TTHM concentrations, while the other two scenarios result in slight decreases. It is important to remember that the majority of the releases from the project islands occur in the summer, and thus Table 13 does not provide a good estimate of the year round impact of the operation of the Delta Wetlands Project.

Time series plots (see Figures 66, 68, 70, and 72) illustrating the change between each alternative scenario and the base case provide a more useful tool to assess the impact of the project operation on TTHM formation. Although these plots show the change due to project operation over the entire simulation period, the intermittent 3.2 ug/l maximum increase in TTHM standard applies only at the times when the regular 64 ug/l standard was exceeded by the base case as shown in Figures 65, 67, 69, and 71. Even though releases from the project islands resulted in significant increases in TTHM at all four urban intake locations, typically these increases did not exceed the 64 ug/l standard, and thus according to the WQMP should not be constrained by the 3.2 ug/l maximum increase standard.

The largest increase in TTHM occurred in the summer of 1988 at the Los Vaqueros Reservoir intake location for both the mid and high levels of DOC release (see Figure 68). However, both of these increases exceeded 64 ug/l at a time when the base case was below the standard (see Figure 67). The maximum monthly increase in TTHM at the urban intake locations for only those times when the base case scenario exceeded the 64 ug/l standard is listed below in Table 14. Based on Table 14, there appears to be little difference between the scenarios. The only location where TTHM increased due to project operation was at Old River at Rock Slough.

Table 14: Maximum monthly increase in TTHM (ug/l) when base scenario was greater than the WQMP 64 ug/l standard.

Location	*Low – Base*	*Mid - Base*	*High - Base*
Old River at Rock Slough	4.39	4.40	4.40
Old River at Los Vaqueros intake	-1.42	-1.42	-1.29
State Water Project	-0.63	-0.63	-0.63
Central Valley Project	-0.58	-0.58	-0.58

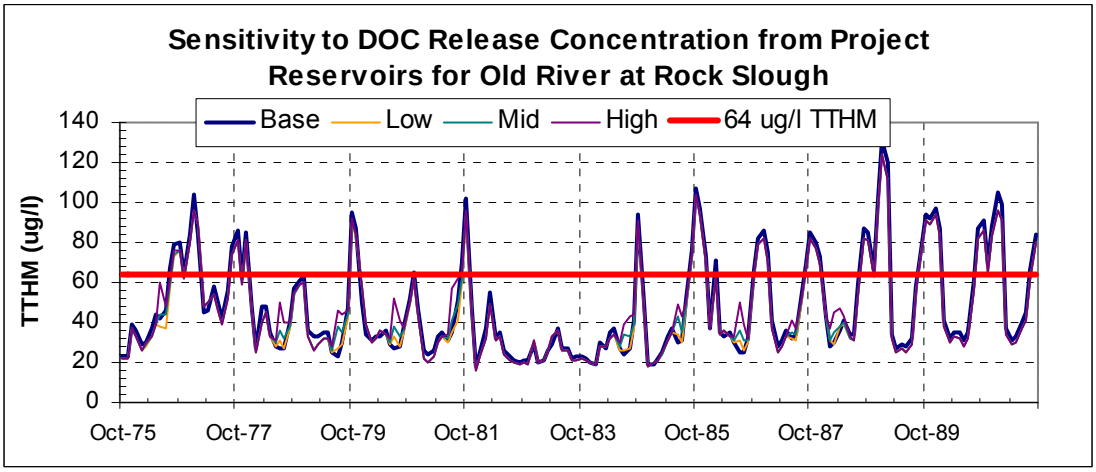


Figure 65: Time Series of TTHM Formation for Old River at Rock Slough.

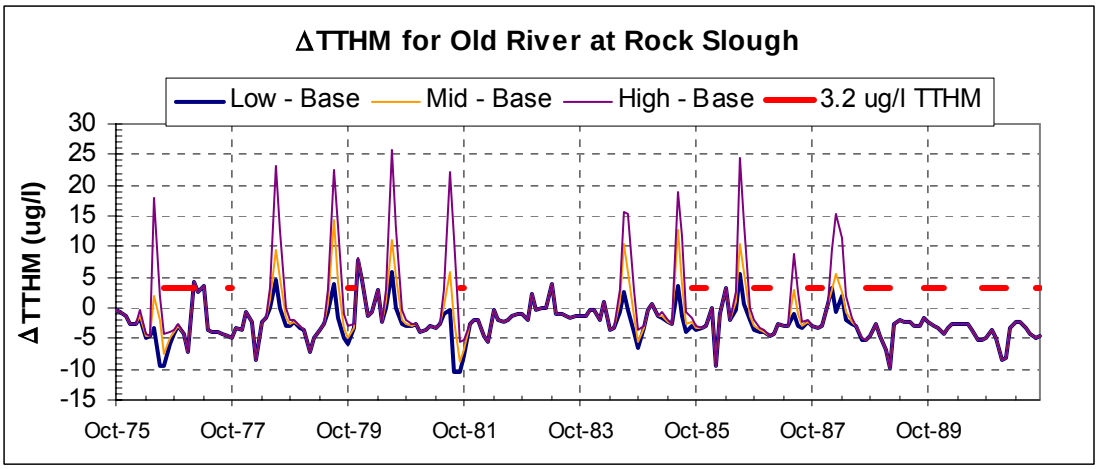


Figure 66: Time Series of Change in TTHM (Alternative – Base) for Old River at Rock Slough.

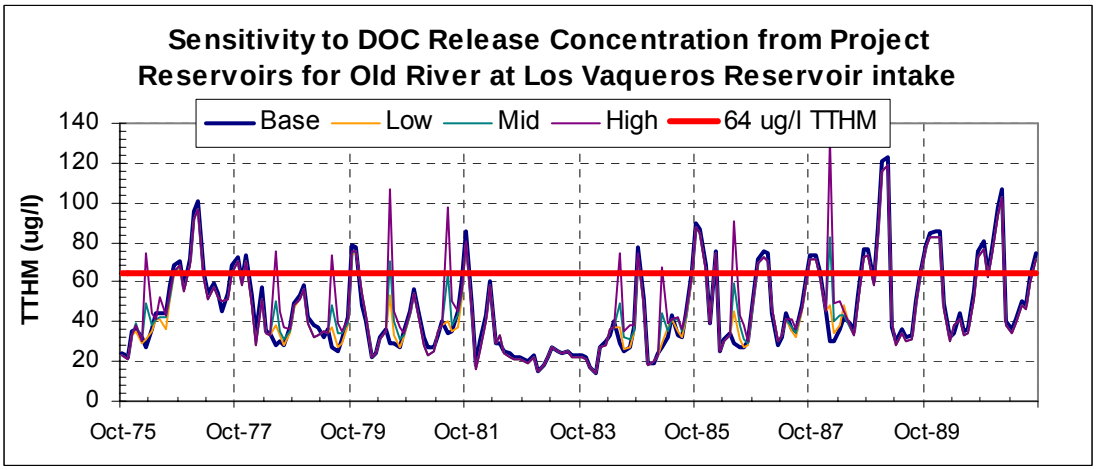


Figure 67: Time Series of TTHM Formation for Old River at Los Vaqueros intake.

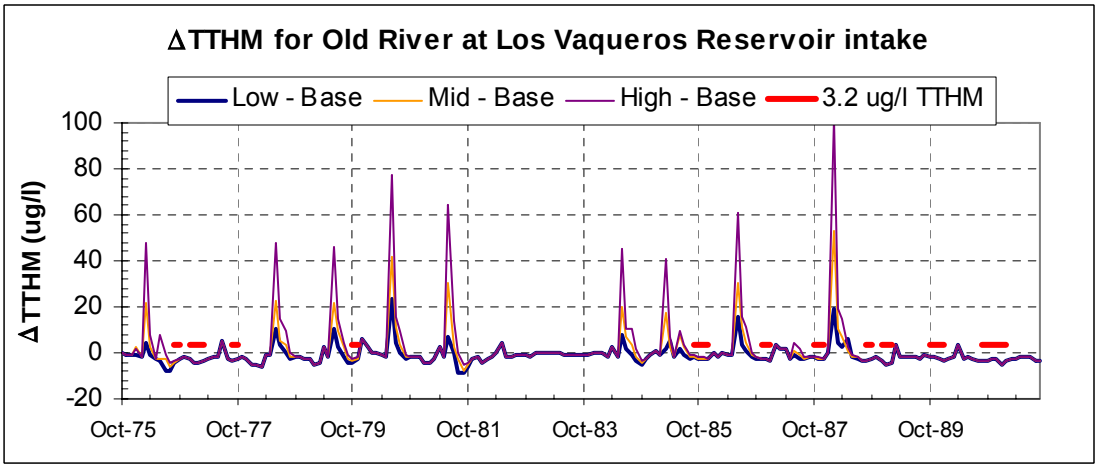


Figure 68: Time Series of Change in TTHM (Alternative – Base) for Old River at Los Vaqueros intake.

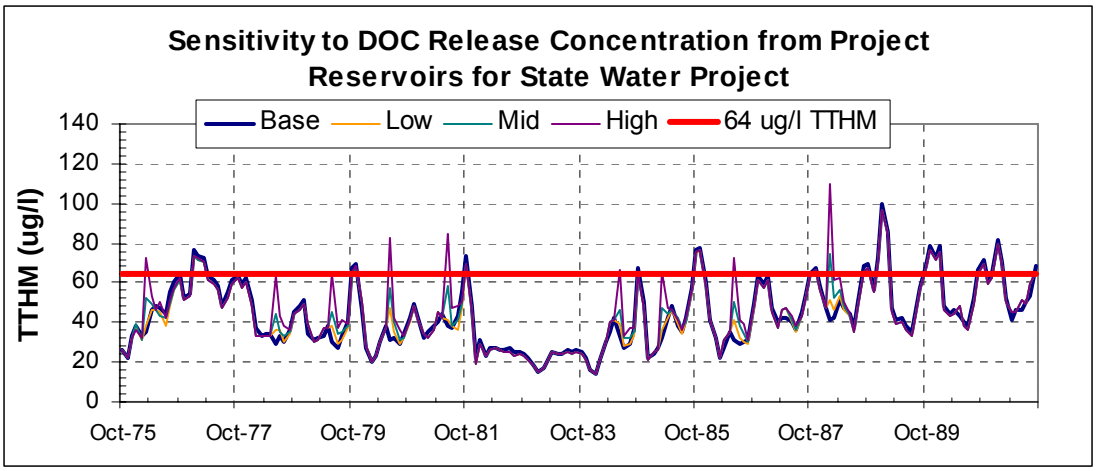


Figure 69: Time Series of TTHM Formation for State Water Project.

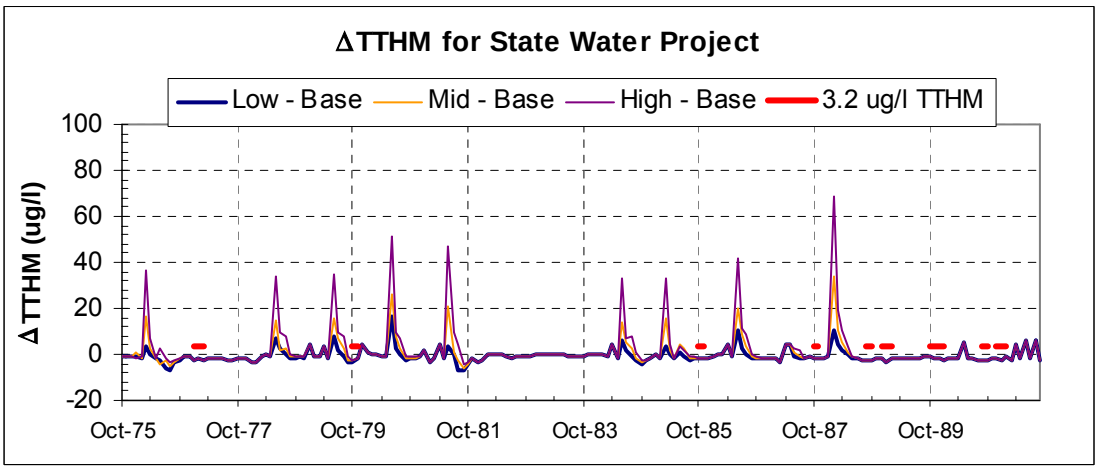


Figure 70: Time Series of Change in TTHM (Alternative – Base) for State Water Project.

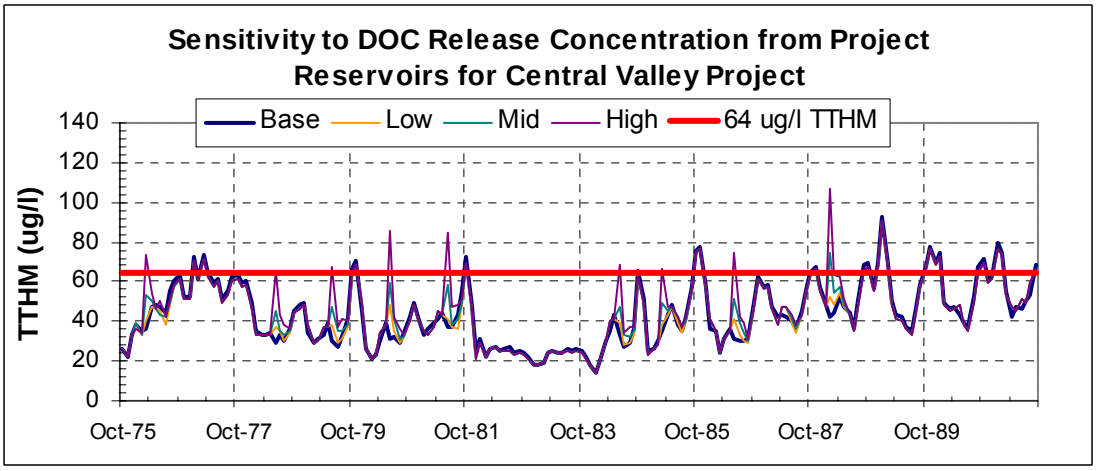


Figure 71: Time Series of TTHM Formation for State Water Project.

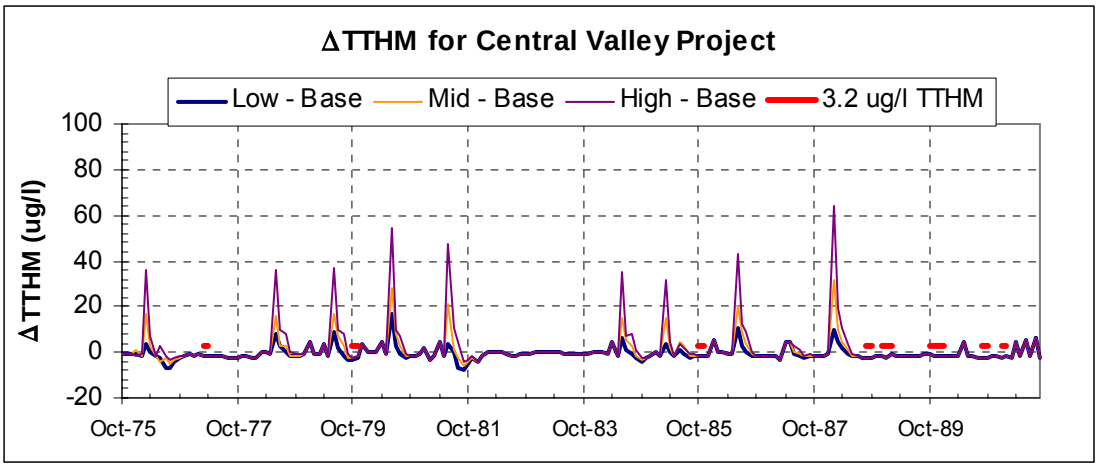


Figure 72: Time Series of Change in TTHM (Alternative – Base) for Central Valley Project.

4.6. Bromate (BRM)

According to the WQMP Bromate formation is limited 8 ug/l. For periods when the modeled base case exceeds this 8 ug/l standard, the WQMP permitted a 5% increase above the standard (0.4 ug/l) due to operation of the Delta Wetlands project.

Using EC and DOC for each of the DSM2 bookend simulations, bromate for Old River at Rock Slough was calculated as:

$$BRM = C_2 \times DOC^{0.31} \times Br^{0.73} \qquad \text{[Eqn. 8]}$$

where

BRM = bromate (ug/l),
C_2 = 9.6 when DOC < 4 mg/l,
C_2 = 9.2 when DOC ≥ 4 mg/l,
DOC = raw water dissolved organic carbon (mg/l) from DSM2, and
Br = raw water bromide from Equations 5 and 6.

Using Equations 6, 7, and 8, the bromate for all the urban intakes was calculated for the entire 16-year simulation period. The sensitivity to DOC release from the project islands is shown in Figures 73 – 80. Though bromate formation is a function of both DOC and bromide concentration, the bromide concentrations used to calculate bromate for each of the three DOC concentration levels were the same. The only differences between the three alternative scenarios occurred when water was released from the project islands, which typically occurred in the summer months (see Figure 2). As shown in Figures 73, 75, 77, and 79, the modeled base case bromate concentrations at all four intakes frequently exceeded the 8 ug/l WQMP standard during these release periods.

The maximum monthly bromate concentrations for each of the simulations are displayed in Table 15. For all four intake locations the operation of the project did not increase the maximum monthly bromate concentration. However, it is important to remember that there are still increases associated with the summer releases discussed above, thus the usefulness of this absolute time series plots and monthly maximum values are limited.

Table 15: Maximum monthly averaged bromate (ug/l) concentrations.

Location	***Base***	***Low***	***Mid***	***High***
Old River at Rock Slough	22.14	21.83	21.83	21.83
Old River at Los Vaqueros	20.54	20.26	2026	20.26
State Water Project	18.26	18.07	18.07	18.07
Central Valley Project	17.62	17.46	17.46	17.46

Time series plots (see Figures 74, 76, 78, and 80) illustrating the change between each alternative scenario and the base case provide a more useful tool to assess the impact of the project operation on bromate formation. Although these plots show the change due to project operation over the entire simulation period, the intermittent 0.4 ug/l maximum increase in bromate standard applies only at the times when the regular 8 ug/l WQMP standard was exceeded by the base case as discussed above. The maximum monthly increase in bromate when this second WQMP standard controls is listed in Table 16.

The bromate concentration at all four intake locations exceeded the WQMP 0.4 ug/l maximum increase standard several times due to the project operation. As listed in Table 16, the largest increase occurred at the Old River at Rock Slough intake location in December 1979. It is important to note that during this month water was diverted to the project islands (see Figure 1) which resulted in salinity in the a difference in salinity of over 200 umhos/cm between the alternative scenarios and the base case (see Figure 17). Increases in bromate concentration at Rock Slough also occurred in the winters of 1985, 1986, and 1988, all of which correspond with both periods of high salinity intrusion into the Central Delta and diversions into one or both of the project islands.

Table 16: Maximum monthly increase in bromate (ug/l) when base scenario was greater than the WQMP 8 ug/l standard.

Location	***Low – Base***	***Mid - Base***	***High - Base***
Old River at Rock Slough	1.69	1.69	1.69
Old River at Los Vaqueros intake	1.36	1.36	1.37
State Water Project	1.02	1.02	1.03
Central Valley Project	0.97	0.97	0.97

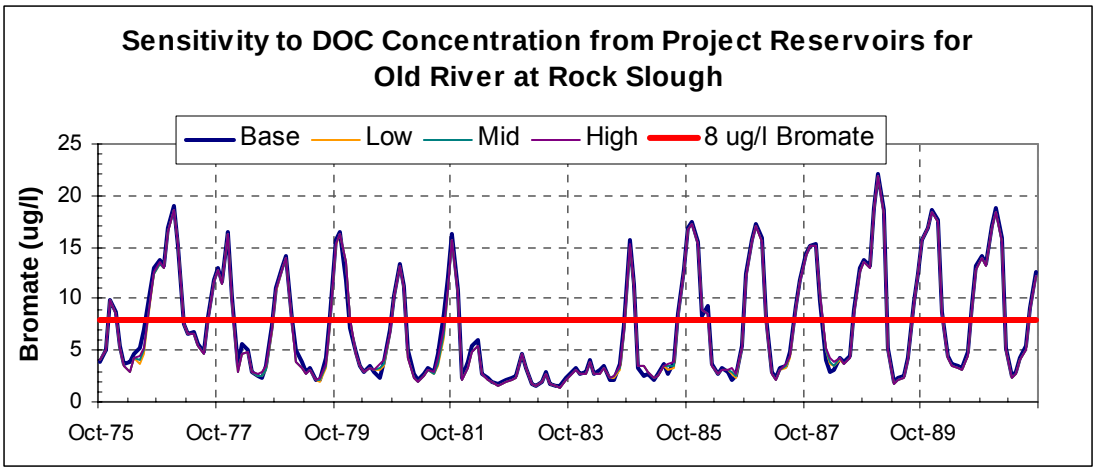


Figure 73: Time Series of Bromate Formation for Old River at Rock Slough.

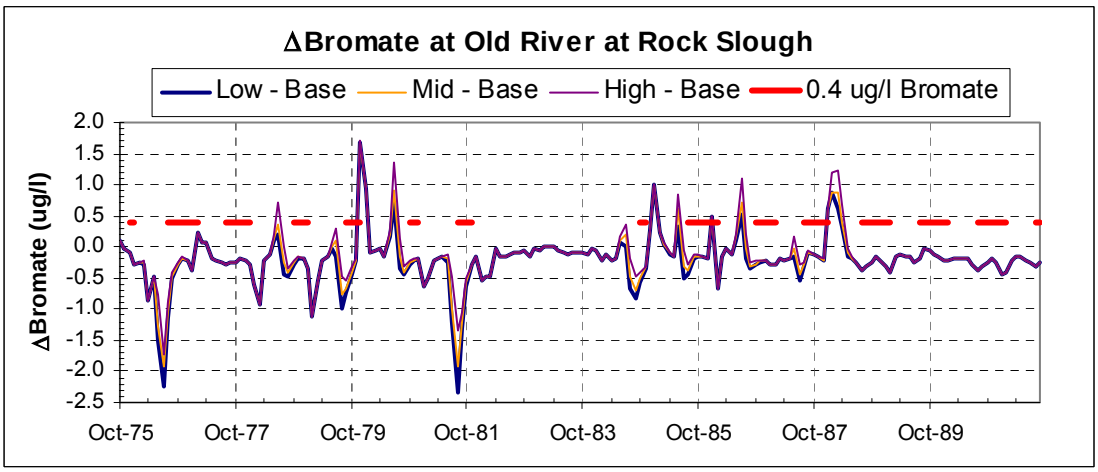


Figure 74: Time Series of Change in Bromate (Alternative – Base) for Old River at Rock Slough.

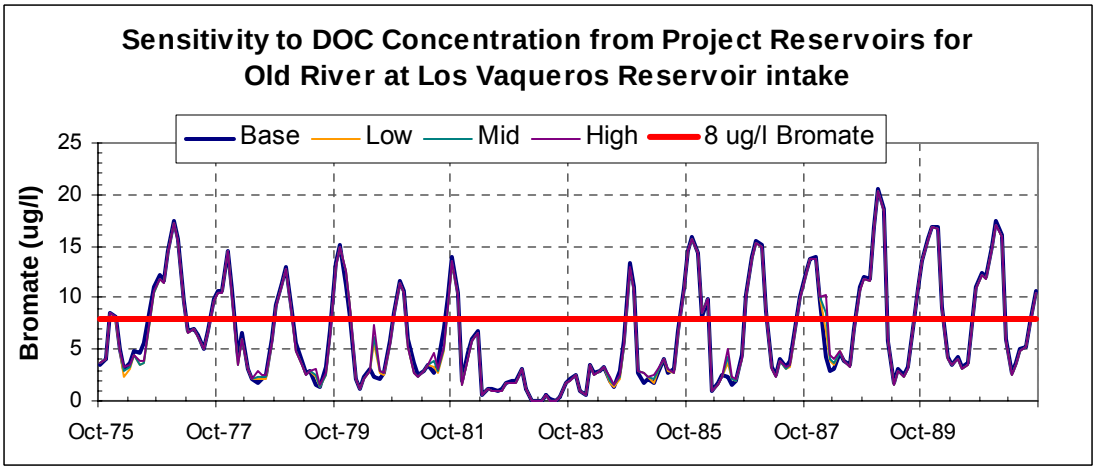


Figure 75: Time Series of Bromate Formation for Old River at Los Vaqueros intake.

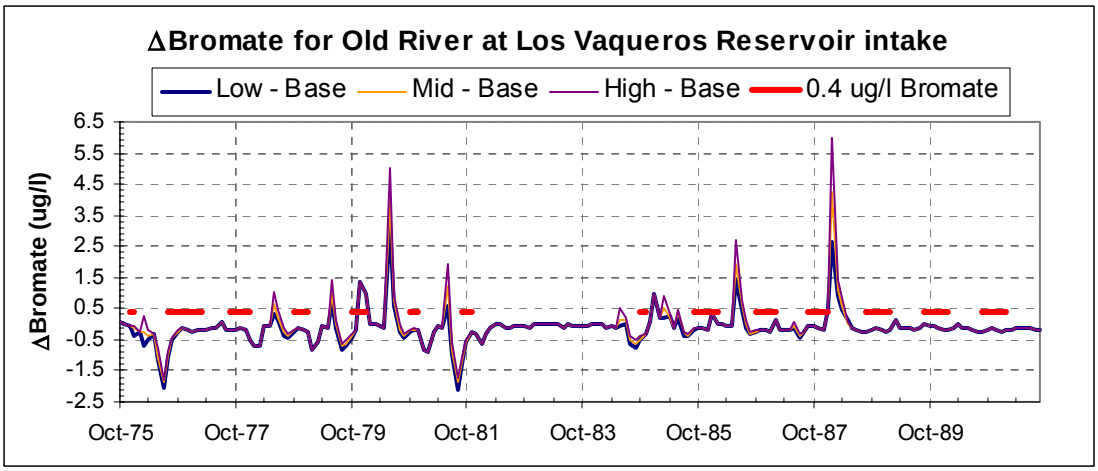


Figure 76: Time Series of Change in Bromate (Alternative – Base) for Old River at Los Vaqueros intake.

