Operational Changes Due to the Salmon & Smelt BO's

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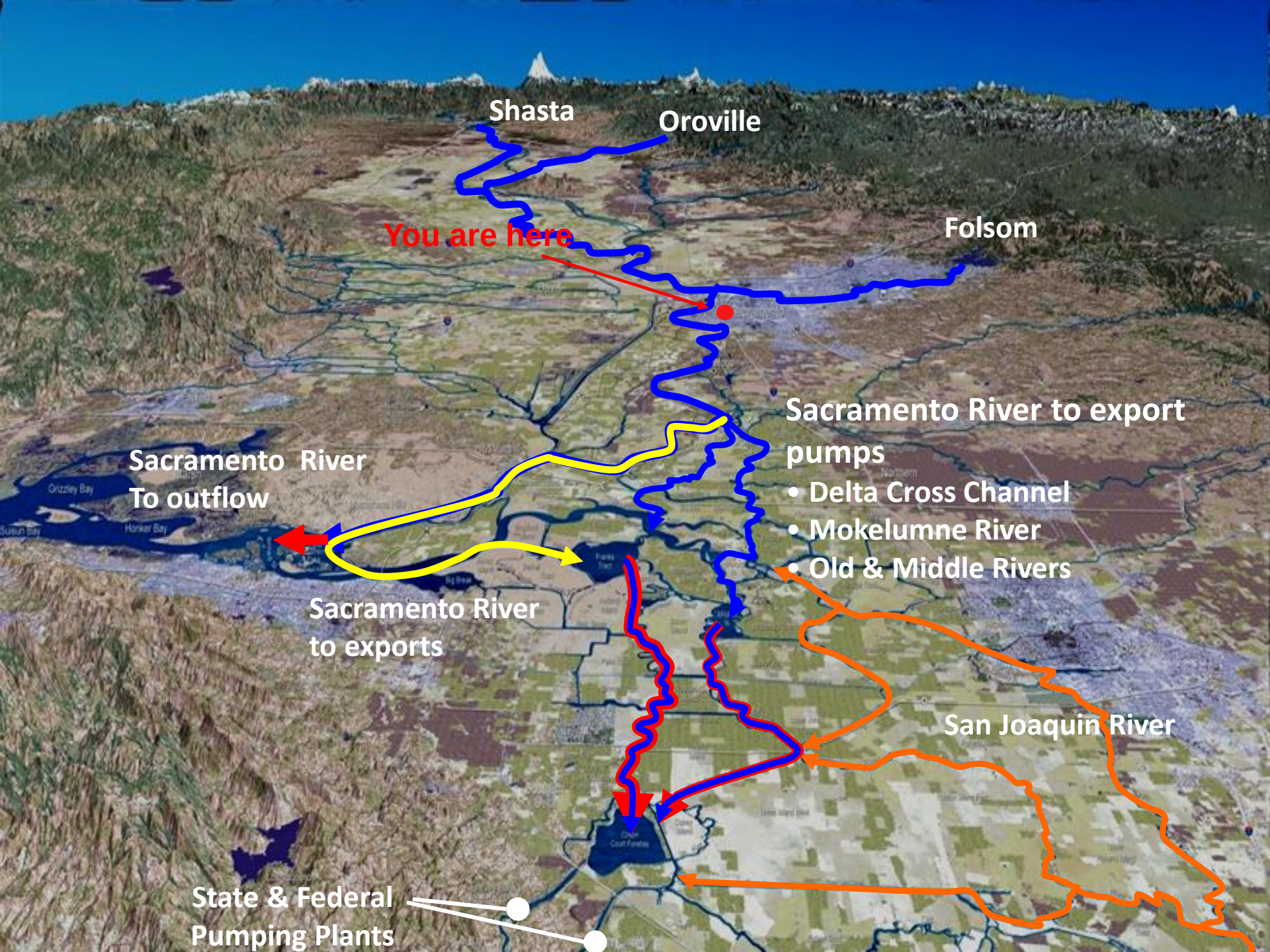
MBK ENGINEERS

