*Where's the Water?

Tracking reported North Delta water flow and the unaccounted for water data gaps.

If there is not enough water left to export, why build tunnels or any other form of conveyance?

Presentation for the North Delta Cares & community: Data compiled by Nicole S. Suard, Esq, (from Snug Harbor on Steamboat Slough).

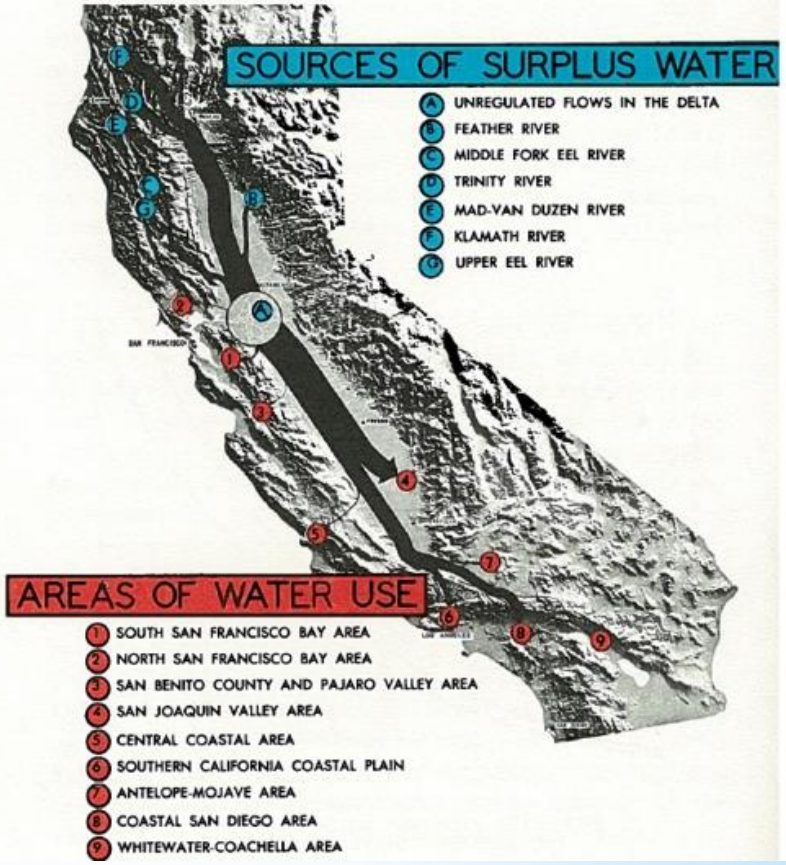
Previous Page Next Page 12 / 63 1960Bulletin_No._76_Delta_Water_Facilities-Color.pdf - olling Pages One Full Page Find

The Delta — its role in California's water development

In 1959, the State Legislature enacted the California Water Resources Development Bond Act to finance construction of the State Water Resources Development System. The bond act was approved by the California electorate in November 1960. The State Water Facilities, the initial features of this system, will complement continuing local and federal water development programs and include the very necessary works in the Delta.

One of the principal objectives of the State Water Resources Development System is to conserve water in areas of surplus in the north and to transport water to areas of deficiency to the south and west. The Delta is important in achieving this objective, since it receives all of the surplus flows of Central Valley rivers draining to the ocean during winter and spring months and is the last location where water not needed in the Delta or upstream therefrom can conveniently be controlled and diverted to beneficial use. Surplus water from the northern portion of the Central Valley and north coastal rivers will be conveyed by the natural river system to the Delta, where it must be transferred through Delta channels to export pumping plants without undue loss or deterioration in quality. Aqueducts will convey the water from the Delta to off-stream storage and use in areas of deficiency to the south and west.

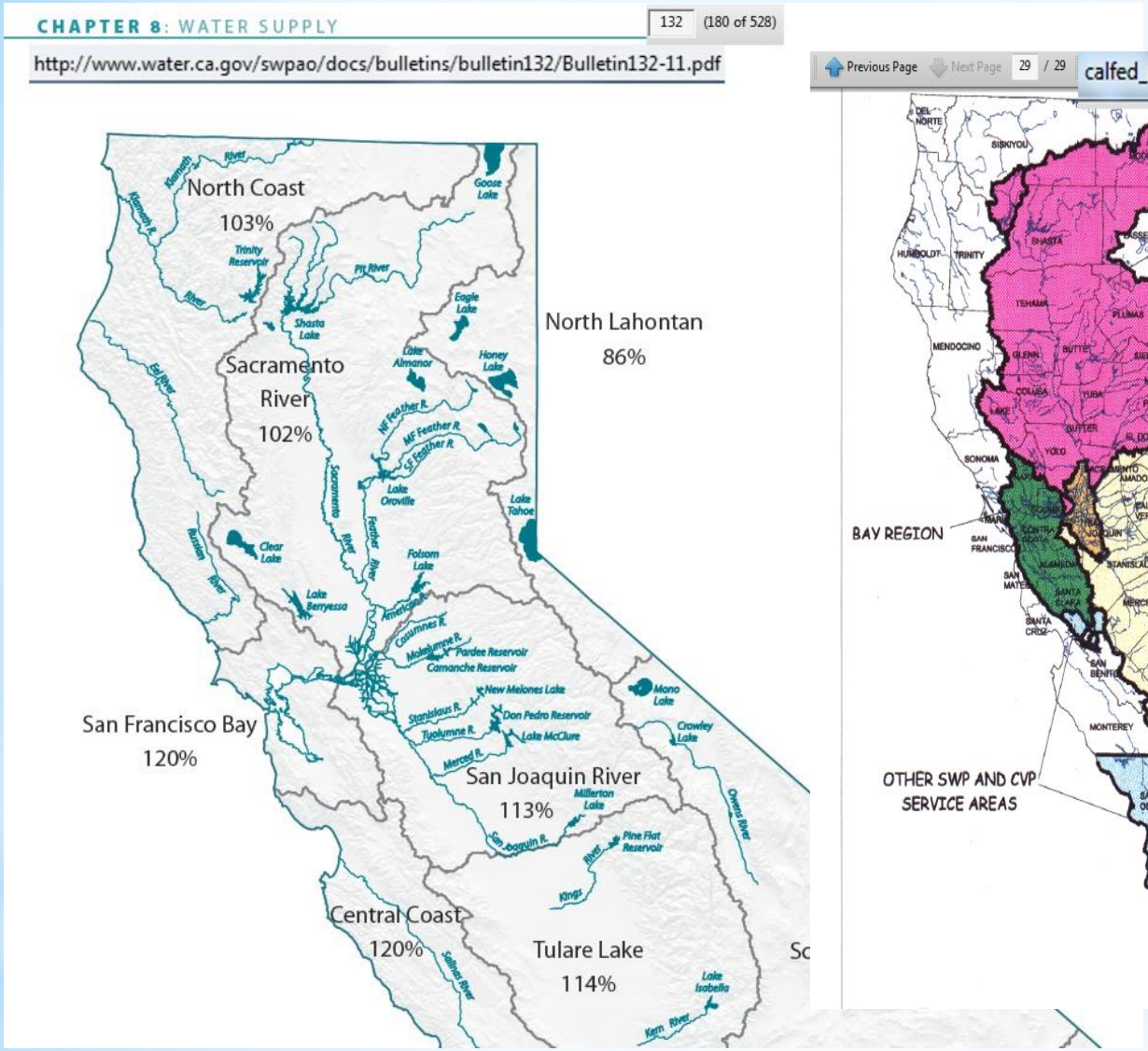
In addition to being an important link in the interbasin transfer of water, the Delta is a significant segment of California's economy, and its agricultural, municipal, and industrial water supply problems, and flood control and related problems, must be remedied. A multipurpose system of Delta water facilities, which will comprise one portion of the State Water Resources Development System, is the most economical means of transferring water and solving Delta problems.

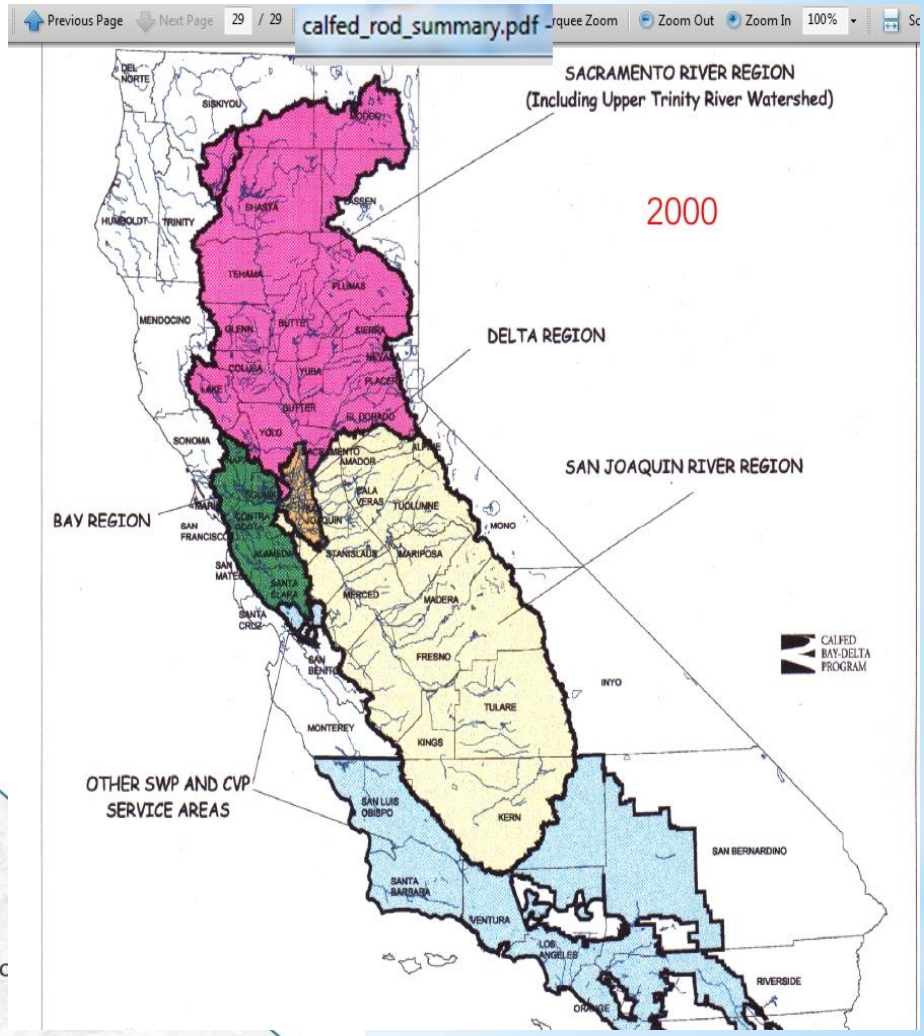


*SWP & CVP "Trust us"

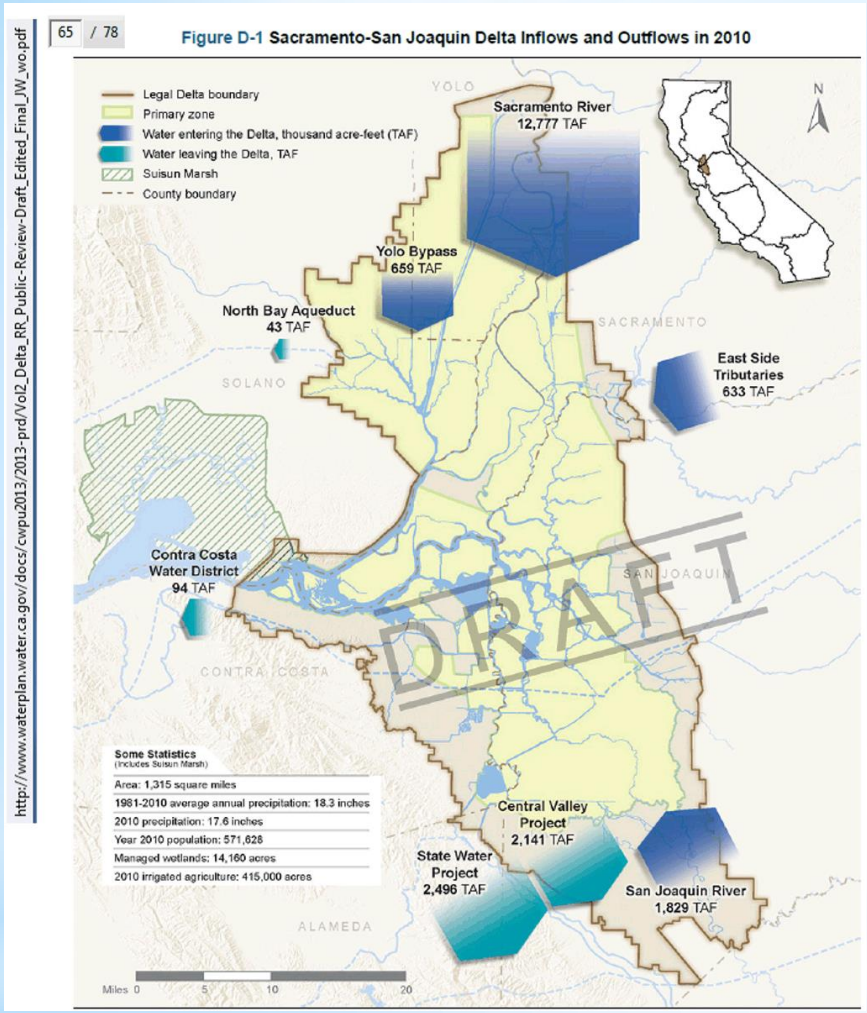
Who: State Water Contractors, Energy Companies, Developers, Online companies

* Over the last 10 years, it is the Delta that has been left with a "computed" surplus or what was left behind from the export pumps and new north-of-the-Delta diversion intakes.