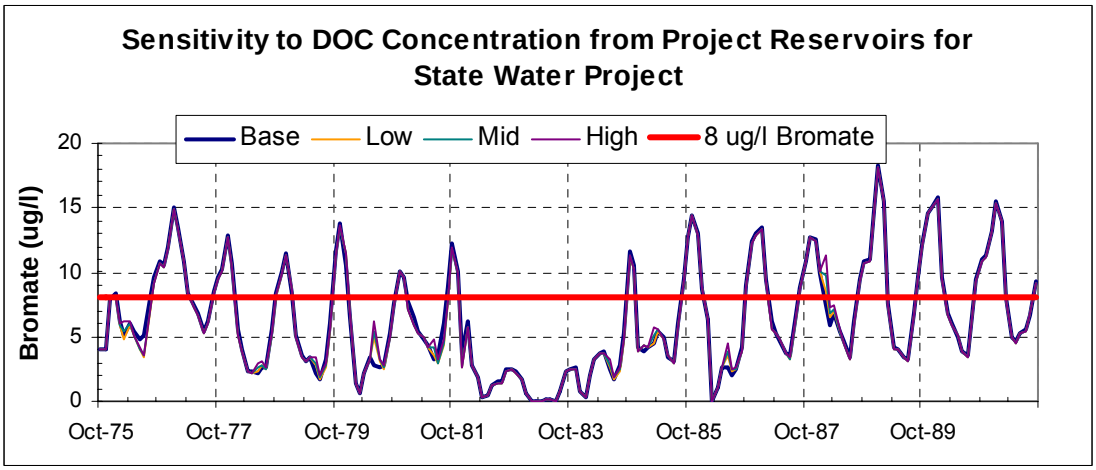


Figure 77: Time Series of Bromate Formation for State Water Project.

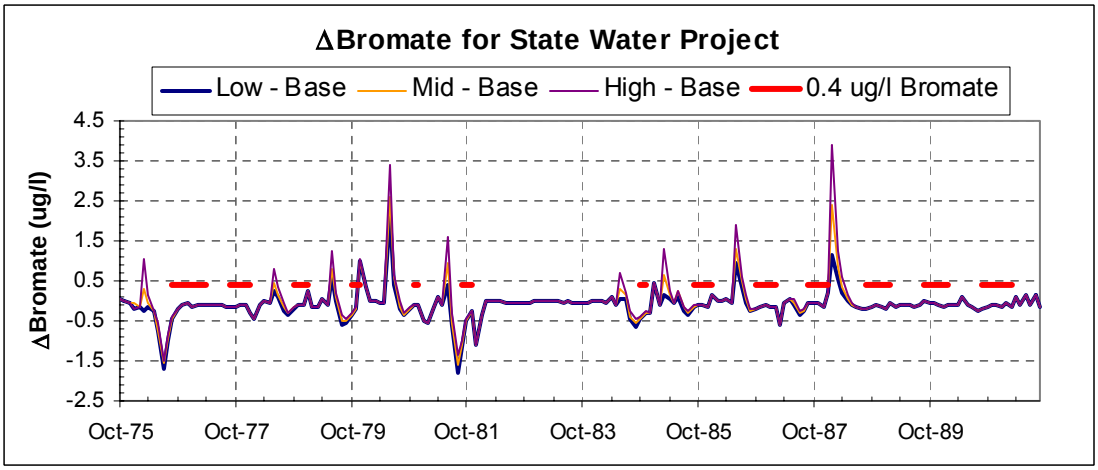


Figure 78: Time Series of Change in Bromate (Alternative – Base) for State Water Project.

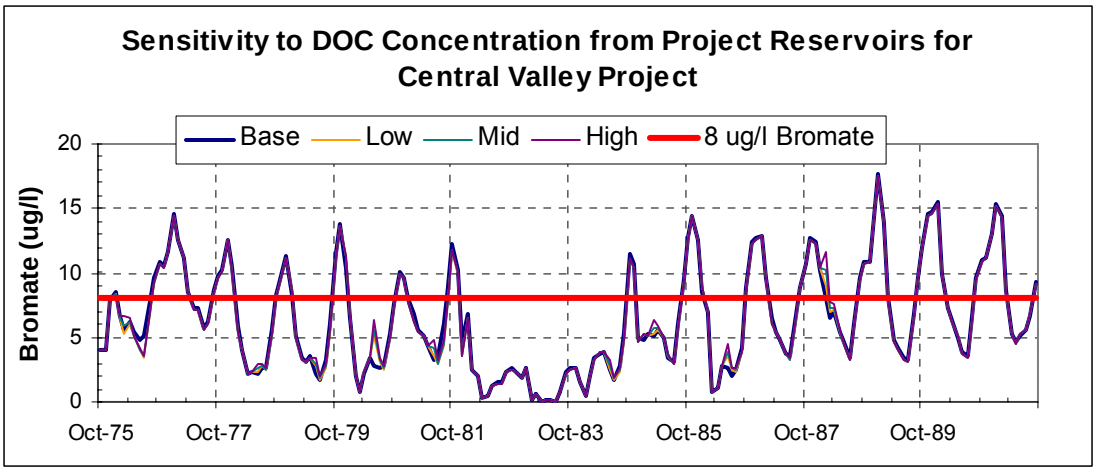


Figure 79: Time Series of Bromate Formation for Central Valley Project.

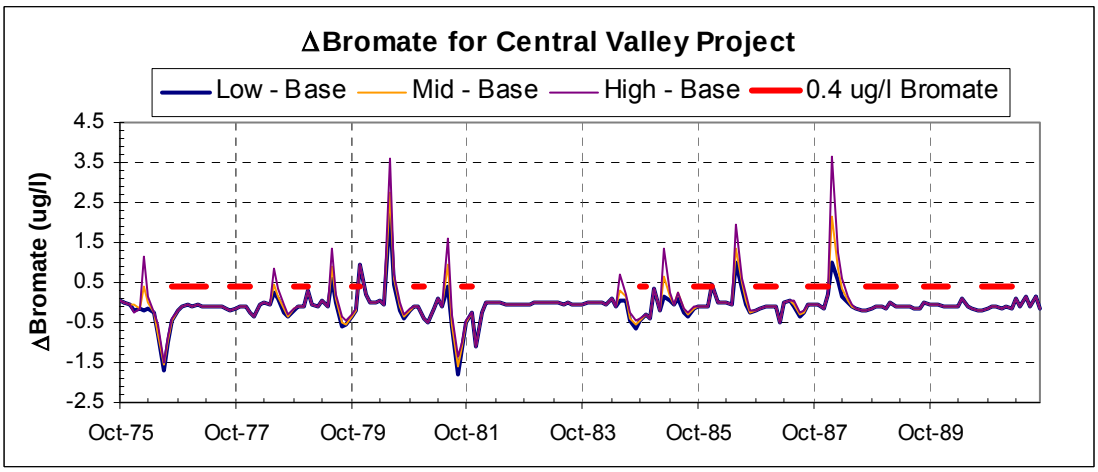


Figure 80: Time Series of Change in Bromate (Alternative – Base) for Central Valley Project.

5. Conclusions

- The DWRSIM 771 base case hydrology exceeded the Rock Slough Chloride standard nearly every winter during the 16-year simulation period with the exception of 1982 and 1983. Therefore the modeled EC at the four urban intakes is suspect for the Delta Wetlands alternative. It is recommended that a more accurate base case hydrology be used in future DSM2 studies.

- There was little difference in modeled EC between the base and Delta Wetlands alternative. The EC concentration of the water released from the project islands is a function of the quality of the water diverted on to the islands. Since TTHM and BRM formation are highly dependent on bromide concentration (which was calculated using EC), care must be taken when diverting water into the project

islands in order to manage the EC, TTHM, and BRM impacts of the project islands.

- DSM2 simulated the project islands releases using three fixed concentrations at the discharge locations. QUAL did not consider the residence time of the water stored in the project islands. For future studies QUAL will be modified in order to better simulate the impact of storing water in the project islands for extended periods.

- The benefit of reducing the return of water from Bacon Island and Webb Tract on DOC, referred to as the *DOC ag credit*, ranged between 0 – 0.3 mg/l for Old River at Rock Slough. This *DOC ag credit* was less significant at the other three intake locations.

- The DSM2 DOC base case frequently exceeded the 4 mg/l DOC standard at all four intake locations during the late winter runoff periods.

- The mid- and high- DOC concentration releases from the project islands (which typically occurred in the summer) exceeded the 4 mg/l DOC standard. The increased DOC observed in DSM2 at the intakes ranged from around 3 – 4 mg/l at Rock Slough to an 8 mg/l increase at the Los Vaqueros intake on the Old River.

- Though the low DOC concentration release from the project islands did not exceed the 1 mg/l increase standard stipulated by the Delta Wetlands WQMP, this 6 mg/l DOC release approached the standard at the Los Vaqueros intake on the Old River.

- The long-term DOC trend (based on 3 year running averages) consistently showed the low-DOC concentration release scenarios to decrease the DOC mass loading at all four urban intakes. The mid- and high-DOC concentration release scenarios all exceeded the WQMP 5% increase in DOC mass loading limit.

- Los Vaqueros is the most sensitive intake location for both short- and long-term DOC. Future studies will model the discharge location for Bacon Island further to the east along the Middle River, which may reduce the DOC loading at Los Vaqueros due to project releases.

- UVA showed trends similar to those discussed above for DOC. The *UVA ag credit* was relatively small at all of the intake locations (less than 0.02 1/cm). Los Vaqueros is the most sensitive intake location. However, UVA is a factor in TTHM formation, thus it should still be modeled in future DSM2 simulations.

- The DWRSIM 771 hydrology, which was used as input for HYDRO, did not separate the diversions / exports between Contra Costa's Old River at Rock Slough intake and its' Los Vaqueros intake. The intake also lies between Bacon Island and the SWP and CVP intakes on the Old River. Even without modeling

any exports from this location, the Los Vaqueros intake showed the most sensitivity to both DOC and UVA. For future studies it is recommended that operating rules be devised so that CALSIM can represent the diversions / exports at the Los Vaqueros intake.

- Since TTHM and BRM formation is highly dependent upon bromide, and even in the base case the Rock Slough chloride standard was exceeded, the TTHM and BRM calculated concentrations are suspect. When DSM2 is run again with improved operating conditions, TTHM and BRM relationships for the other intake locations will be developed and the formation of TTHM and BRM at all the intake locations will be revisited.

6. References

California Department of Water Resources. *Status Report on Technical Studies for CALFED Water Management Planning.* Technical Report dated July 1999. Sacramento, CA.

Delta Wetlands Water Quality Management Plan. (2000). *Exhibit B from the Protest Dismissal Agreement Between Contra Costa Water District and Delta Wetlands Properties.*

Denton, Richard. (2001). *Correspondence about Contra Costa Water District's CCWDOP planned diversions.*

Forkel, David. (2001a). *Correspondence about the proposed Delta Wetlands flow operation schedule, including diversions into and releases from the proposed reservoirs.*

Forkel, David. (2001b). *Correspondence about Delta in channel water temperatures for use in calculating TTHM formation.*

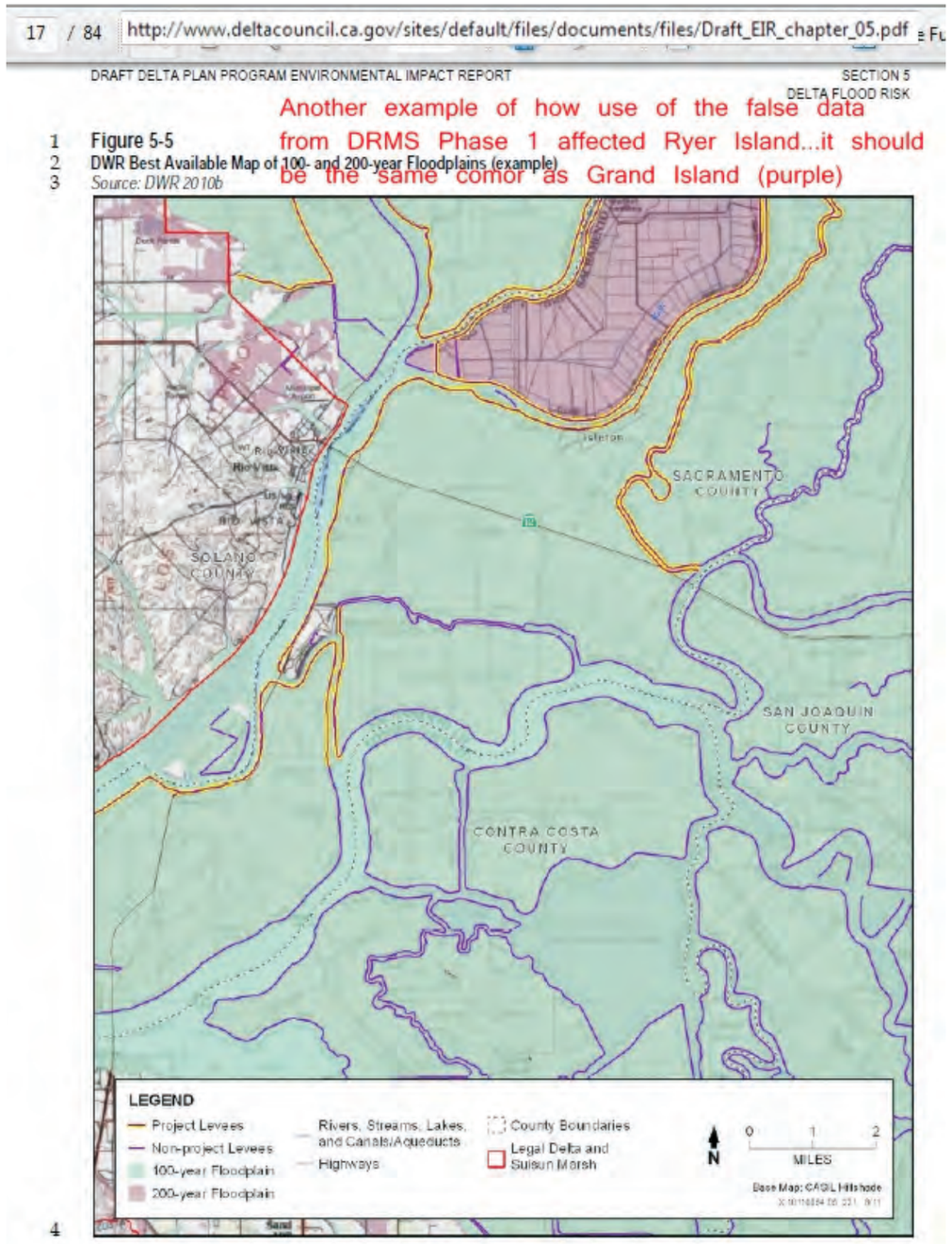
Jones and Stokes (2001). *Delta Wetlands Final Environmental Impact Report.* Sacramento, CA.

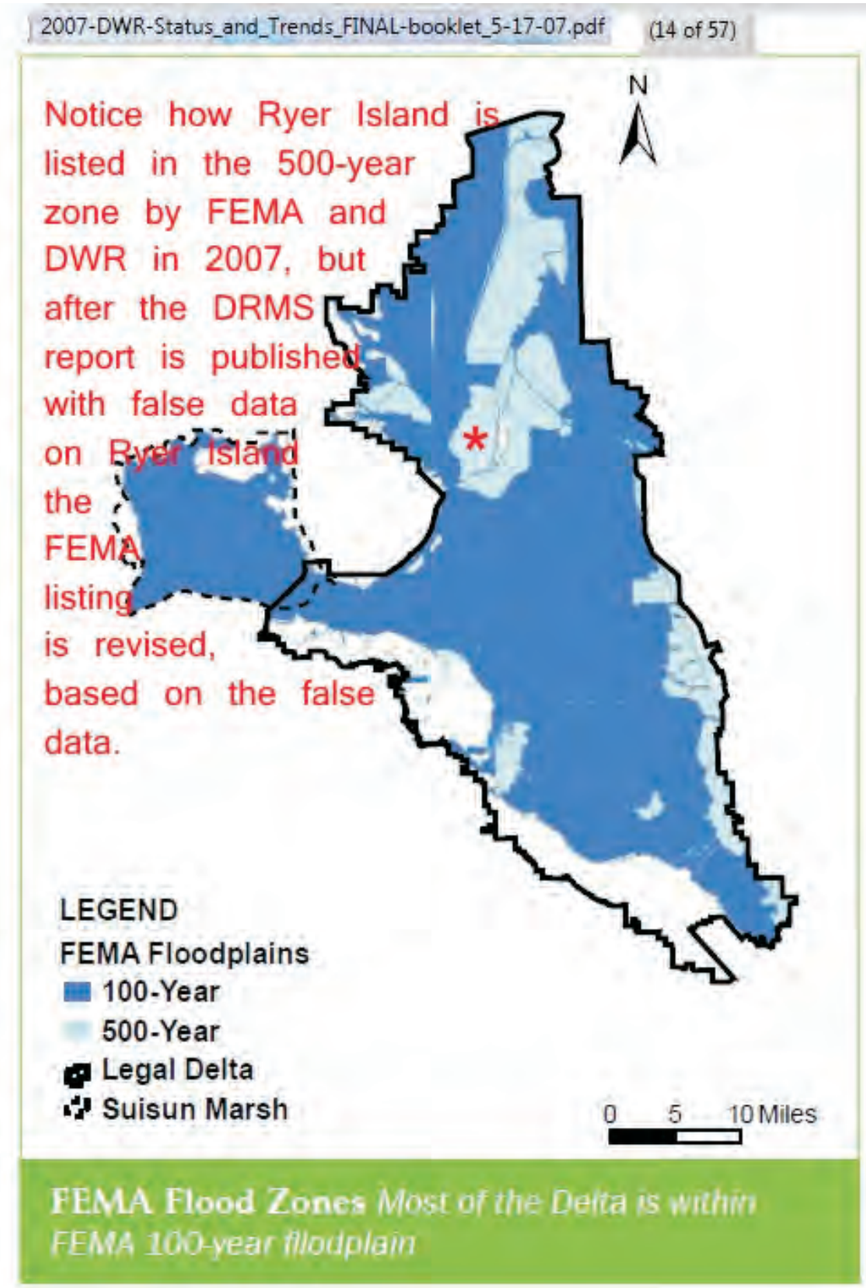
Jung, Marvin. (2000). *Revision of Representative Delta Island Return Flow Quality for DSM2 and DICU Model Runs, Municipal Water Quality Investigation Program.* California Department of Water Resources – Division of Planning and Local Assistance, Sacramento, CA.

Suits, Bob. (2001). *Relationships Between EC, Chloride, and Bromide at Delta Export Locations.* Memo. California Department of Water Resources.

ATTACHMENT B-6 Comments to Delta Plan

It appears the incorrect data regarding Ryer Island that was published in the DRMS Phase 1 “Final” Report ended up at FEMA, who then changed the classification of Ryer Island (as shown in 2007) to the classification shown in the draft Delta Plan. DSC and DWR are fully aware of the false data used in the DRMS Report, so why do they continue to use

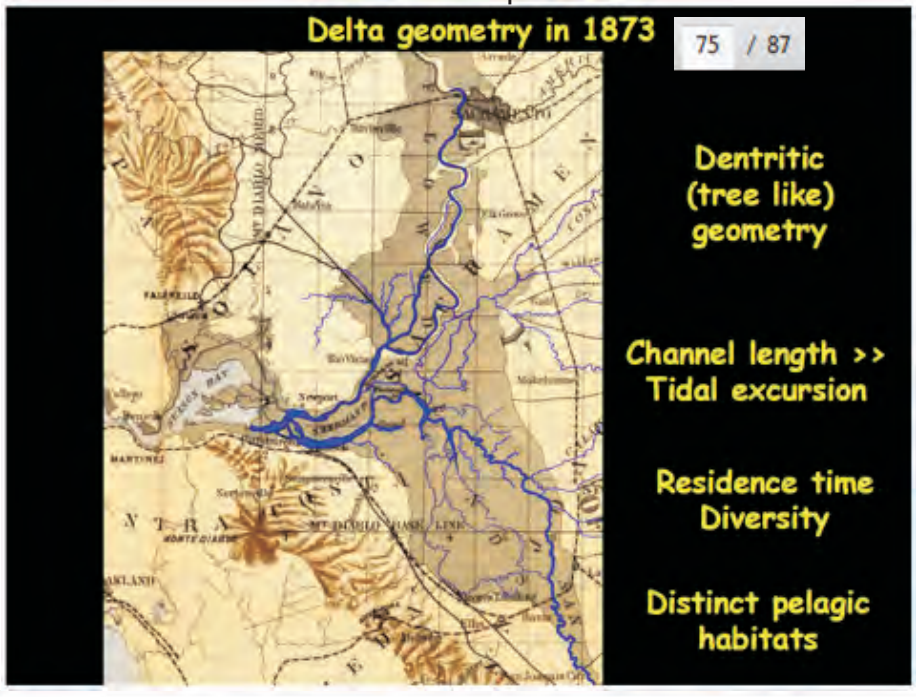


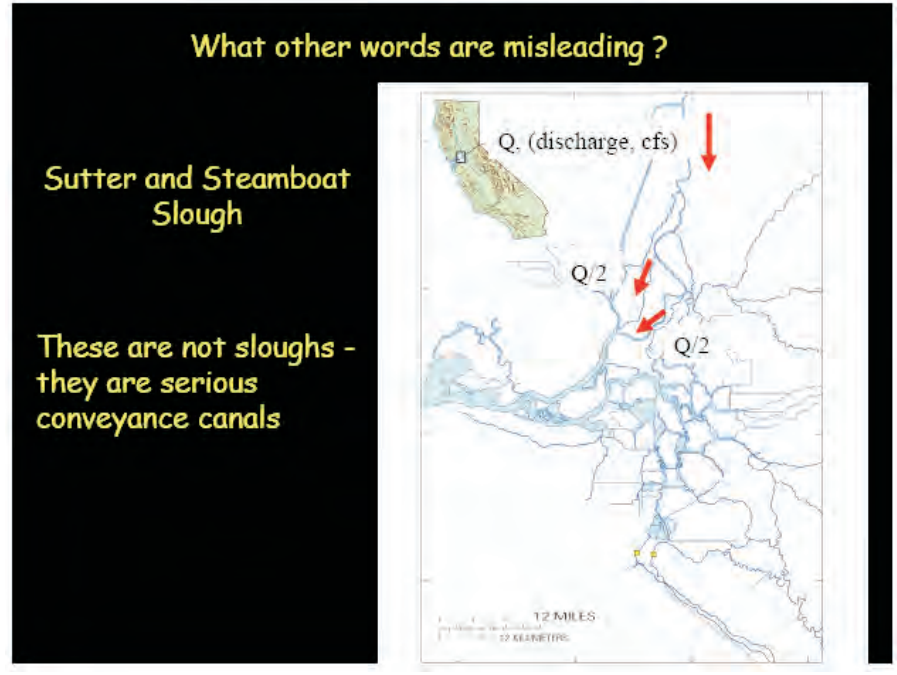


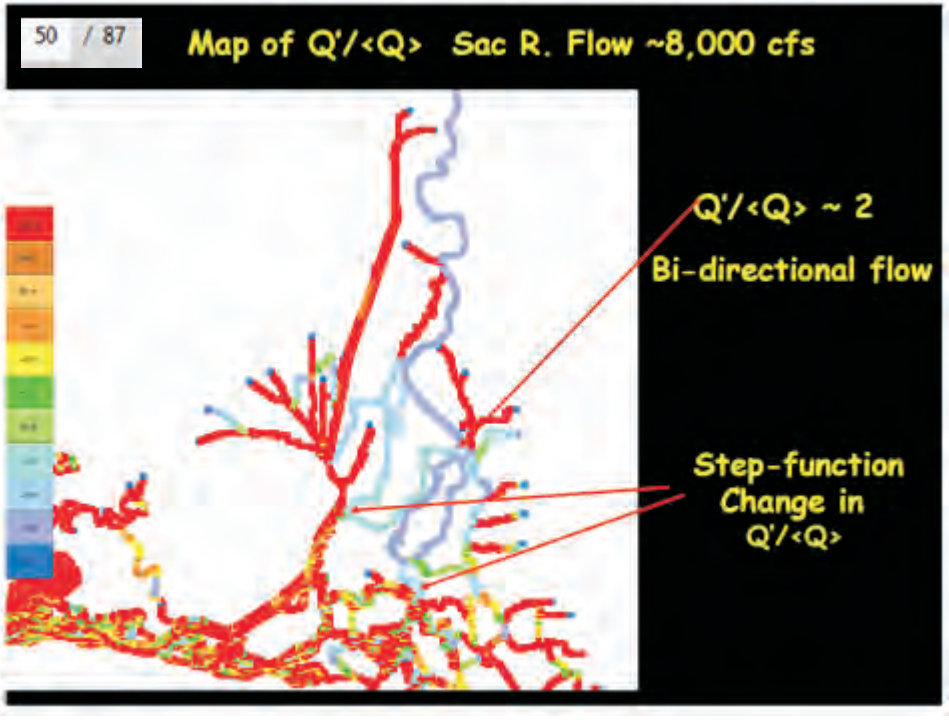
ATTACHMENT D

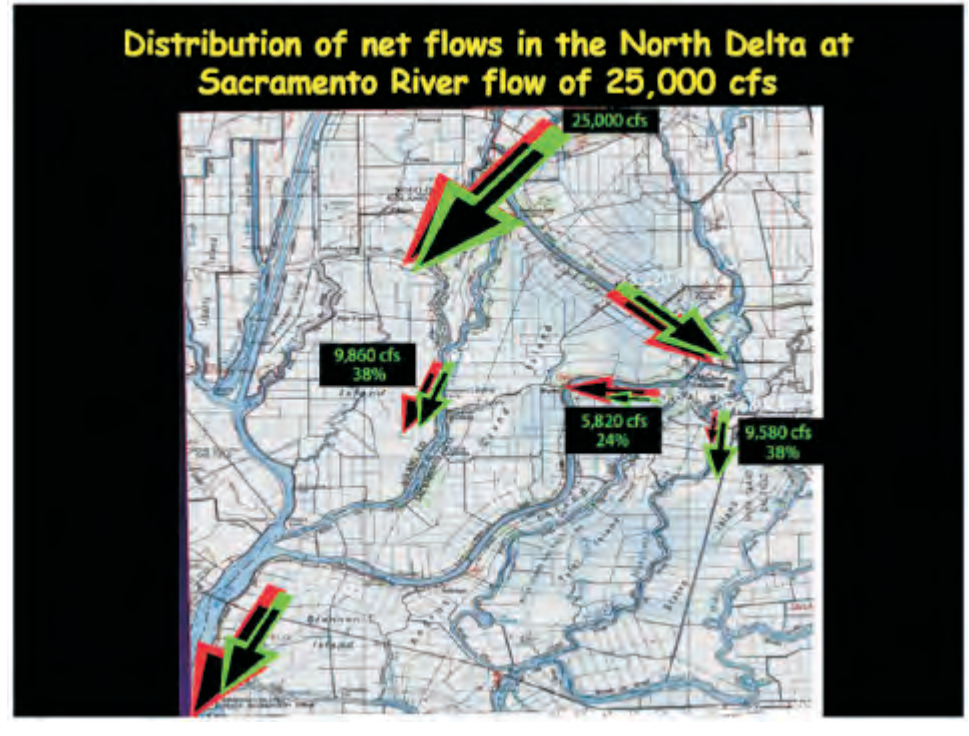
2008Presentation_Land_Water

As the slides from the 2008 DWR-F&G presentation show, Steamboat Slough is an important and natural waterway of the Delta. So why do many recent maps errase its existence? Perhaps to capture the fresh water flow for export elsewhere?