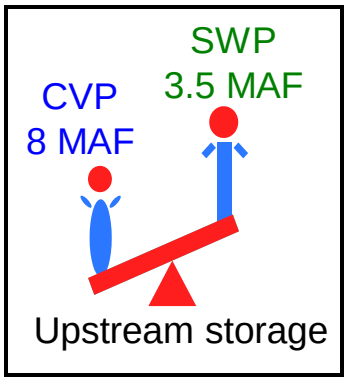
Topics

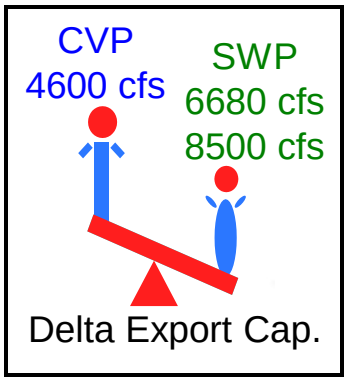
- Review of basic CVP/SWP operations
  - CVP/SWP key facilities
  - CVP/SWP characteristics
  - Operational requirements
- Major operational changes due to BO's
  - Review of historical data
- Major operational changes due to BO's
  - Modeling analysis
- Other effects


Shasta
Oroville
You are here
Folsom
Sacramento River to export pumps
• Delta Cross Channel
• Mokelumne River
• Old & Middle Rivers
Sacramento River To outflow
Sacramento River to exports
San Joaquin River
State & Federal Pumping Plants