* Where North Delta water comes from…



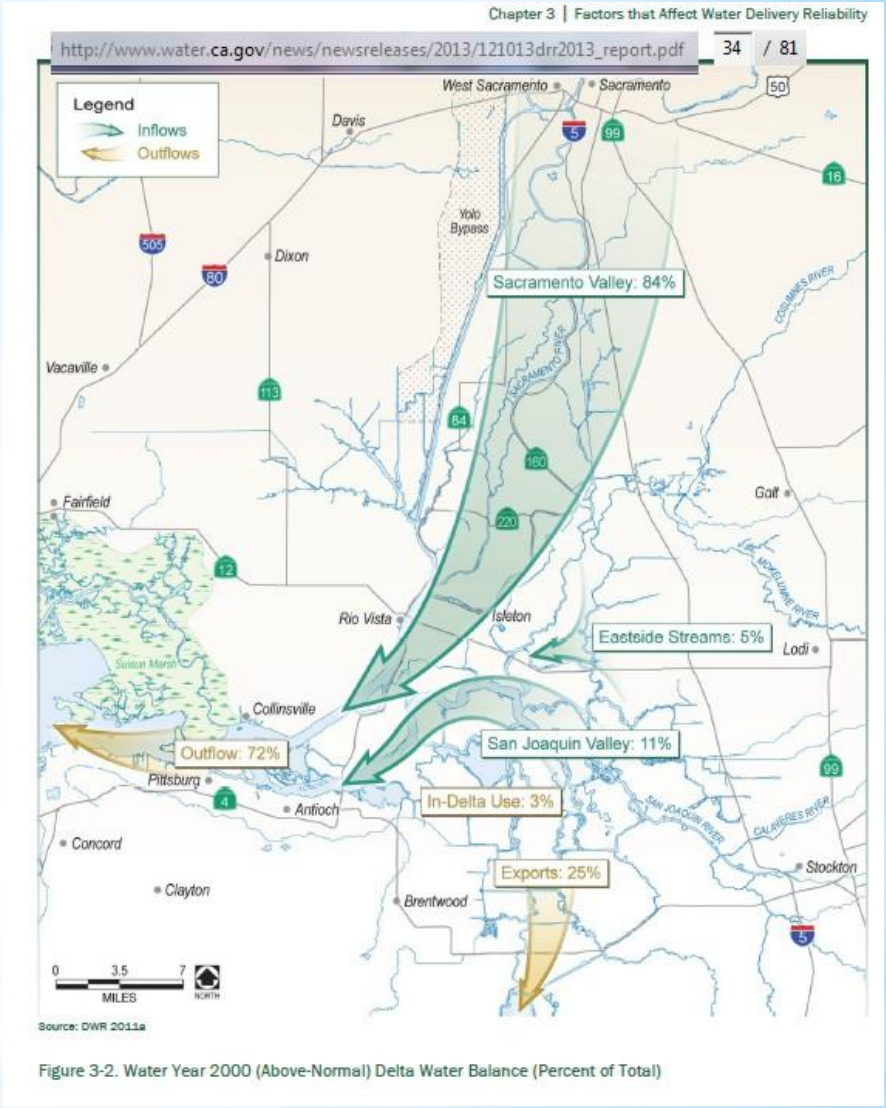
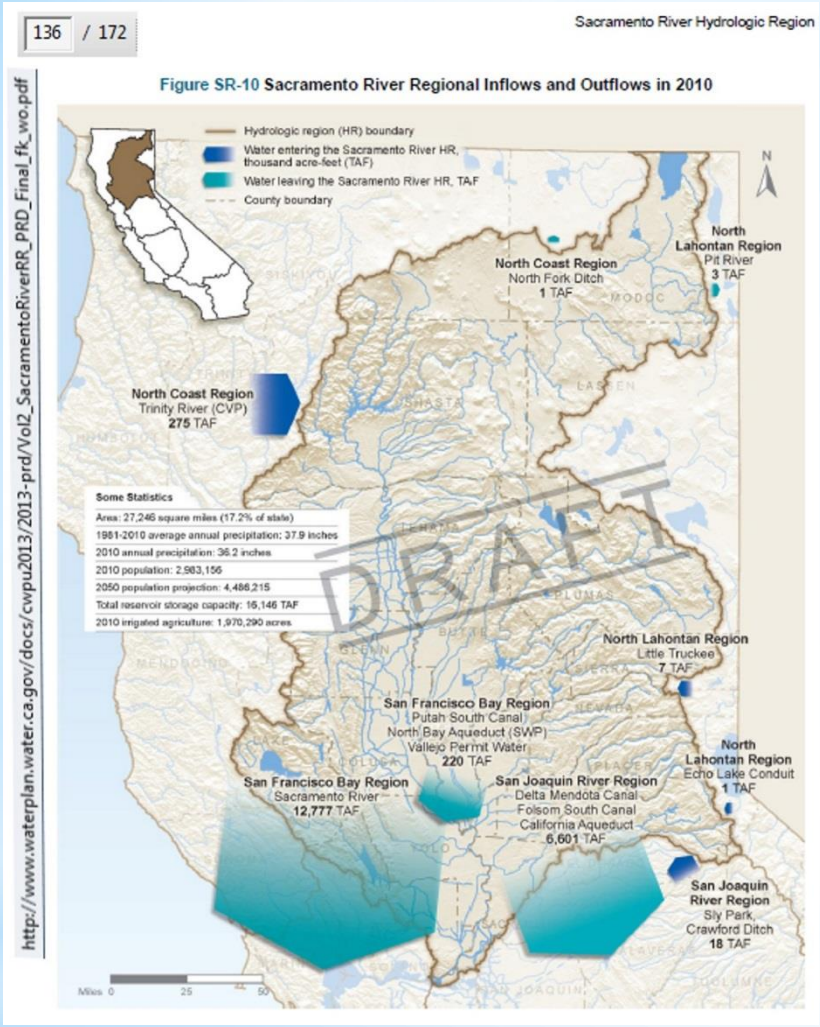
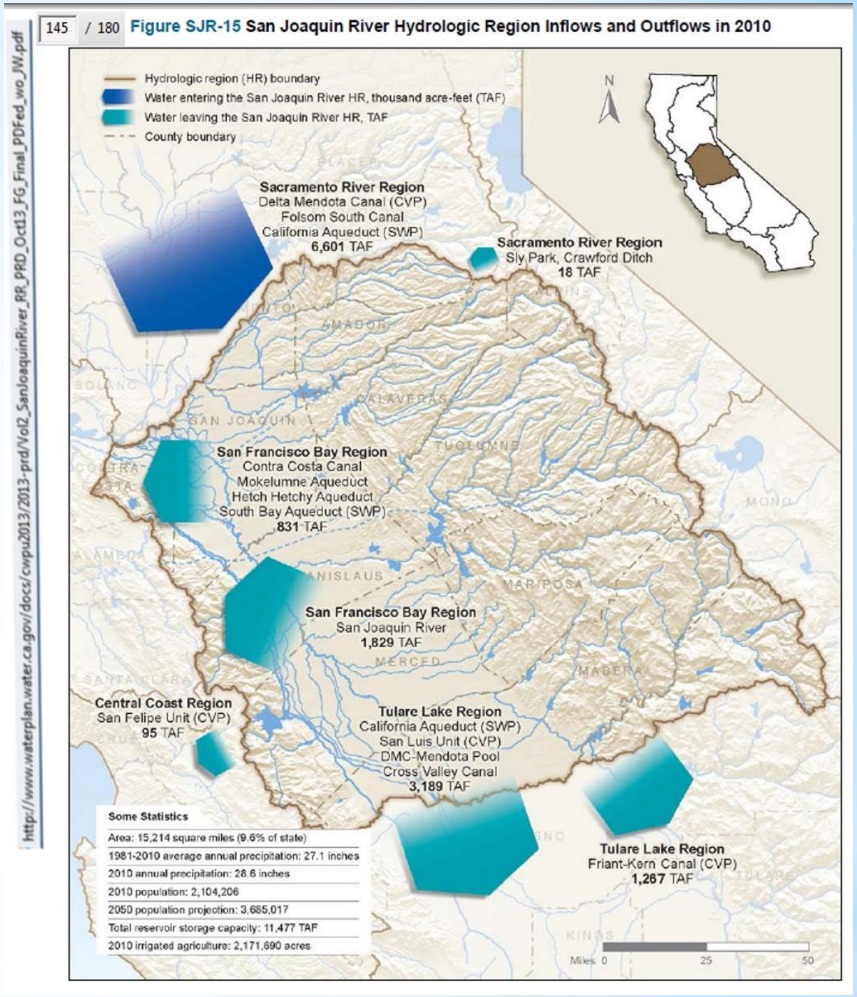


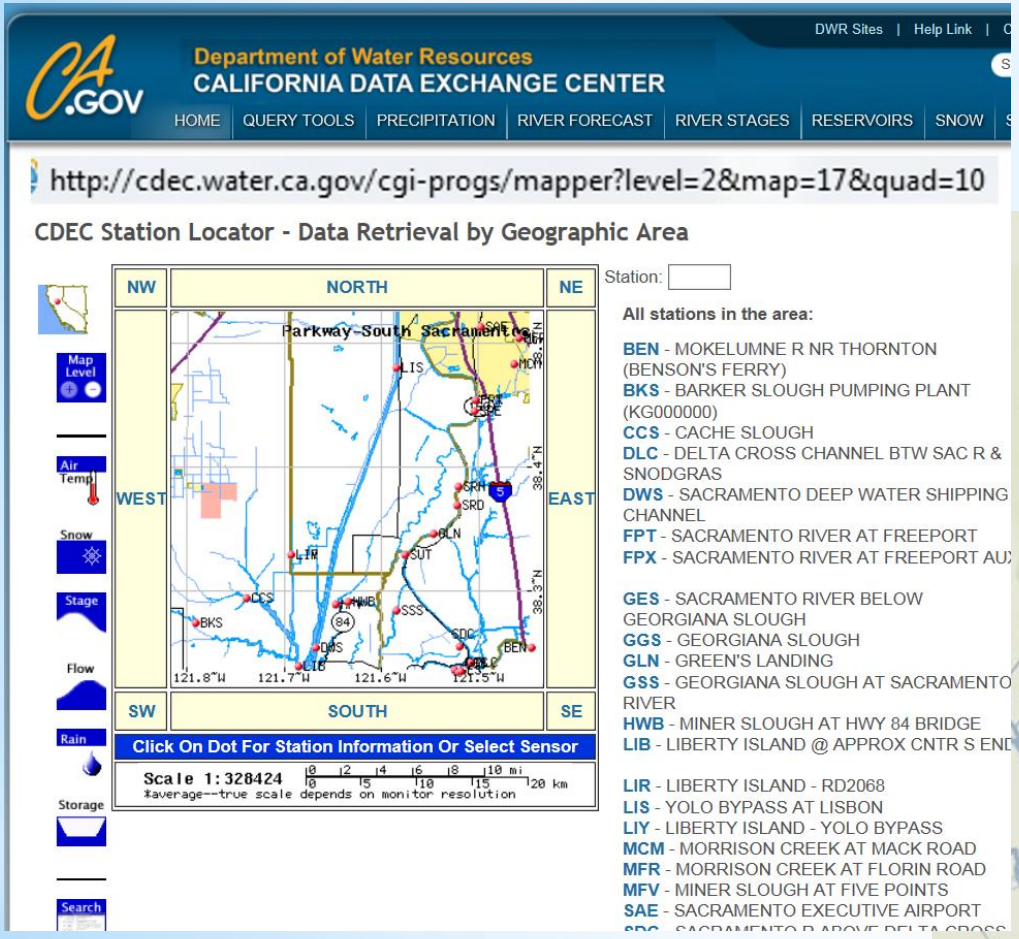
Figure 3-2. Water Year 2000 (Above-Normal) Delta Water Balance (Percent of Total)

* Flows monitored, captured, stored, diverted, reported so water can be sold

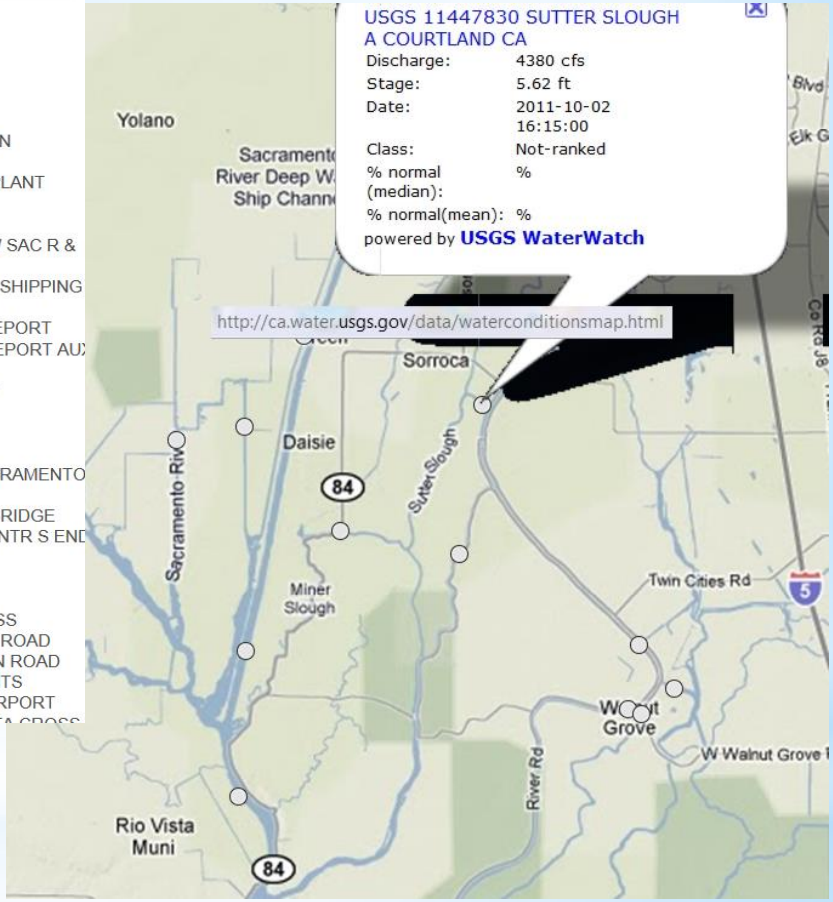




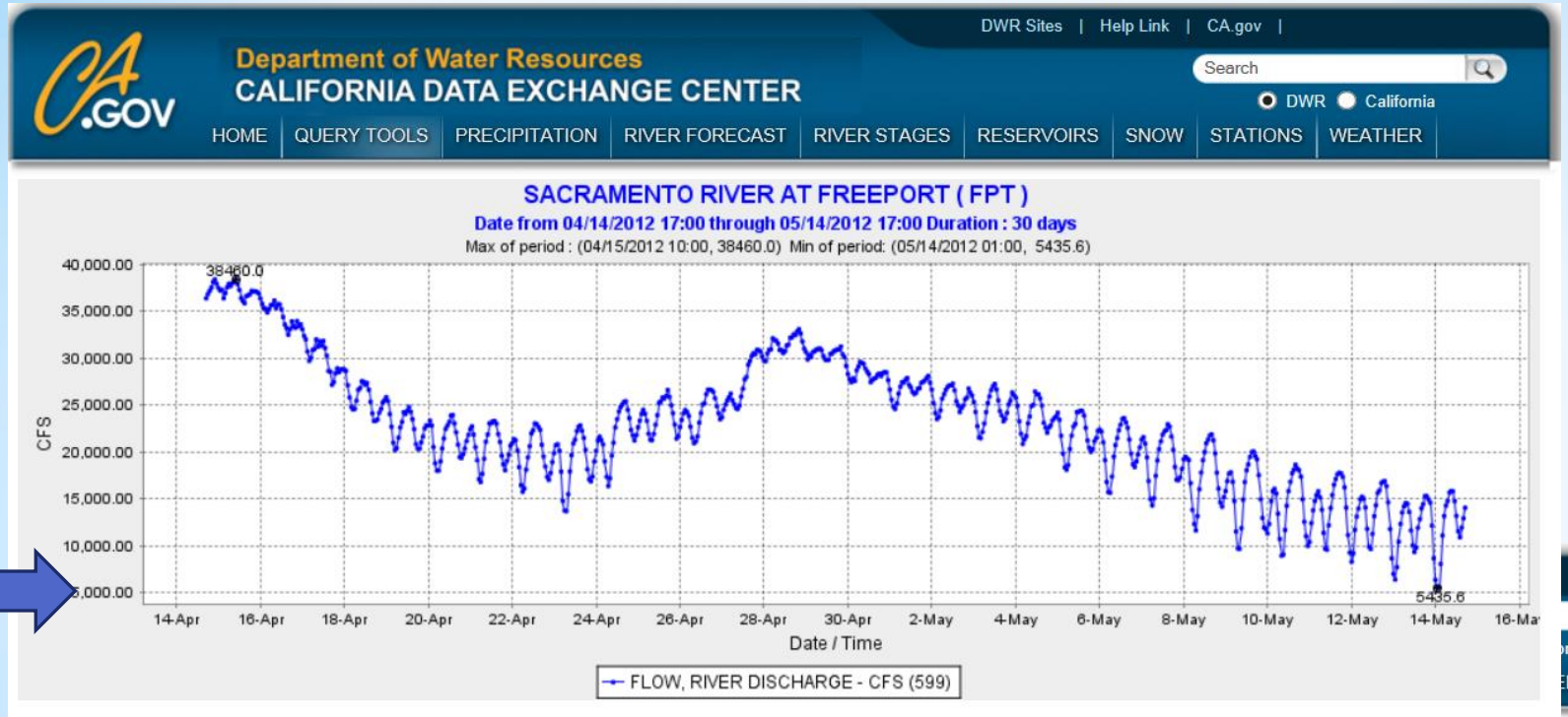
* ONLY "surplus water" was supposed to be diverted from the Sacramento watershed to the south

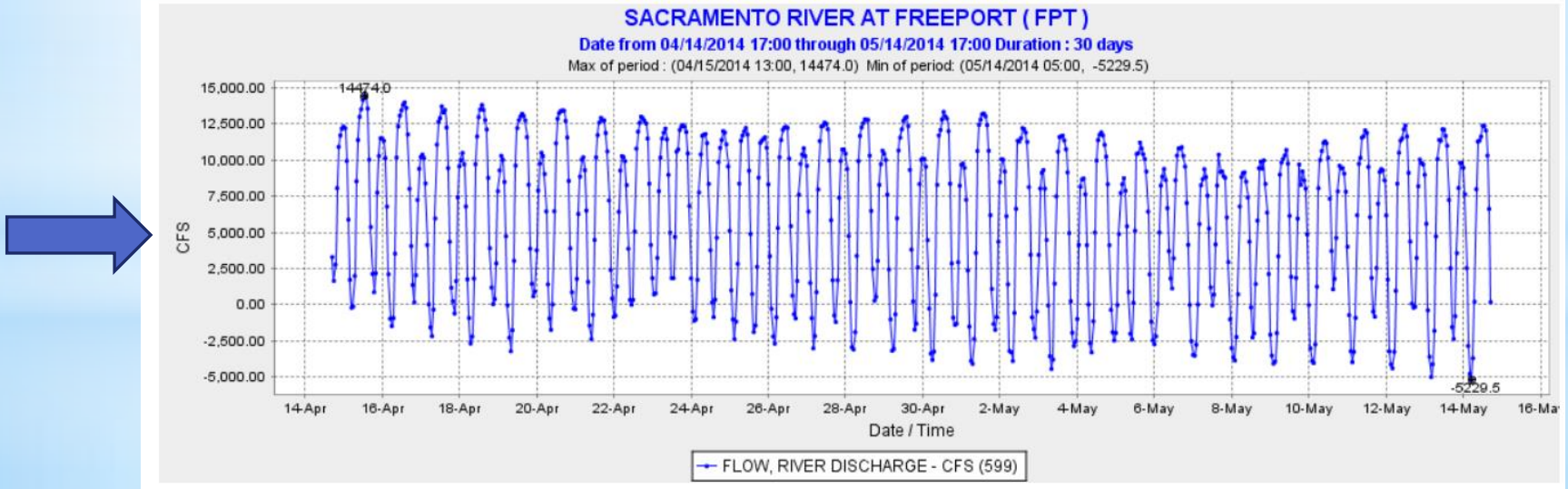


Who is monitoring and reporting the actual flows?