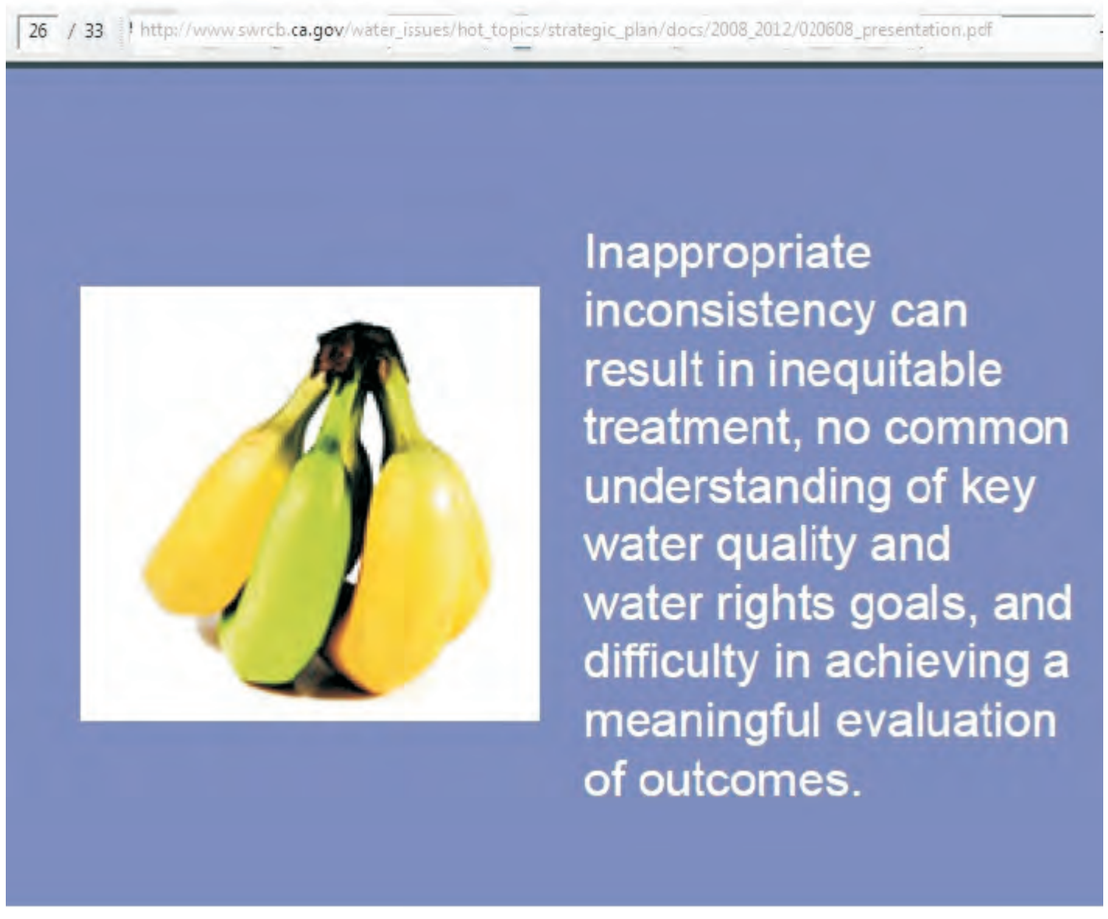






When one reviews past publicatons of DWR and other state agencies, and compares the data to current data used in or for the Delta Plan/BDCP drafts, it becomes apparent there is substantial inconsistency of the "facts" leading to the decisions made in the Delta Plan. Please see the slide below, which recognizes the effect of inappropriate inconsistence.

distributing the revised history. This series of maps & graphics show quickly the difference between true Delta history and what the new Delta Plan/DRW wants you to believe. DWR may revise the future of the Delta ***but why revise the past***



Note the screen print from section 3 of the draft Delta Plan. The major sources of information are from 2009 reports, which then refer back to previous reports and when compared, the inconsistencies are shown. For the series of maps and graphics in this attachments, I will use reports and data from earlier time periods, particularily from when Governor Brown was a governor for the first time, during the period leading up to the 1982 bond vote,

One should question why the Delta Plan proposes to utiliz 2009 reports rather than the volumes of more accurate data previously published.

3.3.1 Major Sources of Information

03_Water_Resources.pdf 3 / 113

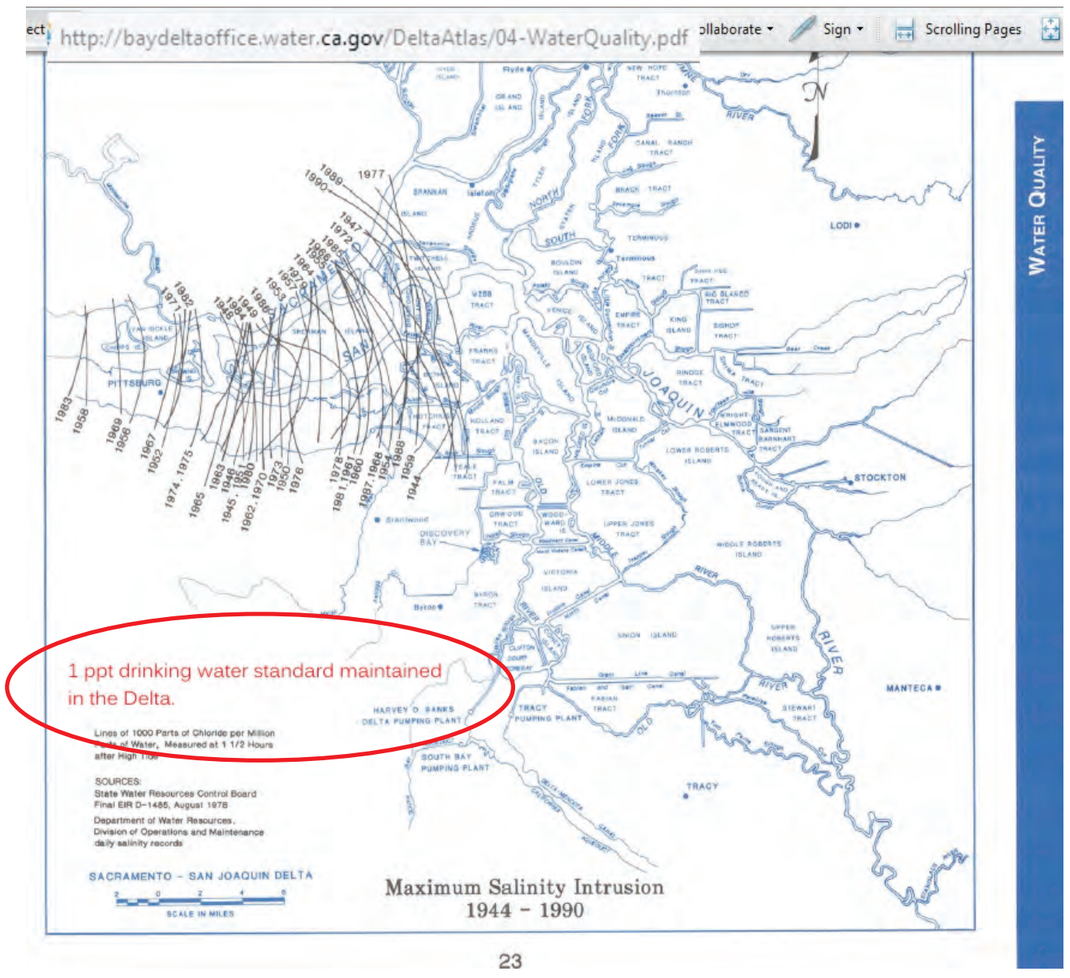
Most of the information in this section is summarized or taken directly from existing documents. The description of the environmental setting for water resources was primarily based on the following sources of information:

- Department of Water Resources (DWR):
  - Bulletin 160: California Water Plan Update 2009
  - Bulletin 118: California's Groundwater 2003 Update
  - California Data Exchange Center
- U.S. Geological Survey (USGS):
  - Professional Paper 1766 (2009)
  - Studies from the Groundwater Ambient Monitoring and Assessment Program
- CALFED Bay-Delta Program (CALFED) Environmental Impact Report (EIR) (2000)
- Central Valley Project Improvement Act (CVPIA) Programmatic Environmental Impact Study (1997–1999)
- Urban Water Management Plans for various regions
- Integrated Regional Water Management Plans (IRWMPs) for various regions
- Groundwater Management Plans for various basins

DELTA HISTORY VS THE DELTA PLAN & DWR MEDIA: 1 ppt vs “X2” or 2 ppt

What Delta History shows...

Monitoring stations measured for 1 ppt or 1000 parts chloride per 1 million parts water, which shows the standard for freshwater in the Delta was BELOW 1ppt; therefore the 1 ppt standard has been maintained as shown in the second map, to assure fresh water in the Delta region.



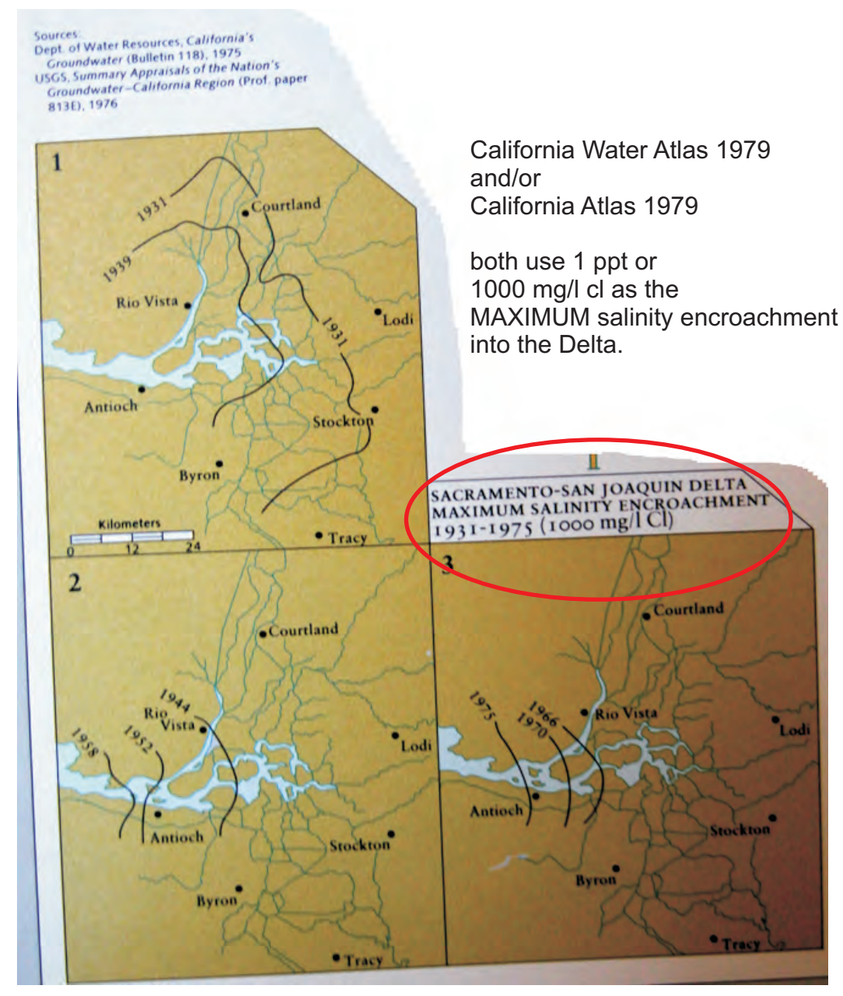
Based on historical records, the salinity encroachment of 1 ppt in the early 1930’s per the map on the left was due to excessive diversion of Sacramento River north of the Delta during a record drought. Excessive withdrawal of Sacramento River north of the Delta was prohibited theraafter.

What the BDCP, incorporated by reference into the Delta Plan and other DWR consultants want you to believe...

BDCP+Effects+Analysis+-+Appendix+C.2+-+Overview+of+Flow+in+the+Sacramento+River%2c+San+Joaquin+River%2c+and+Delta+Systems.pdf 3 / 4

C.2.1.2 Salinity

The concentration of the dissolved salt in a body of water is salinity. Usually measured in parts per thousand (ppt), the salinity gradient transitioning from the ocean to a freshwater stream can vary between 0.5 ppt (fresh water) to 50 ppt (salt water). Historically in the Delta, the point in the salinity gradient that has been tracked and managed is 2 ppt and is referred to as X2. Salinity also can affect the allowable concentration of DO. Fresh water can support DO concentrations as high as 9 mg/L, and salt water can accommodate only up to 8 mg/L.



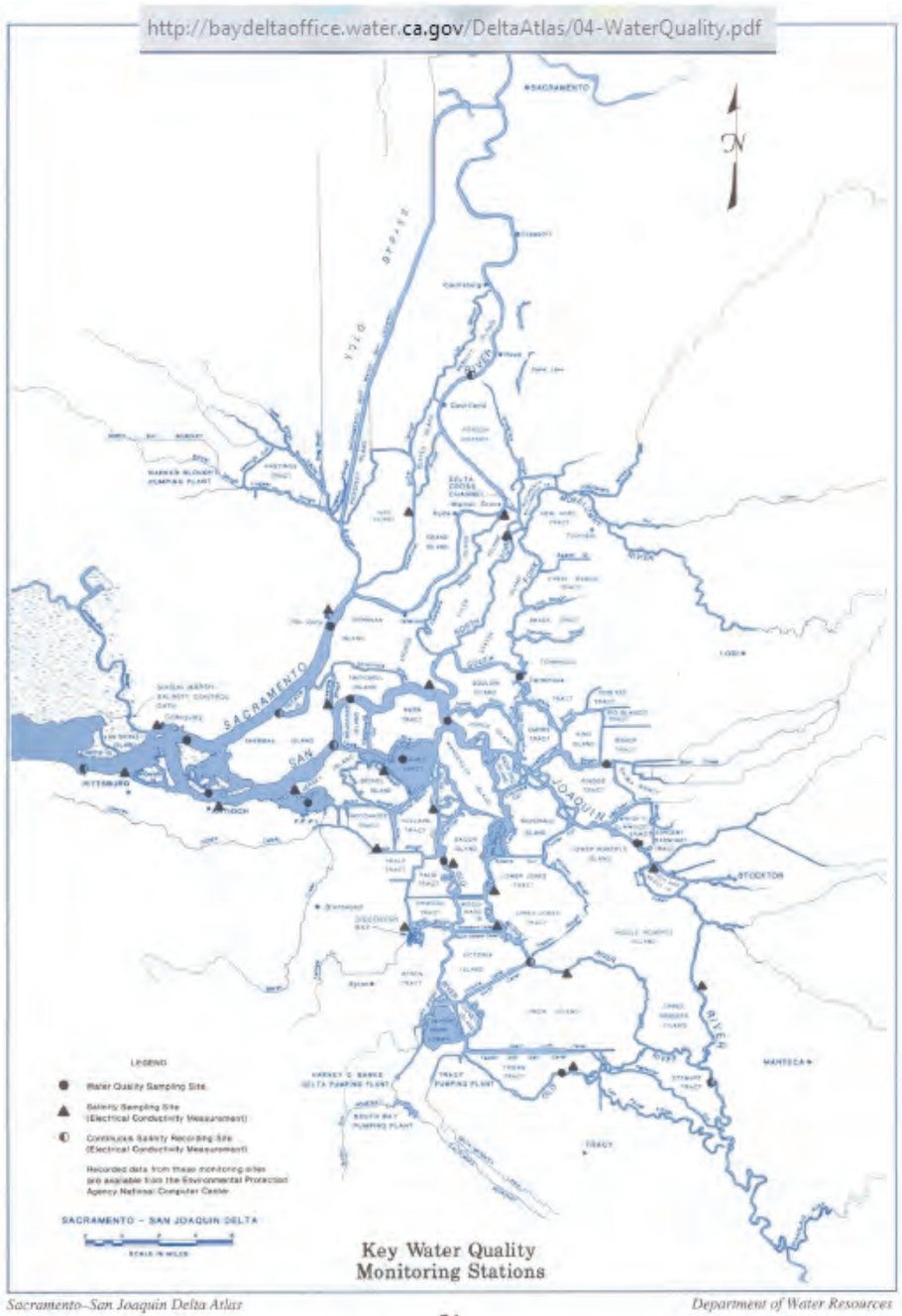
California Water Atlas 1979
and/or
California Atlas 1979

both use 1 ppt or
1000 mg/l cl as the
MAXIMUM salinity encroachment
into the Delta.

DELTA HISTORY VS THE DELTA PLAN & DWR MEDIA:

Water Quality Monitoring Locations: If you don't monitor for salinity, you can pretend its not there?

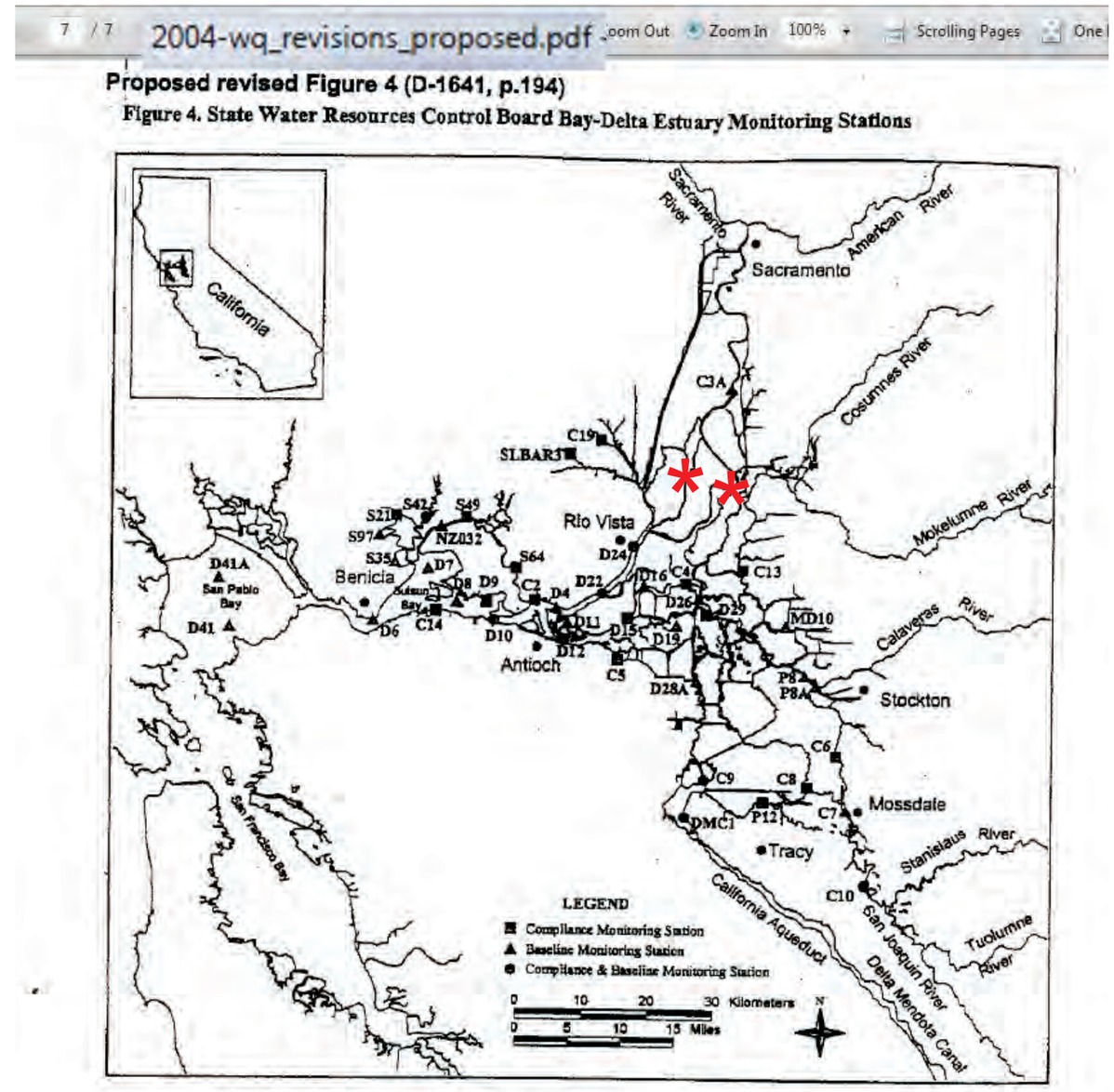
What Delta History shows...



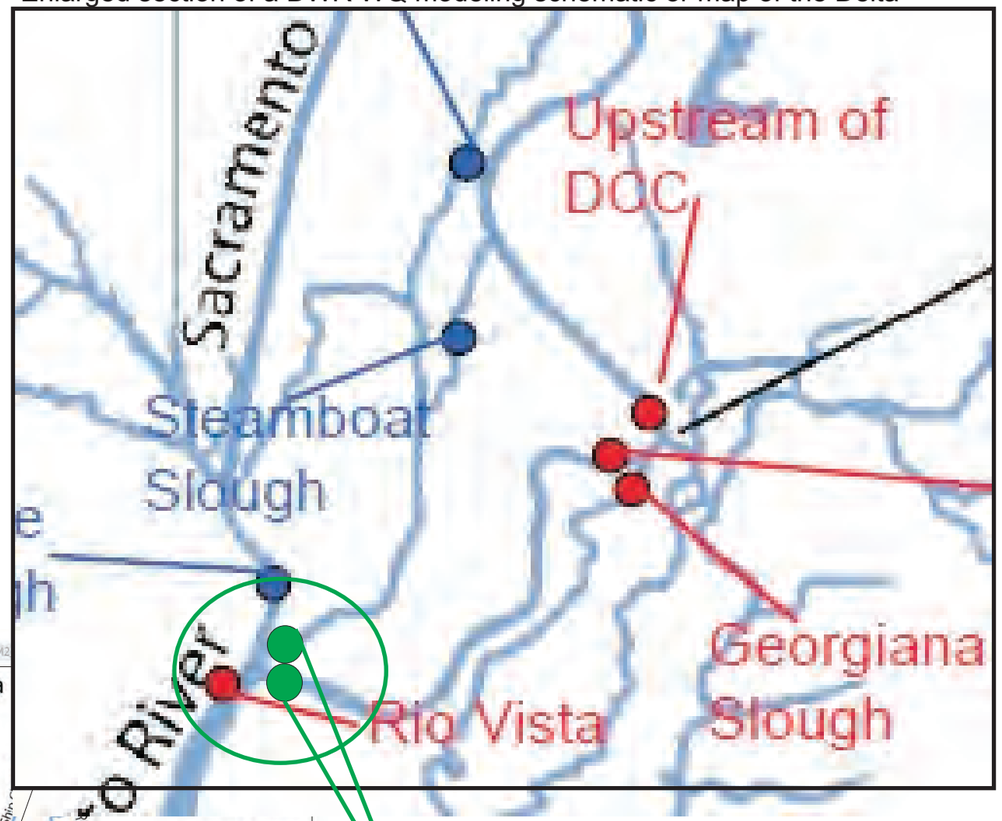
Sacramento–San Joaquin Delta Atlas *Department of Water Resources*

24

Notice the change of location of monitoring station locations, and the elimination of monitors on Steamboat Slough and one on the Sacramento River (* added to map) ..two areas where salinity is projected to increase



Enlarged section of a DWR WQ modeling schematic or map of the Delta



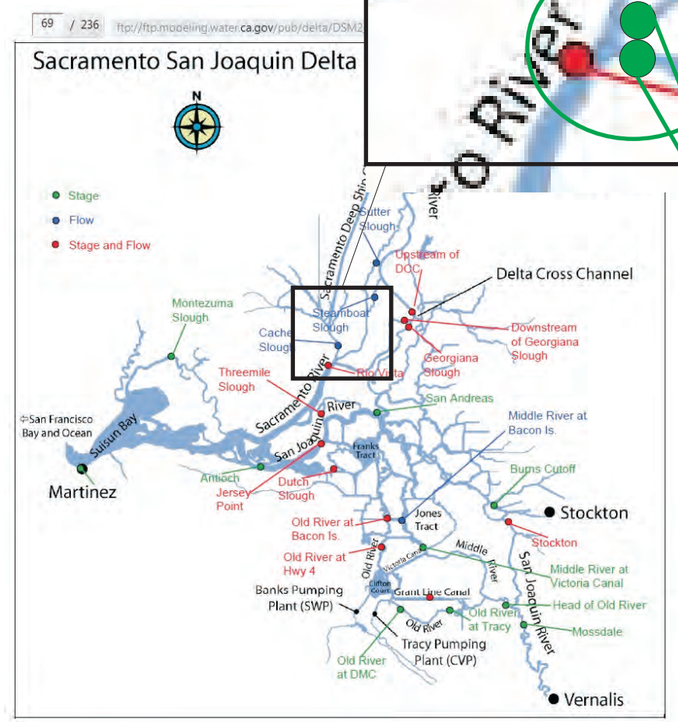
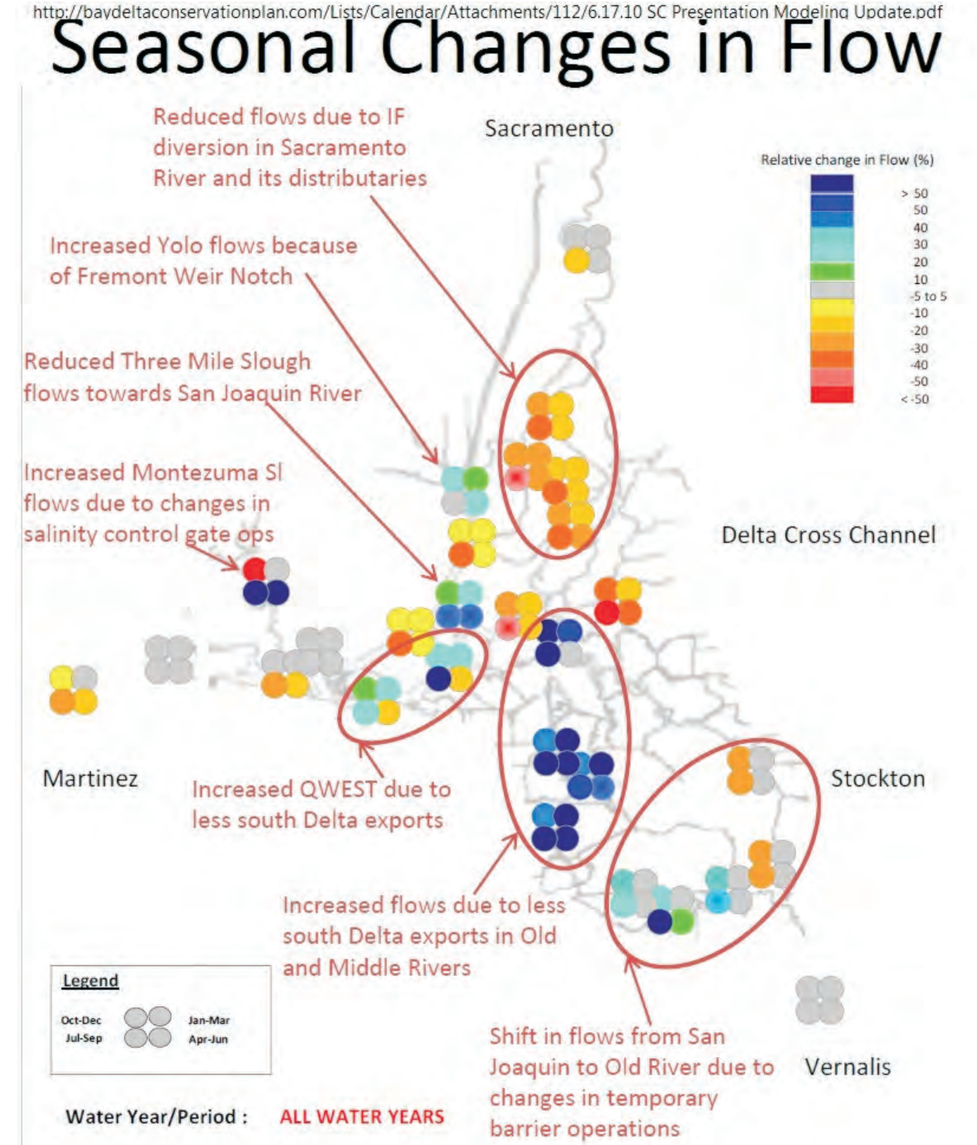


FIGURE 5-1
Map Showing Hydrodynamics Validation Locations

The locations for proposed new water quality and water flow monitoring stations on Steamboat Slough and the "Old River" portion of the Sacramento River west of Ida's Island (Viera's)

The map below was provided by BDCP staff, and it demonstrates the expected change of flow within the North Delta, which should be monitored carefully to assure no intrusion of saline water per NDWA contracts and riparian water rights.