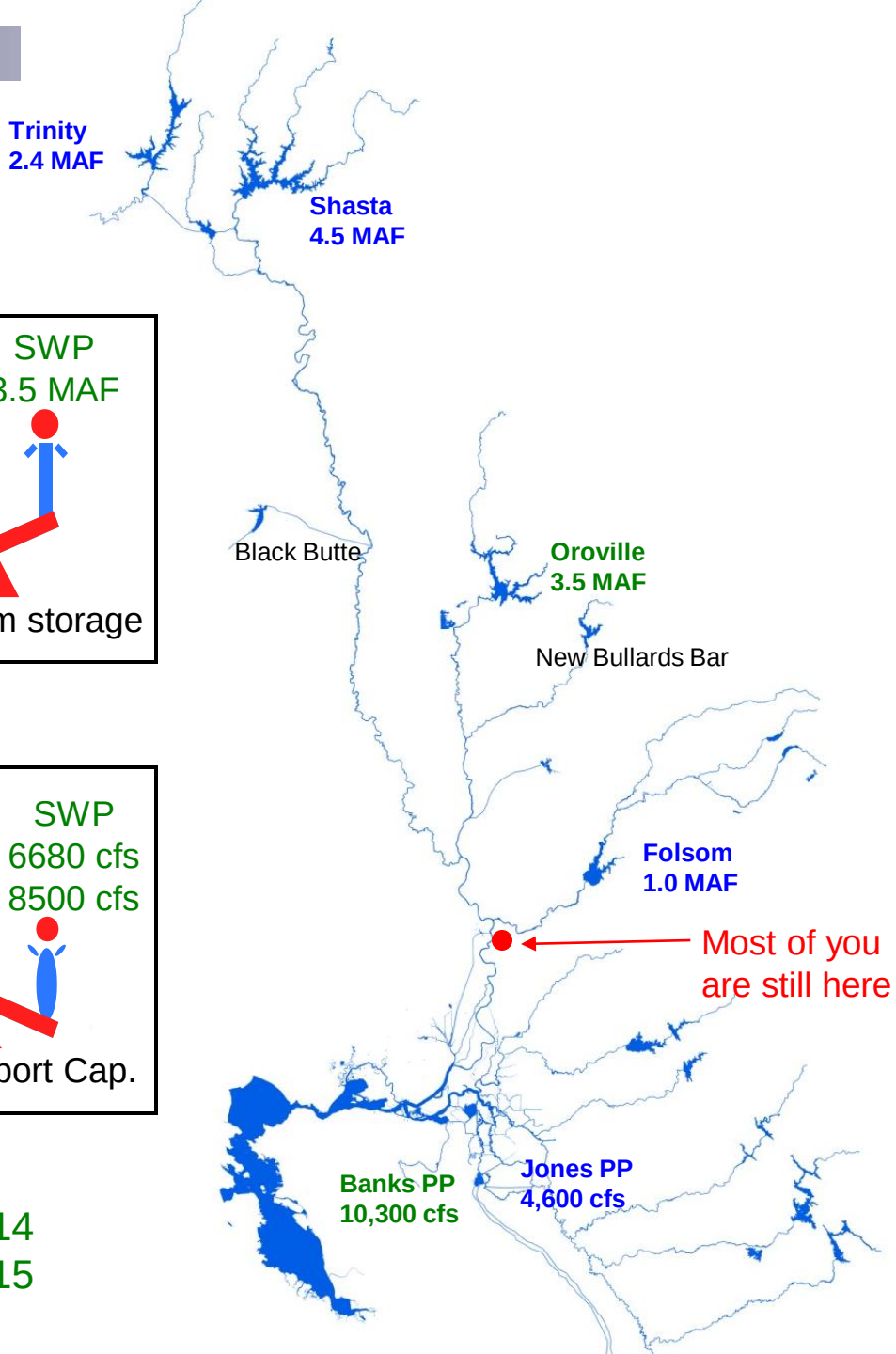
Key Features of CVP/SWP

- CVP
  - Upstream storage
    - Total about 8 MAF
  - Export
    - 4,600 cfs capacity