* Delta monitoring gage stations and online reporting





* Accessing flow reports online: DayFLOW

Department of Water Resources
CALIFORNIA DATA EXCHANGE CENTER

HOME | QUERY TOOLS | PRECIPITATION | RIVER FORECAST | RIVER

SACRAMENTO RIVER AT FREEPORT *(FPT)*

Elevation: 0' · SACRAMENTO R basin · Operator: US Geological Survey

Provisional data, subject to change.

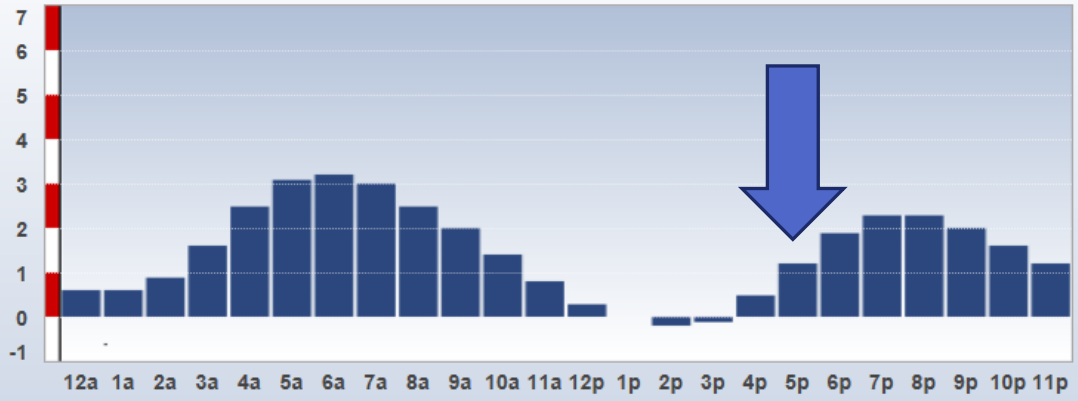
Query executed Wednesday at 17:26:47

FLOW, RIVER DISCHARGE (599)

Date / Time	*FLOW* CFS
04/14/2014 00:00	13107

05/13/2014 11:00	12129
05/13/2014 12:00	12112
05/13/2014 13:00	11674
05/13/2014 14:00	10991
05/13/2014 15:00	7236
05/13/2014 16:00	2512
05/13/2014 17:00	-1562
05/13/2014 18:00	-2377
05/13/2014 19:00	-803
05/13/2014 20:00	3560
05/13/2014 21:00	8070
05/13/2014 22:00	9796
05/13/2014 23:00	9808
05/14/2014 00:00	9464
05/14/2014 01:00	7636
05/14/2014 02:00	2528
05/14/2014 03:00	-2866
05/14/2014 04:00	-4805
05/14/2014 05:00	-5230
05/14/2014 06:00	-3715
05/14/2014 07:00	189
05/14/2014 08:00	7985
05/14/2014 09:00	11283
05/14/2014 10:00	11346
05/14/2014 11:00	11628
05/14/2014 12:00	12387
05/14/2014 13:00	12356
05/14/2014 14:00	12047
05/14/2014 15:00	10310
05/14/2014 16:00	6618
05/14/2014 17:00	163

Hourly Tides for Clarksburg



Wednesday, May 14, 2014

Low tides were never so low on the Sacramento River!

http://baydeltaoffice.water.ca.gov/downloads/DSM2_Users_Group/BDCP/DSM2_Recalibration_102709_doc.

19 / 23

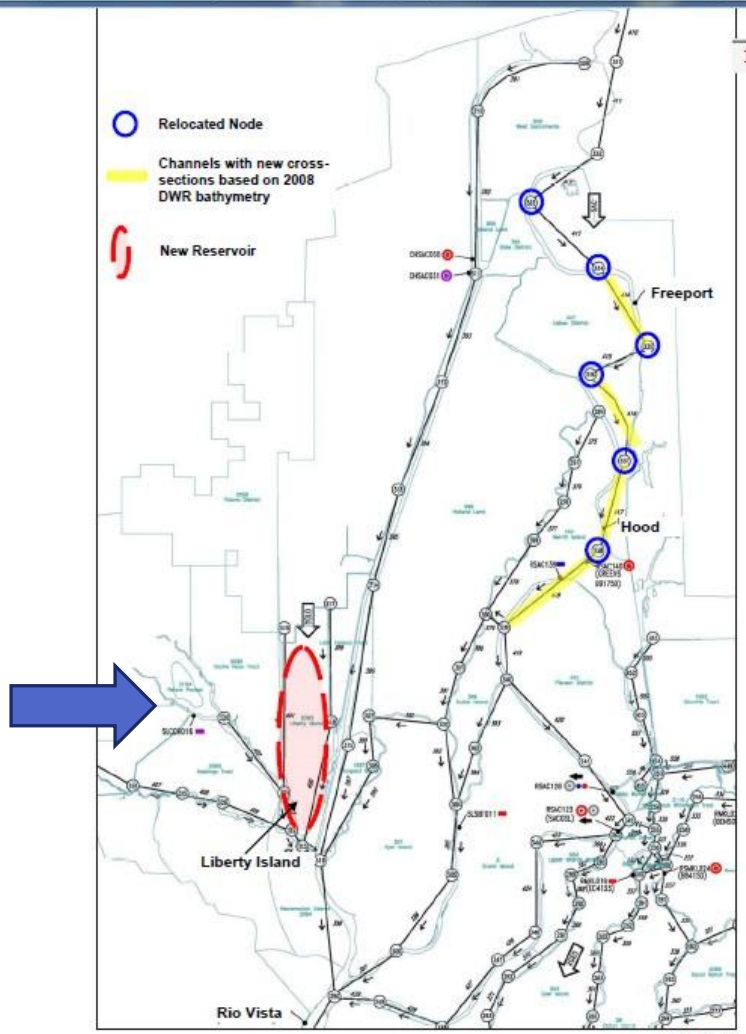


FIGURE 2-2
DSM2 Model Grid in the North Delta Showing the Grid Modifications Performed as Part of the Recalibration Effort

DSM2_Recalibration_102709_doc.pdf - 90 / 236

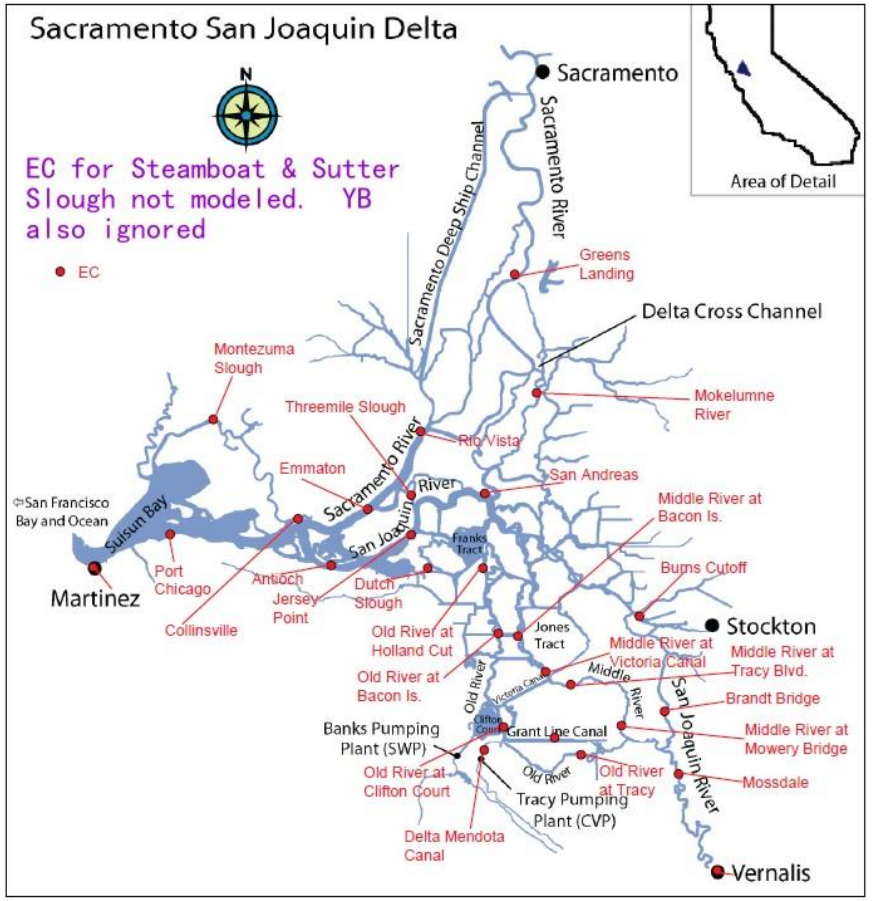
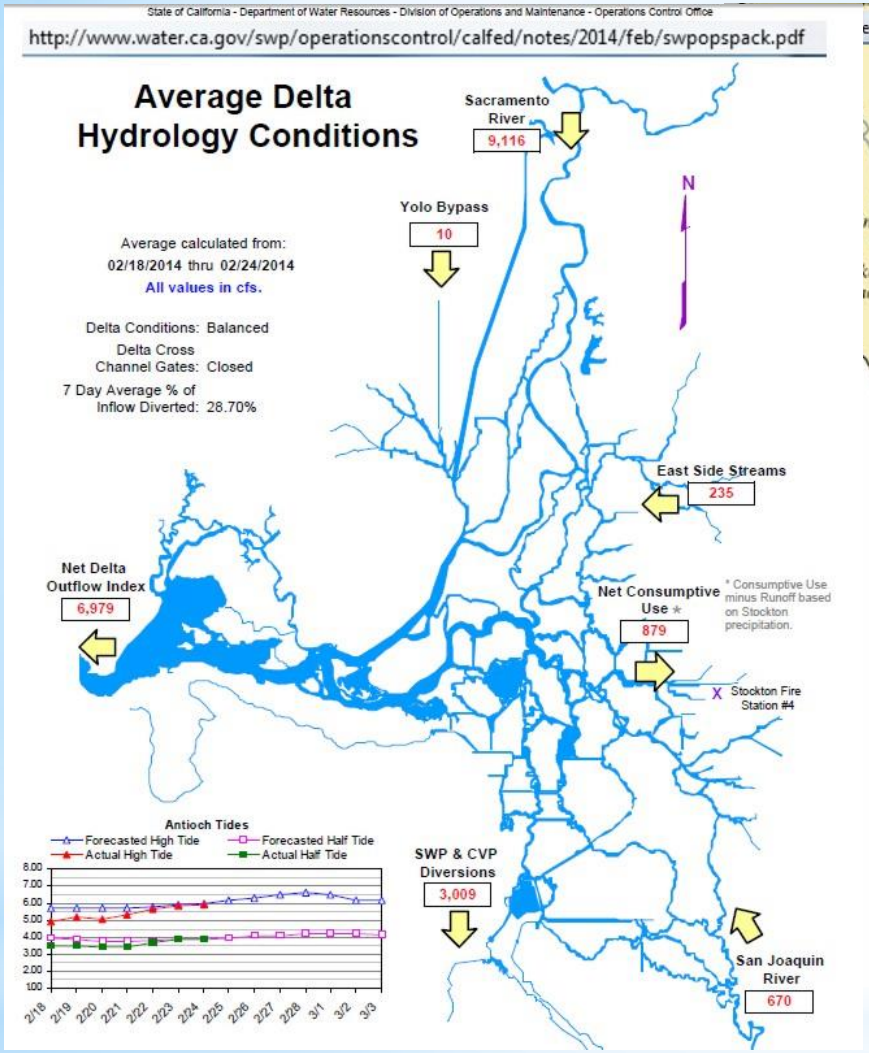


FIGURE 6-1
Map Showing EC Calibration Locations

* Computer modeling for BDCP used the flow data for CALSIM, CALSIM II, DSM2 and others



* Reality: "surplus" water is what *we're* left with now and that water *may* be allowed to flow into the Delta if Delta farmers, business owners and residents fight hard enough to protect their water rights

SACRAMENTO RIVER INFLOW: CONFLICTS IN DATA FOR AN "AVERAGE" WATER YEAR

http://www.deltarevision.com/Issues/water-issues/waterflow/video/north_delta_low_flow_effect.pdf

cfs from the Sacramento River, when over the last 20+ years only 5,000 to 7,000 cfs has been diverted via the DCC and Georgiana Slough.

Flow data based on an "average" year per DWR - water year 2000

- Sacramento River Flow
- Cache Slough/Yolo Bypass Flow
- San Joaquin River Flow

CACHE SLOUGH/YOLO BYPASS FLOW (According to DWR documents)

Pre-2004	3,970 TAF
2005	2,956 TAF
2009	356 TAF
2010	0

Average Delta Outflow (Per DWR documents)

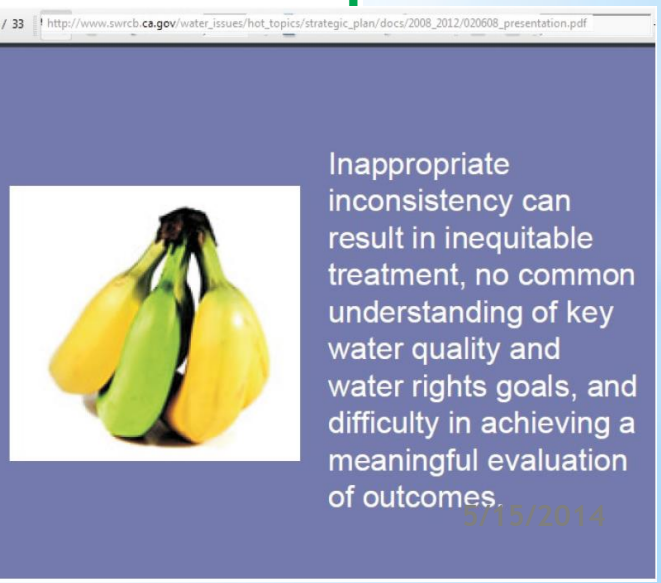
Pre-2003	21,020 TAF
2005	18,144 TAF
2009	not specified in map
2010	18,144 TAF

SACRAMENTO RIVER FLOW (According to DWR documents)

Pre-2004	17,220 TAF
2005	18,327 TAF
2009	8,443 TAF
2010	21,283 TAF

2011 Proposed 15,000 cfs exports from Sacramento River calculates to approximately 10,859 TAF which is more than double the amount of exported water from the Sacramento River current exports!

17,220 TAF
Less 10,859 TAF
Leaves 6,361 TAF
Of flow to share between Elk Slough, Sutter Slough, Steamboat Slough and the portion of the Sacramento River between Georgiana Slough and Ida Island (Vieira's) which is insufficient flows for maintenance of navigation, water quality and management of invasive aquatic species!



Review of flow data reports from several years showed inconsistency in the data flow calculations, leading to questions of formulas used for converting cfs to TAF or MAF

Flow tracking problem #1: which conversion formula do you use? DWR or USGS and CALSIM as an example

Q: Does 1 cubic foot/second equal 646,320 OR 646,272 gallons a day?

