DRAFT May 2014

NSS Comment: The difference between diversions and exports: Where did the water go from Georgiana Slough in April 2014, 2013, 2012? (BDCP EIR/EIS Chapter 5, Section D-see appendix regarding DICU computer modeling; Chapters 6.6 and 7 and any of the conveyance options: what matters most is HOW MUCH fresh water is exported from the Sacramento River.

If you can't count it, you also can't manage or monitor it. This is true with money, soap, energy generation, produce and anything sold, including water. *Flow*s are reported as cubic feet per second or "cfs" generally. *Diversions* are reported in cfs, and sometimes other measures like TAF and MAF. *Exports* are reported in TAF or MAF most often. Therefore it takes the use of conversion formulas to compare what was diverted to what was reported as exports. Somewhere in that process it seems there is missing or unaccounted for exports. The value of that unaccounted for water could represent hundreds of millions of dollars per year if valued at the price California residential rate payers pay for their drinking water. This water flow summary is the third focus area of review of water flow and exports from the Delta, and covers just one location of substantial missing export data as reported by DWR. One needs to question if the DICU computer modeling for the BDCP draft documents as used *in* ***Chapter 6.6*** on Delta hydraulics, and ***BDCP EIR/EIS Chapter 7*** regarding Sacramento River hydraulics, and in every chapter of the Delta Plan, BDCP and EIR/EIS where water flow in and out of the Delta is accounted for or assumptions are made which affect the outcome. As a review of some topics already covered, first there is the confusion of which conversion formula to use, as DWR and USGS conversion charts are different. Second you need to look at the raw flow gage reports to see if there are gaps in the times of flow reporting. Data Gaps will result in under-reporting actual flow at that particular gage. For this third step in the review of unreported flows and exports from the Delta, I will look at just one Delta waterway for one two-week time period, using April 2014 dates and flows on Georgiana Slough in the North Delta. I picked Georgiana Slough because it is deep and has been a major route for conveyance of Sacramento River water into the San Joaquin River for many years. In fact, Georgiana Slough runs deeper than the Sacramento River, so Sacramento flows are more likely to follow gravity and flow into Georgiana instead of going down the historic and natural route of lower Sacramento River. It therefore seems logical to look at Georgiana flows.

For several years, I have gone to the California CDEC website and could find Georgiana Slough flows including the dayflow data which can be downloaded. Since I reported the data gaps found on Freeport, Sutter and Steamboat Sloughs, for some reason DWR has removed the links to find data on Georgiana Slough flow monitor, even though USGS still does provide some data. The links used show on the screen prints I provide in this study of Georgiana Slough, and I encourage you to review it for yourself.

In summary, what I found from review of Georgiana Slough flows in April 2014, was that there seemed to be either something wrong with the flow gages between the one at the beginning of Georgiana and the one at the end of Georgiana, or there was missing diversions going unreported. Based on the USGS data, the "data gap" may reflect very substantial diversions that would be way in excess of normal diversions by local farmers along the slough. I question whether the DICU computer modeling accounts for the data gaps or unreported huge diversion of flow from Georgiana Slough? I then looked back to other years and found that in April 2013, 2012 and 2011 there were also unexplained gaps in the flow gages on Georgiana Slough. By driving and boating along Georgiana Slough, and comparing the farmer diversion locations that are charted online to the visible diversions along Georgiana Slough, there did not seem to be an additional diversion or new intake. That is until I found the circling water one calm afternoon in April 2014. I brought a local landowner back to the spot and pointed out, on a different afternoon in April, the same spot. We both thought there was some sort of intake sucking water down visibly. However, when I boated back to the location in early May. The location did not show any water diversion action. Others are now investigating piping on the island side to try to determine what was seen and photographed.

The following screen prints will help you, the viewer, to quickly understand the location and volume to "missing water" that should be explained by DWR. In addition, one needs to question why there are data gaps at the same time as the installation of the fish barriers at the north end of Georgiana Slough and does the operation of the possible major diversion downpipes affect the outcome of the salmon migration studies? Maps to find gages are found at http://ca.water.usgs.gov/data/waterconditionsmap.html and http://cdec.water.ca.gov/cgi-progs/mapper?level=2&map=17&quad=10

North Georgiana gage: http://waterdata.usgs.gov/ca/nwis/uv?site_no=11447903 and http://cdec.water.ca.gov/cgi-progs/staMeta?station_id=GGS

Fish migration studies are found at

Graphic1 1a & 1b: Screen print showing the reported agricultural diversion pipes or rights along the northern half of Georgiana Slough and DWR computer modeling for Delta diversions

Map above shows the locations of recognized agricultural diversion pumps and pipes along Georgiana Slough and other Delta waterways in that area. The two white boxes were added to show the approximate locations of the flow gages that are the subject of this review of water flow and diversions between the upper white box and lower white box or the flow gages of USGS and CDEC noted in the previously-referenced website links.