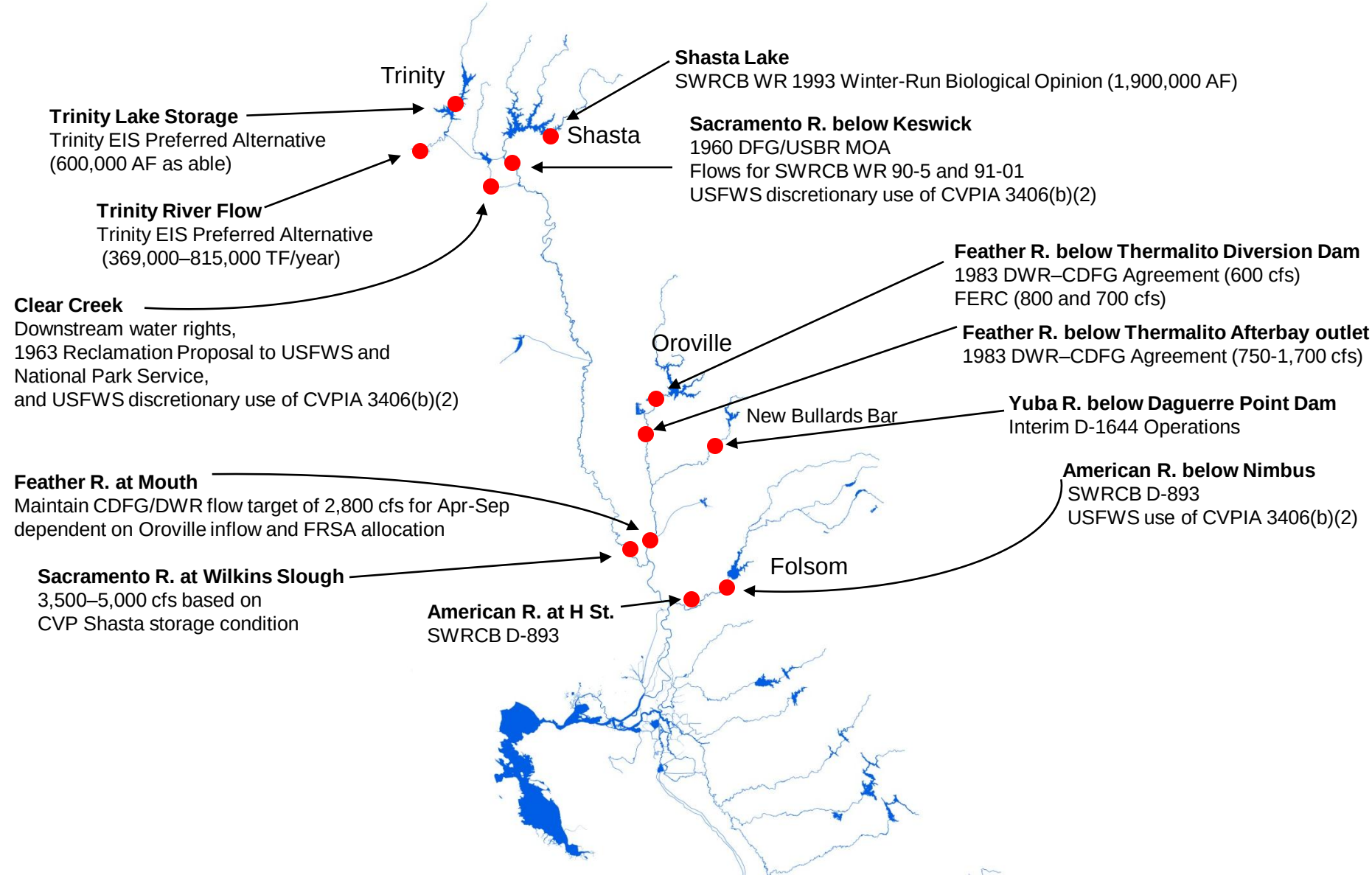




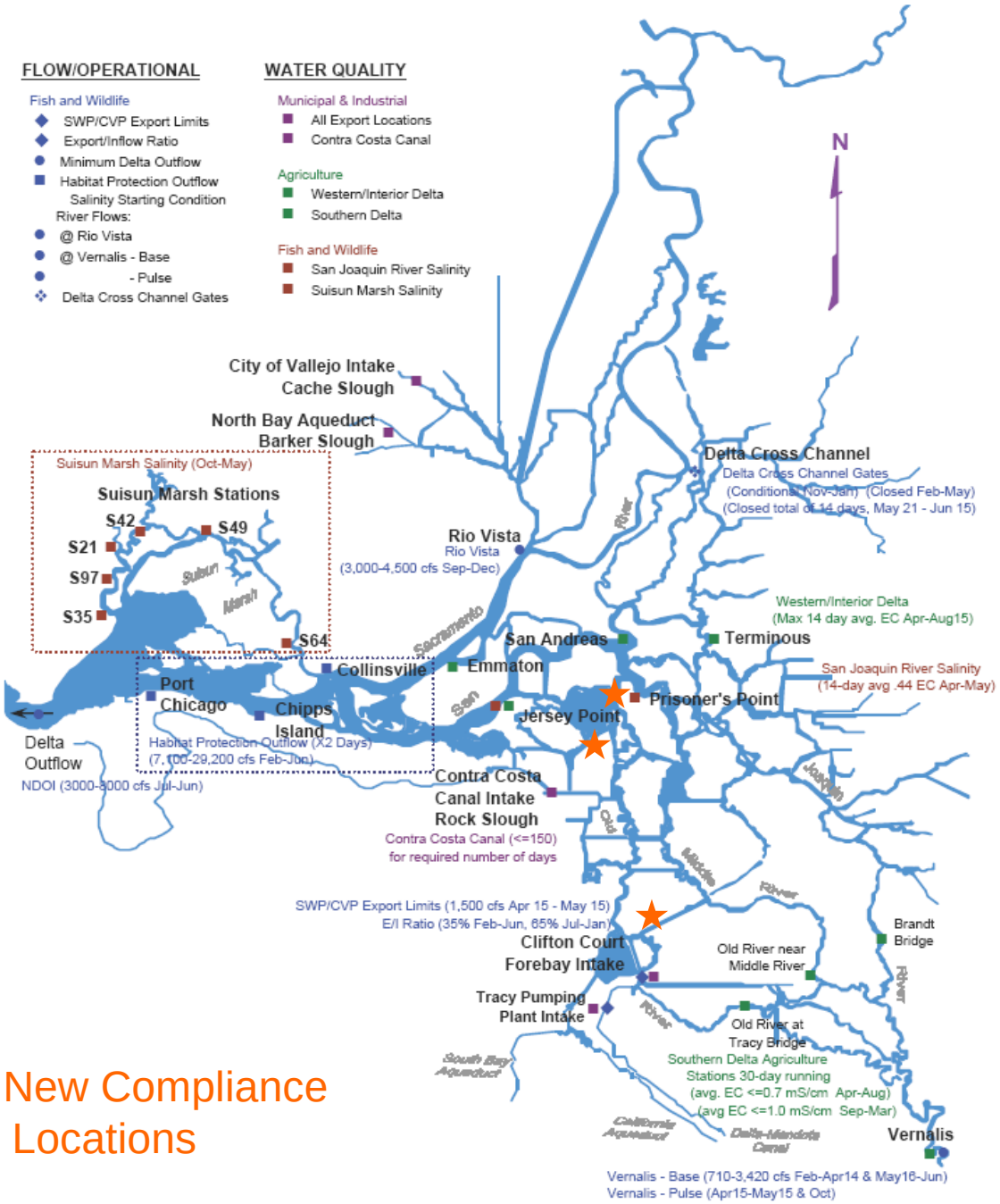
- SWP
  - Upstream storage
    - Total about 3.5 MAF
  - Export
    - 6,680 cfs March 16 – December 14
    - 8,500 cfs December 15 – March 15