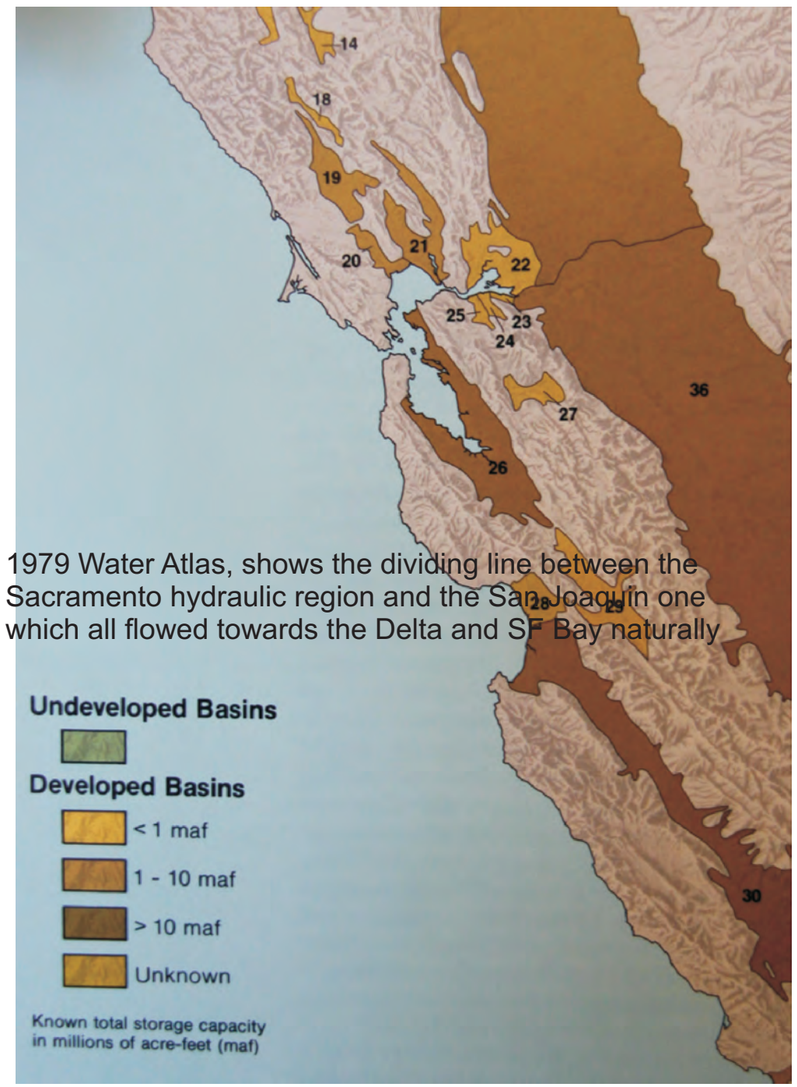
http://baydeltaconservationplan.com/Lists/Calendar/Attachments/112/6.17.10 SC Presentation Modeling Update.pdf



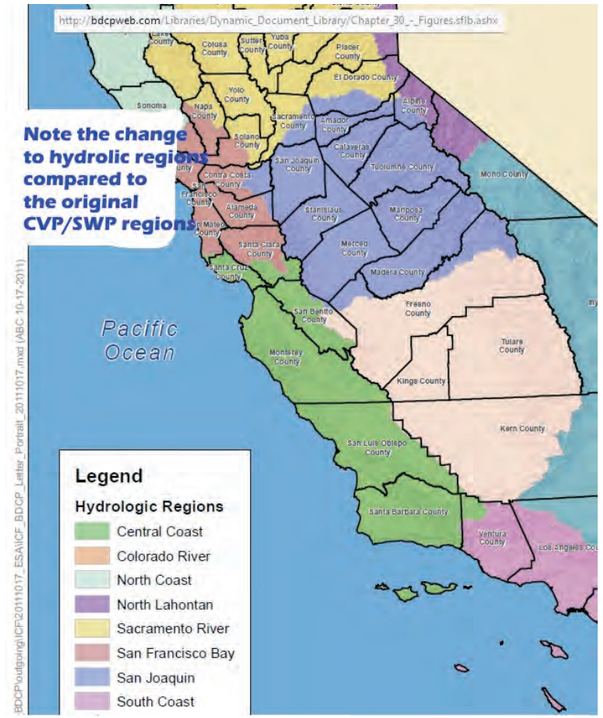
DELTA HISTORY VS THE DELTA PLAN & DWR MEDIA: Changed hydraulic regions

Computer modeling using programs like CALSIM, CALSIM II and CALVIN allowed for changes, on paper, to traditional hydraulic areas, leading to the planning and physical changes of flows to separate out the hydraulic areas, basically increasing the flow on the San Joaquin River by diverting flow that would naturally traveled on the Sacramento River.

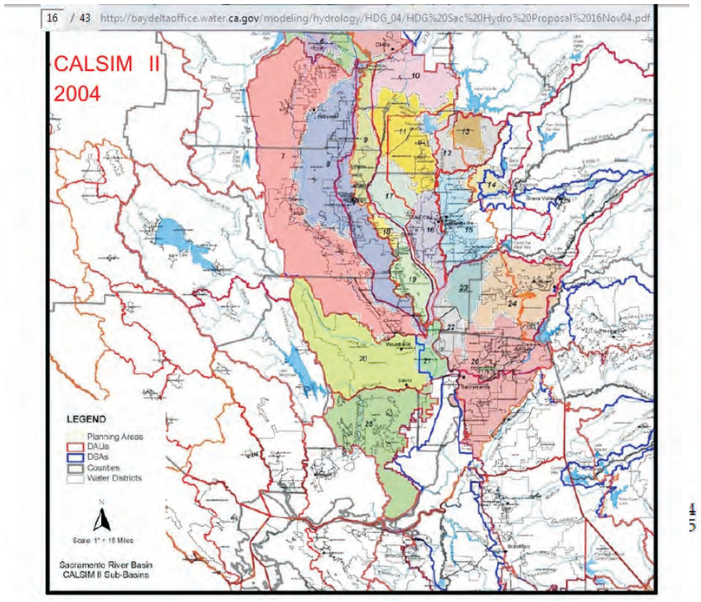
And note that the Delta is not even recognized as a unique region in the current Draft Delta Plan. So should the plan be renamed the revised California Water plan instead?



1979 Water Atlas, shows the dividing line between the Sacramento hydraulic region and the San Joaquin one which all flowed towards the Delta and SF Bay naturally



Modeling the watershed changed with CALSIM II



INITIAL DRAFT 11/17/2004 16/43

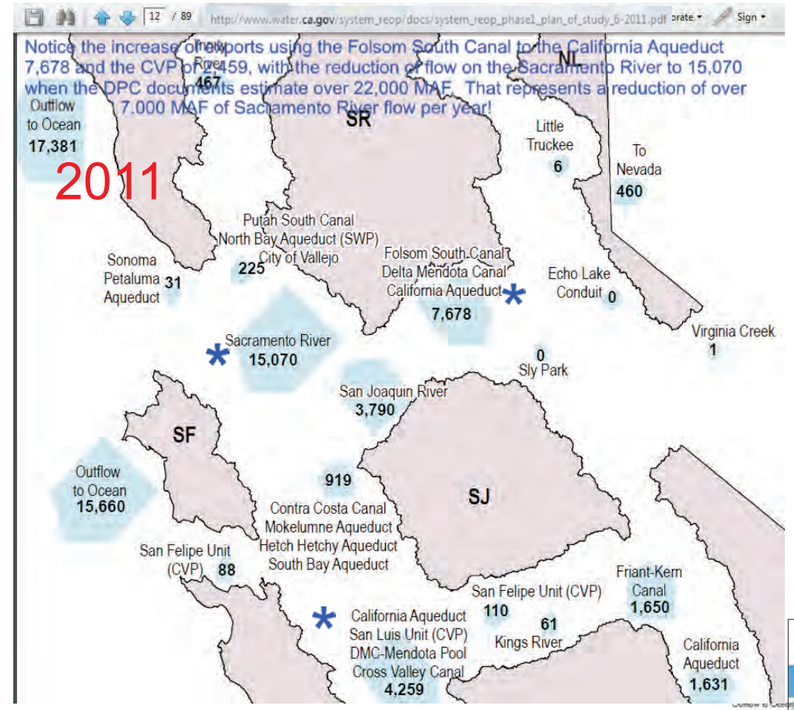
Isn't the Delta the "hub" of the state's water resources?

Changes to Sacramento River flows and hydraulic regions based on computer modeling, and the effects on the North Delta:

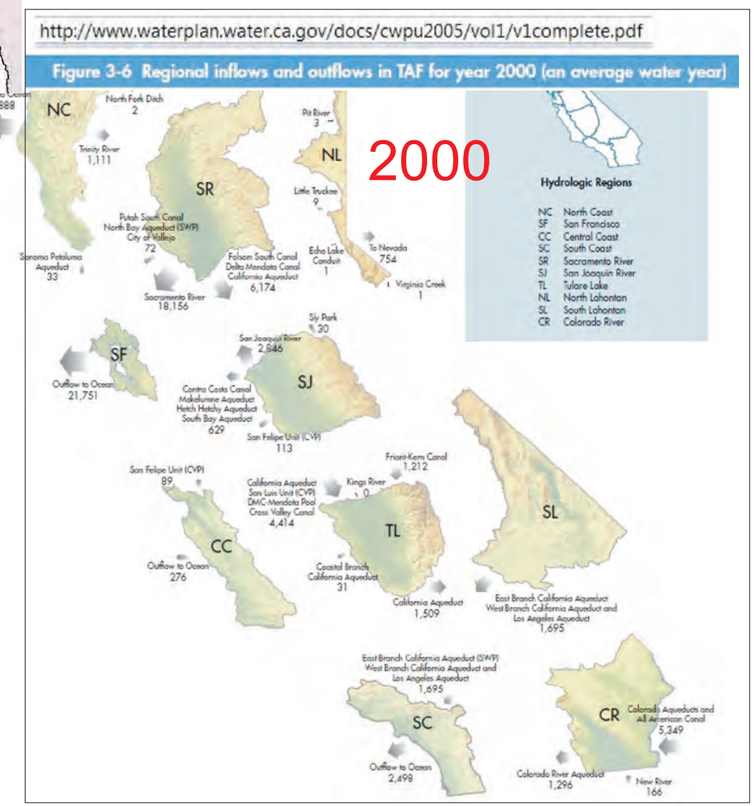
According to the "system reoperation" summary flow map, flow on the Sacramento River through the Delta is proposed to average 15,070 Thousand Acre Feet (TAF) including the Yolo Bypass flows of 4,000 TAF or more per year. That means, in effect, where the North Delta historically received 18,000 to 21,000 TAF per year, the North Delta will instead receive **11,000 TAF at most**. That amounts to substantially higher percent of flow reduction on the Sacramento River in the North Delta region than what was previously reported or modeled.

At the same time, Delta water exports are proposed to increase from **6,100 TAF to 13,081 TAF** per year, (see map to the right) which equals more than double the average exported water!

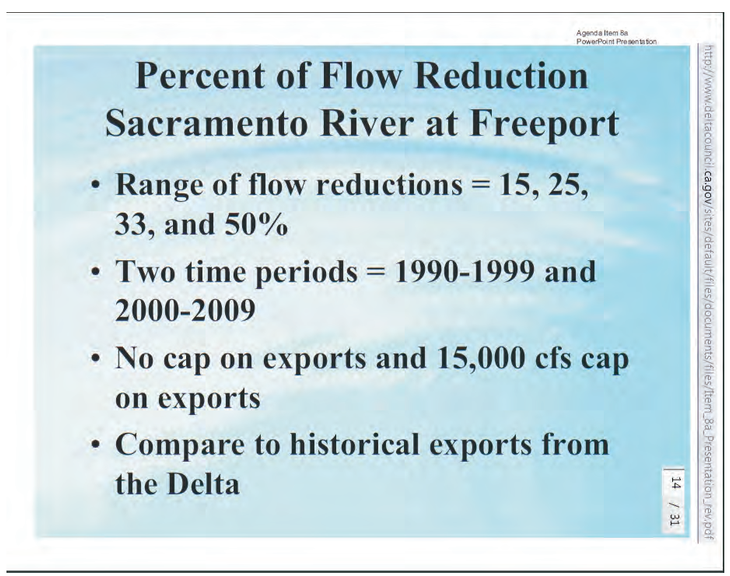
In dry water years, the exports are planned to be reduced, but who will be enforcing the export restrictions?

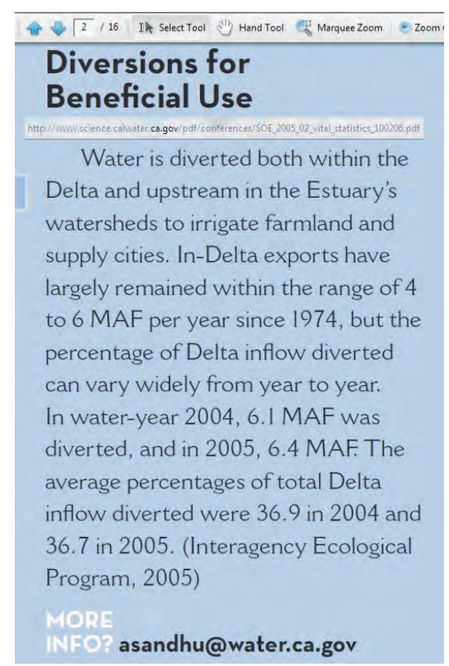


What has changed 11 years later?



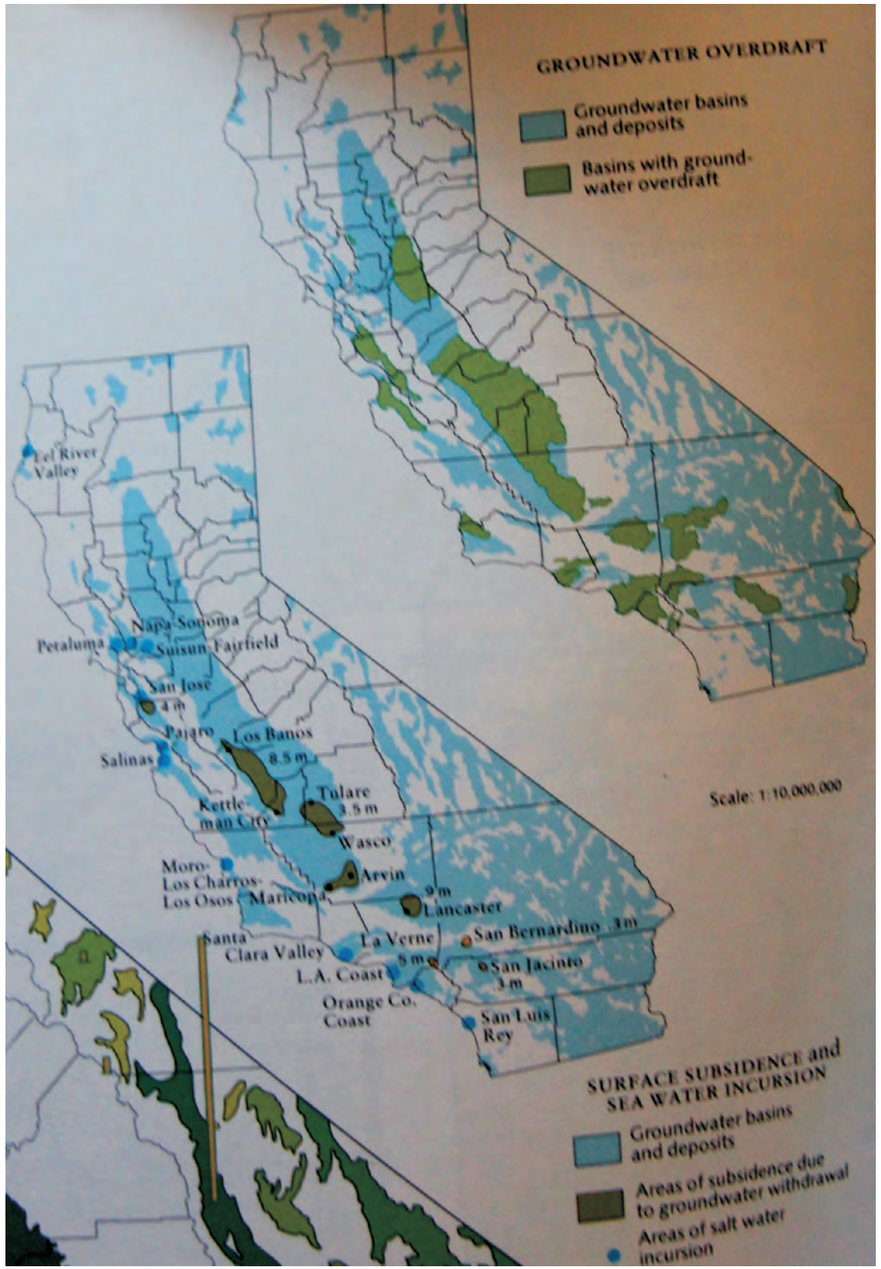
Http://deltarevision.com/Issues/waterflow/video/north_delta_low_flow_effect.jpg
Http://www.water.ca.gov/system_reop/docs/system_reop_phase1_plan_of_study_6-2011.pdf





DELTA HISTORY VS THE DELTA PLAN & DWR MEDIA: Impacts to aquifers

From the 1979 Water Atlas.



In 1979 the state recognized that overdraft of groundwater impacts the area aquifers, and can cause salt water to intrude into the aquifer. Basins with groundwater overdraft at that time included the Sacramento Valley in the Delta region and much of the lower Central Valley. The other map specifies areas of distinct saltwater intruision, including the west Delta area, Monterey, Morrow bay and more locations down south.

The Delta Plan, if enacted and coupled with the BDCP and other related planning documents could result in the allowed diversion of a majority of the Sacramento River flow, before it ever reaches the Delta region. That Sacramento River water has historically replenished most of the Northern California aquifers, not just the Delta and Bay area.

If the Delta Plan consultants and scientists have adequately modeled the impacts to Delta, Bay and Northern California aquifers, I have not found the data yet. However, below is an interesting graphic which demonstrates another computer modeling program that is supposed to address this issue:

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RECLAMATION

Mid-Pacific Region Managing Water in the West

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Reclamation Home Reclamation Offices Newsroom Library Projects & Facilities

http://www.usbr.gov/mp/sccao/sld/index.html

San Luis Drainage Feature Re-evaluation

Project Overview
News and Information
Documents
SCCAO Homepage

MP Region Home Page
Public Affairs
Area Offices
About Us
Programs & Activities
Water Operations
Central Valley Project

San Luis Drainage Feature Re-evaluation

The Bureau of Reclamation is re-evaluating options for providing drainage service to the San Luis Unit of the Central Valley Project.

Proposed drainage service alternatives will be selected that maintain environmental quality and provide for continued agricultural production in a manner consistent with the Plan of Action (adobe formatted) filed April 18, 2001, in Sumner Peck Ranch, Inc., et al., v. Bureau of Reclamation, et al. A Notice of Intent to prepare an Environmental Impact Statement (EIS), pursuit to the National Environmental Policy Act, was published in the Federal Register on Tuesday, October 2, 2001.

For assistance or additional project information, contact Scott Irvine at 303-445-2253 800-735-2922 TTY

Back

February 4, 2010

Reduction of fresh water flow into the Delta and San Francisco Bay coupled with an increase in dumping of toxic runoff from lower western Central Valley irrigated lands will most likely have a tremendous negative impact on aquatic species and aquatic vegitation in the long term. USGS plans to track the effects...

Caltrans Water Quality Standards In... California Rivers Assessment (CA...

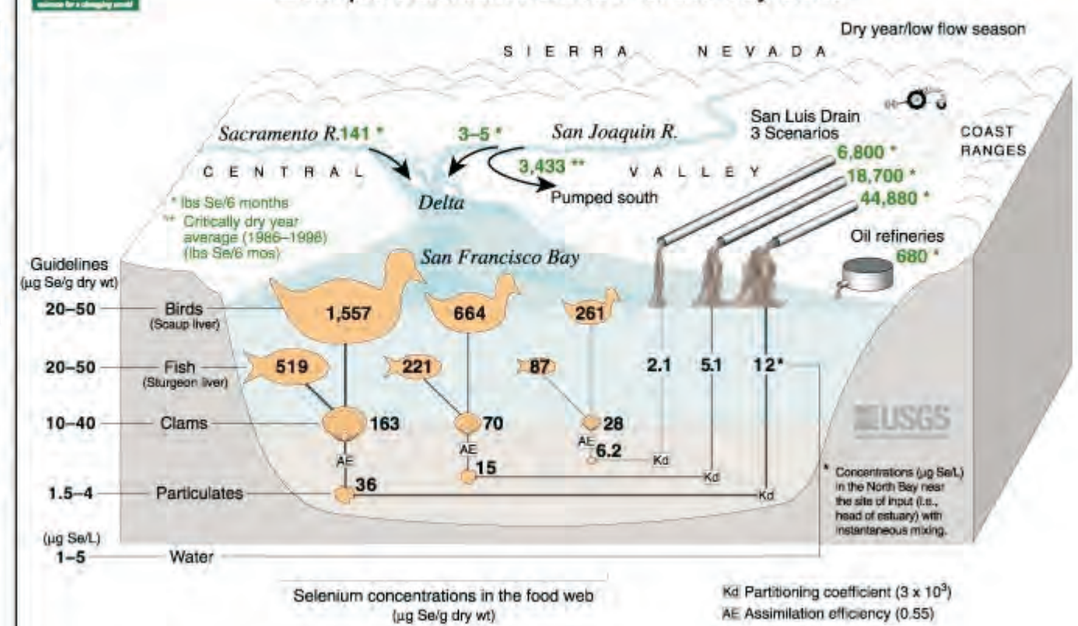
http://endeavor.des.ucdavis.edu/newcara/

General Information
- About CARA
- Background
- Aggregated Information Model
- Future Directions
- Related Efforts
- Access CARA

Watershed Info
- Search by Basin
- Search by County
- Search by Assembly District
- Search by Congressional District

USGS

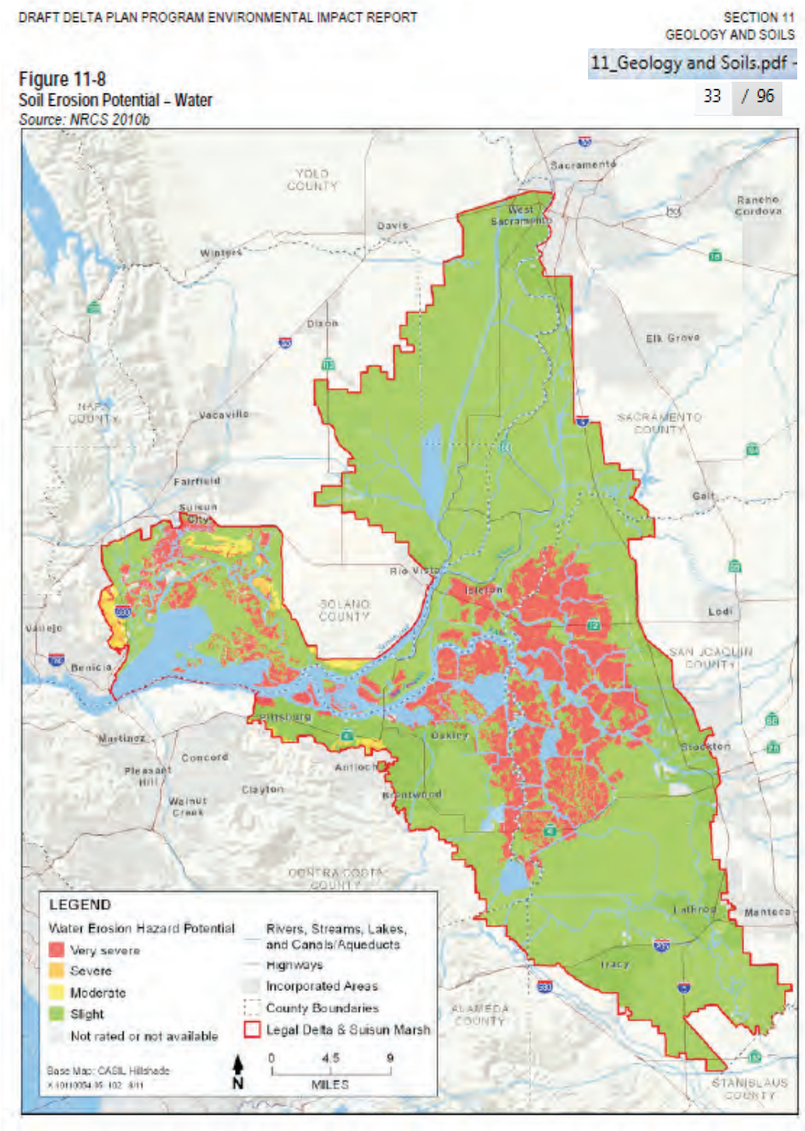
Example Selenium Forecast for the Bay-Delta



DELTA HISTORY VS THE DELTA PLAN & DWR MEDIA: CAUSES OF SUBSIDENCE & Where's the DCC?