Graphic 1b: Computer modeling the water diversions within the Delta. BDCP map for DICU.

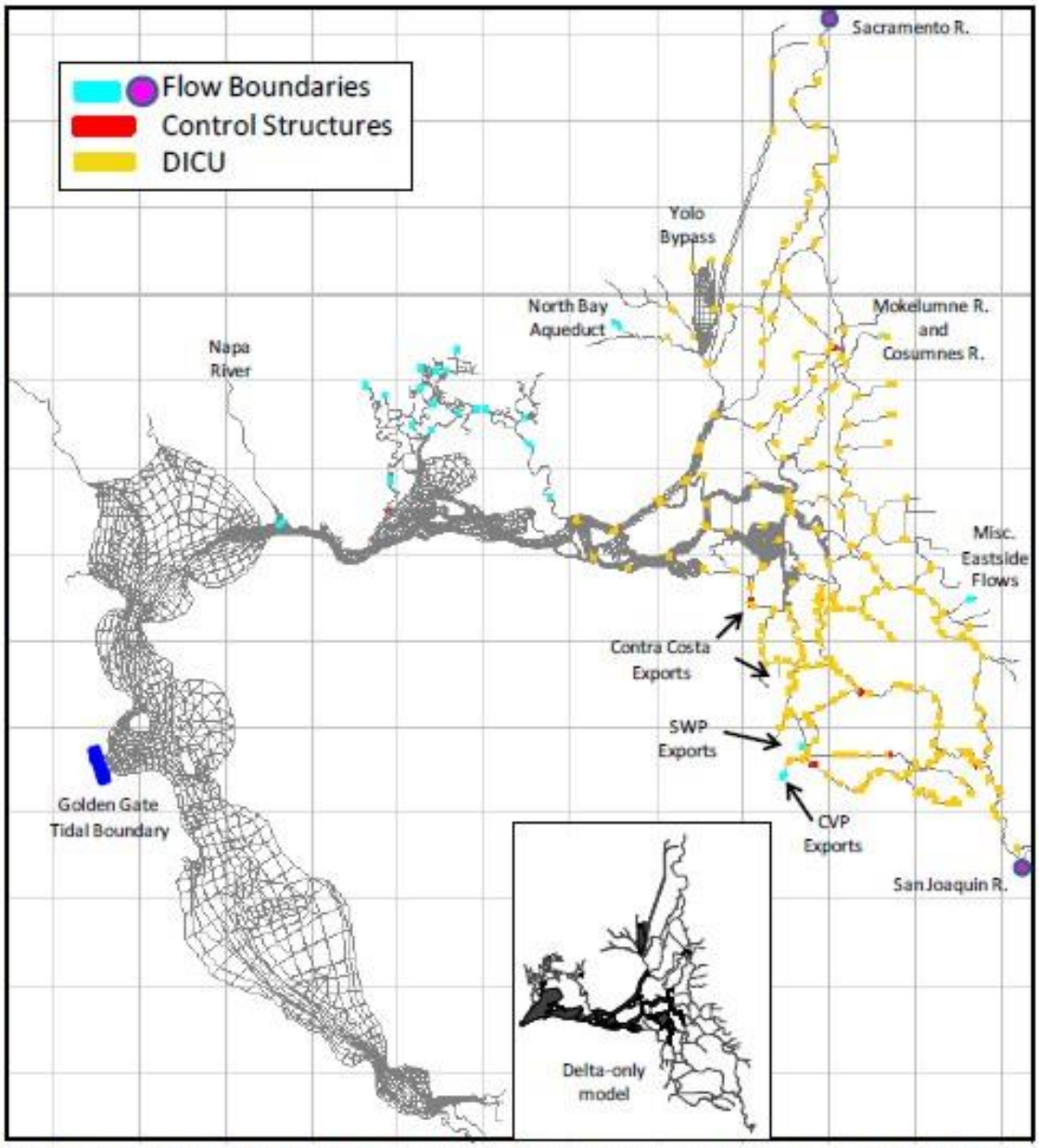
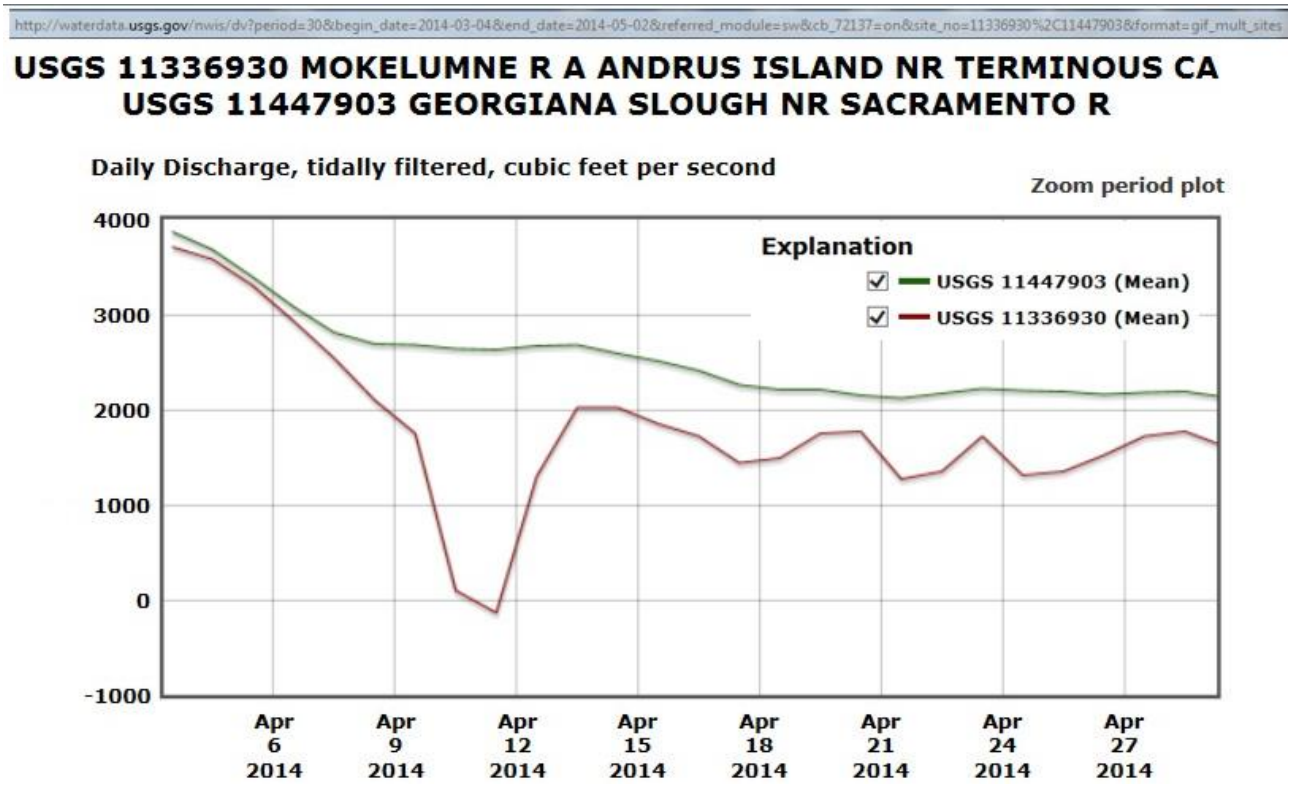