North of Delta Flow Criteria



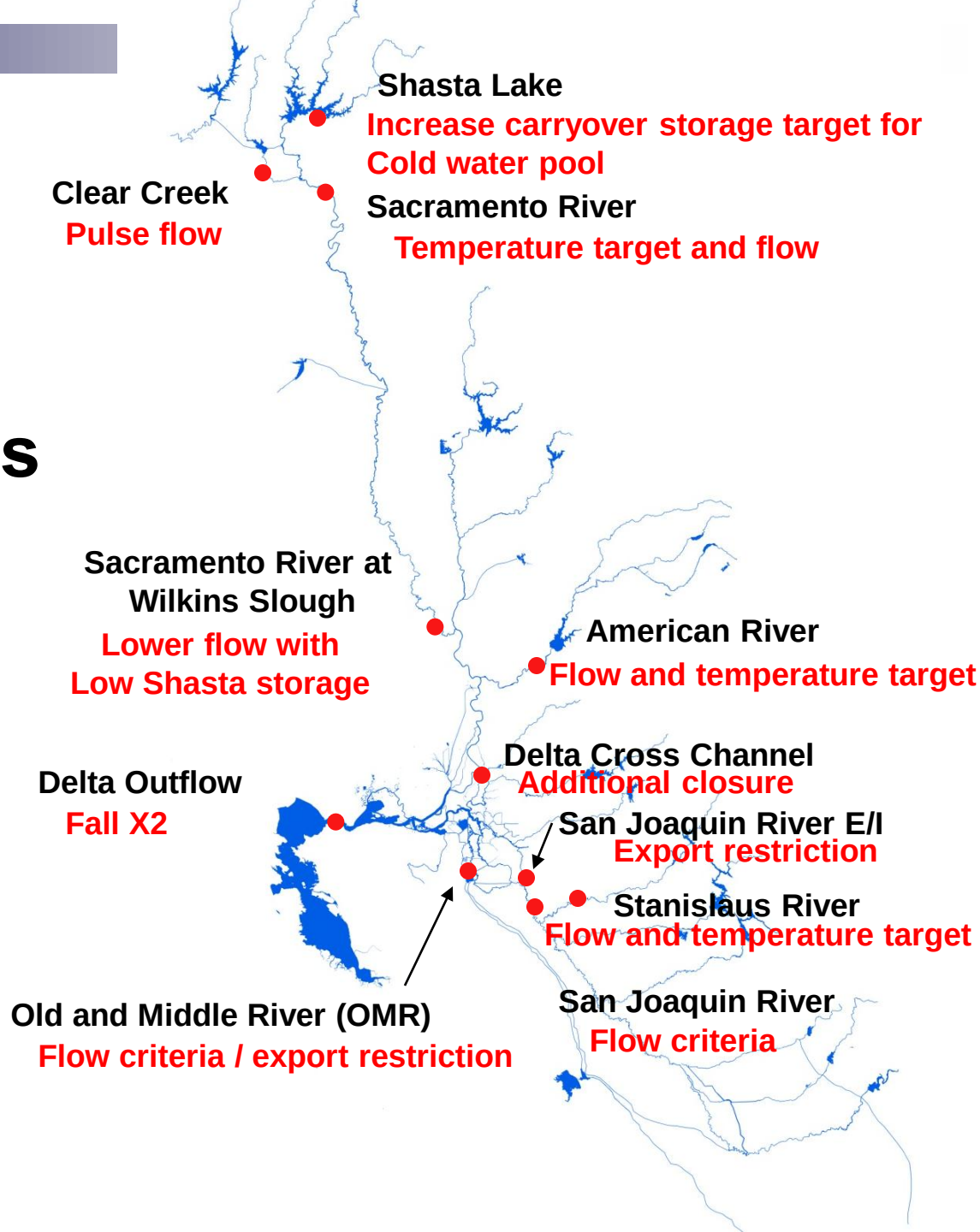
D-1641 Bay-Delta Standards Stations



★New Compliance Locations

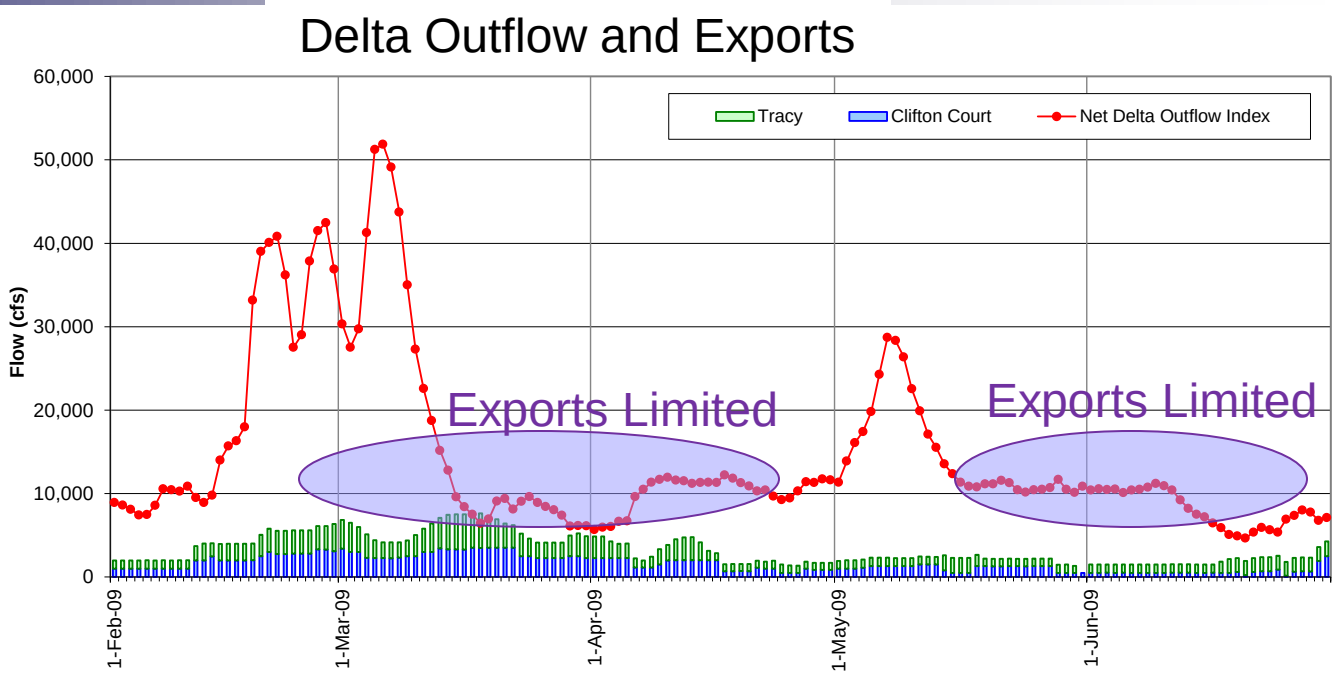