Why does DWR use different conversion numbers from USGS? Compare converting CFS to gallons per day

http://www.water.ca.gov/swp/operationscontrol/docs/annual/annual01.pdf

Conversion Factors

Quantity	Multiply	By	To obtain
Area	acre	43.560	square feet
Volume	cubic foot	7.481	gallons
	cubic foot	62.4	pounds of water
	gallon	0.13368	cubic feet
	acre-foot	325,900	gallons
	acre-foot	43,560	cubic feet
	million gallons	3.07	acre-feet
Flow	cubic foot/second (cfs)	450	gallons/minute (gpm)
	gallons/minute	0.002228	cubic feet/second (cfs)
	million gallons/day	1.5472	cubic feet/second (cfs)
	cubic foot/second (cfs)	646,320	gallons a day
	cubic foot/second (cfs)	1.98	acre-feet a day
	million gallons/day (mgd)	1,120	acre-feet a year
Pressure	feet head of water	.433	pounds/square inch (psi)
Power	kilowatts (kW)	1.3405	horsepower (hp)

http://md.water.usgs.gov/cfscalc/

USGS CFS Conversion Calculator

Convert to: gallons per day

CFS Value (ft³/s): 1

Convert from cfs

Result: 646272

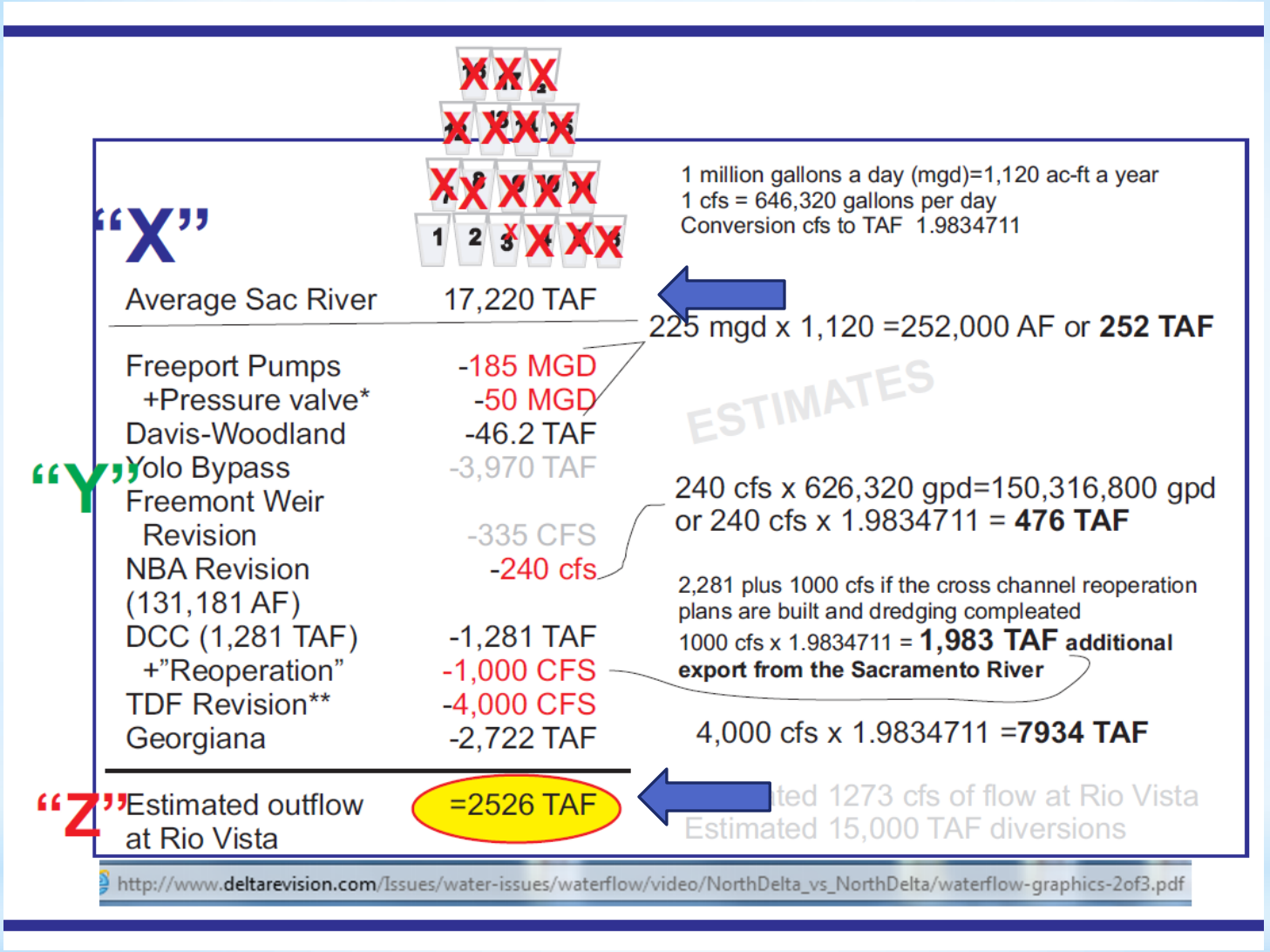
Conversion factors for cfs calculations: 1 cfs =

7	.48	gallons per second
448	.8	gallons per minute
26,928	.0	gallons per hour
646,272	.0	gallons per day
28	.32	liters of water per second
1,699	.2	liters of water per minute
101,952	.0	liters of water per hour
2,446,848	.0	liters of water per day
2.446848	.0	million liters of water per day
0	.646272	million gallons per day
62	.5	pounds of water per second
3,750	.0	pounds of water per minute
225,000	.0	pounds of water per hour
5,400,000	.0	pounds of water per day

close this window

http://www.deltarevision.com/Issues/water-issues/waterflow/video/NorthDelta_vs_NorthDelta/waterflow-graphics-2of3.pdf

"We'll get back to you on that…" (2010)



* Problem #2: Does BDCP, which uses CALSIM 1 and 11, and other flow models use the DWR or USGS conversion formula? It makes a big difference in the actual "surplus" left over in the Delta, if any.

Also note CCWD diversions are included in Delta Consumptive use and also listed as a separate category, indicating double-counting of same export #.

http://www.waterplan.water.ca.gov/docs/cwpu2013/ae/water_portfolio-inflow_outflow_delta.pdf

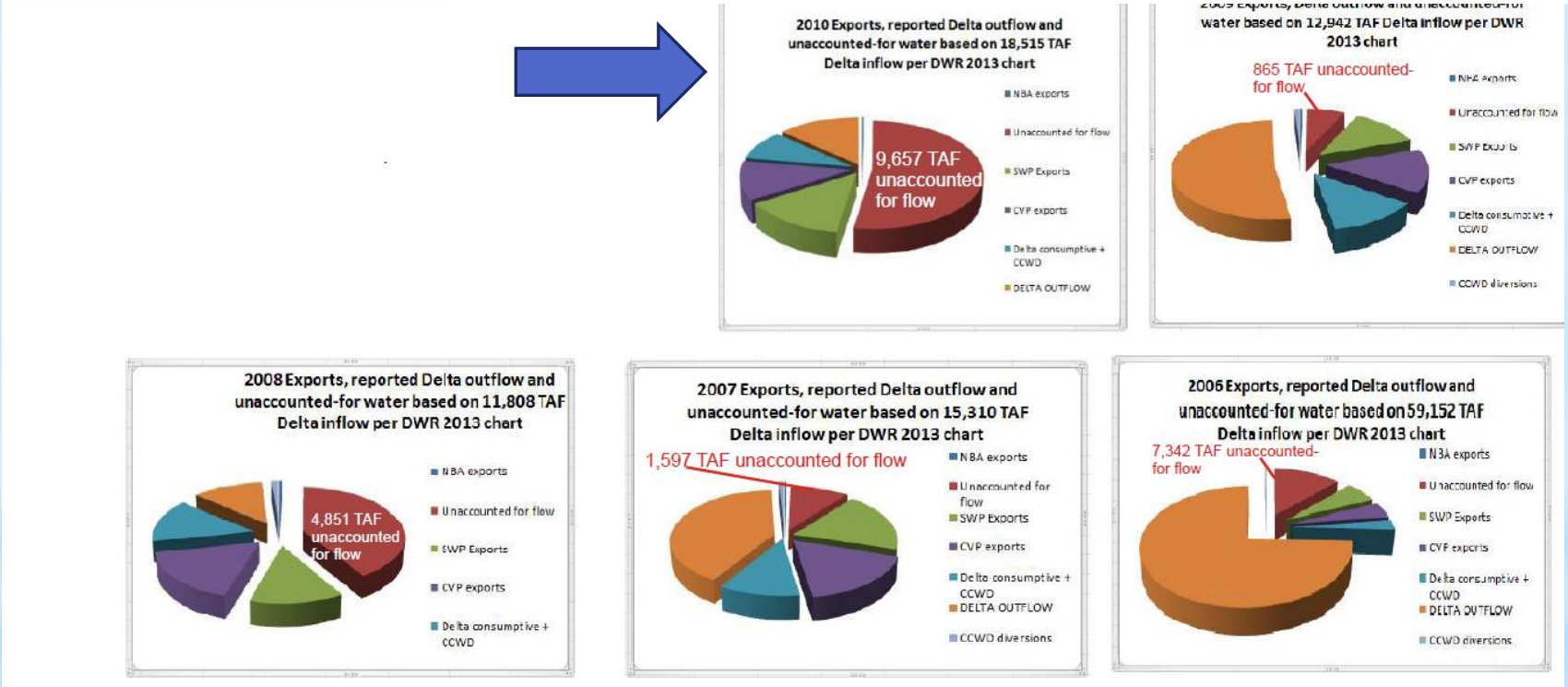
Delta Water Balance Estimates[1] (TAF)	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Sacramento River Inflow	29615	21770	18360	10517	13104	18304	17129	16747	28039	11010	9557	9867	12777
Yolo Bypass Inflow	8996	1635	2961	366	708	1122	3121	707	13034	248	417	317	659
Eastside Tributaries Inflow	2096	1399	1078	372	462	534	445	1173	9679	1979	n	1231	2461
San Joaquin River Inflow	8456	3568	2846	1732	1396	1365	1373	3777	7341	1596	1234	865	1829
North Bay Aqueduct Exports	39	37	47	45	47	42	52	48	43	61	55	46	43
Contra Costa Water District Diversions at Rock Slough and Old River	160	133	126	104	121	138	120	119	116	112	135	107	94
State Water Project Exports at Banks Pumping Plant or Clifton Court Intake	2134	2439	3692	2635	2900	3458	3251	3625	3527	2954	1527	1636	2496
Central Valley Project Exports at Tracy	2474	2262	2487	2332	2505	2685	2722	2679	2628	2679	2018	1884	2141
Delta Consumptive Use[2]	1691	1691	1693	1691	1691	1691	1693	1691	1691	1691	1693	1691	1666
Delta Precipitation[2]	1423	734	956	764	758	739	753	1089	1059	477	900	662	789
Delta Outflow	43487	22542	18155	6944	9163	14050	14922	16403	43805	6216	1529	6713	2461

1 Data from DAYFLOW Program; NOTE: includes DAYFLOW corrections through 01-07-2004 (http://iep.water.ca.gov/dayflow)
2 Content Required by Water Code Section 10004.6

YEAR	total inflows	EXPORTS	DELTA OUTFLOW reported	Unaccounted for flow
2010	18515	6397	2461	9657
2009	12542	5364	6713	865
2008	11808	5428	1529	4851
2007	15310	7497	6216	1597
2006	59152	8005	43805	7342
2005	23459	8102	15403	72
2004	22821	7838	14922	61
2003	22064	8014	14050	0
2002	16428	7264	9163	1
2001	13706	6807	6944	-45
2000	26201	8045	18156	0
1999	29106	6562	22542	2
1998	49986	6498	43487	1

Data and references compiled by N. Suard, Esq. For use by Delta landowners 2/2014

http://snugharbor.net/images-2014/bdcp/flows/unaccounted_diversions.pdf



* Problem #3: Unaccounted for Delta outflow and DWR failure to account for incorrect flow data distribution

DWR CORRECTS WATER BALANCE TABLE ... MAYBE

Data compiled by N. Suard, Esq.
posted online 3/27/14

Location of flow study based on the first chart posted by DWR:
http://www.snugharbor.net/images-2014/bdcp/flows/unaccounted_diversions.pdf

In January 2014 it was noticed by Delta landowners that a chart online providing the estimated Delta outflow and in-Delta water uses indicated substantially low Delta outflow. In addition, there appeared to be "missing water". I hired a certified Quickbooks person to enter the numbers as shown in the top chart, as if those numbers were dollars instead of thousands of acre feet of water. The result was that there appeared to be MISSING water and the CCWD diversions may be counted twice as both independent export amount and as a portion of the in-Delta consumptive use figure. North Delta landowner focus on flows has been heightened in the last few years because DWR or USBR has been greatly reducing flows on Steamboat Slough, in particular, except for when the salmonid migration studies with pulse flows are going on. The above chart was provided to several North Delta water engineers and agency people with a request that others review the data.

Without notice to others, DWR revised the chart and posted it online on 3/19/2014, after revising the data in late February. It will take more time to analyze the new numbers, but the first posting shows how even for very important data like Delta outflow there is inconsistency when DWR reports data and then makes corrections without acknowledging the correction.

SCREEN PRINT OF DWR CHART ONLINE BEFORE DWR UPDATE

http://www.waterplan.water.ca.gov/docs/cwpu2013/ae/water_portfolio-inflow_outflow_delta.pdf

Delta Water Balance Estimates[1] (TAF)	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Sacramento River Inflow	29015	21770	18360	10517	13104	18304	17129	16747	28039	11010	9557	9867	12777
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Contra Costa Water District Diversions at Rock Slough and Old River	160	133	126	104	121	138	120	119	116	112	135	107	94
State Water Project Exports at Banks Pumping Plant or Clifton Court Intake	2134	2439	3692	2635	2900	3458	3251	3625	3527	2954	1527	1636	2496
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Delta Consumptive Use[2]	1691	1691	1693	1691	1691	1691	1693	1691	1691	1691	1693	1691	1666
Delta Precipitation[2]	1423	734	956	764	758	730	753	1089	1059	477	600	662	789
Delta Outflow	43487	22542	18155	6944	9163	14050	14922	15403	43805	6216	1529	6713	2461

1 Data from DAYFLOW Program; NOTE: includes DAYFLOW corrections through 01-07-2004 (http://iep.water.ca.gov/dayflow)
2 Content Required by Water Code Section 10004.6

SCREEN PRINT OFDWR CHART CORRECTED BY DWR AND POSTED 3/19/2014

http://www.waterplan.water.ca.gov/docs/cwpu2013/ae/water_portfolio-inflow_outflow_delta.pdf

http://www.waterplan.water.ca.gov/docs/cwpu2013/ae/water_portfolio-inflow_outflow_delta

Delta Water Balance Estimates[1] (TAF)	Note: Draft Information. The final Water Plan assumptions and estimates will be included in Volume 5, the Technical Guide.												
	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Sacramento River Inflow	29,015	21,770	18,360	10,517	13,104	18,304	17,128	16,747	27,592	10,970	9,557	9,867	12,777
Yolo Bypass Inflow	8,416	1,629	2,961	366	708	1,122	3,128	707	10,939	248	417	317	659
Eastside Tributaries Inflow	2,090	1,399	1,078	372	462	534	445	1,173	2,338	383	295	366	633
San Joaquin River Inflow	8,491	3,568	2,846	1,732	1,396	1,365	1,373	3,777	7,341	1,596	1,234	865	1,829
North Bay Aqueduct Exports	39	38	47	45	47	42	52	48	43	61	55	46	43
Contra Costa Water District Diversions at Rock Slough and Old River	160	133	126	104	121	138	120	119	116	112	135	107	94
State Water Project Exports at Banks Pumping Plant or Clifton Court Intake	2,134	2,439	3,692	2,635	2,900	3,458	3,251	3,625	3,527	2,954	1,527	1,636	2,496
Central Valley Project Exports at Tracy	2,474	2,263	2,487	2,332	2,505	2,685	2,722	2,679	2,628	2,679	2,018	1,884	2,141
Delta Consumptive Use (2	1,751	2,039	2,017	1,863	1,837	1,791	1,991	2,096	1,881	1,700	1,793	1,784	1,865
Delta Precipitation (2 (3	2,033	1,088	1,271	936	903	839	976	1,233	1,249	525	700	755	988
Delta Outflow	43,487	22,542	18,147	6,944	9,163	14,050	14,914	15,070	41,264	*6,216	*6,675	*6,713	*10,247

*1) Data from DAYFLOW Program; 7-1-2012 (http://www.water.ca.gov/dayflow)
2) Content Required by Water Code Section 10004.6
*3) Delta only without Suisun Marsh

Corrected chart posted online 3/19/14 with no reference to the fact it is a correction of the previous posting by DWR

