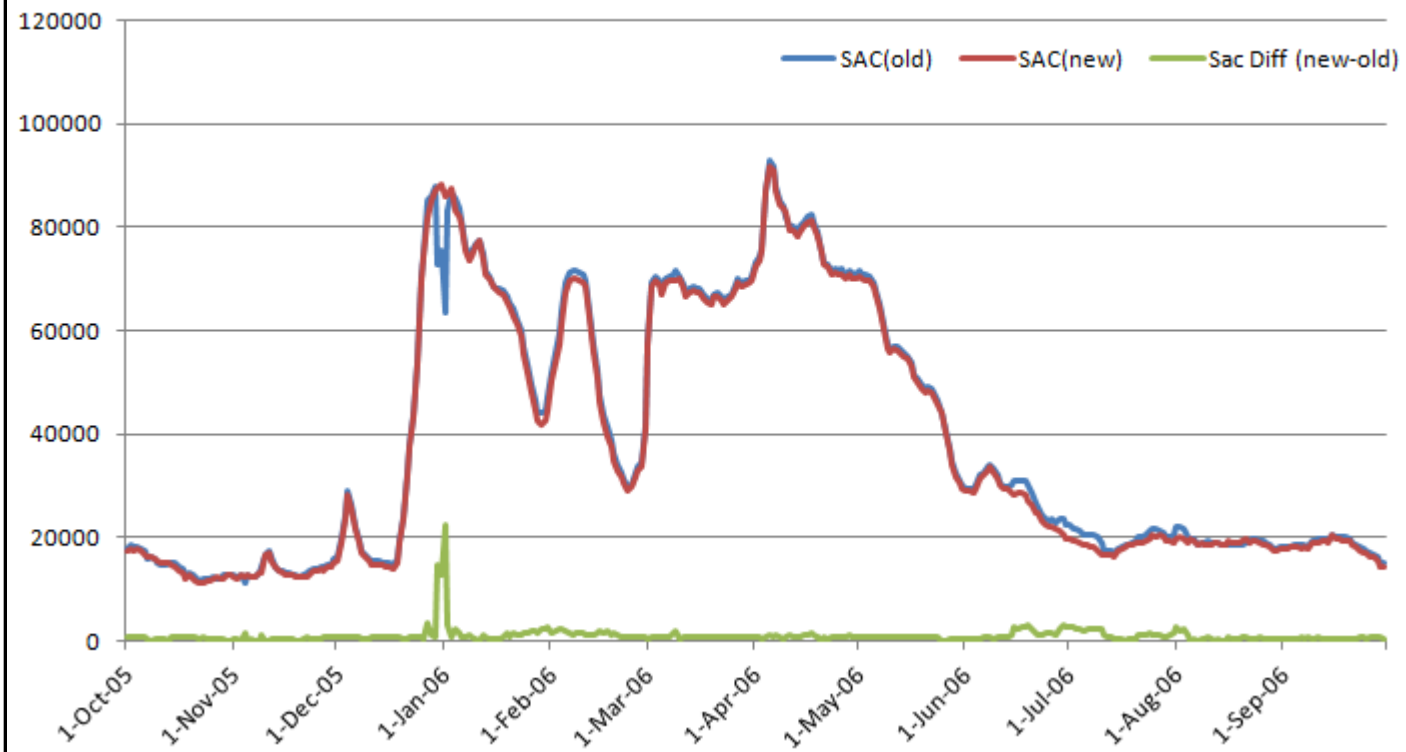
**Figure 16**



**Figure 17: WY 2006 Yolo Bypass Flow (cfs) Difference**



**Figure 18: WY 2006 Sacramento River Flow (cfs) Difference**



**Figure 19: WY 2007 Sacramento River Flow (cfs) Difference**