New Criteria From BO's

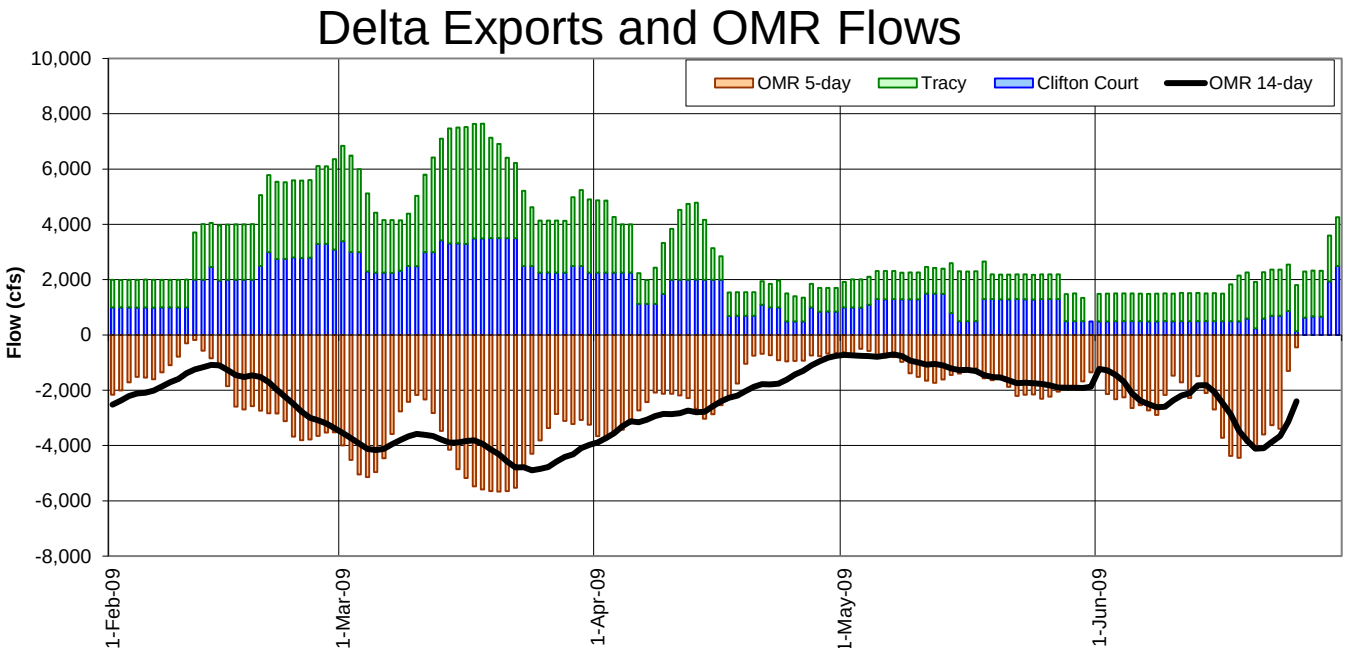
- Salmon BO RPA's
- Smelt BO RPA's



Recent Operations With Court Ordered OMR Requirements