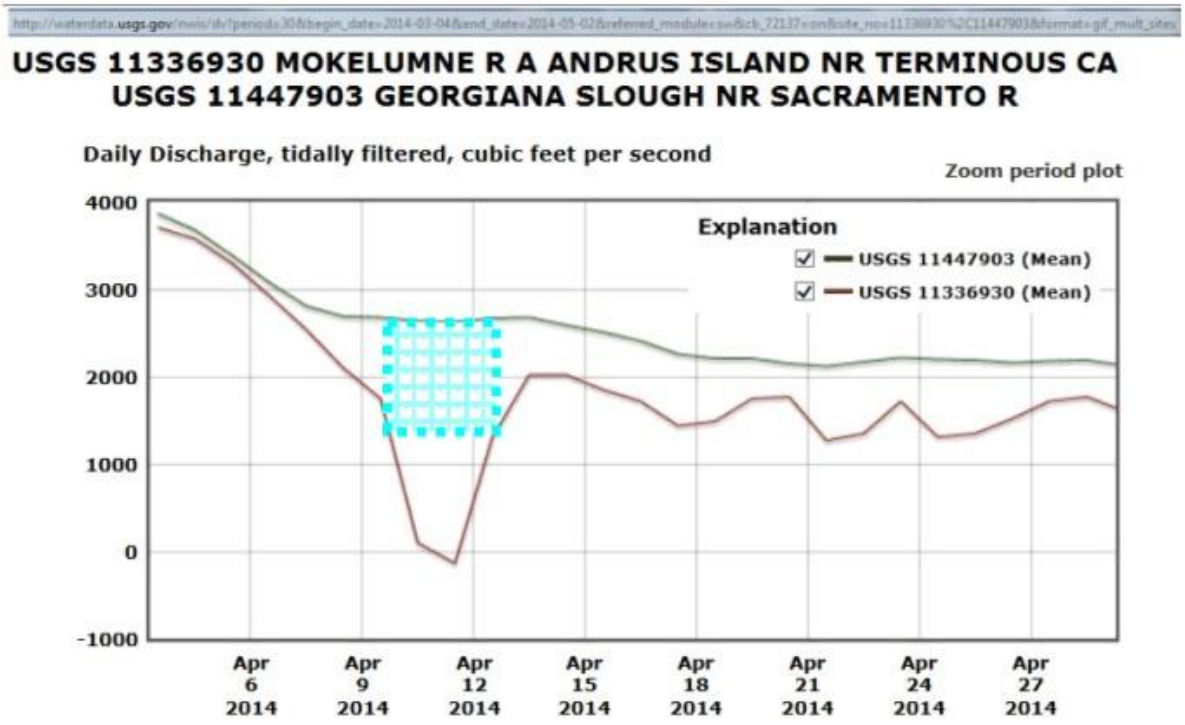
Figure 2-1 Model grid showing inflow and export locations, flow control structures and DICU. Inset shows the Delta-only version of the model used in the coupled simulations.