Document Properties
Description | Security | Fonts | Initial View | Custom
Description
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Title: Water_Balance_Estimates_02-27-14(
Author: smcich
Subject:
Keywords:
Created: 3/19/2014 1:54:54 PM
Modified: 3/19/2014 1:57:33 PM
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Advanced
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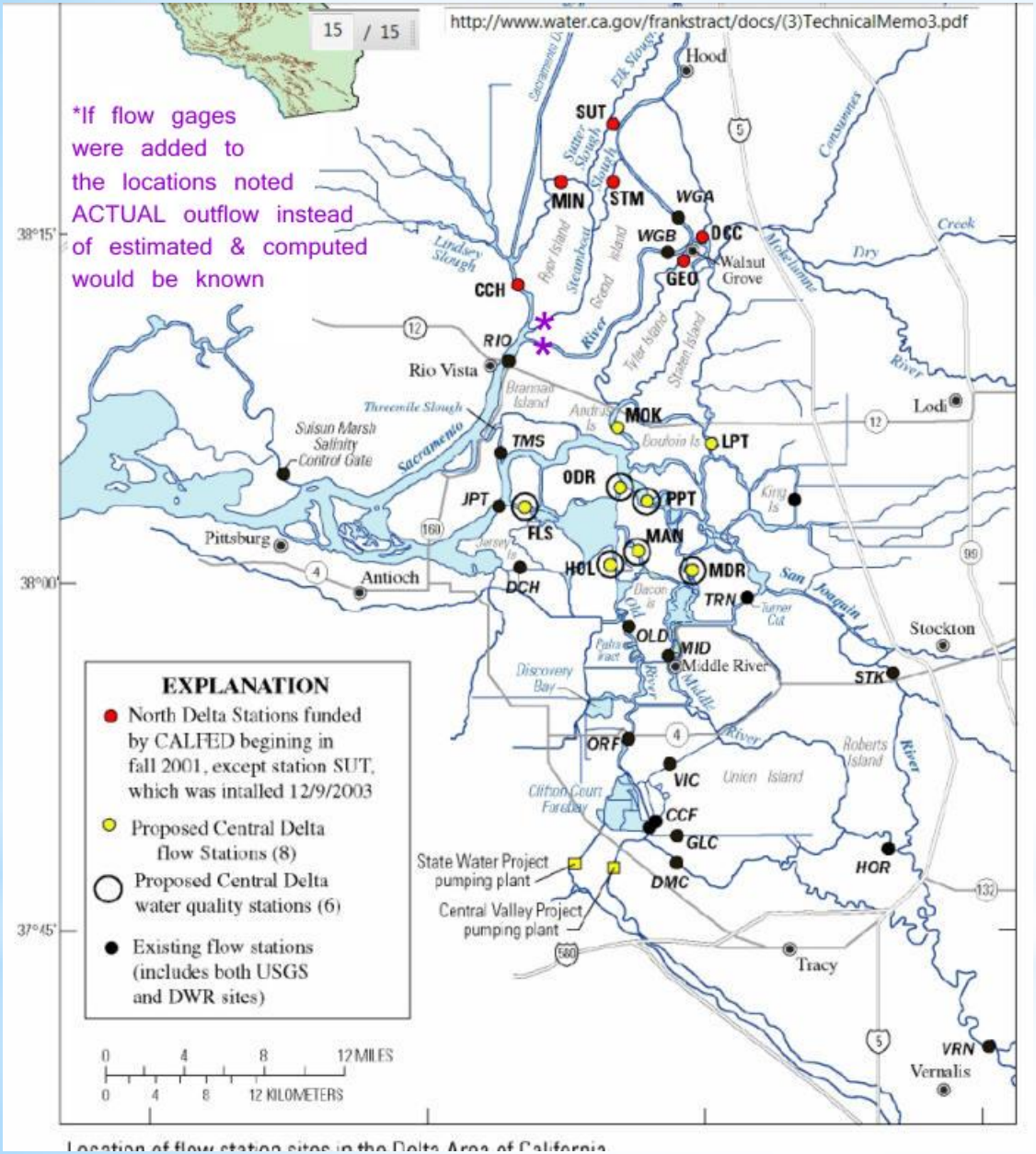
PDF Version: 1.5 (Acrobat 6.x)
File Size: 79.46 KB (81,366 Bytes)

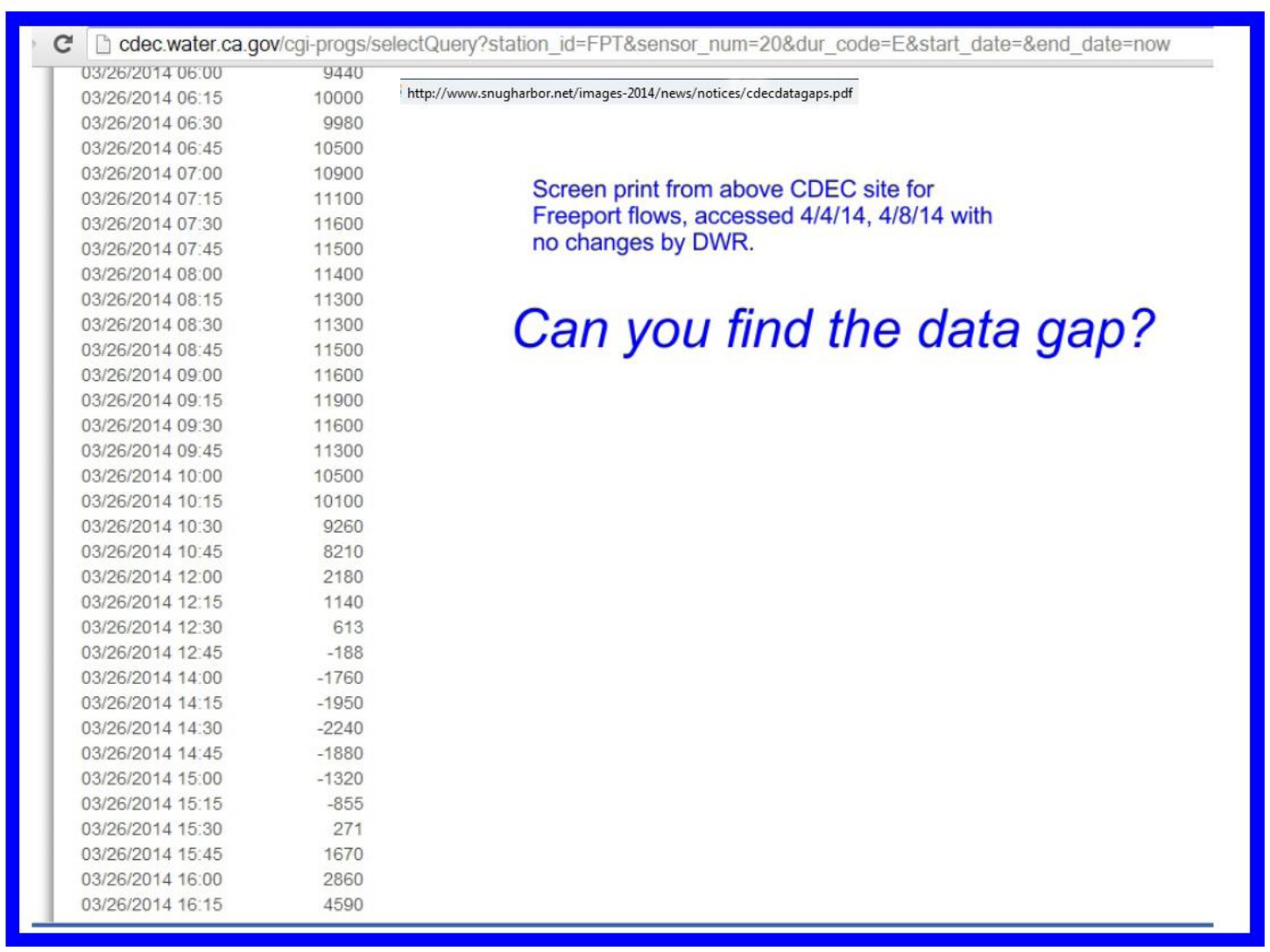
*"We'll get back to you on that…"



Location of flow station sites in the Delta Area of California

* By adding flow gages or moving existing ones to the lower end of waterways, actual in-Delta use and outflow from the Sacramento River could be more correctly calculated…if DWR wanted to use the actual flow data.

Why isn't the Steamboat Slough gage raw data available online? "We'll get back to you on that…"



03/26/2014 06:00	9440
03/26/2014 06:15	10000
03/26/2014 06:30	9980
03/26/2014 06:45	10500
03/26/2014 07:00	10900
03/26/2014 07:15	11100
03/26/2014 07:30	11600
03/26/2014 07:45	11500
03/26/2014 08:00	11400
03/26/2014 08:15	11300
03/26/2014 08:30	11300
03/26/2014 08:45	11500
03/26/2014 09:00	11600
03/26/2014 09:15	11900
03/26/2014 09:30	11600
03/26/2014 09:45	11300
03/26/2014 10:00	10500
03/26/2014 10:15	10100
03/26/2014 10:30	9260
03/26/2014 10:45	8210
03/26/2014 12:00	2180
03/26/2014 12:15	1140
03/26/2014 12:30	613
03/26/2014 12:45	-188
03/26/2014 14:00	-1760
03/26/2014 14:15	-1950
03/26/2014 14:30	-2240
03/26/2014 14:45	-1880
03/26/2014 15:00	-1320
03/26/2014 15:15	-855
03/26/2014 15:30	271
03/26/2014 15:45	1670
03/26/2014 16:00	2860
03/26/2014 16:15	4590

Problem #4: Flow data gaps. Gaps in flow data, which appear to be intentionally hidden in plain sight in the online flow charts, result in UNDERREPORTING of actual water flow on the Sacramento River, Steamboat and Sutter Sloughs. Note the pattern of the data gaps…

Example: Data gap on 3/26/14 for Freeport and Steamboat Slough

http://www.snugharbor.net/images-2014/news/notices/cdecdatagaps.pdf

From 10:45 to 12 noon Sacramento River flow drops over 6000 cfs, from 8210 to 2180. Flows continue to drop to -1760 in just a 3 hour time. This indicates all flow on the Sacramento River at Freeport had been cut off

Impact to Steamboat Slough from flow cut-off is hidden due to gap in data reporting. What does show is that Steamboat Slough was already not receiving freshwater inflow, and the cutoff of flow created a more drastic low tide at this time. Impact to Sutter Slough shows less drastic low water impact.

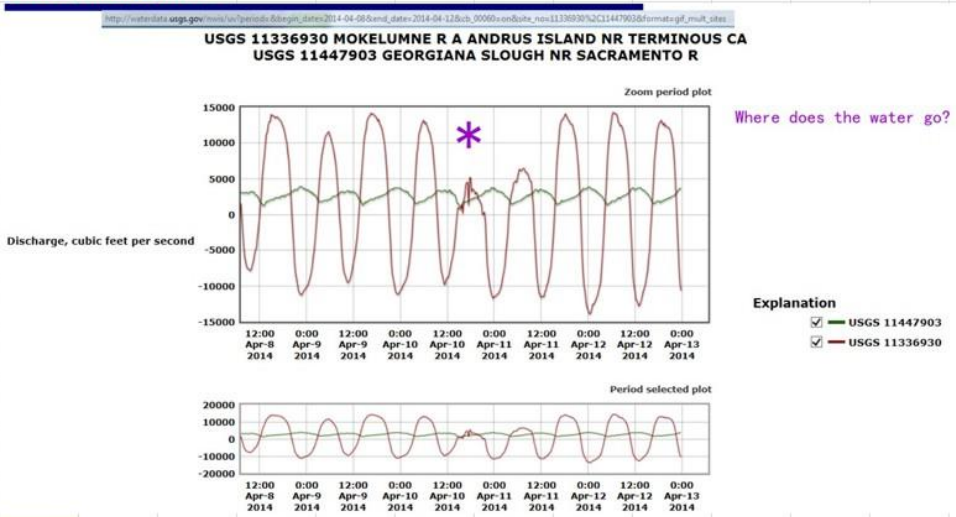
2014FLOW-updated.xlsx — Section of review of flow data from CDEC which exposed missing data and experimental flow timing:

	A	B	C	D FREEPORT		F	G SUTTER	H	I	J STEAMBOAT	K	L	M GEORGIANA		O	
1100		3/26/2014 9:45		3/26/2014 9:45	11300		3/26/2014 9:45	2190		3/26/2014 9:45	1200		3/26/2014 9:45	3370		3/
1101		3/26/2014 10:00		3/26/2014 10:00	10500		3/26/2014 10:00	1910		3/26/2014 10:00	510		3/26/2014 10:00	3180		3/2
1102		3/26/2014 10:15		3/26/2014 10:15	10100		3/26/2014 10:15	1610		3/26/2014 10:15	-129		3/26/2014 10:15	2990		3/2
1103		3/26/2014 10:30		3/26/2014 10:30	9260		3/26/2014 10:30	1420		3/26/2014 10:30	-842		3/26/2014 10:30	2830		3/2
1104		3/26/2014 10:45		3/26/2014 10:45	8210		3/26/2014 10:45	1200		3/26/2014 10:45	-1770		3/26/2014 10:45	3050		3/2
1105	11:00 AM	3/26/2014 11:00		MISSING	DATA		3/26/2014 11:00	1190		3/26/2014 11:00	-2030		3/26/2014 11:00	2960		3/2
1106		3/26/2014 11:15		MISSING	DATA		3/26/2014 11:15	966		MISSING	DATA		3/26/2014 11:15	3100		3/2
1107		3/26/2014 11:30		MISSING	DATA		3/26/2014 11:30	714		MISSING	DATA		3/26/2014 11:30	3010		3/2
1108		3/26/2014 11:45		MISSING	DATA		3/26/2014 11:45	240		MISSING	DATA		3/26/2014 11:45	2840		3/2
1109	NOON	3/26/2014 12:00		3/26/2014 12:00	2180		3/26/2014 12:00	-7		MISSING	DATA		3/26/2014 12:00	2750		3/2
1110		3/26/2014 12:15		3/26/2014 12:15	1140		3/26/2014 12:15	-242		3/26/2014 12:15	-3000		3/26/2014 12:15	2620		3/2
1111		3/26/2014 12:30		3/26/2014 12:30	613		3/26/2014 12:30	-408		3/26/2014 12:30	-3130		3/26/2014 12:30	2480		3/2
1112		3/26/2014 12:45		3/26/2014 12:45	-188		3/26/2014 12:45	-658		3/26/2014 12:45	-3040		3/26/2014 12:45	2410		3/2
1113	1:00 PM	3/26/2014 13:00		MISSING	DATA		3/26/2014 13:00	-931		3/26/2014 13:00	-3050		3/26/2014 13:00	2320		3/2
1114		3/26/2014 13:15		MISSING	DATA		3/26/2014 13:15	-1040		MISSING	DATA		3/26/2014 13:15	2220		3/2
1115		3/26/2014 13:30		MISSING	DATA		3/26/2014 13:30	-1230		MISSING	DATA		3/26/2014 13:30	2110		3/2
1116		3/26/2014 13:45		MISSING	DATA		3/26/2014 13:45	-1260		MISSING	DATA		3/26/2014 13:45	1890		3/2
1117	2:00 PM	3/26/2014 14:00		3/26/2014 14:00	-1760		3/26/2014 14:00	-1310		MISSING	DATA		3/26/2014 14:00	1830		3/2
1118		3/26/2014 14:15		3/26/2014 14:15	-1950		3/26/2014 14:15	-1260		3/26/2014 14:15	-2070		3/26/2014 14:15	1620		3/2
1119		3/26/2014 14:30		3/26/2014 14:30	-2240		3/26/2014 14:30	-1120		3/26/2014 14:30	-1390		3/26/2014 14:30	1390		3/2
1120		3/26/2014 14:45		3/26/2014 14:45	-1880		3/26/2014 14:45	-959		3/26/2014 14:45	-588		3/26/2014 14:45	1130		3/2
1121	3:00 PM	3/26/2014 15:00		3/26/2014 15:00	-1320		3/26/2014 15:00	-635		3/26/2014 15:00	302		3/26/2014 15:00	732		3/2
1122		3/26/2014 15:15		3/26/2014 15:15	-855		3/26/2014 15:15	-194		3/26/2014 15:15	1260		3/26/2014 15:15	731		3/2