What the Delta Plan or other DWR media wants you to believe is that there is no water conveyance facilities in the Delta, yet the DCC and Mokelumnke Rivers are used for conveyance at least as of 2012.

Withdrawal of natural gas has caused subsidence in other areas of the country so why isn't this studied or even mentioned in the BDCP or Delta Plan? Notice the areas of subsidence are around the same area as the underground storage of natural gas on McDonald Island



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

Beginning in 2004, average water flow data for the Sacramento River and the Cache Slough/Yolo Bypass area kept changing, depending on which official publication one viewed from DWR. At the same time, computer modeling to analyze the effects of proposed changes to the Delta used different sets of "raw data" for different projects, rather than be consistent. As of 2011, plans are proposed to divert up to 15,000 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

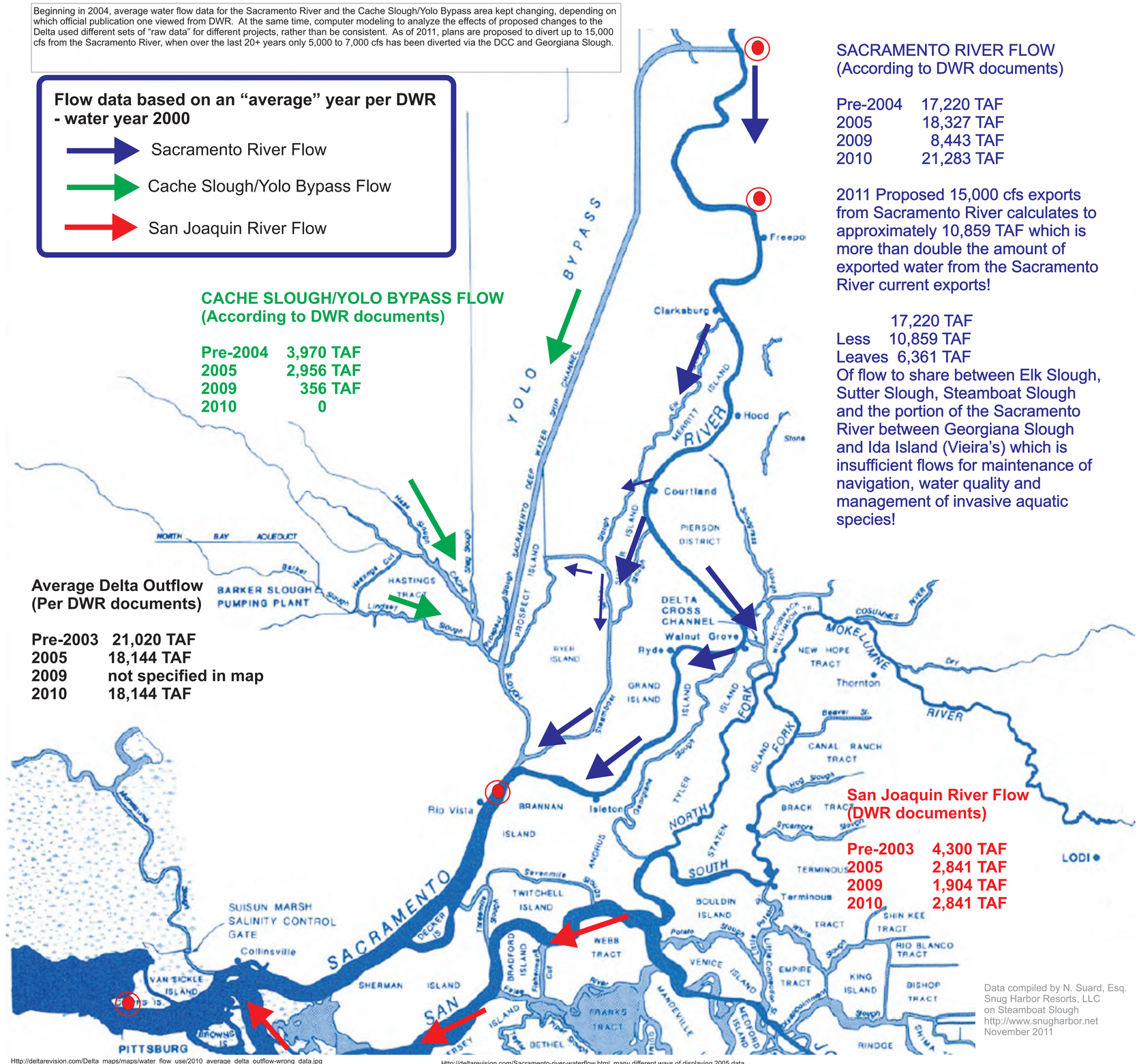
- Sacramento River Flow
- Cache Slough/Yolo Bypass Flow
- San Joaquin River Flow

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!

San Joaquin River Flow (DWR documents)

Pre-2003	4,300 TAF
2005	2,841 TAF
2009	1,904 TAF
2010	2,841 TAF

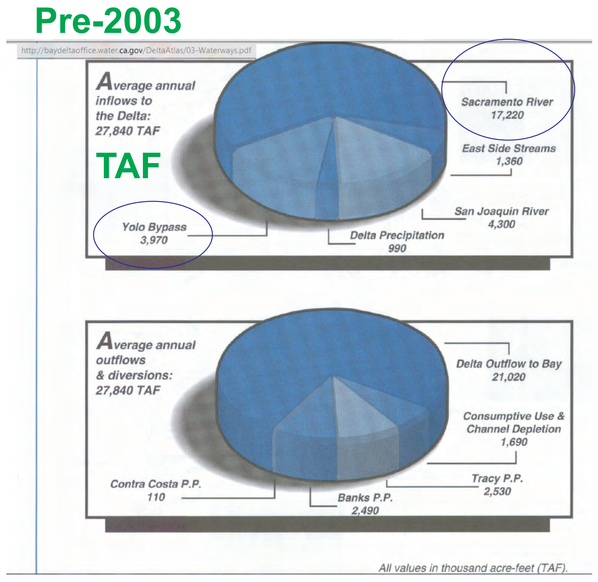
Data compiled by N. Suard, Esq.
Snug Harbor Resorts, LLC
on Steamboat Slough
http://www.snugharbor.net
November 2011

http://deltarevision.com/Delta_maps/maps/water_flow_use/2010_average_delta_outflow-wrong_data.jpg
http://deltarevision.com/Delta_maps/maps/water_flow_use/2000delta_water_flows.jpg
http://deltarevision.com/2011videos/waterflow/1995_delta_in-out_flows.jpg 2003 water plan reflects years of consistent flow charts
http://deltarevision.com/2011videos/waterflow/2005_waterflow_waterplan.jpg 2005 water plan revises the numbers

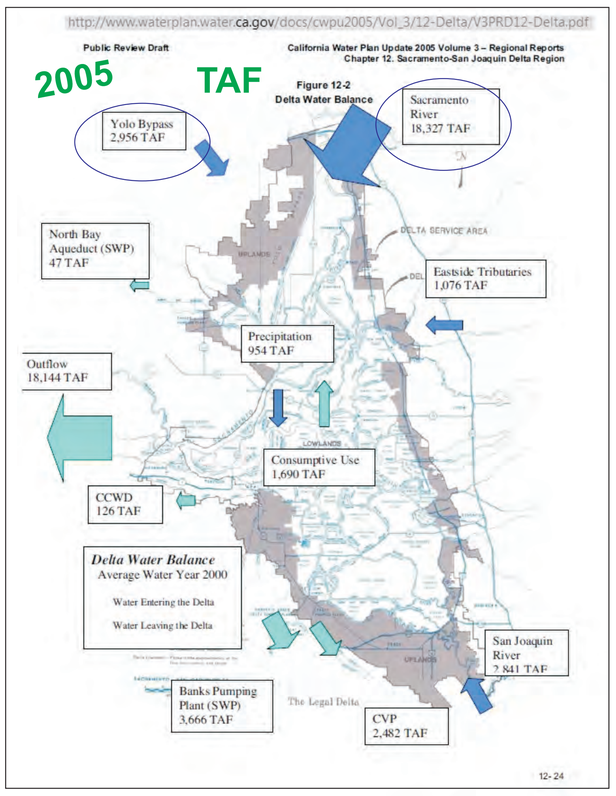
http://deltarevision.com/Sacramento-river-waterflow.html many different ways of displaying 2005 data
http://deltarevision.com/2011videos/waterflow/more-jpgs/ref-17.jpg 2009 water plan map
http://deltarevision.com/Delta_maps/maps/water_flow_use/2010_average_delta_outflow-wrong_data.jpg 2010

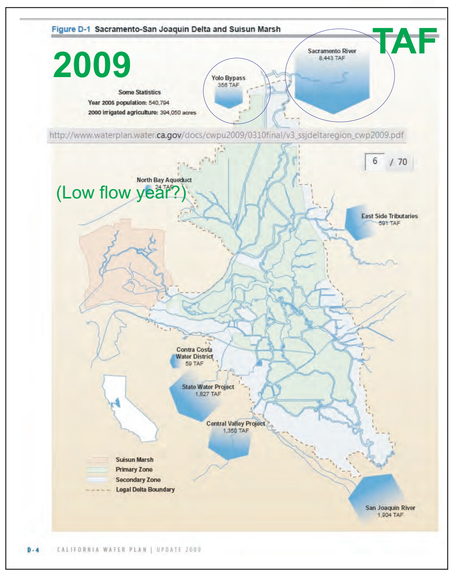
Pre-2003

http://baydeltaoffice.water.ca.gov/DeltaAtlas/03-Waterways.pdf



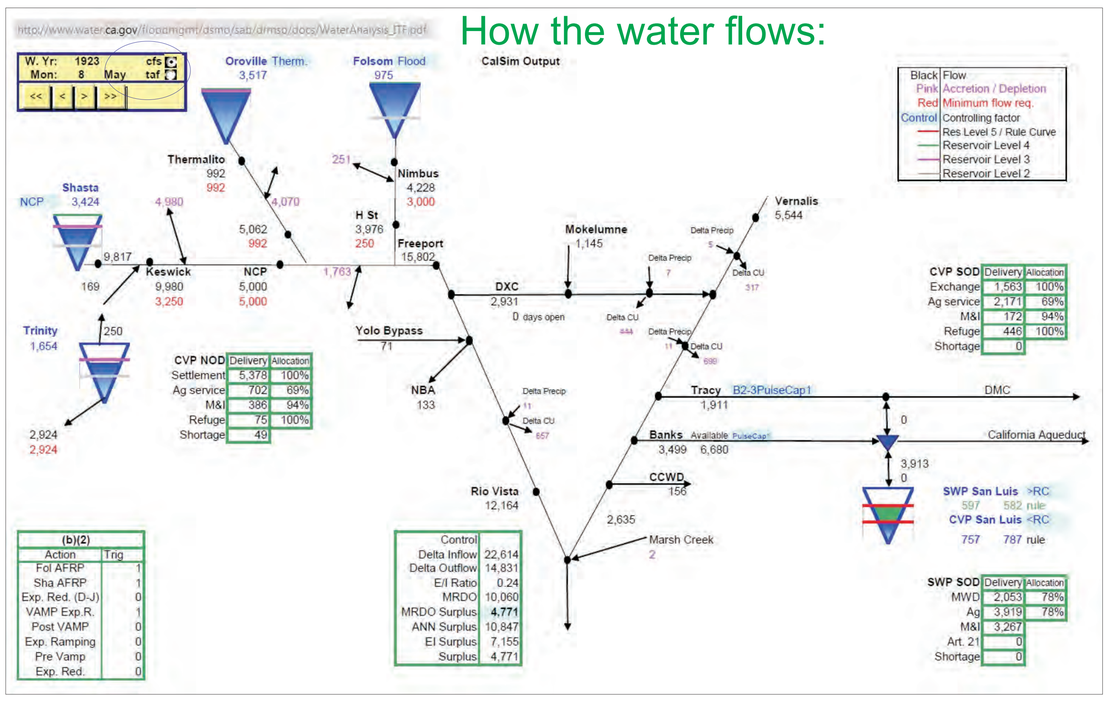
http://www.waterplan.water.ca.gov/docs/cwpu2005/Vol_3/12-Delta/V3PRD12-Delta.pdf





How the water flows:

http://www.water.ca.gov/floodmgmt/dsmo/sab/drmsb/docs/WaterAnalysis_ITF.pdf



2004... TAF and CFS

http://www.science.calwater.ca.gov/pdf/isb/ISB_packet_public_meeting_092104_v2.pdf

assumed that greater export pumping in relation to inflows results in increased levels of entrainment (*i.e.*, greater direct losses) as well as indirect losses attributable to fish being delayed or misdirected by modified flow fields in the Delta, which may move fish to less desirable habitat areas and/or expose them to higher rates of predation. There is debate regarding the relative influence of various exports rates on mortality as well as the effects of mortality at the pumps relative to population level effects.

3.2 Minimum Delta Outflow and Habitat Protection Outflow (X2)

D-1641 contains Delta outflow objectives that vary by month and are broken out into two pieces in Table 1. The objective from July through January is referred to as *Minimum Delta Outflow* in Table 1. The objective for February through June is called *Habitat Protection Outflow* in Table 1, and is commonly referred to as X2.

The primary purpose for the Minimum Delta Outflow and X2 objectives is the protection of estuarine habitat, particularly in the western Delta. An extensive body of scientific evidence indicates that flows into, within, and through estuaries are important to organisms that depend on the estuary fresh water for at least a portion of their life cycles. Delta outflow has been recognized as an important habitat indicator for estuarine populations expressed as survival or abundance in the Bay/Delta Estuary. (Jassby, et. al. 1995, Kimmerer 2002)

3.2.1 Minimum Delta Outflow

The Delta outflow objective requires that certain calculated minimum flows, referred to as the *Net Delta Outflow Index* (NDOI), be maintained during each month. The NDOI is computed based on Delta inflow minus net Delta consumptive use minus Delta exports. Delta outflow requirements vary by water year type and by month as shown in Table 2 below. Achievement of the Delta outflow objective is directly related to implementation of export limits (as described in Section 3.1 above) and river flow objectives (as described in Section 3.5 below).

While the 1995 Bay-Delta Plan establishes Delta Outflow objectives for each month, this standard is rarely controlling because of the influence of other related standards, such as the implementation of export limits (as described in Section 3.1 above) and river flow objectives (as described in Section 3.3 below). The X2 objective is used as an alternative to the NDOI during the February–June period.

Table 2—Minimum Monthly Average Delta Outflow (cfs).
If monthly standard ≤ 5,000 cfs, the 7-day average must be within 1,000 cfs of standard;
if monthly standard > 5,000 cfs, the 7-day average must be > 80% of standard.

Year Type	All	W	AN	BN	D	C
Jan	4,500*					
Jul		8,000	8,000	6,500	5,000	4,000
Aug		4,000	4,000	4,000	3,500	3,000
Sep	3,000					
Oct		4,000	4,000	4,000	4,000	3,000
Nov-Dec		4,500	4,500	4,500	4,500	3,500

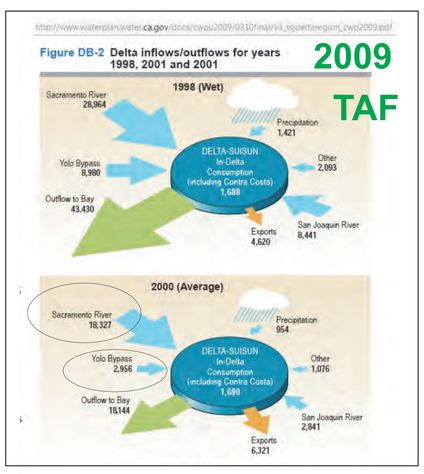
* Increase to 6,000 if the Dec 8RI is greater than 800 TAF

X2

Delta Water Quality Standards — Page 7 of 16

2009 TAF

http://www.waterplan.water.ca.gov/docs/cwpu2009/0310final/v3_sjdeltaregion_cwp2009.pdf



2011 CMS ?

http://www.water.ca.gov/iep/newsletters/2011/IEPNewsletterFinalSpring2011.pdf

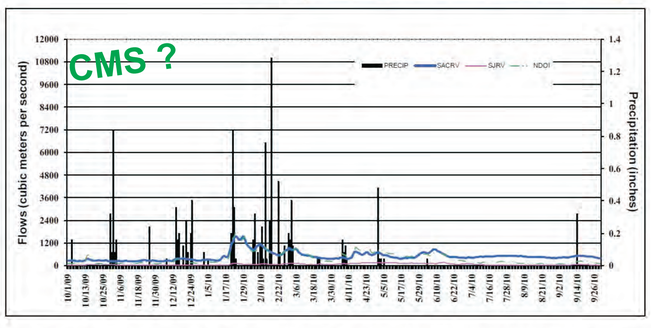


Figure 1 Water year 2010 Sacramento River flow, San Joaquin River flow, net Delta outflow, and precipitation

http://www.water.ca.gov/iep/newsletters/2011/IEPNewsletterFinalSpring2011.pdf

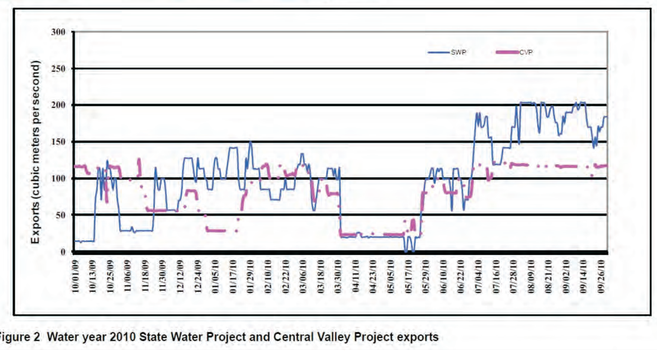
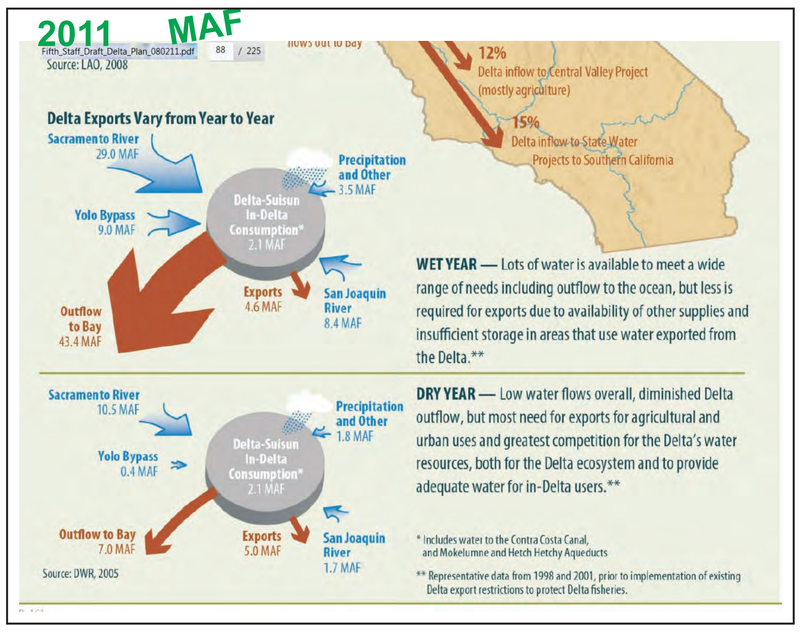


Figure 2 Water year 2010 State Water Project and Central Valley Project exports

2011 MAF

Fifth_Staff_Draft_Delta_Plan_080211.pdf



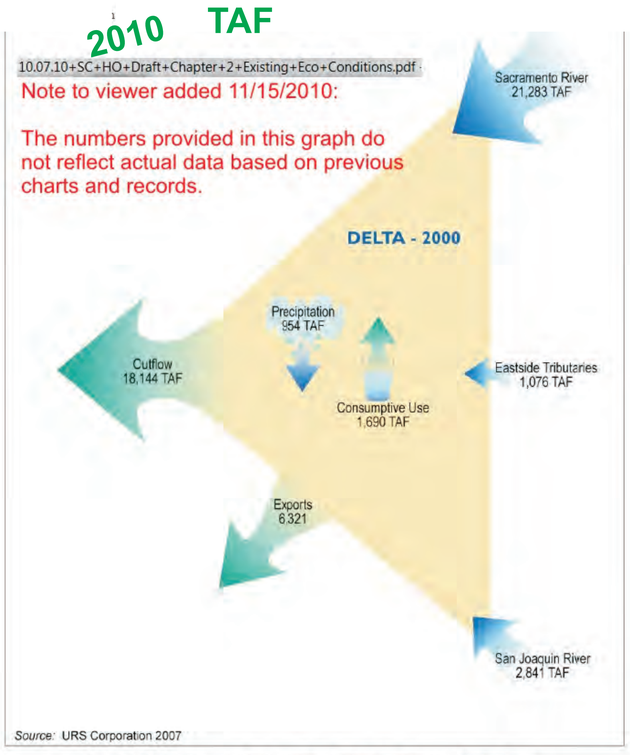
Reference documents and maps are available at http://www.DeltaREvision.com. Go to "waterflow" pages.
Data compiled by N. Suard, Snug Harbor Resorts, LLC on Steamboat Slough November 2011

2010 TAF

10.07.10+SC+HO+Draft+Chapter+2+Existing+Eco+Conditions.pdf

Note to viewer added 11/15/2010:

The numbers provided in this graph do not reflect actual data based on previous charts and records.



Source: URS Corporation 2007

Figure 2-12. Example Delta Water Balance for 2000 Water Year,

June 1, 2011
Submitted to NRV: Committee on Sustainable Water and Environmental Management in the California Bay-Delta

By Nicole S. Suard, Esq., Managing Member, Snug Harbor Resorts, LLC, a Delta land and business owner.

Questions and challenges regarding the overall "science" applied to Delta lands (islands and waterways).

This comment paper is submitted to request answers to four technical sections of the science currently applied to the decision making process for the Sacramento-San Joaquin Delta region. "Best available science" when proved wrong is bad science. Bad science, applied, results in bad outcomes. It is financially, legally and socially irresponsible for any scientist, politician or government agency to make important decisions regarding the future of Delta lands, waterways, people and water rights based upon bad science. Basing decisions on bad science also exposes the taxpayers of California to increased taxation to cover the costs of litigation and punitive awards to the harmed landowners when the state (or federal government) intentionally moves forward with changes to Delta islands and water flow based on *known* bad science. This paper specifically asks four series of questions and requests that the named agency representative investigate and resolve the data conflict or issue presented. The research and document giving cause to ask the questions are provided as follows:

A. **Salad-bar science:** The historical island data used for the DRMS Phase 1 Final Report (2008) and its two revisions (3/2009 and 12/2009), have been shown to be false and inaccurate, yet the data continues to be used or quoted in most BDCP documents.
Question series for Gerald Meral, Deputy Secretary, California Resources Agency: Why is DWR continuing to use false data regarding individual island flood and seismic history? Why did DWR combine flood, seismic and soil data for two different Ryer Islands into the DRMS report? Why did the DCC gate log show the Jones Tract levee failure on June 1, 2004 while DWR reported the levee failure on June 3, 2004? (See documentation-Section A)

B. **It depends on who's counting**: When computing water flow and velocity for reports comparing past and current water flow in the Delta, I found formula conflicts between conversion tables used by DWR and USGS.
Queston for Karen Schwinn, Associate Director, Water Division, EPA Region 9 or David H. Blau, Senior Water Resource Planner: If the conversion table from DWR was used for the initial raw data and formula input for CALSIM modeling, wouldn't this explain one reason why CALSIM II modeling doesn't match actual water flow calculations for some studies? Which conversion table is correct: DWR or USGS? (See documentation and links-Section B)

C. **What's Where When or 101 Wrong Maps of the Delta**: Several different important Delta-related studies and agencies confuse the islands and waterways of the Delta.

Question for NOAA speaker or BDCP speaker: If the scientists or government agencies can't even come up with accurate maps of the Delta, why should their study results be accurate or trusted? (See documentation and links-Section C)

D. **CalFed did not "fail" in 2003** regarding the conveyance portion of the plan, as construction has continued to move forward as "regional projects". It appears most of the elements of the CalFed 2000 ROD "preferred alternative" are complete or almost complete.
Question for BDCP or DWR speaker: Is it expected the central conveyance or "preferred alternative" which includes reoperation of the DCC, expanded capacity of Freeport pumps, revision to McCormack/Williamson Tract, dredging around the area of DCC and Dead Horse island to facilitate greater water flow down the Mokelumne Rivers, etc will be operational by the end of 2012 or earlier? Will it include use of Staten Island for In-Delta water "detention" or other Delta islands and if so, which islands are planned to be IDS? (See links-Section D)

Please note that the following pages will provide links to documents found online at the time of researching this paper. However, sometimes the government websites or nonprofit websites remove documents quoted, so the presumed public record document, or a portion thereof, is preserved and available at the following web page, to be used for educational and comparative purposes only: http://www.deltaREvision.com/sciencechallenge.html (pending upload to website)

A **Salad-bar science:** The historical island data used for the DRMS Phase 1 Final Report (2008) and its two revisions (3/2009 and 12/2009), have been shown to be false and inaccurate, yet the data continues to be used or quoted in most BDCP documents.

Question for Gerald Meral, Deputy Secretary, California Resources Agency: Why is DWR continuing to use false data regarding individual island flood and seismic history? Why did DWR combine flood, seismic and soil data for two different Ryer Islands into the DRMS report[1]? Why did the DCC gate log show the Jones Tract levee failure on June 1, 2004[2] while DWR reported the levee failure on June 3, 2004[3], if the island was the target of IDS field studies[4]?