Graphic 2: Georgiana Slough gages showing flow gap in 2014 in CFS, daily discharge, tidally filtered.



Graphic 3 (next page): Same 2014 Georgiana flow data, plus analysis of the value of the unaccounted for water. The value of over 7000 cfs of unaccounted for Georgiana Slough flow is as high as over $32,000,000 for just a portion of the unaccounted for flows!

DATA GAP OR UNACCOUNTED FOR WATER DIVERSIONS



The blue box was added to the USGS graphic showing the flow on Georgiana Slough and at the gage on the Mokelumne just below the end of Georgiana Slough. What happens to the Georgiana Slough flow which appears to show 1200 to 2500 missing cfs? That is a substantial amount of unaccounted for water in just a few days time frame. Oddly, there is a similar data gap several years going back, in April. To put it in perspective, the intake at Freeport is reported to run at 300 cfs. A typical larger farmer diversion pipe might have the capacity of 20 cfs down to less than 1 cfs. The unaccounted for water or data gap represents 1000 to 2500 cfs over the three day period shown, estimated.

Focusing on just the blue box area, the following formula was used to estimate how much water flow is unaccounted for on Georgiana Slough in 2014, from April 9 to April 12, and what is the value of that unaccounted for water flow:

1 cfs =1.98 af per day

1200 cfs x 1.98 af per 3 days = 7,128 af unaccounted for water

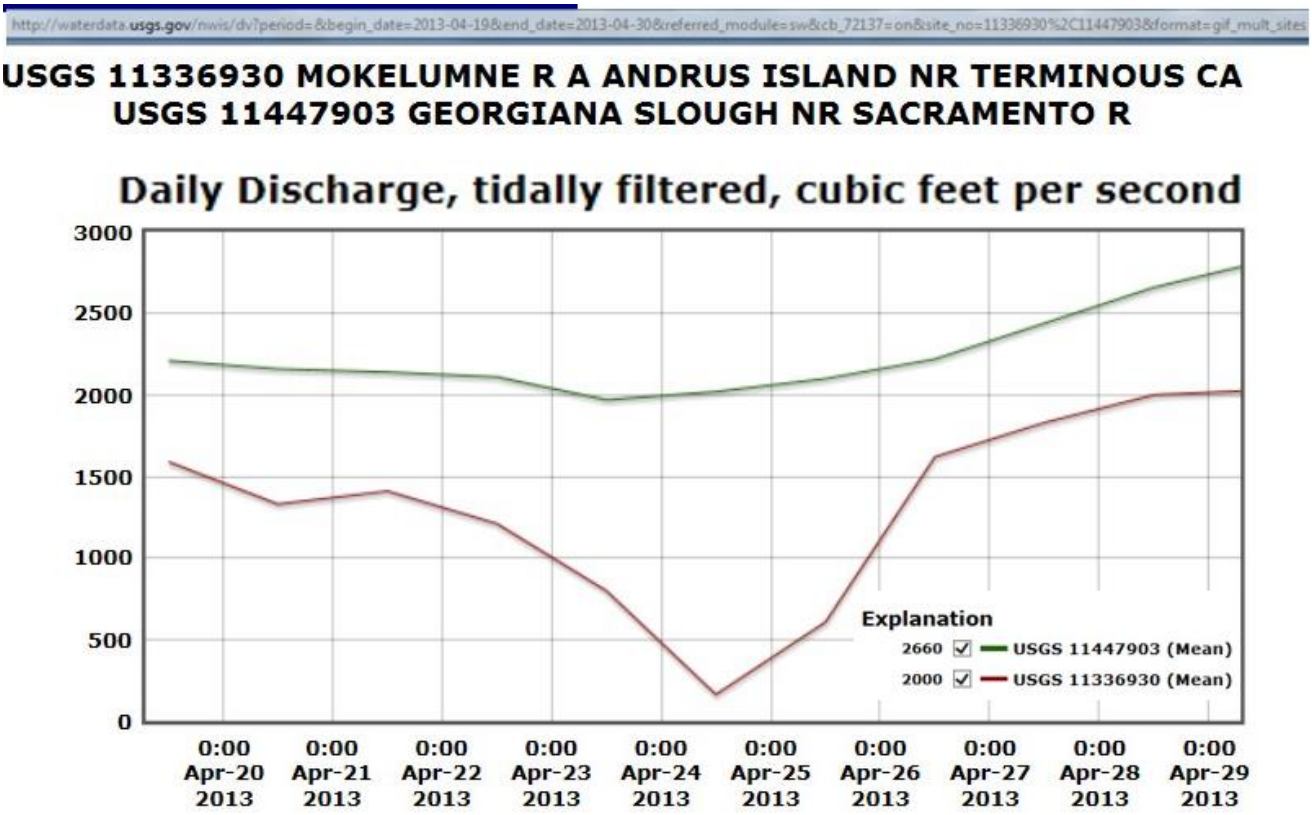
Value of 7,128 acre feet if sold at $150 per af agriculture use: **$1,069,200**