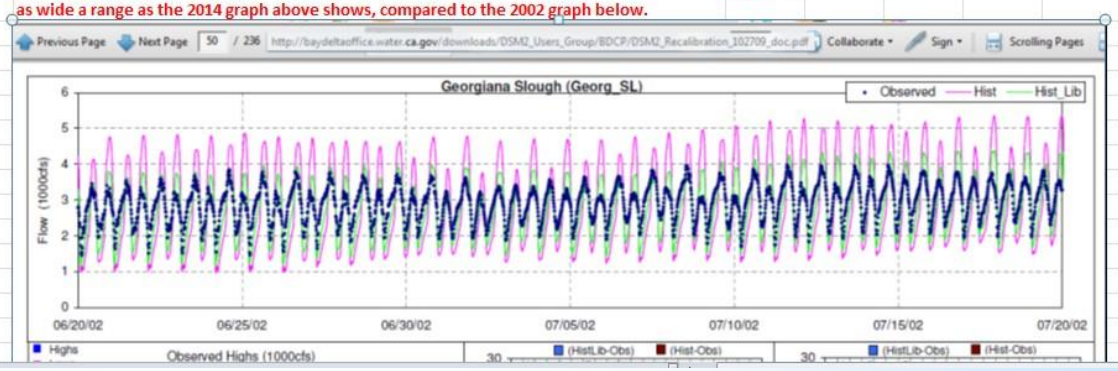
Sheet1 Sheet2 Sheet3

Georgiana	flow	Mokelumne	Flow
4/10/2014 9:15	2730	4/10/2014 9:15	9560
4/10/2014 9:30	2760	4/10/2014 9:30	7970
4/10/2014 9:45	2870	4/10/2014 9:45	6380
4/10/2014 10:00	3050	4/10/2014 10:00	4710
4/10/2014 10:15	3190	4/10/2014 10:15	2080
4/10/2014 10:30	3350	4/10/2014 10:30	-378
4/10/2014 10:45	3390	4/10/2014 10:45	-2860
4/10/2014 11:00	3380	4/10/2014 11:00	-4880
4/10/2014 11:15	3270	4/10/2014 11:15	-6630
4/10/2014 11:30	3310	4/10/2014 11:30	-7910
4/10/2014 11:45	3200	4/10/2014 11:45	-8430
4/10/2014 12:00	3260	4/10/2014 12:00	-9140
4/10/2014 12:15	3380	4/10/2014 12:15	-9770
4/10/2014 12:30	3450	4/10/2014 12:30	-9720
4/10/2014 12:45	3180	4/10/2014 12:45	-9070
4/10/2014 13:00	3120	4/10/2014 13:00	-8820
4/10/2014 13:15	3330	4/10/2014 13:15	-8850
4/10/2014 13:30	3220	4/10/2014 13:30	-8390
4/10/2014 13:45	3470	4/10/2014 13:45	-7710
4/10/2014 14:00	2960	4/10/2014 14:00	-6830
4/10/2014 14:15	3110	4/10/2014 14:15	-6240
4/10/2014 14:30	2880	4/10/2014 14:30	-5540
4/10/2014 14:45	2790	4/10/2014 14:45	-4640
4/10/2014 15:00	2770	4/10/2014 15:00	-3330
4/10/2014 15:15	2300	4/10/2014 15:15	-1710
4/10/2014 15:30	1680	4/10/2014 15:30	-199
4/10/2014 15:45	1610	4/10/2014 15:45	1000
4/10/2014 16:00	1380	4/10/2014 16:00	899
4/10/2014 16:15	1090	4/10/2014 16:15	696
4/10/2014 16:30	1130	4/10/2014 16:30	889
4/10/2014 16:45	1220	4/10/2014 16:45	1470
4/10/2014 17:00	1710	4/10/2014 17:00	197
4/10/2014 17:15	1710	4/10/2014 17:15	2040
4/10/2014 17:30	1750	4/10/2014 17:30	2620
4/10/2014 17:45	1790	4/10/2014 17:45	4240
4/10/2014 18:00	1870	4/10/2014 18:00	4510
4/10/2014 18:15	1860	4/10/2014 18:15	4480
4/10/2014 18:30	1970	4/10/2014 18:30	1330
4/10/2014 18:45	2030	4/10/2014 18:45	5190

in April 2014 when substantial amounts of fresh water was diverted from Georgiana Slough, which caused the saltier water of the San Joaquin River to travel up into Georgiana Slough creating the "reverse flows" as indicated from the flow data. Who was diverting that much water and ***WHERE DID THE WATER GO?***



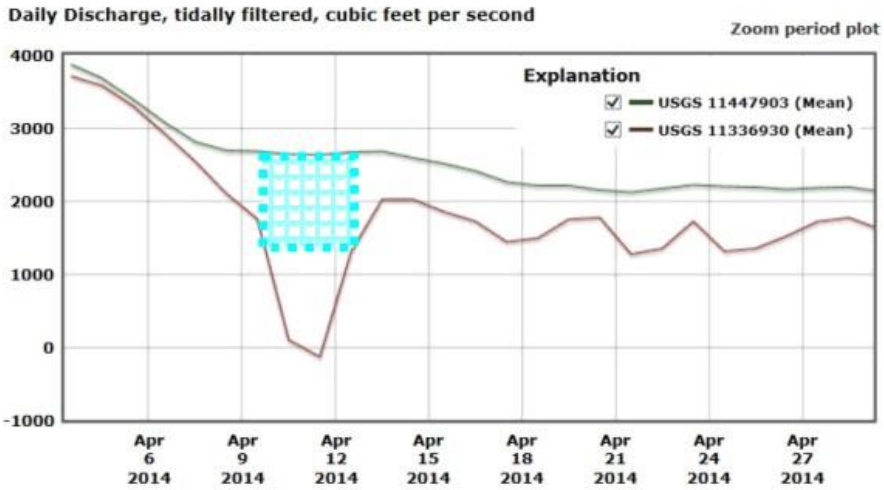
Note that Georgiana Slough used to always have OUTFLOW into the MokeLumne River at the gage, and the tidal fluctuation was not as wide a range as the 2014 graph above shows, compared to the 2002 graph below.



* Problem #5: Unexplained but consistent April 2014, 2013, 2012 unaccounted for substantial water exports from Georgiana Slough

DATA GAP OR UNACCOUNTED FOR WATER DIVERSIONS

USGS 11336930 MOKELUMNE R A ANDRUS ISLAND NR TERMINOUS CA
USGS 11447903 GEORGIANA SLOUGH NR SACRAMENTO R



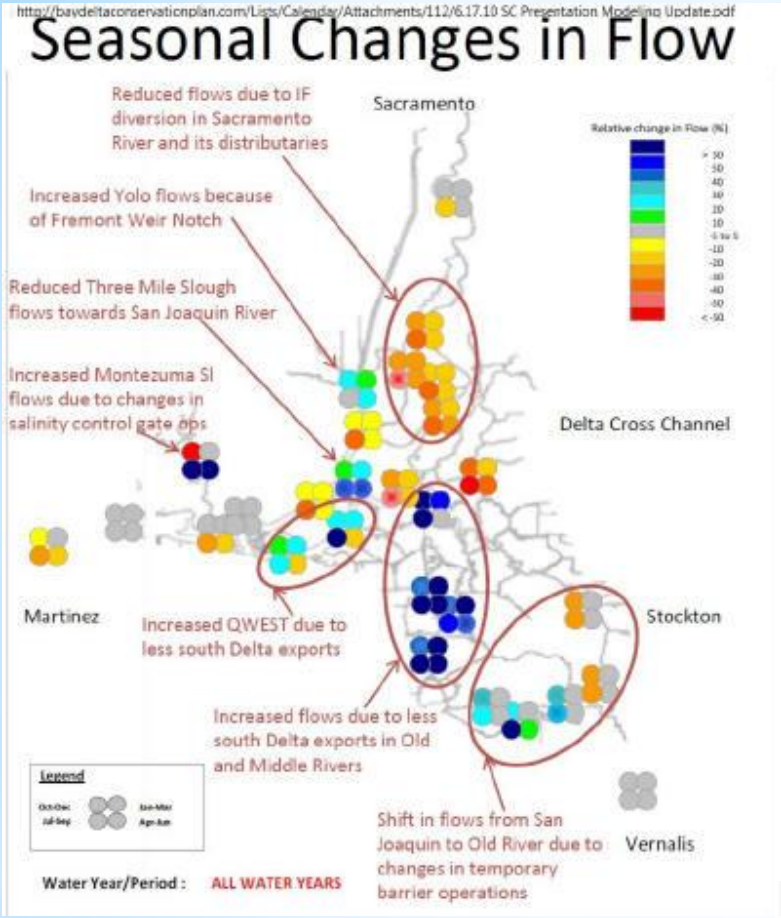
The blue box was added to the USGS graphic showing the flow on Georgiana Slough and at the gage on the Mokelumne just below the end of Georgiana Slough. What happens to the Georgiana Slough flow which appears to show 1200 to 2500 missing cfs? That is a substantial amount of unaccounted for water in just 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.

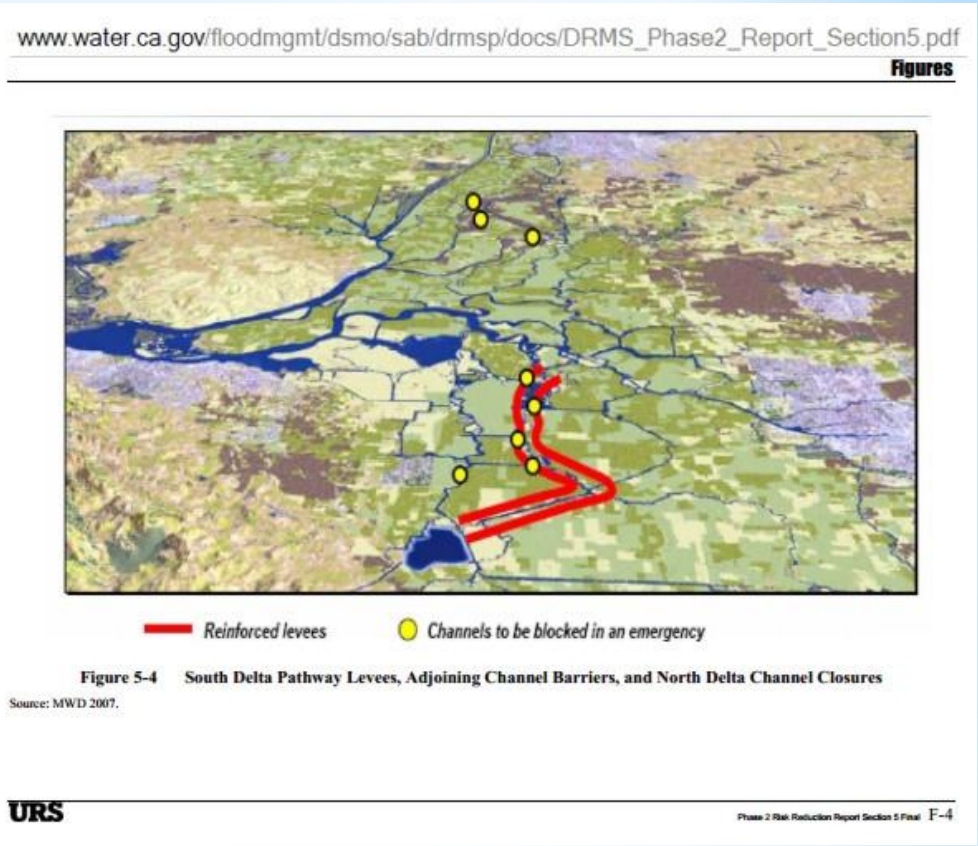
Focusing on just the blue box area, the following formula was used to estimate how much water flow is unaccounted for on Georgiana Slough in 2014, from April 9 to April 12, and what is the value of that unaccounted for water flow:
1 cfs =1.98 af per day
1200 cfs x 1.98 af per 3 days = 7,128 af unaccounted 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

* **Problem #5: Flow data gaps.** Where did the Georgiana water go? The value each year of "missing" water could be $37 million if sold to highest bidder!





* Problem #6: Does BDCP, (which bases decisions on modeling outcomes from CALSIM 1 and 11, DSM2 and other flow models), use the DWR or USGS conversion formula? If DWR's, there is actually less flow in the Delta than modeled, which may be one reason why we are seeing impacts already...

* Did you know DWR, USBR or some other water-related agency already installed an in-water berm at the north end of Steamboat Slough? The in-water berm is already blocking a portion of the natural freshwater flow into Steamboat Slough. Did CALSIM, DSM2, RMA and the other computer models account for the different depths of the waterways or for the new in-water berms?
* Since the NOAA North Delta navigation chart appears to show substantially lower water levels than what we have seen so far, is that chart actually a prediction of what we should expect in the near future?

SALINITY AND IMPACTS OF THE BDCP AND CALFED actions:

Before 1850 the Delta was entirely freshwater. When diversions north of the Delta, and dams on the rivers were built, less fress water flowed into the Delta, which began to affect drinking water and irrigation water quality

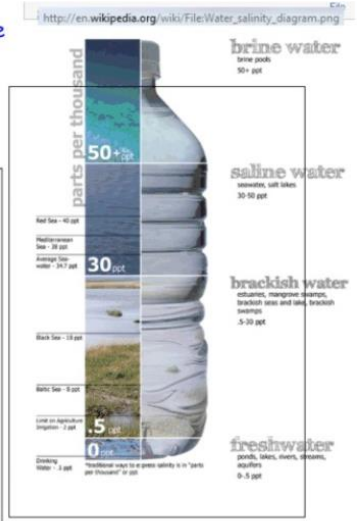


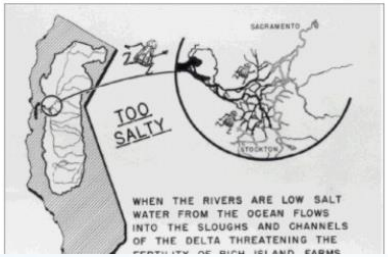
Table 10-1 Measurements of salinity

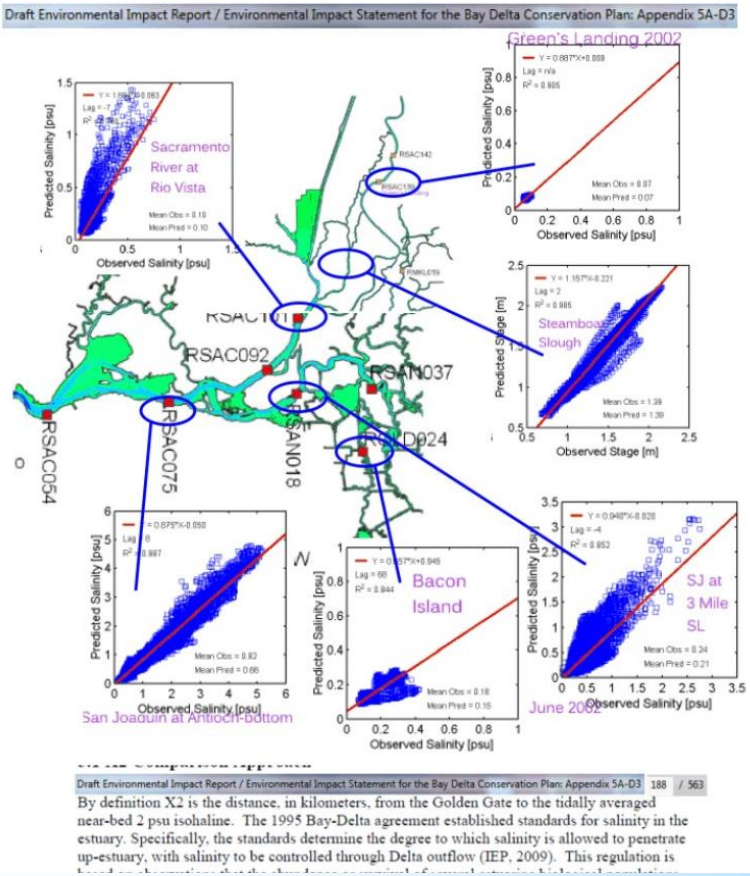
Salinity metric	Common Units	Comment
Electrical conductivity (EC)	µS/cm	EC is a measure of the concentration of dissolved ions in water, and is reported in µmhos/cm (micromhos per centimeter) or µS/cm (microsiemens per centimeter). A µmho is equivalent to a µS. EC may also be called specific conductance or specific conductivity of a solution.
Total dissolved solids (TDS)	mg/l or ppm	TDS is a measure of the all the dissolved substances in water and its units are milligrams per liter (mg/l) of solution.
Practical salinity units (PSU)	Unit-less	PSU is approximately equivalent to salinity expressed as parts per thousand (e.g. salt per 1,000 g of solution). Seawater is about 35 PSU. Its actual measurement is a complex procedure. Oceanographers are likely to use PSUs so it is mentioned here.

Degrees of salinity (L3)

There is no fixed delineation between "fresh" and "brackish" water; as such and for this chapter, a TDS concentration value of 1000 mg/l or 0.1 percent salinity is used for the dividing line, which is consistent with many references.