Summary, documents and links: Beginning 2002 there was a transition to use of Salad-bar Science. A Salad-bar Scientist is someone (or a group of persons) who pick out bits and pieces of other reports and data on a particular topic, to combine the incomplete data as proof of a predetermined desired outcome. The Delta Risk Management Strategy (DRMS) 2008 Final Phase 1 published 2008[5], and the subsequent revisions March 2009 and December 2009[6] is a perfect

[1] http://ryerisland.com/DRMS_wrong_on_ryer_island.htm
[2] http://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/wq_control_plans/2006wqcp/exhibits/append2/doi/doi-07.pdf go to 2004 log
[3] http://www.usbr.gov/mp/cvo/vungvari/Ccgates.pdf revised operations log
[4] http://deltarevision.com/2011/Bacon_Island_Jones_Tract_field_studies.pdf
[5] http://www.science.calwater.ca.gov/drms/drms_irp.html website now says 'archived" See flood risk sections
[6] http://www.water.ca.gov/floodmgmt/dsmo/sab/drmsp/phase1_information.cfm Corrected regarding Ryer Island flood history only

example of the application of salad-bar science. Review of the historical process of the DRMS process shows the following steps:

First, the DRMS funder (DWR) determined outcome desired-a technical report of Delta island failure history which would create the impression of immediate danger. i.e support the concept that "Delta islands are on the verge of failure based on historical records".

Second, the DRMS contractor (URS) along with the DRMS funder proceeded to pick and choose time frames and historical data, and even included records from areas not within the physical location of the Delta.

Third, the DRMS authors inconsistently applied and reported the data so that anyone attempting to review the data would not be able to duplicate the findings and therefore have difficulty challenging the report without recompilation of historical data independently.

However, the DRMS report was and continues to be challenged in many ways, which is the natural outcome of salad-bar science. It's bad science.

Specifically, the DRMS reported that Delta Islands had flooded 158 times in the last 100 years[7]. The last comprehensive Delta flood study, reported by USACE, reported 36 floods since the Delta islands were leveed[8]. How would two government agencies come up with such different numbers? DWR/URS came up with the false and inflated flood number by (1) counting islands floods from a time before levees were even built[9]; (2) counting islands not located in the legal Delta as if they were in the Delta[10]; (3) counting intentional or controlled flooding of islands as if they were accidental floods[11]; (4) inconsistently adding incidents of controlled flooding[12]; (5) fabricating flood history for target areas of the Delta[13]; (6) confusing the locations of Delta islands by applying flood history to alternate islands[14]; and (7) fabricating a "flood" incident in 2004[15] as if it was an accidental

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[7] http://www.science.calwater.ca.gov/pdf/drms/DRMS_Risk_Report_section_01_071008.pdf look at section 2, 7.

[8] http://www.spk.usace.army.mil/organizations/cespk-pao/delta/delta_reports/Plate%201%20Delta%20Flooding%20Map.pdf complete report: http://www.spk.usace.army.mil/projects/civil/Delta/Docs.html

[9] http://www.water.ca.gov/floodmgmt/dsmo/sab/drmsp/docs/Risk_Report_Section_13_Final.pdf Uses period from 1900 to 2000 but the current levee system was not improve to current standards until 1930's. http://www.science.calwater.ca.gov/pdf/drms/DRMS_Risk_Report_section_02_062608.pdf Maps at the end reflect incorrect historical data.

[10] http://www.science.calwater.ca.gov/pdf/drms/DRMS_Risk_Report_section_13_071008.pdf See page 23; and see maps for reference: http://www.delta.ca.gov/res/docs/map/Black_and_White_Map.pdf Legal Delta Region island names (no Suisun Marsh) See also http://www.delta.ca.gov/res/docs/map/delta.pdf and DRMS includes Suisun Marsh http://www.water.ca.gov/floodmgmt/dsmo/sab/drmsp/docs/RiskAnalysis_ITF.pdf see page 9. http://www.delta.ca.gov/res/docs/Sacto-SanJoaqin_fact.pdf "Delta Facts" includes Suisun Marsh area.

[11] http://www.deltarevision.com/2011/historic-timeline/historic_maps/1975_delta-floods-dwr.pdf see map of "controlled flooding" islands

[12] http://www.deltarevision.com/2011/historic-timeline/historic_maps/1975_delta-floods-dwr.pdf same document but make note of Yolo Bypass area

[13] http://ryerisland.com/DRMS_wrong_on_ryer_island.htm

[14] http://ryerisland.com/Ryer_maps.htm

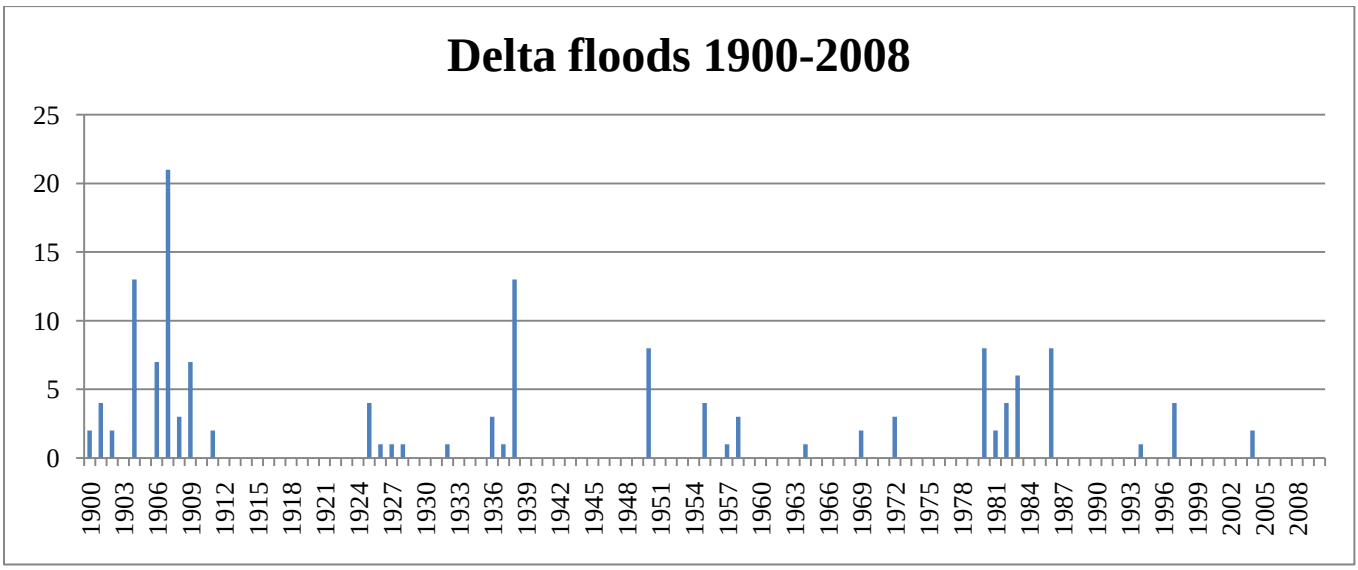
[15] http://deltarevision.com/Jones_Tract.htm

occurrence instead of a field study for In-Delta storage proposals. Please see the timeline IDS study[16] for details.

What is important to note is that is that Delta islands have ***not*** accidentally flooded since the record water flows of the 1980's, even though there have been very wet rain years and a major earthquake in the Bay Area since the last accidental island flood. The timelines below represent accidental Delta island failure from flood and from seismic event and are provided to graphically demonstrate the truth, that historically Delta island flood risk is declining, not increasing. In other words, USACE, USBR and the Delta Reclamation Districts have been doing their job to protect Delta lands from accidental floods:

The timelines below are based on reports and materials provided by Department of Water Resources published in 1975[17], 1987[18], 2005[19], 2007[20], and reports and documents provided by Department of Interior, USBR, or US Army Corps of Engineers dated 1980, 1999 and 2006[21]. The *totals were summarized* in a spreadsheet.[22]

Figure 1: Timeline of Historical Floods in Delta, both accidental and intended floods.



As the above timeline shows, the vast majority of flood events in the Delta occurred prior to the first series of levee improvements started in the 1930's. In fact, 86 islands flooded prior to 1930, and since the islands were not improved prior to 1930 it is intentionally misleading to use flood incidents from a time when the levees did not exist! In other words, DWR's claim of 158 floods should be reduced by 86 to "72" based on this fact alone.

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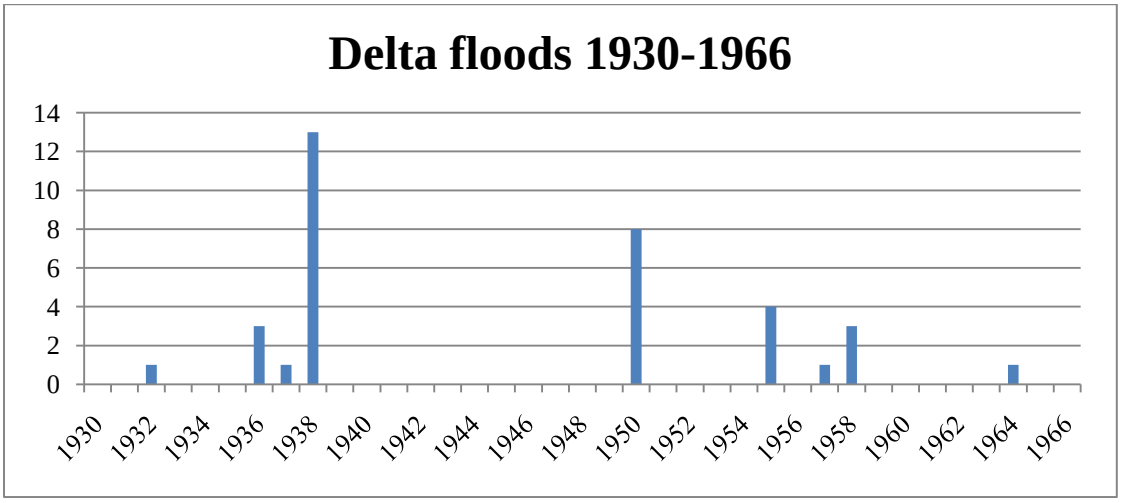
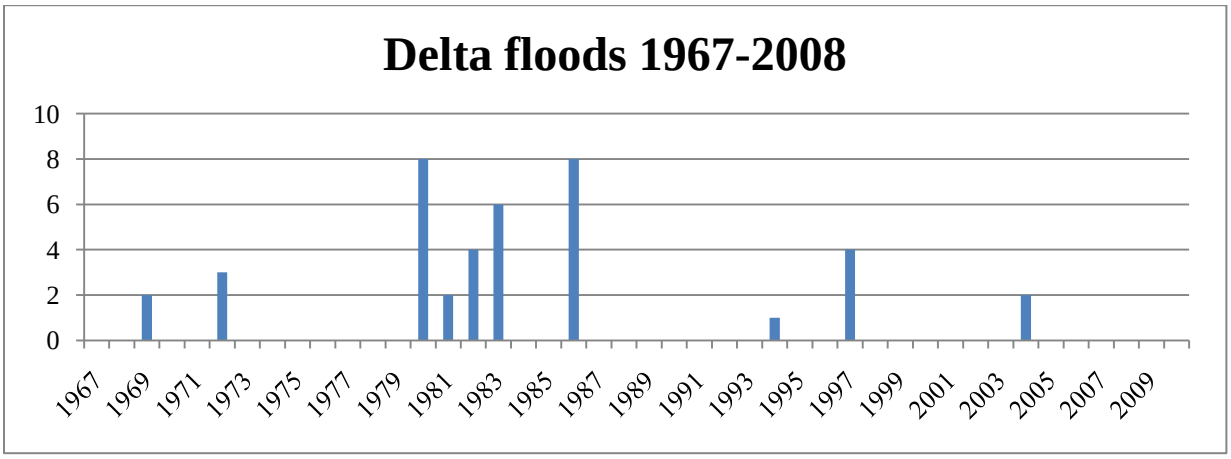
[16] http://deltarevision.com/2011/Bacon_Island_Jones_Tract_field_studies.pdf
[17] http://www.deltarevision.com/2011/historic-timeline/historic_maps/1975_delta-floods-dwr.pdf see map of "controlled flooding" islands
[18] http://deltarevision.com/1848-1989_docs/1986-tyler_island_flood.pdf
[19] http://www.waterplan.water.ca.gov/docs/cwpu2005/Vol_1/v1PRD.combined.pdf page 187
[20] http://baydeltaoffice.water.ca.gov/sdb/tbp/deltaoverview/delta_overview.pdf
[21] http://www.spk.usace.army.mil/organizations/cespk-pao/delta/delta_reports/Plate%202%20Regional%20Map.pdf and full report at http://www.spk.usace.army.mil/projects/civil/Delta/Docs.html http://www.spk.usace.army.mil/organizations/cespk-pao/delta/index.html for more details
[22] http://ryerisland.com/images/floods/delta_floods_final.pdf graphs at http://deltarevision.com/2011/historic-timeline/historic_maps/timeline_delta_levee_failures.pdf

In fact, prior to 2004, DWR, USBR and other government agencies consistently reported Delta flood incidents in two time periods: 1930 to 1966 and 1967 to the present. This is because levees were improved between 1930 and 1966 for the Federal water project, and later received more improvements as part of the state water projects of the late 1960s and beyond.

The two tables below clearly show the decline of flood incidents as levees are improved and Delta water inflows become more and more managed by the joint operation of DWR and USBR.





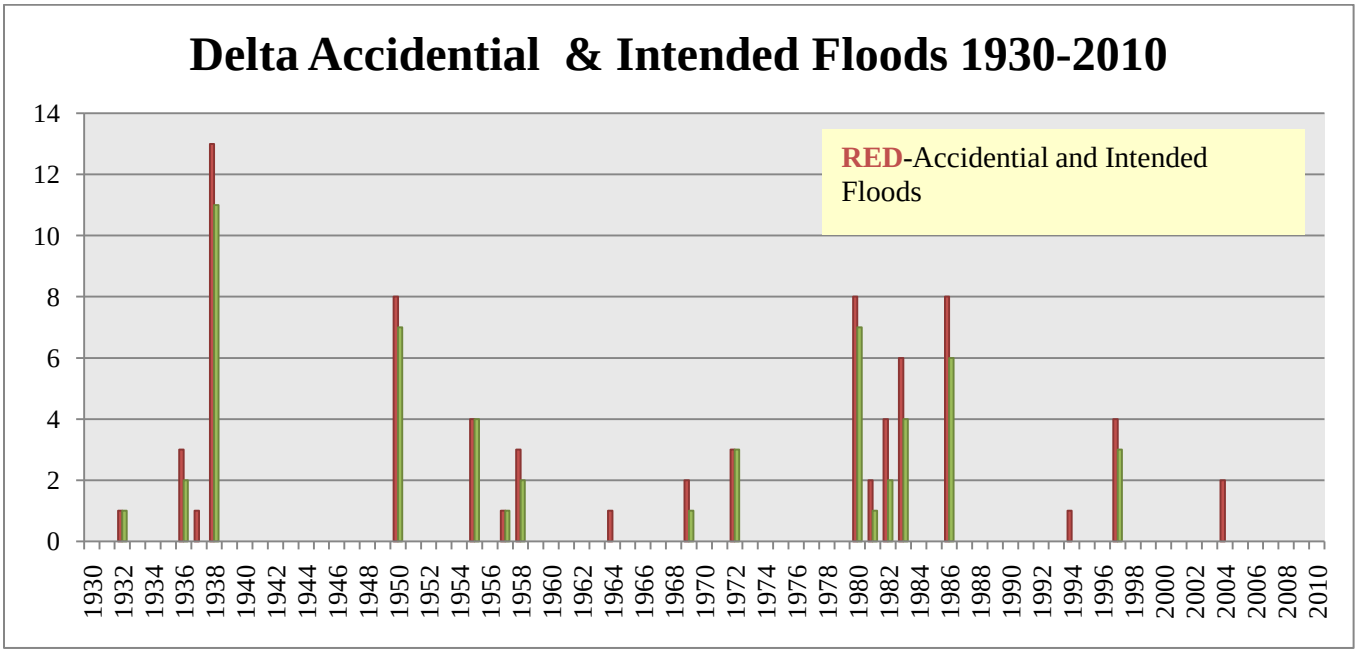
The wettest year of record was 1983, but many of the recent floods were not correlated to the wettest periods. It is interesting to note that the businesses and farmers outside the Delta, who have very strong political ties, were pushing for passage of the Peripheral Canal plan from approximately 1978 to the vote of 1982. Allowing flooding of Delta islands was as politically opportune in 1980 as it was in 2004 for the Jones Tract "sunny day" flood.

Another way that DWR is currently intentionally misleading viewers regarding Delta flood history to list intended, planned or control floods as if they were accidental floods. According to DWR in their 1975 publications[23], several islands are managed for "flood control" meaning the island is intentionally flooded for to relieve water pressure or flow to a different island or waterway in the Delta. McCormack/Williamson Tract and all of the Yolo Bypass area have been intentionally flooded for

[23] http://www.deltarevision.com/2011/historic-timeline/historic_maps/1975_delta-floods-dwr.pdf see map of "controlled flooding" islands

water management purposes. So why would DWR now list the same flood events as if they were accidental floods? Below is a table showing Accidental floods, which excludes islands that were intentionally flooded at various times, islands that were flooded and remain flooded for water storage or ecosystem restoration projects, and flood events that were intended to be field studies for In-Delta Storage modeling reports. Flood events/islands excluded: Big Break, Clifton Court Tract, Donlon Island, Franks Tract, Little Franks Tract, Little Mandeville Island, Lower Sherman Island, Mildred Island, McCormack-Williamson Tract, and Lower/Upper Jones Tract (2004 flood excluded as accidental). Note that DWR in 2006 compiled a summary of the costs of "major Delta levee breaks[24]" and the last major north or central Delta levee break was in 1986, and in 1997 there was a levee break in the lower San Joaquin area. No mention of Jones Tract 2004 levee breach which was reported to be the most expensive one, most likely due to the extended studies associated with that breech.

Compare the red bars which include both intended and accidental foods, with the green bars, which include only *accidental* floods of Delta Islands in use today:



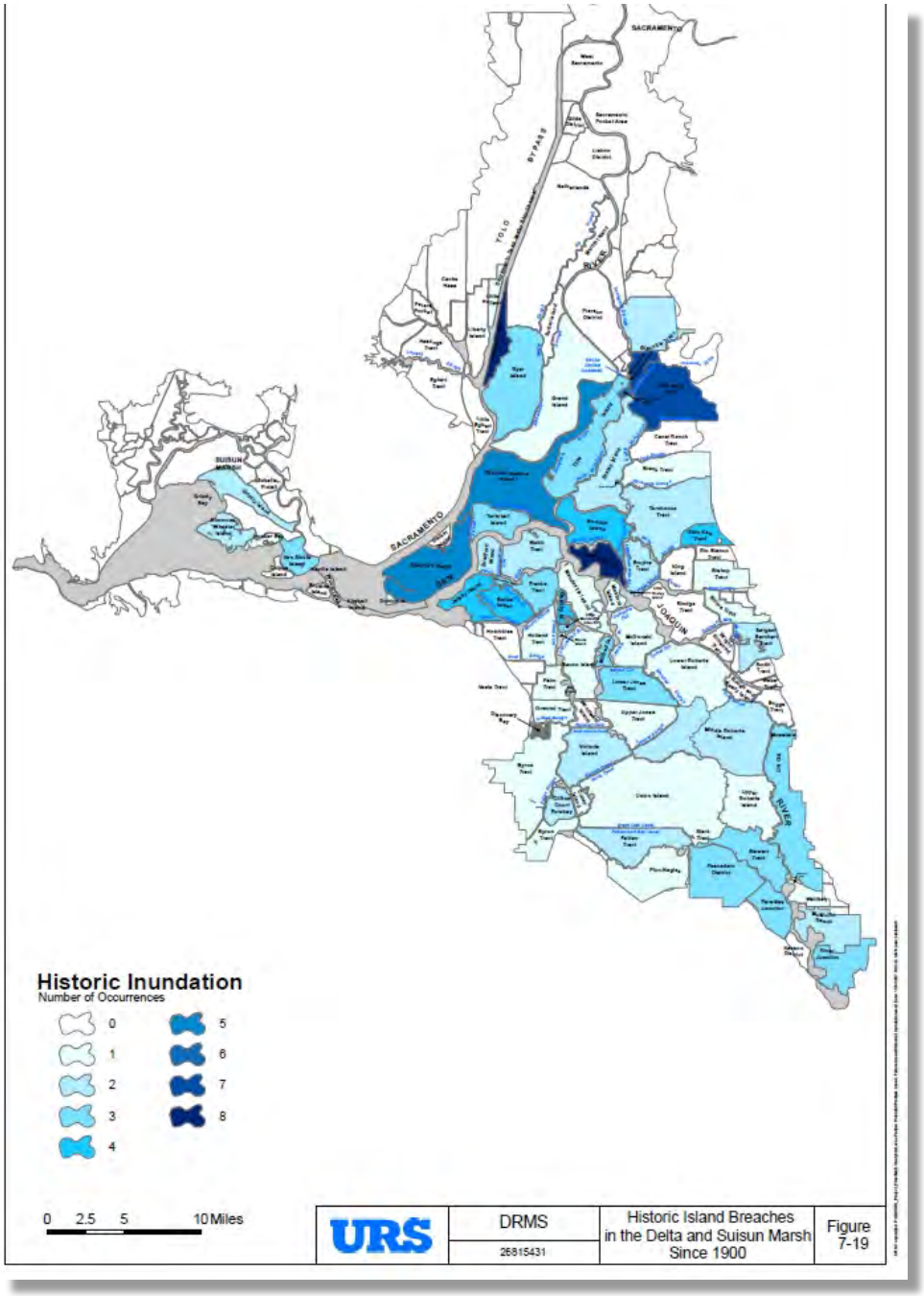
Historical data shows the clear trend away from levee failures as the state and federal agencies have communicated more and managed the water systems jointly. 1997 was the last time there were accidental Delta floods, and the major flood of Tyler Island was the result of overflow from the "controlled flood" area of McCormack/Williamson Tract. Notice that the much publicized 2004 Jones Tract "sunny day" failure is listed as an intended flood, not an accidental one. That is because documents indicate USBR/DOI was aware of the Jones Tract levee failure on June 1, 2004 (see the DCC operations log for 6/1/2004) but it was not reported by DWR until June 3, 2004. Reports show from 2002 to June 1, 2004 there was substantial focus on computer modeling and research for the "In-Delta Storage Project"[25] (IDSP) using Bacon Island and Webb Tract for in-delta water storage. In other words, the data compiled from the breach of Lower Jones

[24] http://www.water.ca.gov/floodmgmt/dsmo/sab/drmsp/docs/Comparison_of_Major_Levee_Breaks_in_Delta.pdf
[25] http://deltarevision.com/2011/Bacon_Island_Jones_Tract_field_studies.pdf

Tract levee was intended and used as a "field study" for the Bacon Island IDS proposals[26]. In the computer modeling, Jones Tract field study data was logged in under "Bacon Island" as noted in the later reports on the matter[27].

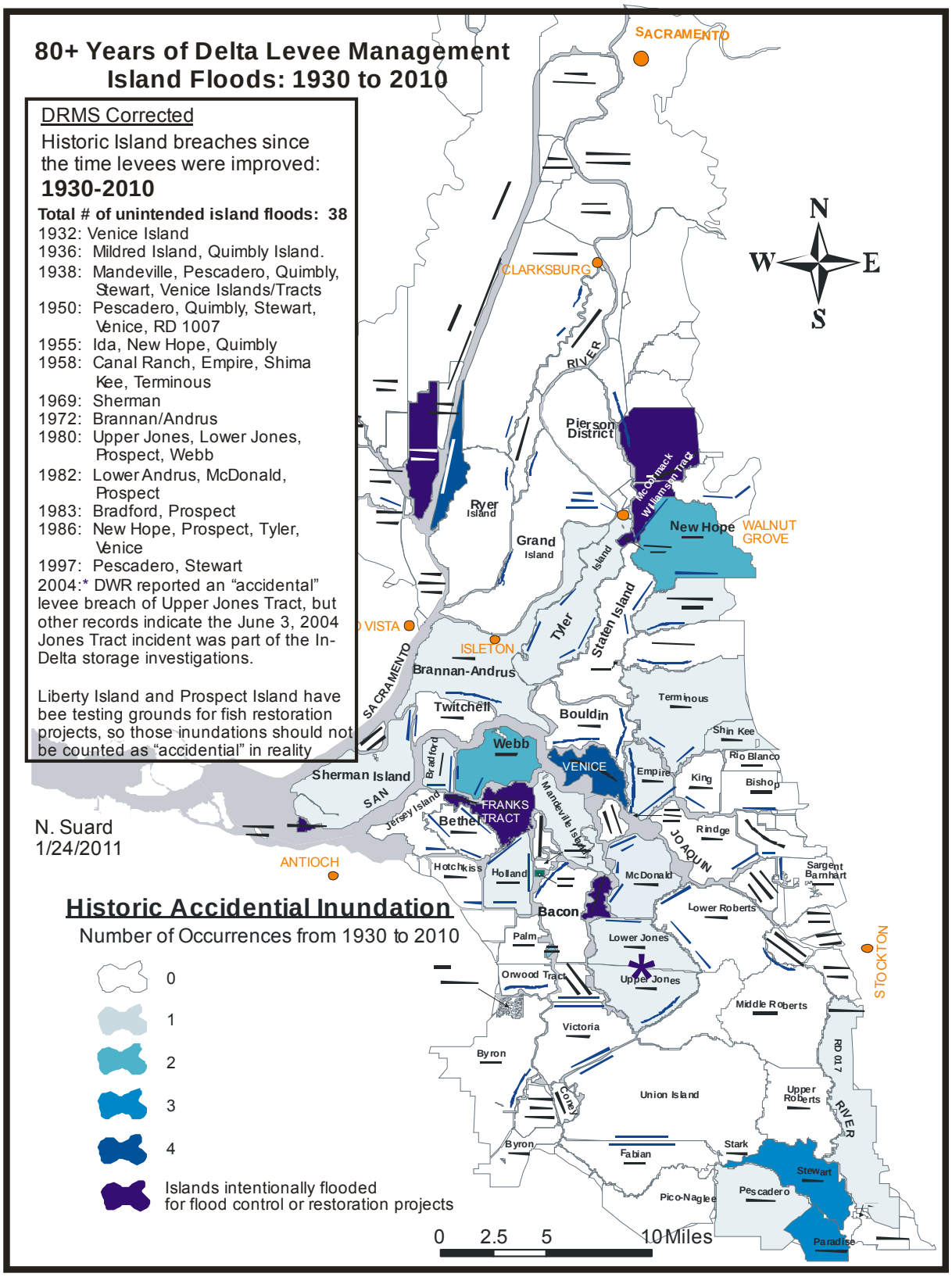
Compare the DRMS 2008 Delta Island Inundations map below with a more accurate representation on the following page and see if you guess how many ways the DRMS 2008 map represented incorrect data.