Daily from
February 1, 2009
To
June 28, 2009





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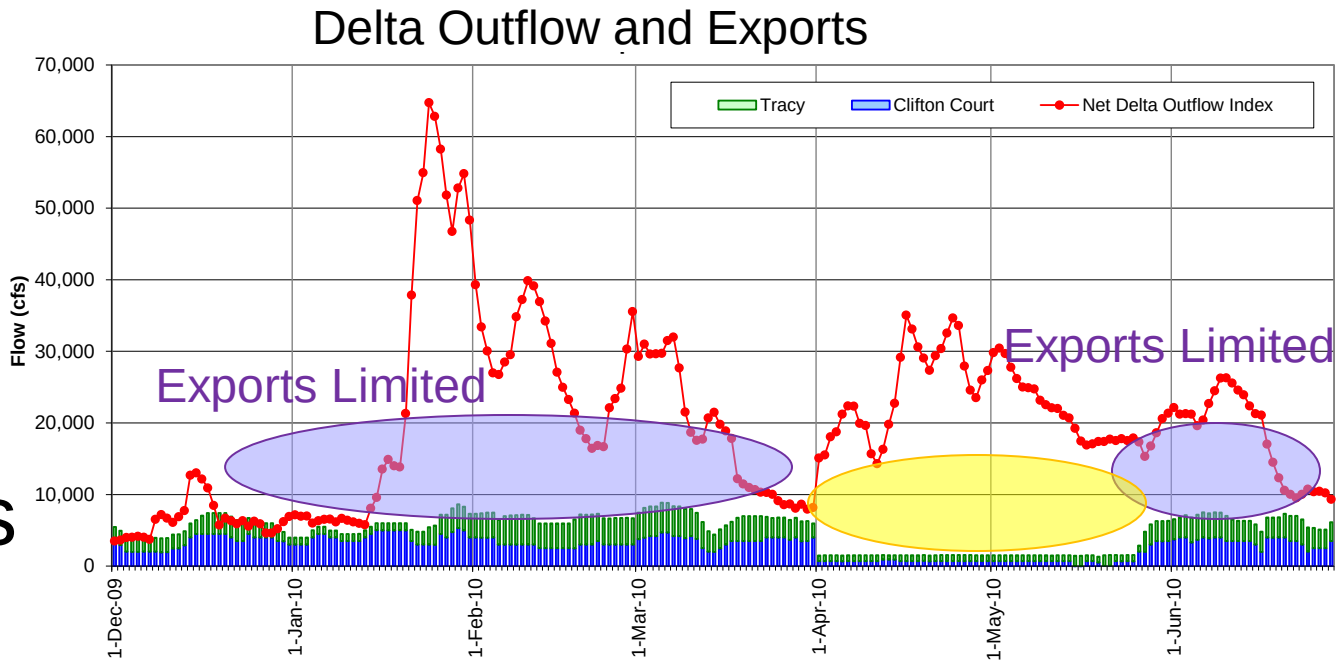