Value of 7,128 acre feet if sold at municipal/residential rates of $5,200 per acre foot: **$37,065,600.**

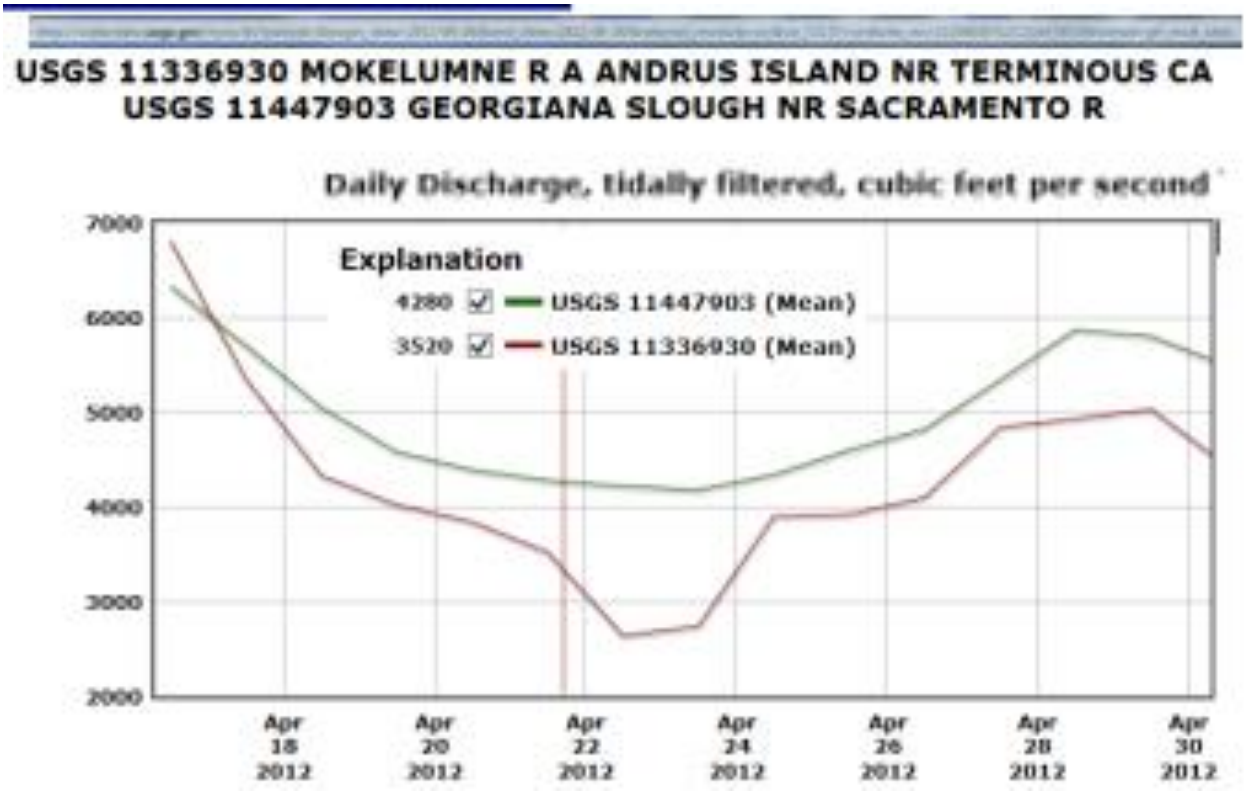
Conversion charts found at:
Http://md.water.usgs.gov/cfscalc/
Http://dnrc.mt.gov/water_rts/wr_genral_info/wrforms/615.pdf
http://www.ppic.org/content/pubs/report/R_1112EHR.pdf
Ag and residential value per acre foot based on online reports of water transfer values:
Http://exiledonline.com/how-limousine-liberals-oligarch-farmers-and-even-sean-hannity-are-hijacking-our-water-supply/
Http://www.sacbee.com/2012/01/08/4168916/water-barons-will-corner-market.html