Pay attention to Ryer Island, Prospect Island, Grand island, Tyler Island, McCormack/Williamson Tract, Dead Horse Island, Lower Jones Tract, just to name a few of the islands with misstated history in DRMS.



Note, also, that in December 2009, DRMS Fiinal Phase 1 was revised regarding Ryer Island flood history, at the instance of Ryer landowners[28]but many of the tables reflecting means and averages of flood history were not corrected, so the DRMS report continues to reflect false data regarding Ryer Island along with other Delta islands.[29]

[26] http://deltarevision.com/Jones_Tract.htm
http://deltarevision.com/Delta_maps/In_Delta_water_storage.htm [27]
[28] http://ryerisland.com/DRMS_wrong_on_ryer_island.htm emails & documents with DWR regarding Ryer Island flood history
[29] http://ryerisland.com/images/smalls/drms-using_maps_to_hide_mistakes.jpg


80+ Years of Delta Levee Management
Island Floods: 1930 to 2010
DRMS Corrected
Historic Island breaches since the time levees were improved:
1930-2010
Total # of unintended island floods: 38
1932: Venice Island
1936: Mildred Island, Quimbly Island.
1938: Mandeville, Pescadero, Quimbly, Stewart, Venice Islands/Tracts
1950: Pescadero, Quimbly, Stewart, Venice, RD 1007
1955: Ida, New Hope, Quimbly
1958: Canal Ranch, Empire, Shima Kee, Terminous
1969: Sherman
1972: Brannan/Andrus
1980: Upper Jones, Lower Jones, Prospect, Webb
1982: Lower Andrus, McDonald, Prospect
1983: Bradford, Prospect
1986: New Hope, Prospect, Tyler, Venice
1997: Pescadero, Stewart
2004:* DWR reported an "accidental" levee breach of Upper Jones Tract, but other records indicate the June 3, 2004 Jones Tract incident was part of the In-Delta storage investigations.
Liberty Island and Prospect Island have bee testing grounds for fish restoration projects, so those inundations should not be counted as "accidential" in reality
N. Suard
1/24/2011
Historic Accidential Inundation
Number of Occurrences from 1930 to 2010
0
1
2
3
4
Islands intentionally flooded for flood control or restoration projects
0 2.5 5 10 Miles
N
W
E
S
SACRAMENTO
CLARKSBURG
WALNUT GROVE
ISLETON
ANTIOCH
STOCKTON
SACRAMENTO RIVER
SAN JOAQUIN RIVER
Pierson District
McCormack Williamson Tract
New Hope
Ryer Island
Grand Island
Tyler Island
Staten Island
Brannan-Andrus
Twitchell
Bouldin
Terminous
Shin Kee
Rio Blanco
Bishop
King
Empire
Webb
VENICE
Bradford
Sherman Island
Jersey Island
Bethel
FRANKS TRACT
Mandeville Island
Rindge
Hotchkiss
Holland
McDonald
Sargent Barnhart
Bacon
Lower Roberts
Palm
Lower Jones
Upper Jones
Orwood Tract
Middle Roberts
Victoria
Byron
Coney
Union Island
Upper Roberts
RD 017
Stark
Fabian
Stewart
Pescadero
Pico-Naglee
Paradise

Map above was compiled from an extensive comparison of the various historical records and publications of Delta Flood history[30], summarized in the chart below, but still and estimate:

Island Name	80 year period:		Total # of	Total # of	106 years
	Island Floods 1930-1980	Island Floods 1981-2010	Floods-USACE	Floods-DWR previous docs	Floods-**DWR/DRMS** 1900-2006
Total Floods for the Time Period, 58 islands	22	9	35	34	158*
Andrus (upper)	0	0	0	0	1
Andrus (Lower)	0	1982	1	1	**5**
Bacon Island	0	0	0	0	1
Bethel Tract	0	0	0	0	**4**
Bishop Tract	0	0	0	0	1
Boudin Island	0	0	0	0	**4**
Brack Track	0	0	0	0	1
Bradford Island	0	1983	1	1	2
Brannan Island	1972	0	1	1	**5**
Byron Track	0	0	0	0	1
Canal Ranch Tr.	1958	0	1	1	0
Coney Island	0	0	0	0	1
Decker Island	0	0	0	0	0
Drexler	0	0	0	0	0
Empire Tract	1958	0	1	1	2
Fabian Tract	0	0	0	0	2
Grand Island	0	0	0	0	1
Hastings Tract	0	0	0	0	0
Holland Tract	0	1980	1	1	1
Hotchkiss Tract	0	0	0	0	0
Ida Island	1955	0	1	1	2
Jersey Island	0	0	0	0	**4**
Jones Tract (lower)	1980	2004*	2	2	**4**
Jones Tract (upper)	1980	2004*	2	2	1
King Island	0	0	0	0	0
Mandeville Island	1938	0	0	0	1
McDonald Tract	0	1982	1	1	1
Merritt Island	0	0	0	0	0
Medford Island					1
Mildred Island	1936	0	1	1	**3**
New Hope Tract	1955	1986	2	2	**7**
Orwood Tract	0	0	0	0	
Palm Tract	0	0	0	0	1
Paradise Junction					3
Pescadero Tract	1938,1950	1997	2	1	3
Pierson District	0	0	0	0	
Prospect Island	1980	82,83,86	4	4	**8**
Quimbly Island	1936,38,50,55*				**4**
Ringe Tract	0	0	0	0	0
Rio Blanco Tract	0	0	0	0	0
Roberts Island (lower)	0	0	0	0	1

[30] http://ryerisland.com/images/floods/delta_floods_final.pdf
http://deltarevision.com/maps/islands_floods_levees/usace_delta_flood_history_2007_report_to_congress.pdf

Roberts Island (middle)	0	0	0	0	2
Roberts Island (upper)	0	0	0	0	1
Rough & Ready	0	0	0	0	0
Ryer Island	0	0	0	0	**3**
Sargent-Barnhart	0	0	0	0	2
Sherman Island	1969	0	1	1	**5**
Shima Kee Tr.	1958	0	1	1	**4**
Staten Island	0	0	0	0	**2**
Shima Tract	0	0	0	0	1
Stewart Tract	1938,1950	1997	3	3	3
Terminous	1958	0	1	1	2
Twitchell Island	0	0	0	0	3
Tyler Island	0	1986	1	1	3
Union Island	0	0	0	0	1
Veal Tract	0	0	0	0	0
Venice Island	1932,38,50	1986	4	4	**8**
Victoria Island	0	0	0	0	2
Webb Tract	1950,1980	0	2	2	2
Woodward Island	0	0	0	0	0
Wright-Elmwood	0	0	0	0	0
RD 1007	1950	0	1	1	1
Summary: 58 islands	**22**	**9**	**35**	**34**	**158***
			USACE	DWR pre-2006	DRMS/DWR 2009
The following Islands and time periods were excluded from this study for the reasons given:					
Island history 1900-1929	Levees of the Delta had not been improved to withstand flooding prior to 1930, when work began by USACE as part of the initial state water canal project. It is scientifically inaccurate to assess risk of a structure using occurrences from prior to the time the structure was built. Note that prior to 2006, even DWR documentation focused on Delta flood history starting after 1930.				
Franks Tract	Island was left flooded to be used for fishing, recreation and restoration field studies				
McCormack/ Williamson Tr.	According to DWR 1975 documentation, these areas are state-owned and intentionally used for "controlled flooding", which accounts for the many times this area has been flooded. (DWR Bulletin No. 192, May 1975, page 10)				
Dead Horse Island	Also listed as a "controlled flooding" island per above DWR report				
Grainville Tract	Also listed as a "controlled flooding" island per above DWR Report				
Clifton Court Forebay	Intentionally flooded to be used as surface storage area for the water export pumps				
Suisun Marsh	DWR/DRMS included islands not previously listed in Delta studies, which makes it confusing and inflates flood incidents since the islands of Suisun Marsh area were never improved to withstand occasional floods.				
Jones Tract	The 2004 flooding of Jones Tract (Upper and Lower) appear to have been a pre-planned field study extension of the In-Delta Storage investigations under CalFed and USBR jurisdiction. (See attachment 7 for details)				

If DRMS Delta Flood history is substantially incorrect, then the DRMS seismic risk calculations, which included purported consideration of island flood history, would also be incorrect, logically. In addition, the studies proposing which islands to "save" in case of levee breech are also based on false historical island flooding[31]. In other words, if you input wrong numbers into a formula, the

[31] http://deltasolutions.ucdavis.edu/pdf/WorkingPapers/LeveeDecisions-2009Draft.pdf

outcome would also be wrong. The next step, then, is to review the history of seismic events that caused levee failures in the Delta region, to better understand *current* seismic risk of Delta levees.

DRMS SEISMIC STUDIES: Regarding the risk to Delta levees from seismic event in the Bay Area, the formula used to come up with means and averages ignores factual history of individual Delta islands, then compiles data from islands within the legal Delta region with islands outside the Delta, to come up with means and averages that really do not apply to Delta islands. Clearly any lands located within California are subject to some damage from seismic events, but the areas of high risk are the San Francisco Bay area and the Los Angeles to San Diego areas, not the Delta.

NOTE: NO TIMELINE PROVIDED BECAUSE NO LEVEE HAS EVER BEEN KNOWN TO FAIL DUE TO SEISMIC ACTION IN NORTHERN CALIFORNIA

The end result of the salad-bar approach to the DRMS report is that many other scientists, agencies and nonprofit organizations have been repeating the same false Delta island history data over and over again. If a lie is repeated over and over again, does that make it the truth? **No**. Each time the incorrect data is repeated, it puts the veracity and integrity of the reporting scientist at risk, exposes the scientist or reporting agency to legal exposure for disseminating false information, and exposes the taxpayer citizenship of the state to added expense when legal action is taken against the state for changes to the Delta based on false "science". Please take the time to review the following examples of reports, maps or documents which regurgitate the false data contained in DRMS Phase 1 Final Report from the following resources: PPIC[32], UCB[33], Laird Report to CA Assembly 2006[34], Delta Vision 2008[35], DFG/Delta Vision 2011[36]State of the Bay Report 2008[37] to name just a few.

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[32]

[33] http://deltarevision.com/maps/islands_floods_levees/urs-levee-floods-wrong.jpg

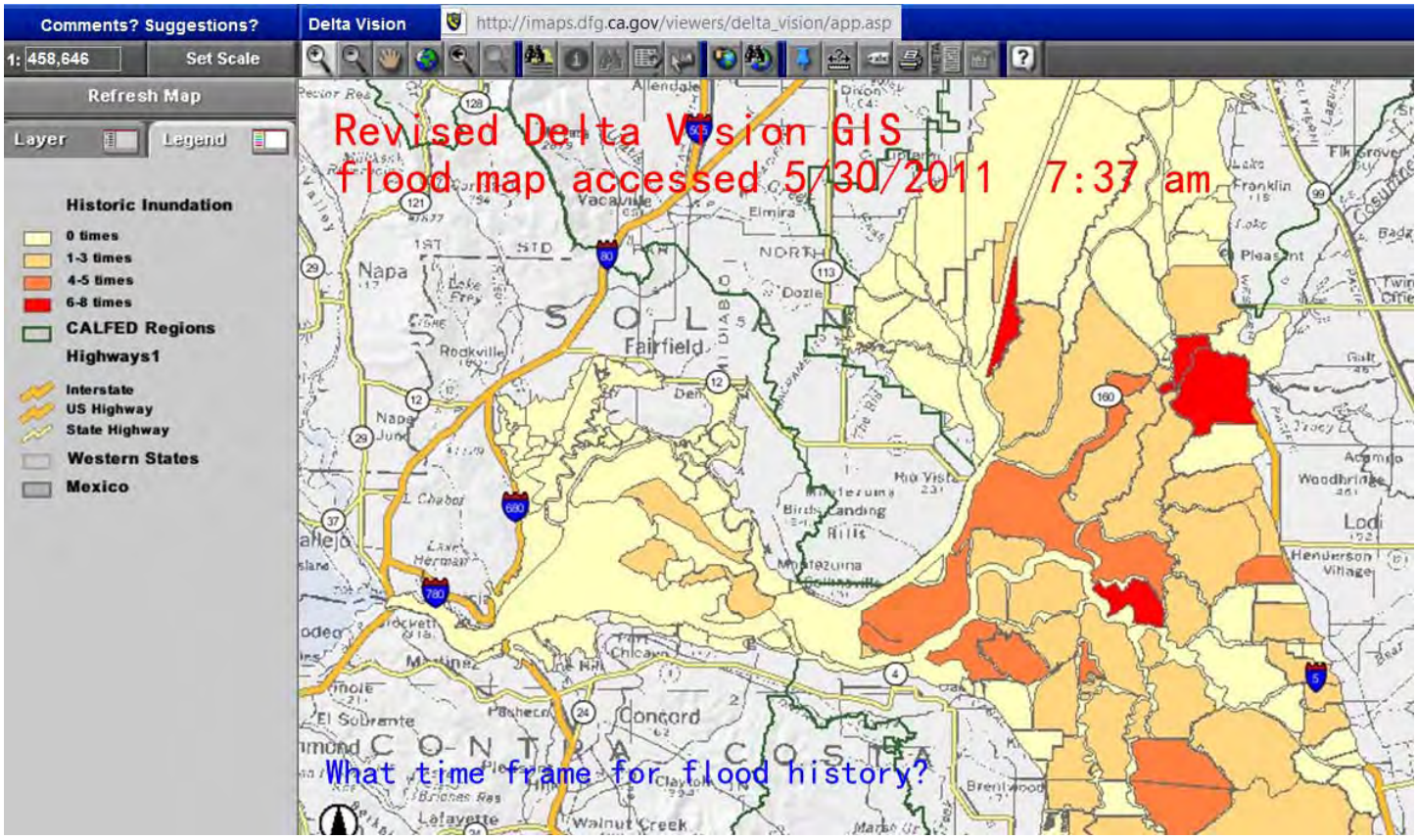
[34] http://deltarevision.com/maps/islands_floods_levees/2007_urs.jpg
http://deltarevision.com/maps/islands_floods_levees/2008ab1200_laird.GIF

[35] http://ryerisland.com/images/maps/DV_wrong_on_ryer.JPG 2008 Delta Vision GIS wrong on Ryer Island and
http://ryerisland.com/images/gov-pdfs/floods/2_Ryers-flooding.pdf

[36] http://imaps.dfg.ca.gov/viewers/delta_vision/app.asp Historical inundation map found through Delta Vision website-still wrong

[37]

Example: 2011 interactive online map at DFG website continues to display incorrect data compiled by DRMS:



(go to next page)

B

It depends on who's counting: When computing water flow and velocity for reports comparing past and current water flow in the Delta, I found formula conflicts between conversion tables used by DWR/USBR and USGS.

Question for Karen Schwinn, Associate Director, Water Division, EPA Region 9 or David H. Blau, Senior Water Resource Planner: If the conversion table from DWR/USBR was used for the initial raw data and formula input for CALSIM modeling in 2002, wouldn't this explain one reason why CALSIM II modeling results don't match actual water flow calculations? Which conversion table is correct specifically regarding conversion between cubic feet per second (cfs) and million gallons per day (MGd): DWR/USBR[38] or USGS[39]?

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)

[38] http://www.water.ca.gov/swp/operationscontrol/docs/annual/annual01.pdf
[39] http://ks.water.usgs.gov/waterwatch/flood/conv.html#factors

Below is a specific USGS conversion chart and the next page has a more detailed conversion chart. The difference of 48 gallons between the conversion charts seems minimal. However, when one considers 48 gallons times the number of cubic feet per second of flow over a year's time, it becomes more substantial:

http://ks.water.usgs.gov/waterwatch/flood/conv.html#factors

Conversion factors for the above calculations:

1 ft³/s =

1.9835	acre-feet per day
7.48	gallons per second
448.8	gallons per minute
26,928	gallons per hour
★ 646,272	gallons per day
28.32	liters of water per second
1,699.2	liters of water per minute
101,952	liters of water per hour
2,446,848	liters of water per day
2.446848	million liters of water per day
.646272	million gallons per day (Mgal/d)
62.5	pounds of water per second
3,750	pounds of water per minute
225,000	pounds of water per hour
5,400,000	pounds of water per day

http://water.usgs.gov/nwsum/WSP2425/conversion.html

U.S. CUSTOMARY (INCH-POUND)		U.S. CUSTOMARY (INCH-POUND) OR INTERNATIONAL SYSTEM (METRIC)
	LENGTH	
1 in (inch)	=	25.4 mm (millimeters)
1 ft (foot)	=	0.3048 m (meter)
1 mi (mile)	=	5,280. ft
	=	1,609.344 m
	=	1.609344 km (kilometers)
	AREA	
1ft^2 (square foot)	=	0.09290304 m^2 (square meter)
1 acre	=	43,560. ft^2 (square feet)
	=	0.0015625 mi^2 (square mile)
	=	0.40469 ha (hectare)
	=	4,046.9 m^2
1mi^2	=	640. acres
	=	259.00 ha
	=	2.5900 km^2 (square kilometers)
	VOLUME OR CAPACITY (liquid measure)	
1 gal (gallon, U.S.)	=	231. in^3 (cubic inches)
	=	0.13368 ft^3 (cubic foot)
	=	3.7854 L (liter)
	=	0.0037854 m^3 (cubic meter)
1 Mgal (million gallons)	=	3.0689 acre-ft (acre-feet)
1 ft^3	=	1,728. in^3
	=	7.4805 gal
	=	28.317 L
	=	0.028317 m^3
1 acre-ft*	=	43,560. ft^3
	=	0.32585 Mgal
	=	1,233.5 m^3
	SPEED	
1 mi/hr (mile per hour)	=	1.4667 ft/s (feet per second)
	=	0.44704 m/s (meter per second)
	VOLUME PER UNIT OF TIME	
1 ft^3/s (cubic foot per second)	=	448.83 gal/min
	=	0.64632 Mgal/d
	=	1.9835 acre-ft/d (acre-feet per day)
	=	28.317 L/s (liters per second)
	TEMPERATURE [°F (degrees, Fahrenheit) to °C (degrees, Celsius)]	
	(°F − 32) x 5/9 = °C	

* Volume of water 1 foot deep covering an area of 1 acre.

Please take a close look at the water conversion table used by DWR[40] and the ones used by USGS[41]. You will note that when converting between CFS and Mgd, the conversion numbers are slightly different, which results in different gross water flow answers. This is important because many of the planning documents related to water flow in the Delta use different methods to express flow and quantity of water, and CALSIM I and II, it is presumed, uses the DWR/USBR conversion formula. If the USGS formula is correct, wouldn't this be one

[40] http://www.water.ca.gov/swp/operationscontrol/docs/annual/annual01.pdf
[41] http://ks.water.usgs.gov/waterwatch/flood/conv.html

of the explanations for the difference in modeling flows vs. actual flows shown in some of the current conveyance and conservation planning documents?

For example, the Freeport pump project (FRWP) documents use the figure of 185 million gallons per day as the capacity of the facility, or rather the transport tunnels, but we do not know the capacity of the pumps in CFS, which could actually remove more Sacramento River water that would be discharged (via the pressure relief valve) into the Mokelumne River/conveyance channel. Should an interested person who wants to understand the total amount of water to be taken from the Sacramento River at Freeport use the conversion table from DWR/USBR or from USGS? When the reoperation of the Delta Cross Channel Gates is included in the water flow calculations which define how much more water will be taken from the Sacramento River system, it makes a difference of almost 242 acre feet per year, or 79,840,000 gallons per year **plus** the unmonitored quantity of the FRWP pressure relief valve.

COMPARING DWR WATER CONVERSION TABLE TO USGS WATER CONVERSION TABLE

		gallons per day	divided by gallons	equals cfs
FRWP	DWR	185,000,000	646,320	286.236
	USGS	185,000,000	646,272	286.257
difference			**48**	**0.021**

http://www.water.ca.gov/swp/operationscontrol/docs/annual/annual01.pdf
http://ks.water.usgs.gov/waterwatch/flood/conv.html
links to other charts: http://www.deltaREvision.com/calculate.html

48 gallons times 365 days = 17,520 gallons per year at a minimum
.021 cfs times 365 days = 7.665 cubic feet per second difference per year, at a minimum

.021 cfs times 1.98 equals .04158 acre-feet a day times 365 days equals 15.18 acre feet per year, or approximately the water for 30 households...or else *underreporting* of waterflow by 15.18 acre per year.

		cfs	times gallons per day	gallons per day	days per yr capacity operation	gallons per day	gallons per year
DCC with	DWR	4500	646,320	2,908,440,000	365	2,908,440,000	1,061,580,600,000
NDIP	USGS	4500	646,272	2,908,224,000	365	2,908,224,000	1,061,501,760,000
difference			**48**	**216,000**	365	**216,000**	**78,840,000**

USGS 1 acre-foot equals 325,900 gallons 78,840,000 divided by 325,900 equals **241.915 acre feet per year difference.**

If 1 acre foot is enough water for two households for a year, then the difference between DWR and USGS water conversion table results for the DCC amounts to 484 extra households of water use. Or else underreporting water flow by at least approximately 242 acre feet per year

In summary, the question is, which water conversion formulas are correct, DWR/USBR or USGS?

C **What's Where When or 101 Wrong Maps of the Delta**: Several different important Delta-related studies and agencies confuse the islands and waterways of the Delta. **Question for NOAA speaker or BDCP speaker**: If the scientists or government agencies can't even come up with accurate maps of the Delta, why should their study results be accurate or trusted?

When an agency or scientist conducts a study of the Delta, he/she/they should first be sure of the physical location of the Delta Islands, and those island names. The confusion of Delta island names and locations affected not just the DRMS report (section A above) but also many other currently-used reports intended to validate the building of the central conveyance canal and other ongoing Delta construction projects. Just a few of the wrong Delta maps are provided below, but a compilation of many more are available online[42].

In order to recognize wrong maps of the Delta, one must have as reference a correct map of the Delta Islands and waterways. The first map below appears to show correct island and waterway names. On the following map red circles were added to help the viewer pay attention to the areas of the subsequent sample Delta maps that display wrong geographic information. (You might want to test your Delta knowledge by guessing how many times or ways each of the maps are wrong, when compared to the correct Delta map:

[42] http://www.deltarevision.com/101wrongmapsofthedelta.html

Correct Delta island and waterways from USACE [43] and CALFED 2000 ROD documents[44]