The term "brackish", in general, refers to water that has more salinity than fresh water but less than sea water. There also is no rigid delineation between brackish water and seawater; however, 30,000 mg/l or 3 percent salinity will be used for the purposes of this chapter to make a general delineation between brackish and sea water.





Draft Environmental Impact Report / Environmental Impact Statement for the Bay Delta Conservation Plan: Appendix 5A-D3 188 / 563

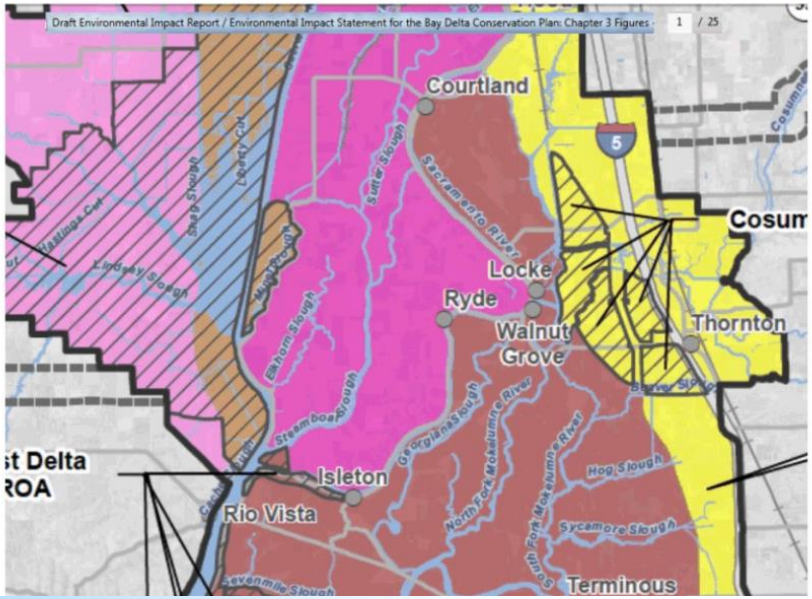
By definition X2 is the distance, in kilometers, from the Golden Gate to the tidally averaged near-bed 2 psu isohaline. The 1995 Bay-Delta agreement established standards for salinity in the estuary. Specifically, the standards determine the degree to which salinity is allowed to penetrate up-estuary, with salinity to be controlled through Delta outflow (IEP, 2009). This regulation is

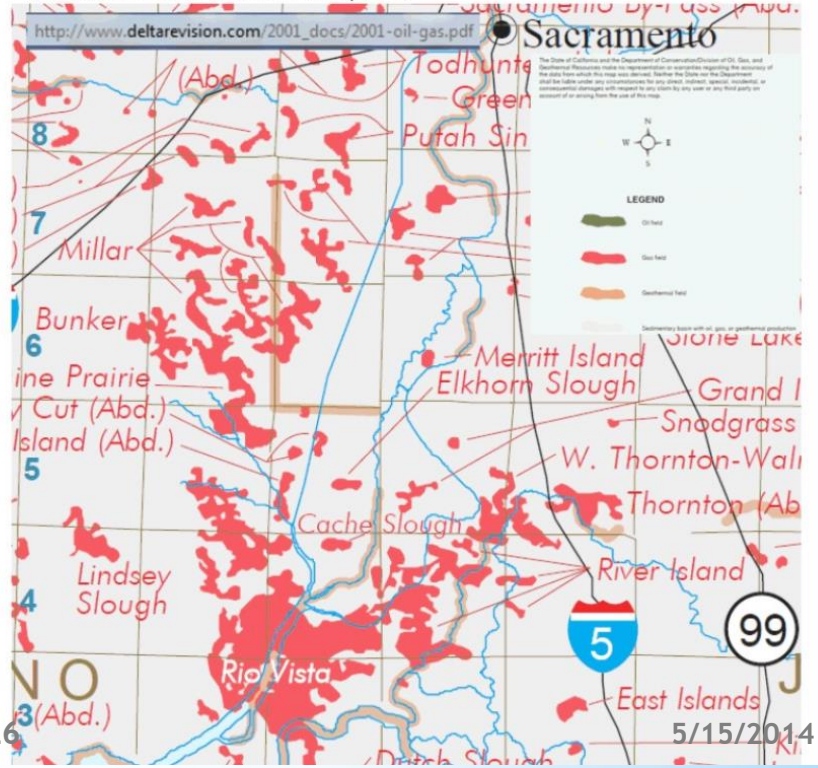
* We do not need to wait for the BDCP approval to feel the negative impacts of the pre-built elements of the BDCP/Delta Plan. Mismanagement of the reservoirs in 2012 and 2013 already has the impact of current increased salinity in the Delta in 2014.

* Problem #7: Does BDCP water flow and in-Delta use account for water used for ***fracking*** and does BDCP computer modeling account for the fact that tules consume three times more water than crop irrigation, which therefore increases in-Delta water requirements?

THE CORRELATION BETWEEN NATURAL GAS RESERVES AND THE TARGETED "RESTORATION" AREAS

Look at the map sections below. Map on the right shows the locations of natural gas pockets available through the new "fracturing" method invented in 1998. Map on the left shows the areas of the Delta proposed for "restoration". The landowners in the Delta have mineral rights under their land most likely. Isn't it an interesting correlation that the places that are targeted "restoration" are also the places to be fracked, which has already started in the Delta? So DWR and other agencies appear to be using the BDCP as an excuse to take over privately-owned lands or force the sale of the lands. The water rights get sold to the highest bidder, and the oil companies like Chevron are free to frack the Delta. Ask what happens to the Bay Area aquifers from fracking residue fluids left in the Bay Area aquifer? Fracking induces seismic events (earthquakes). Will Chevron and the other chemical companies clean up the destroyed aquifer when they induce an earthquake that not only knocks down levees but breaks the residue wells to allow cross-contamination of our aquifer?





New fracking wells of the Delta as of 2009

http://deltarevision.com/Issues/conveyance/intakes/630cfs.jpg

2. Jibbon and I Street. Unknown million gallons per day (approximately 400 cfs ?) from the size of it as planning documents don't show online.

3. By Sac State on the American River . 200 million gallons per day (225 cfs)
http://www.nhcweb.com/section.asp?pageid=7077

4. Folsom South Canal expansion 100-200 Million gallons per day
http://deltarevision.com/2012%20docs/construction/fulsom-south-diversion.jpg and
http://deltarevision.com/Issues/conveyance/intakes/fulsomesouth-3500cfs.jpg

5. Freeport Project. 185 million gallons per day (286 cfs)

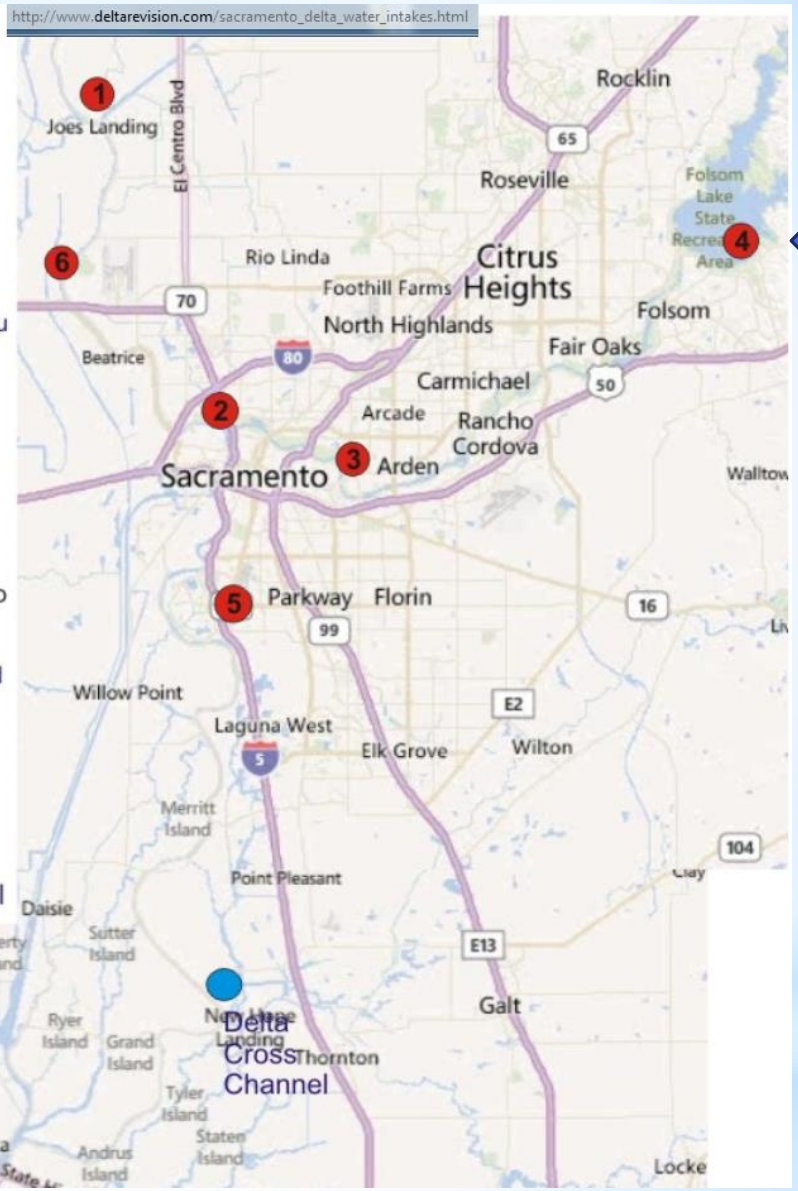
6. (Proposed) Woodland/Davis intake. Xx million gallons per day (400 cfs) See also the **Wilkins Slough** pumping plant with **830 cfs capacity**!
http://deltarevision.com/2012%20docs/construction/5-calfedupdate12-2011.jpg

7. (Proposed) NBA expansion of Barker Slough pumps: xx million gallons per day (240 cfs) and linking of Suisun Marsh with the Delta, diverting Puta Creek water that used to flow into the Yolo Bypass/West Delta.

8. Empire Tract intake. At least 250 cfs capacity
http://www.deltawatersupplyproject.com/documents/DWSPupdate_July2011.pdf

9. Victoria Canal intake. At least 250 cfs capacity.
Http://deltarevision.com/2012%20docs/construction/8-calfedupdate12-2011.jpg

Photos and planning documents for most of the projects available online at
Http://deltarevision.com/2012_delta_construction.html

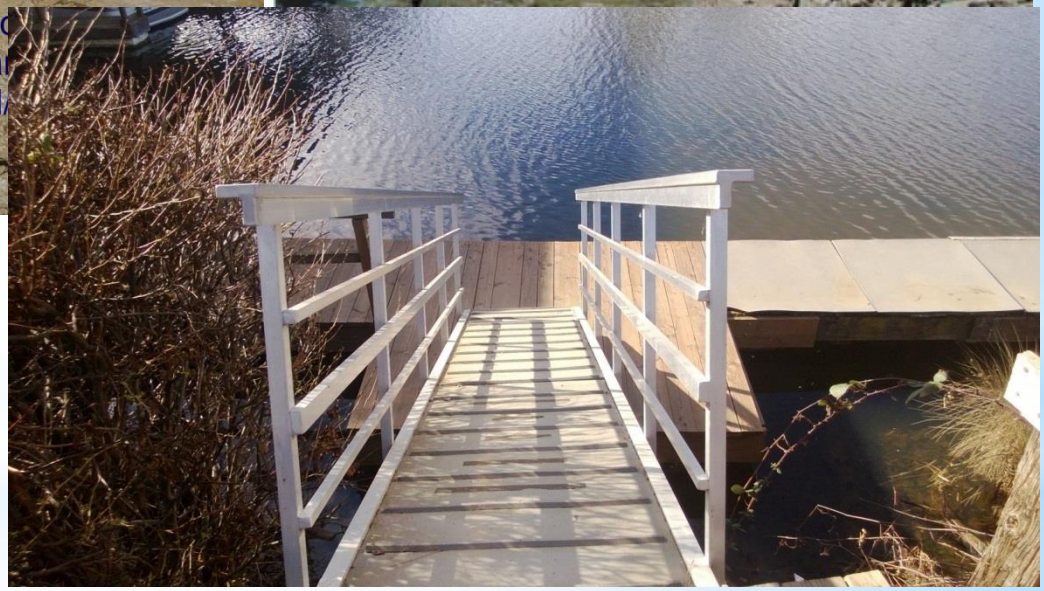


* Problem #8: Does BDCP account for all of the new intakes built north of the Delta and in the Delta?

26 / 33 http://www.swrcb.ca.gov/water_issues/hot_topics/strategic_plan/docs/2008_2012/020608_presentation.pdf

Inappropriate inconsistency can result in inequitable treatment, no common understanding of key water quality and water rights goals, and difficulty in achieving a meaningful evaluation of outcomes.

* If they can't correctly count the water flow, they also can't control it. Why should we trust them (DWR, USBR, SWC) to make sure there is sufficient fresh water flow in the North Delta?



* Current Impacts from the low water flows on the Sacramento River into the Delta: dry docking marinas

Current low flow impacts: the death of waterside old oak trees on Georgiana Slough

* Current low flow impacts: reduced North Delta water quality in drinking water wells and irrigation pumps

* Current low flow impacts: increased non-native water weeds which clog the navigable waterways and gets into the farmer's irrigation channels

*Roads are already being blocked…

http://www.dot.ca.gov/dist4/publicaffairs/docs/rte12160mapfront.pdf

2-4-14: Ferry at SR still broken and, by the way, when did SR 84 become 160?

Rte 12/160 Detours

REPAIR CONTRACT FOR 3-MILE SLOUGH BRIDGE NIGHTLY CLOSURES OF STATE ROUTE 160 IN APRIL NO THROUGH TRAFFIC ON 160 RIO VISTA – ANTIOCH CLOSURE INFORMATION

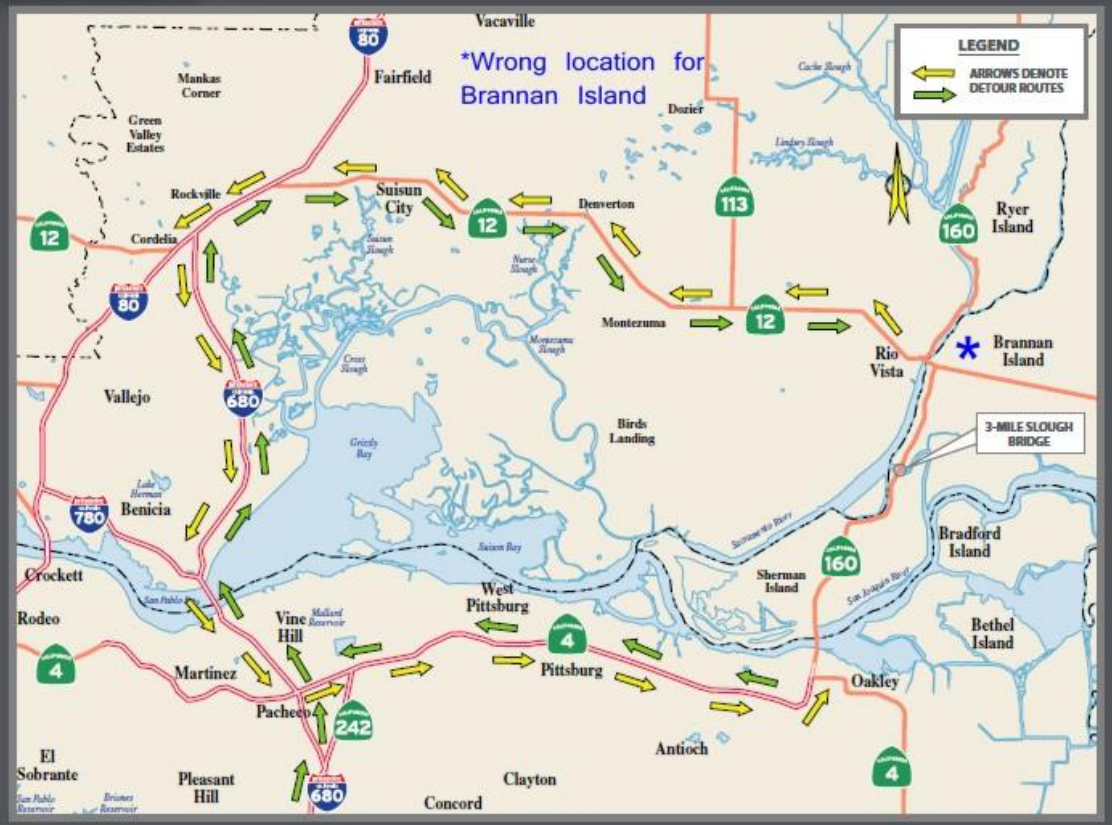
Beginning Thursday, April 1 and continuing through Friday, April 30, State Route 160 (Highway 160) will be closed each night to all through traffic between Rio Vista and Antioch from 9:00 p.m. to 5:00 a.m. the following morning. Only local traffic will be allowed on SR 160 south of Rio Vista or north of the Antioch Bridge. The nightly closures of Route 160 will be in effect every night in April and under all weather conditions to facilitate the necessary repairs to the 3-Mile Slough Bridge.