Data review by N. Suard, Esq. May 2014

Graphic 4: Georgiana Slough gages showing flow gap in 2013 accessed 5/3/2014. Note that in April 2013 there was a similar substantial change in the flow on Georgiana vs the outflow at the bottom end of Georgiana where it merges with the Mokelumne River.



Graphic 5: Georgiana Slough gages showing flow gap in April 2012



Graphic 6: Screen print example of Exports in wet and dry years from degeorge-predation-wkshp-2013-07-22-r1.pdf found at website page with videos and pdfs of many presentations. One should wonder if the flow gap in April has been going on for many years and if the unaccounted for water was known to computer modelers, since the data gap would have an effect on the outcomes of the various computer models.

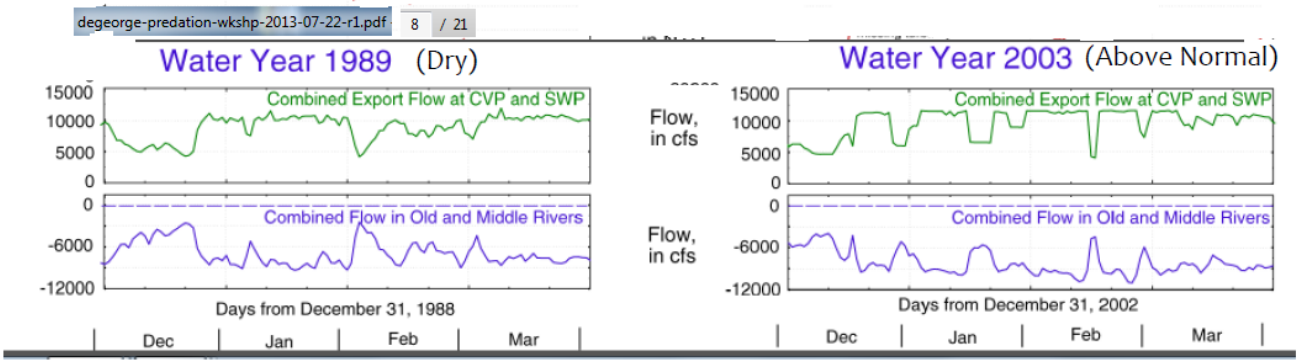
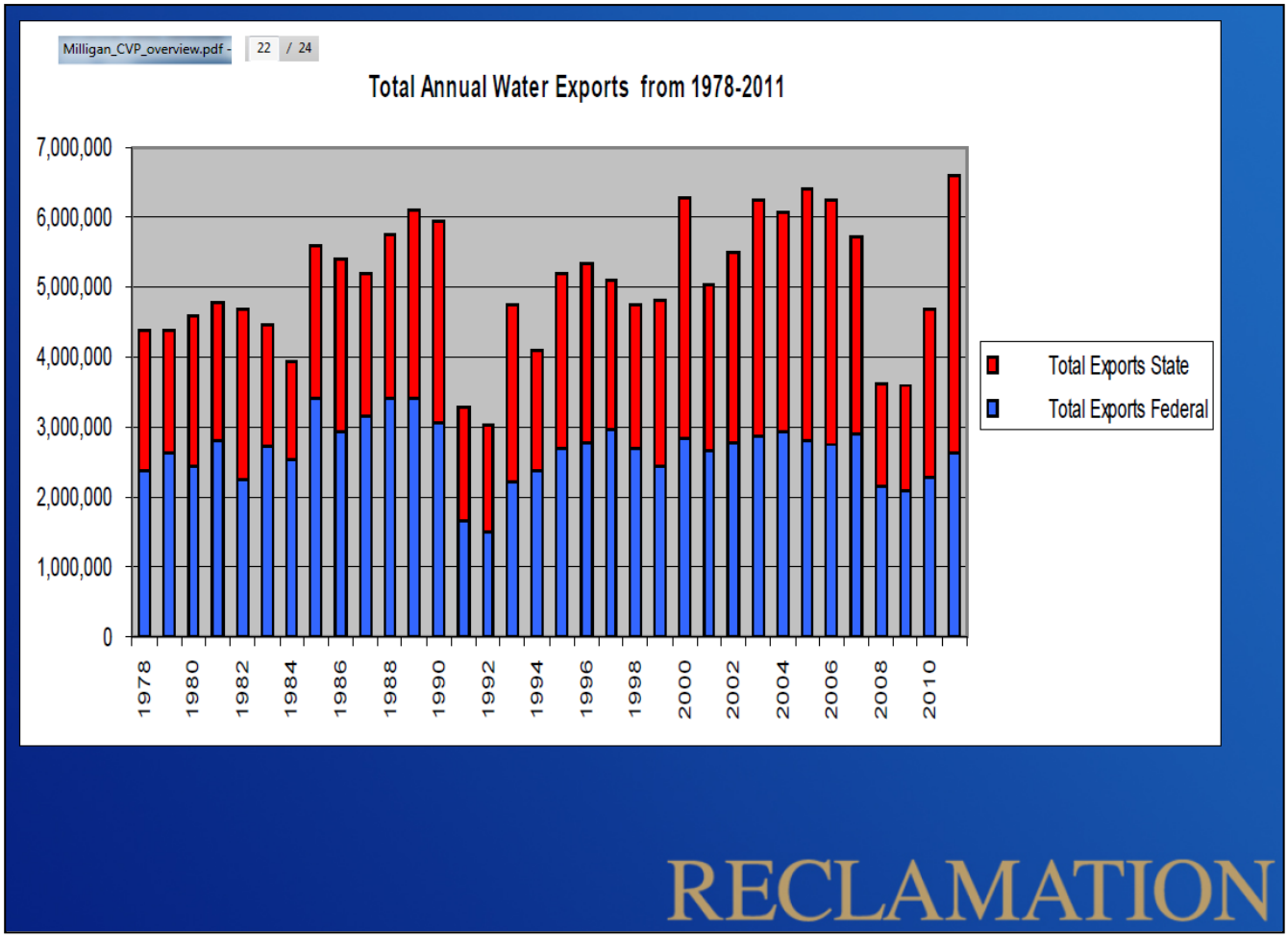