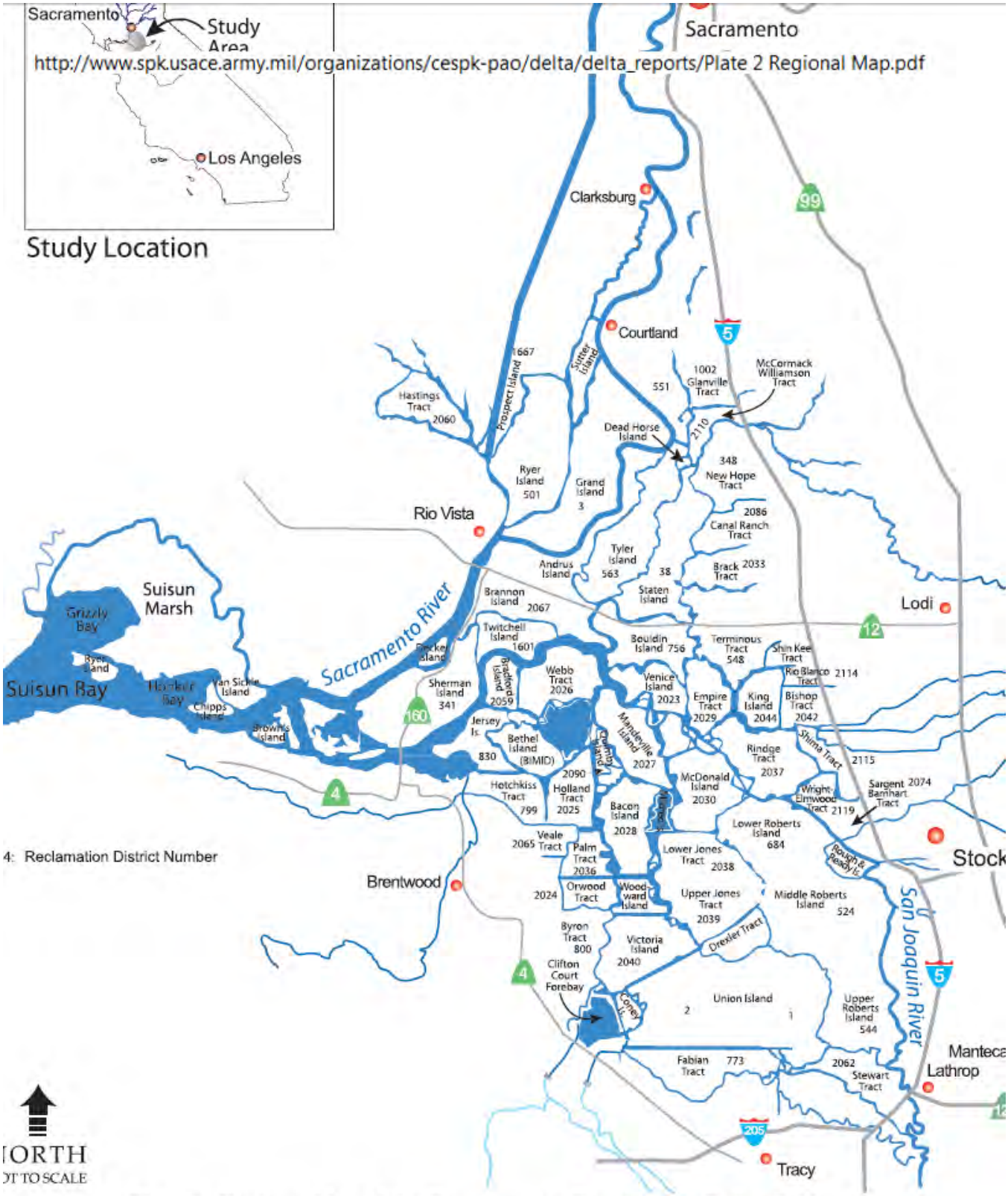
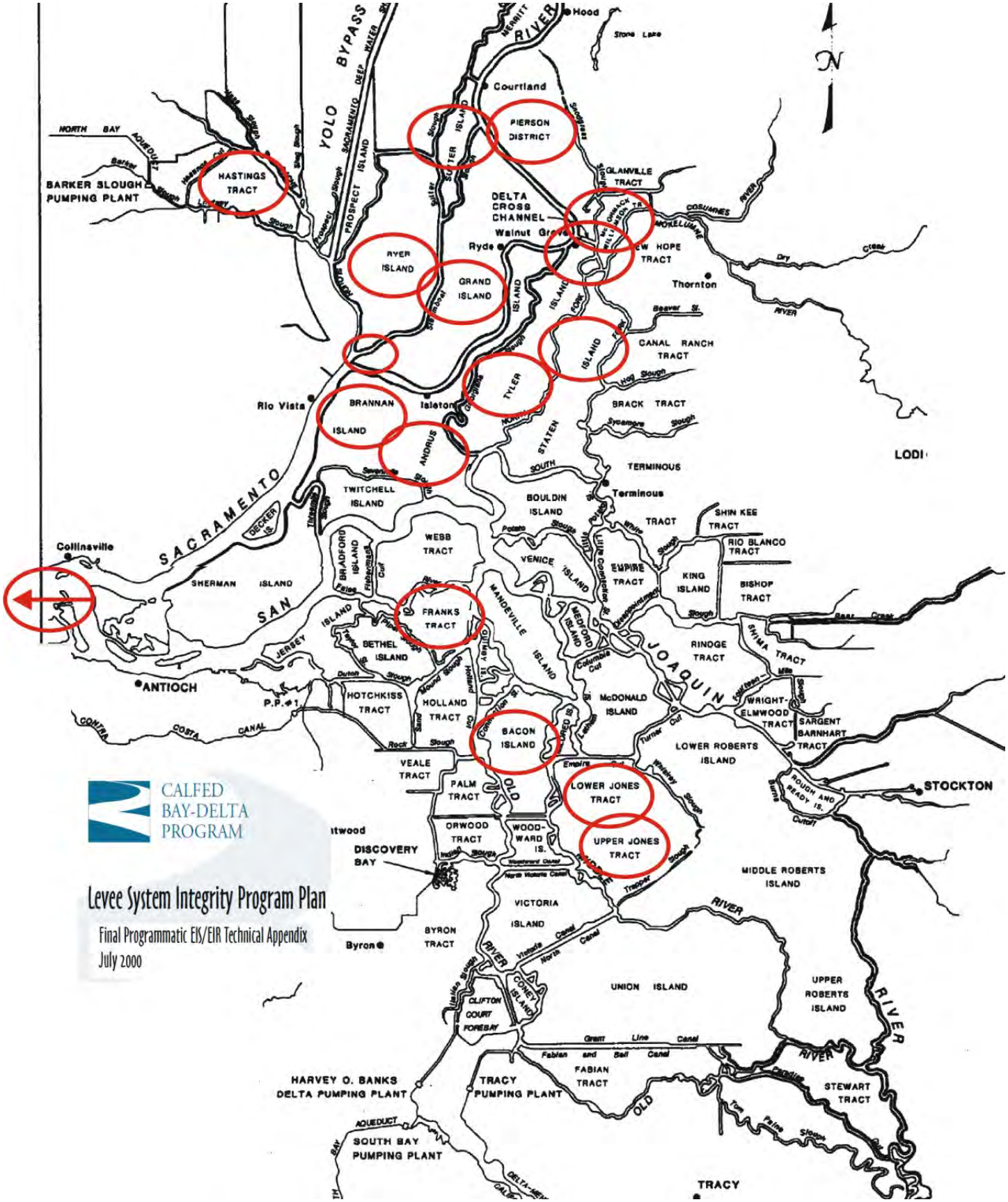
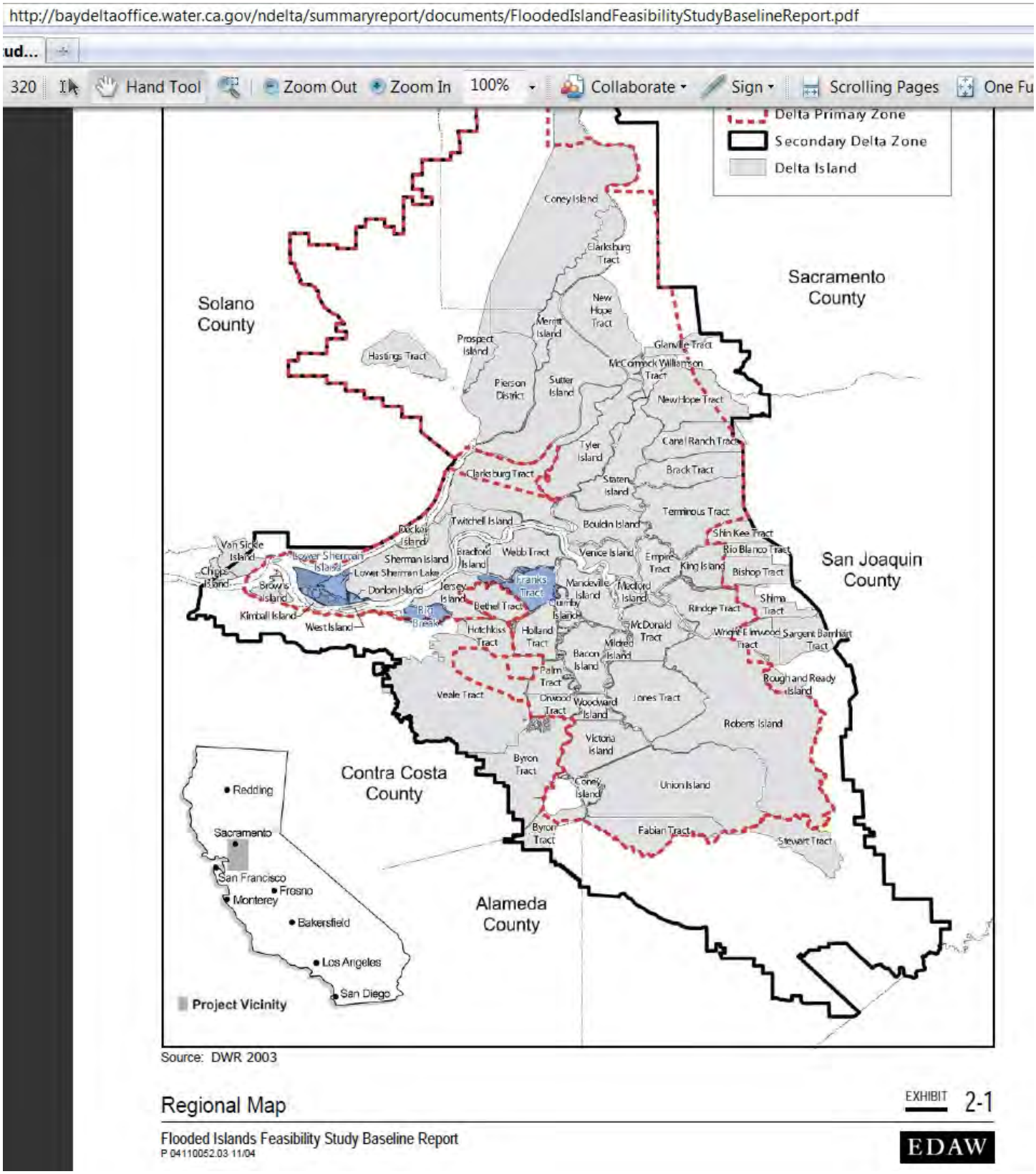


Plate 2. Regional Map of the Sacramento - San Joaquin Delta, California

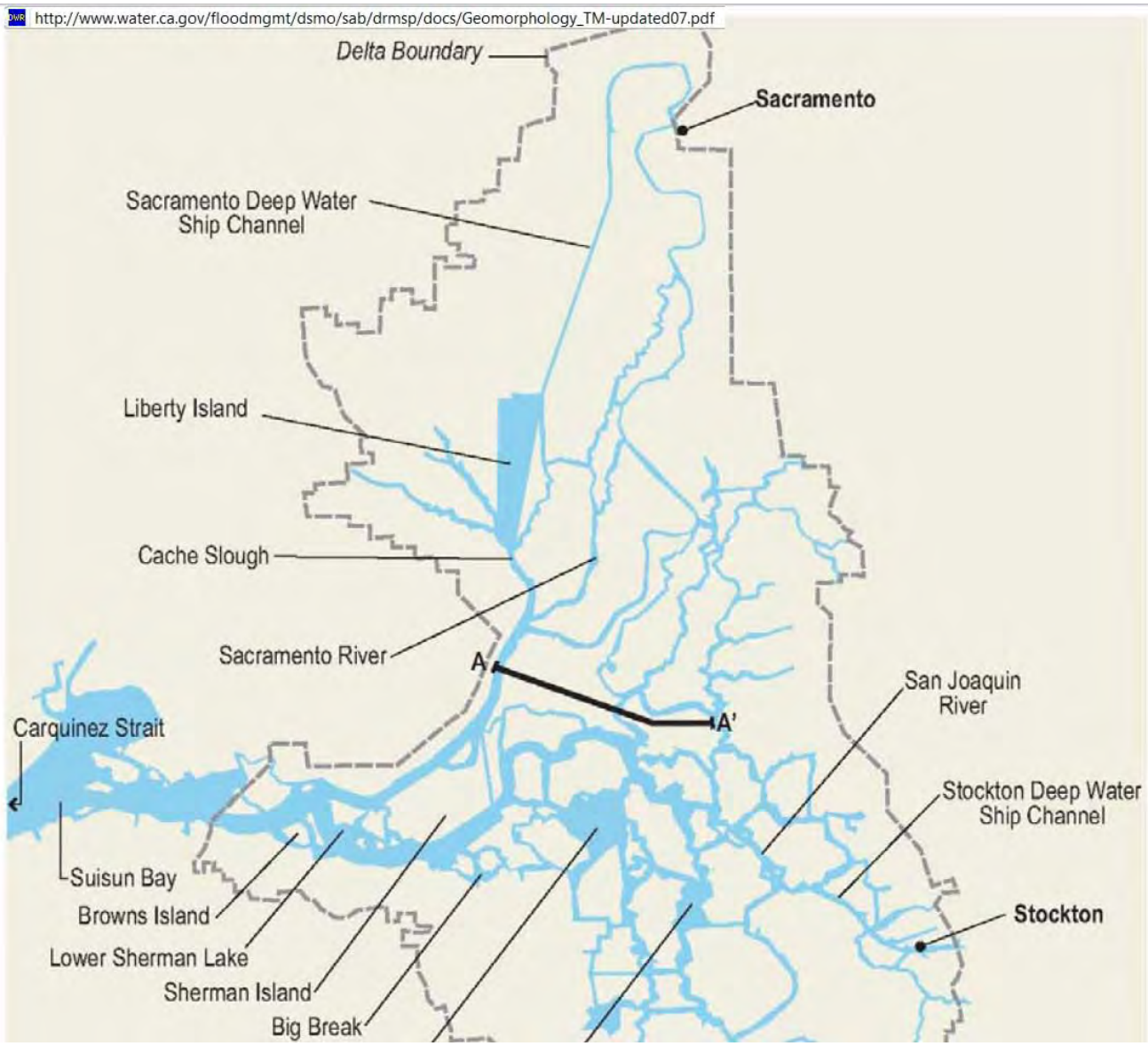
[43] http://www.spk.usace.army.mil/organizations/cespk-pao/delta/delta_reports/Plate%202%20Regional%20Map.pdf
[44] http://calwater.ca.gov/calfed/objectives/Levee_System_Integrity.html and also see http://calwater.ca.gov/content/Documents/library/305-1.pdf page 132


CALFED
BAY-DELTA
PROGRAM
Levee System Integrity Program Plan
Final Programmatic EIS/EIR Technical Appendix
July 2000
HASTINGS TRACT
BARKER SLOUGH PUMPING PLANT
PIERSON DISTRICT
GLANVILLE TRACT
DELTA CROSS CHANNEL
Walnut Grove
Ryde
Courtland
Hood
RYER ISLAND
GRAND ISLAND
Thornton
CANAL RANCH TRACT
TYLER ISLAND
BRANNAN ISLAND
ANDRUS ISLAND
Rio Vista
Isleton
BRACK TRACT
TERMINOUS
Terminous
TWITCHELL ISLAND
BOULDIN ISLAND
SHIN KEE TRACT
RIO BLANCO TRACT
WEBB TRACT
VENICE ISLAND
EMPIRE TRACT
KING ISLAND
BISHOP TRACT
Collinsville
SHERMAN ISLAND
BRADFORD ISLAND
FRANKS TRACT
MANDEVILLE ISLAND
MEDFORD ISLAND
RINDGE TRACT
SHIMA TRACT
BETHEL ISLAND
ANTIOCH
P.P.#1
HOTCHKISS TRACT
HOLLAND TRACT
McDONALD ISLAND
WRIGHT-ELMWOOD TRACT
SARGENT BARNHART TRACT
BACON ISLAND
LOWER ROBERTS ISLAND
VEALE TRACT
PALM TRACT
LOWER JONES TRACT
STOCKTON
ROUGH AND READY IS.
ORWOOD TRACT
WOOD-WARD IS.
UPPER JONES TRACT
DISCOVERY BAY
MIDDLE ROBERTS ISLAND
VICTORIA ISLAND
BYRON TRACT
Byron
UNION ISLAND
UPPER ROBERTS ISLAND
CLIFTON COURT FOREBAY
CONEY ISLAND
FABIAN TRACT
STEWART TRACT
HARVEY O. BANKS DELTA PUMPING PLANT
TRACY PUMPING PLANT
SOUTH BAY PUMPING PLANT
TRACY
LODI
SACRAMENTO
SAN JOAQUIN
RIVER
YOLO BYPASS
CONTRA COSTA CANAL
N

Compare the correct map with the "Flooded Island Feasibility Baseline Report from 2005.[45] Hint: there are at least 8 mistakes in this one map:



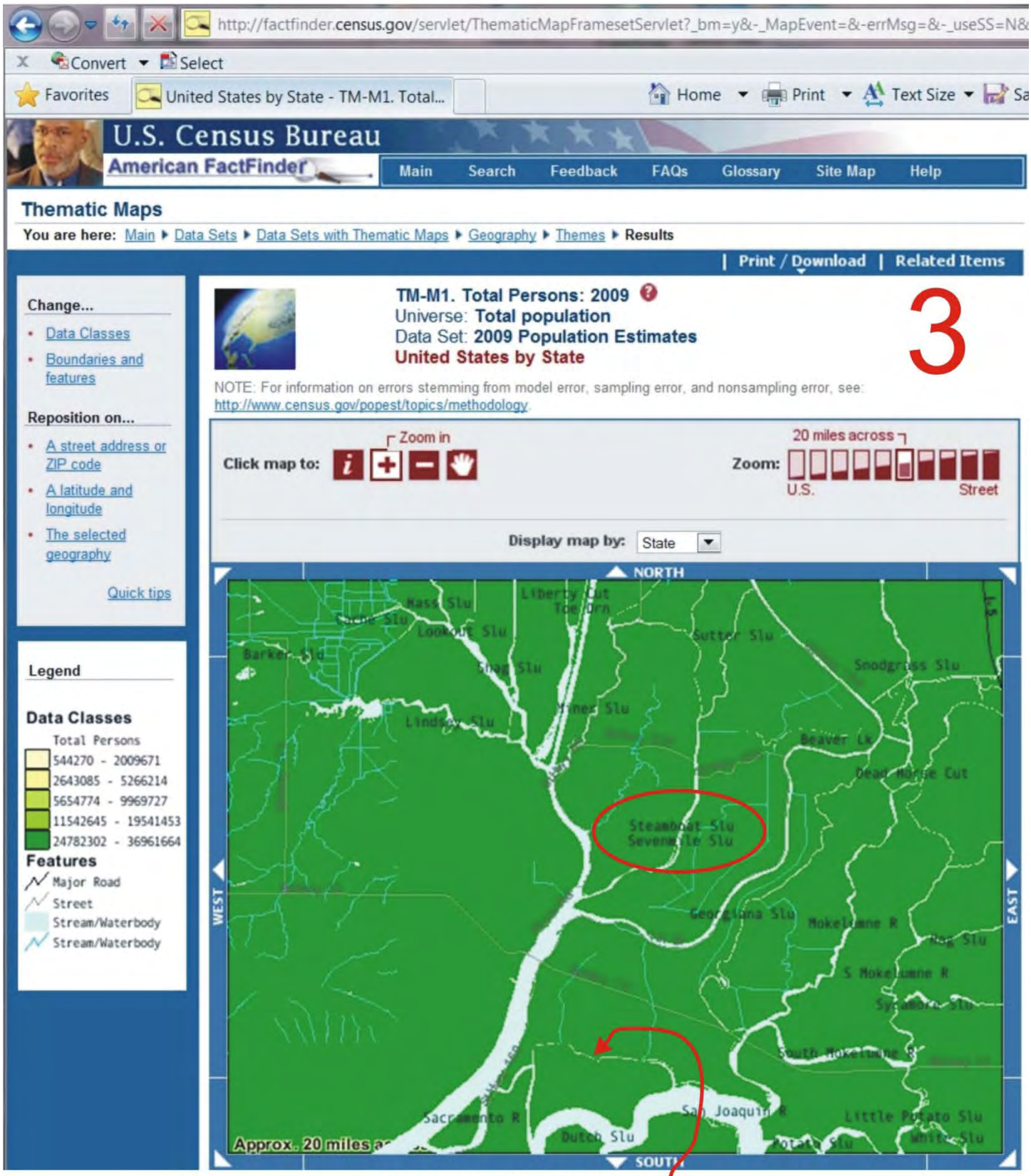
[45] http://www.water.ca.gov/frankstract/docs/%286%29Flooded%20Islands%20Pre-Feasibility%20Report.pdf page 19 and also http://baydeltaoffice.water.ca.gov/ndelta/summaryreport/index.cfm for links to the modeling results



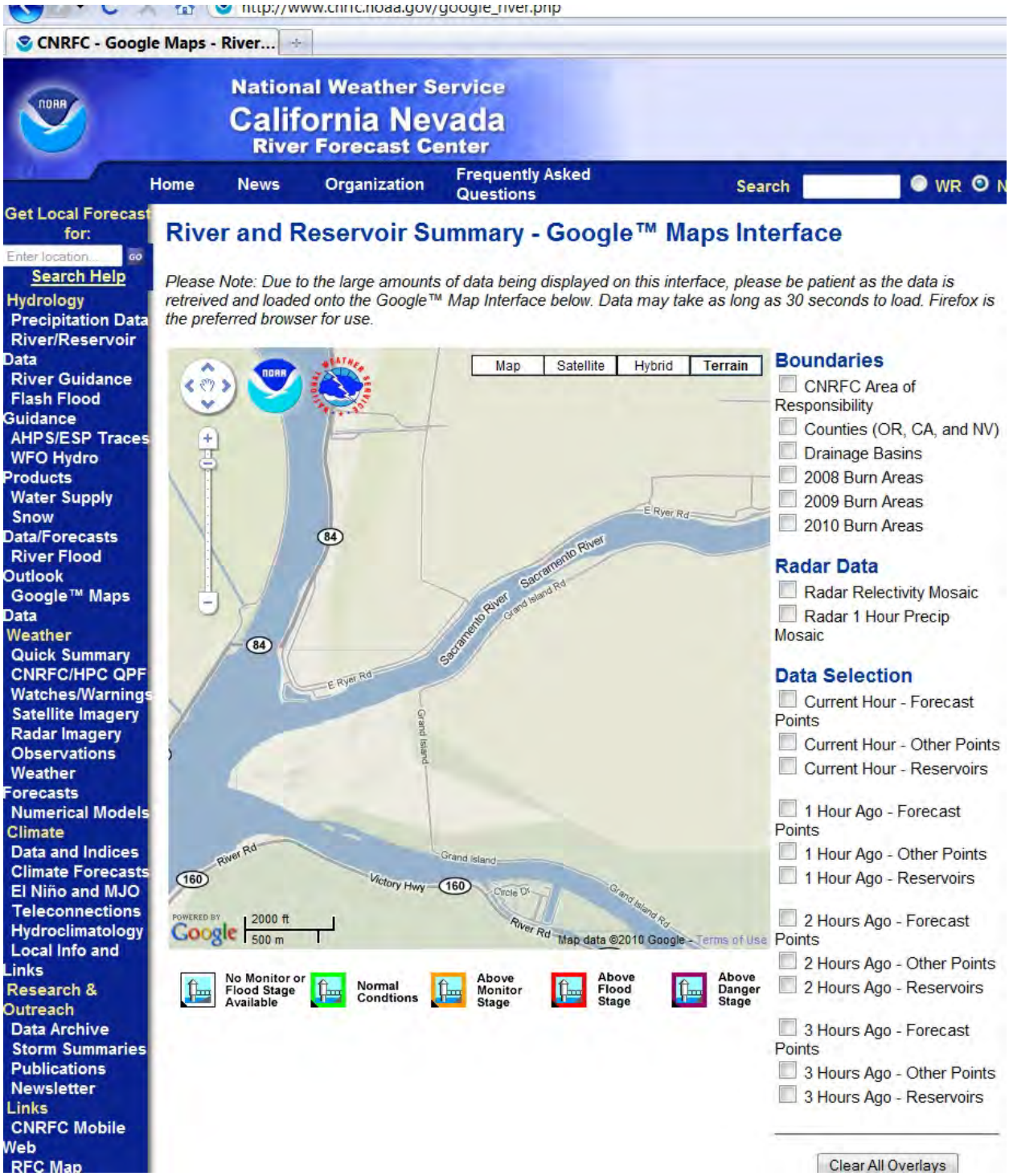
The above map is from the DWR study on geomorphology dated 2007[46]. It's a test of your knowledge of some of the Delta waterways. Hint: Look for the Sacramento River, Steamboat Slough, Sutter Slough. Note the study that shows online has now been corrected, at least the map has been corrected.

[46] http://www.water.ca.gov/floodmgmt/dsmo/sab/drmsp/docs/Geomorphology_TM-updated07.pdf See page 33
http://www.water.ca.gov/floodmgmt/dsmo/sab/drmsp/docs/Geomorphology_TM.pdf the same map, corrected

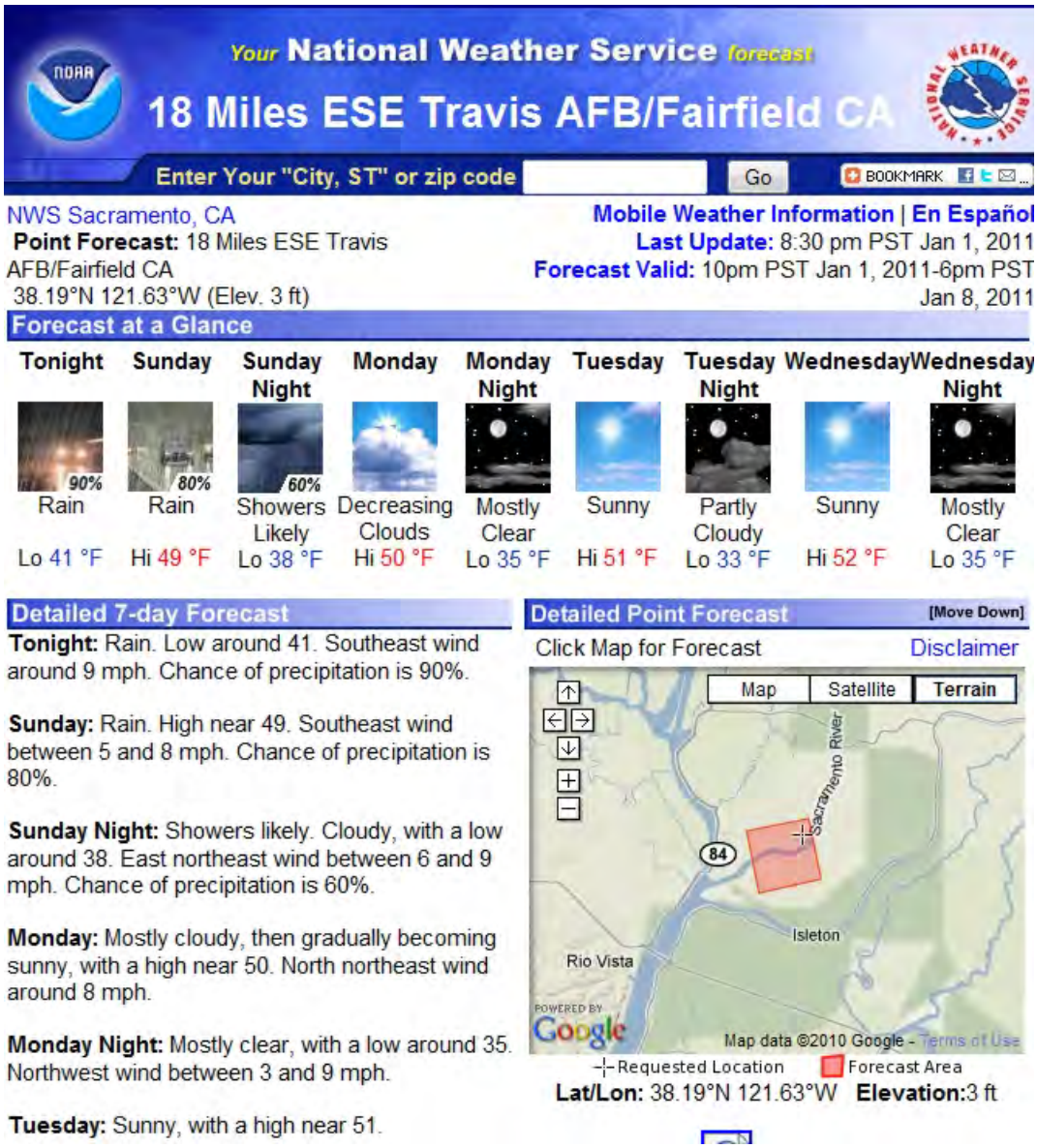
Below is the US Census Bureau map, which renames Steamboat Slough as Seven Mile Slough. Seven Mile Slough is located in Sacramento County, down by Twitchel Island, not where the map below shows it. If the US Census Bureau can't even get a waterway location right, how can we trust their reports on the census for 2010?!



Seven Mile Slough is here



Above is a “print screen” from the NOAA website, and it also confuses Steamboat Slough with the Sacramento River. In cases of emergency, does NOAA recommend boaters on Steamboat Slough define their location as Sacramento River instead?



NOAA national weather service website “print screen” also shows Steamboat Slough as the Sacramento River. When did Steamboat Slough officially get renamed to Sacramento River?