TRAFFIC DETOURS

Changeable message signs have been strategically placed throughout the detour routes in both directions to assist in guiding motorists through the detour to destination points ending in Antioch and Rio Vista. These message signs will provide advanced closure notice prior to April 1, and then activated nightly through April to direct traffic during the closure of the 3 Mile Slough Bridge on Highway 160 between Rio Vista and Antioch. Please keep in mind that these detours could add more than 90 minutes to your travel time.

Traffic from the Rio Vista area with destination points in and around Antioch, will be detoured via State Route 12 west to and onto westbound Interstate 80 and west on I-80 to and south onto I-680 at the Cordelia Junction (I-80/I-680 interchange). Continue south on I-680 across the Benicia-Martinez Bridge and then east onto State Route 4 (about 3.8 miles south of Bridge), at the I-680/Route 4 Interchange in Concord. Continue east on Route 4 to destination points and detour end in Antioch.

Traffic from the Antioch area with destination points in and around Rio Vista, will be detoured via Route 4 west to and then north onto I-680 and continue north on I-680 to and onto I-80 east at the I-80/I-680 Interchange (Cordelia Junction). From I-80 east take Route 12 east, and continue east on SR 12 to destination points and detour end just east of Rio Vista at the Routes 12/160 intersection.

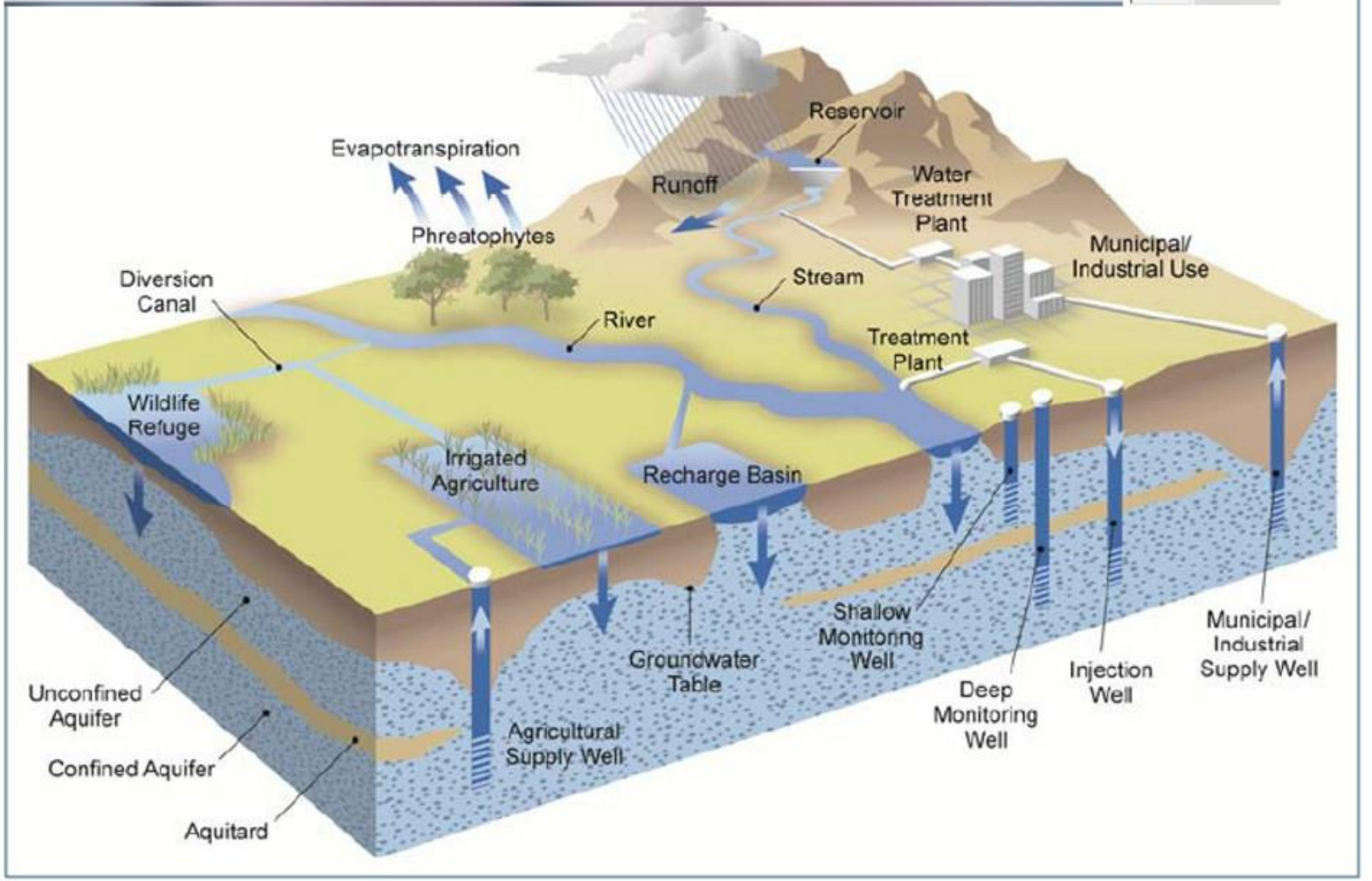


Caltrans

CT1405 Audio Visual Graphic Services 3/04

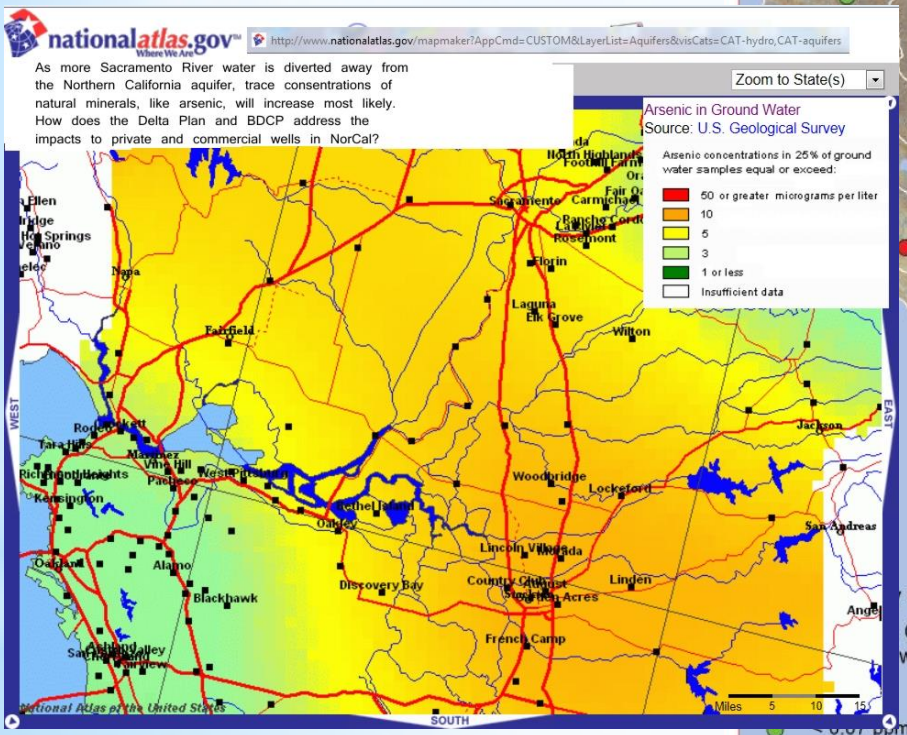
Figure 1 Conceptual Model of Water Management System

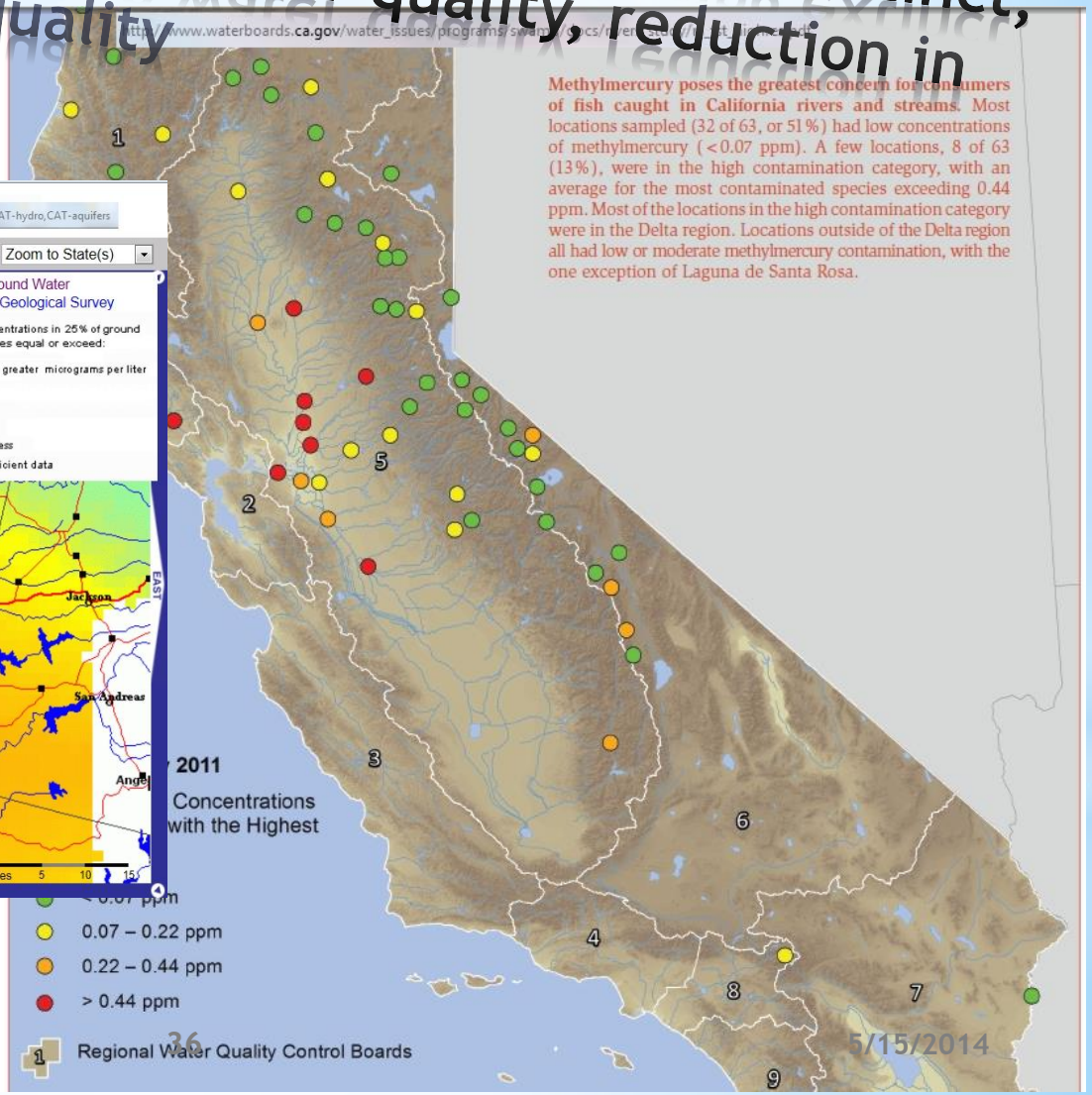
http://www.waterplan.water.ca.gov/docs/cwpu2013/ae/ae_brochure-cwpu2013.pdf 9 / 22



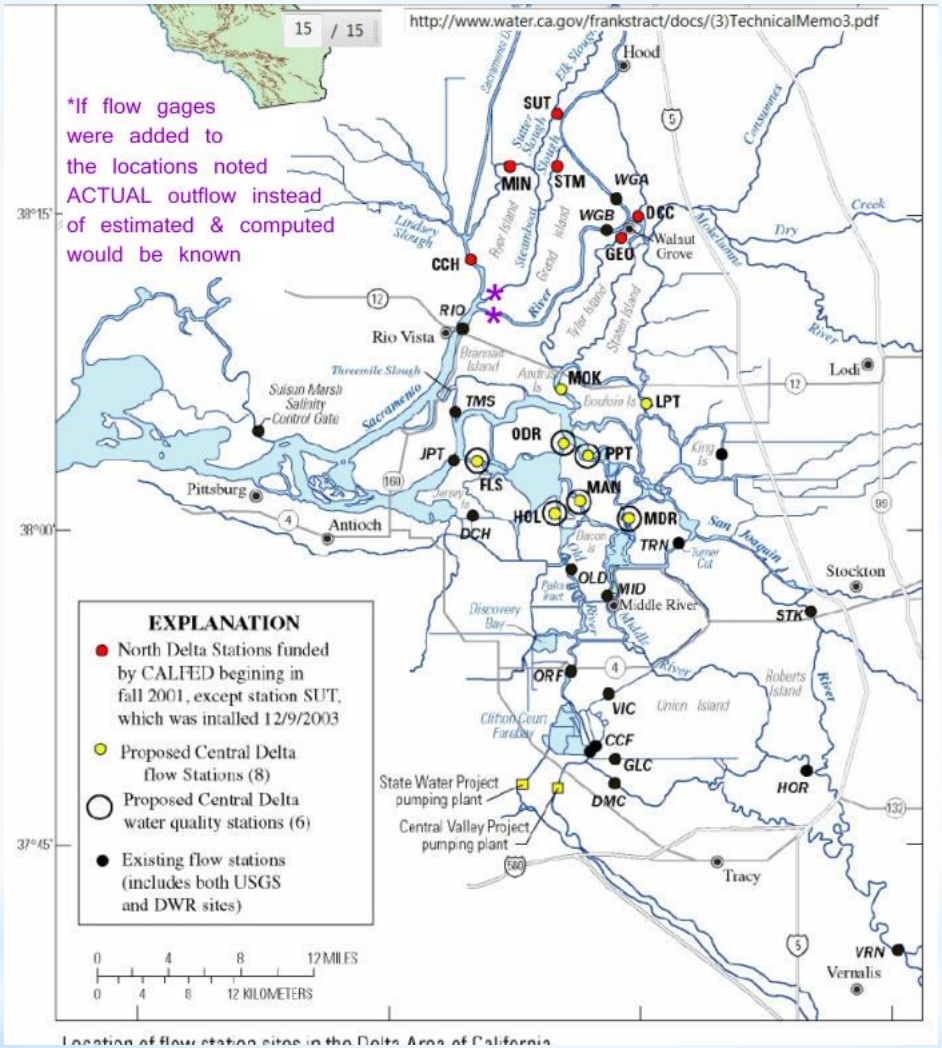
If all Sacramento River water is diverted into tunnels or other conveyance options, how does the Delta aquifer get replenished? Or will sea water invade the North Delta? Note: there is no such thing as an "aquitard" but it is one of the funnier new words invented by the silent players in this round of California water wars!

Current low flow impacts: native fish going extinct, reduction in irrigation water quality, reduction in livestock water quality





Have your drinking water well tested NOW and at least every month in low flow seasons!



Location of flow station sites in the Delta Area of California

* Demand that Delta outflow is reported based on gages, not a computed "estimate" of what might be left over after all exports, in-Delta uses and the unaccounted for water.

* State Water Contractors should pay for the monitoring of water flows statewide but not CONTROL the gages or CONTROL the reports. North Delta Water Agency or another Delta landowner controlled-entity should be funded to monitor and report actual flows and all monitoring gages should be viewable online for anyone. If water quality, water flows or water levels get below a reasonable point, the export pumps must be shut off and additional reservoir flows must be released to replenish the prime farm lands of California and preserve senior water rights.

* http://www.snugharbor.net/history_of_california_water_wars.html

* http://www.deltarevision.com/timeline.htm

* http://www.snugharbor.net/images-2013/deltastuff/wrongdeltanames.jpg

May 15, 2014. Presentation data compiled by Nicole Suard, Esq. (from Snug Harbor on Steamboat Slough) for educational purposes only. Water flow calculations are estimates only, provided to establish the fact there are gaps in flow data provided to the public, and substantial inconsistencies in flow and export reporting since at least 2004. Presenter is NOT a water engineer or expert at water flow or rights, so please refer specific questions regarding water flow to your local water agency representative, a water engineer, or your personal attorney.