Figure Credit: Peter E. Smith, USGS, ret., Effects of Turbidity and Hydrodynamics on Distributions of Delta Smelt, 2012 CWEMF Annual Meeting

Graphic 7: Exports chart from a USBR presentation showing how exports have varied over the years. One should question if the unaccounted for flows of Georgiana Slough are included in the export numbers or if there is simply silence on the issue.



Graphic 8: Gives an example of computer modeling on Georgiana Slough by "RMA". How does the unaccounted for Georgiana Slough flow affect computer modeling outcome for factors such as salinity encroachment into Georgiana Slough during the time when the outflow is non-existent while the inflow into Georgiana is substantial. Is the diversion of the unaccounted for water drawing saltier San Joaquin River water into Georgiana Slough?

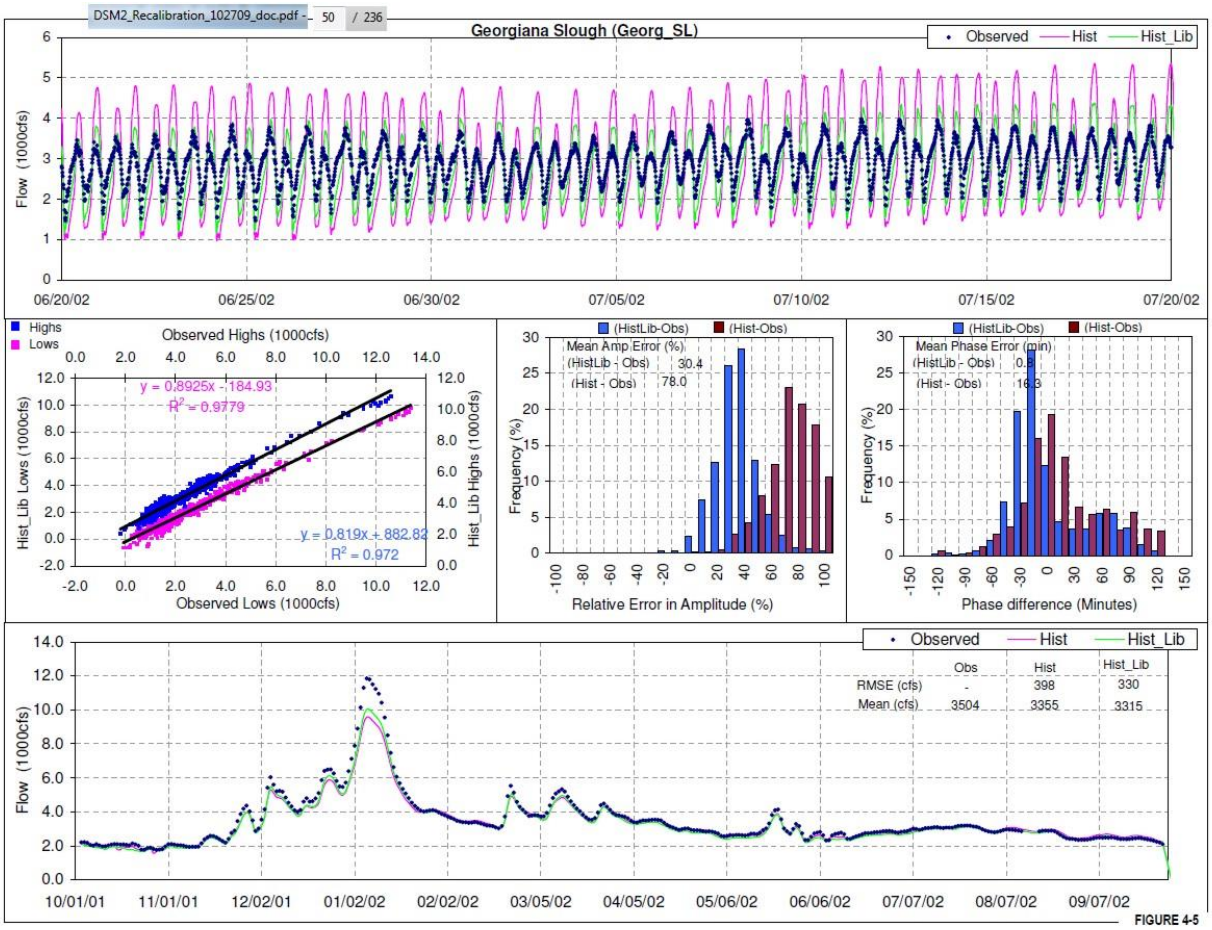


FIGURE 4-5

Graphic 9: Back to the Georgiana Slough unaccounted for water of April 2014

WHERE DOES THE WATER GO?

Georgiana - cfa		Mokelumne - cfs		
4/8/2014 8:30	3100	4/8/2014 8:30	-474	
4/8/2014 8:45	3040	4/8/2014 8:45	-2580	
4/8/2014 9:00	3010	4/8/2014 9:00	-4500	Where is the flow from
4/8/2014 9:15	3000	4/8/2014 9:15	-5960	Georgiana Slough being
4/8/2014 9:30	3100	4/8/2014 9:30	-6660	diverted during this
4/8/2014 9:45	3120	4/8/2014 9:45	-7260	timeperiod?
4/8/2014 10:00	2960	4/8/2014 10:00	-7580	
4/8/2014 10:15	3020	4/8/2014 10:15	-7610	
4/8/2014 10:30	3050	4/8/2014 10:30	-7740	
4/8/2014 10:45	3240	4/8/2014 10:45	-7860	
4/8/2014 11:00	3110	4/8/2014 11:00	-7500	
4/8/2014 11:15	3210	4/8/2014 11:15	-6920	
4/8/2014 11:30	3170	4/8/2014 11:30	-6450	
4/8/2014 11:45	3020	4/8/2014 11:45	-5570	
4/8/2014 12:00	2710	4/8/2014 12:00	-4880	
4/8/2014 12:15	2700	4/8/2014 12:15	-4690	
4/8/2014 12:30	2620	4/8/2014 12:30	-3190	
4/8/2014 12:45	2330	4/8/2014 12:45	-1900	
4/8/2014 13:00	2030	4/8/2014 13:00	-497	
4/8/2014 13:15	1800	4/8/2014 13:15	1200	

http://cdec.water.ca.gov/cgi-progs/mapper?level=2&map=17&quad=10

As the above graphic shows, there appears to be unaccounted for Georgiana Slough flows in just the time period recorded above. The flow data also indicates reverse flows on Georgiana Slough, which would draw saltier San Joaquin River water into Georgiana. It was noted on 5/3/2014 that many of the Oak Trees along the levees were dying. Could this be one of the reasons?

The in-Delta diversions have been chronicled by flow gages and by the DICU computer modeling-BDCP drafters need to explain the silence regarding the flow data gap in April on Georgiana Slough and analyze if the excessively lower water levels below the apparent intake below water surface has had the very visual effect of drawing water levels so low that the roots of the old oaks along Georgiana are left bare so the trees die quickly. (Note the oaks on the

land side of the levees are fine-it is the oaks on the water side of the levees of lower Georgiana that are suffering).

Given the evidence of impacts to the old oak trees of Georgiana Slough, and the fact BDCP decisions are based on outdated and likely understated DICU data, wouldn't it be prudent to require a complete review of the North Delta flow data for Georgiana Slough, and a reassessment of the flow splits between Georgiana, Sutter, Steamboat and the lower Sacramento River are necessary?