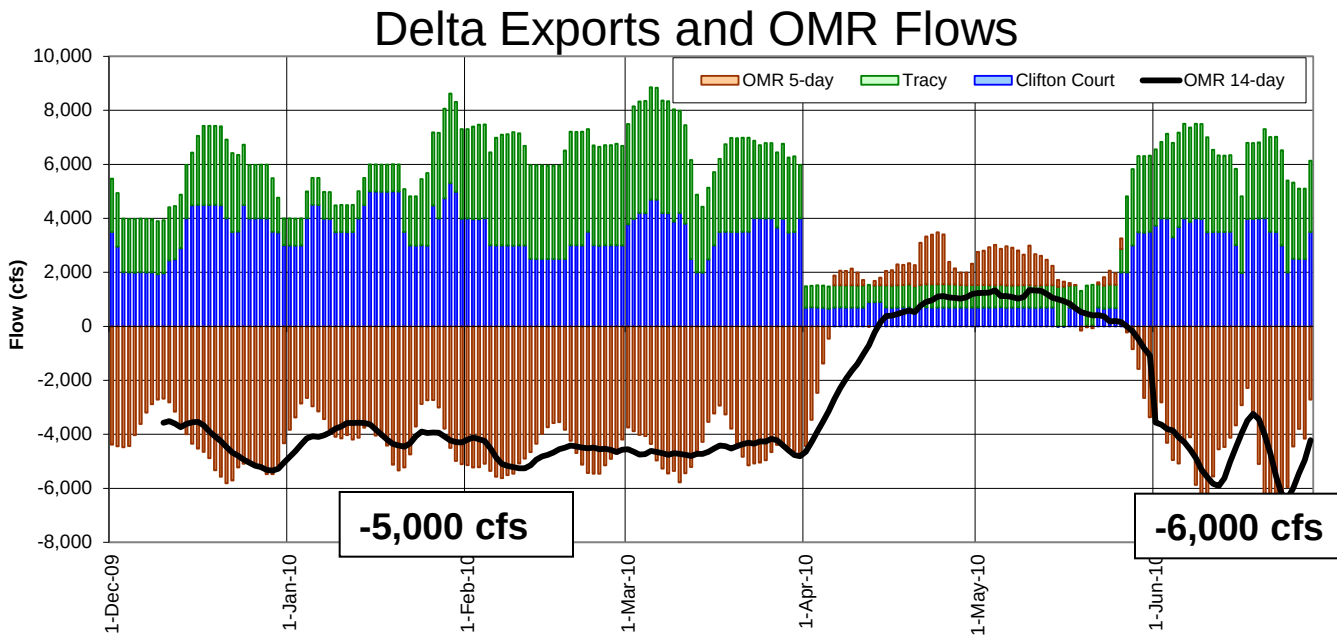

Recent Operations With Court Ordered OMR Requirements

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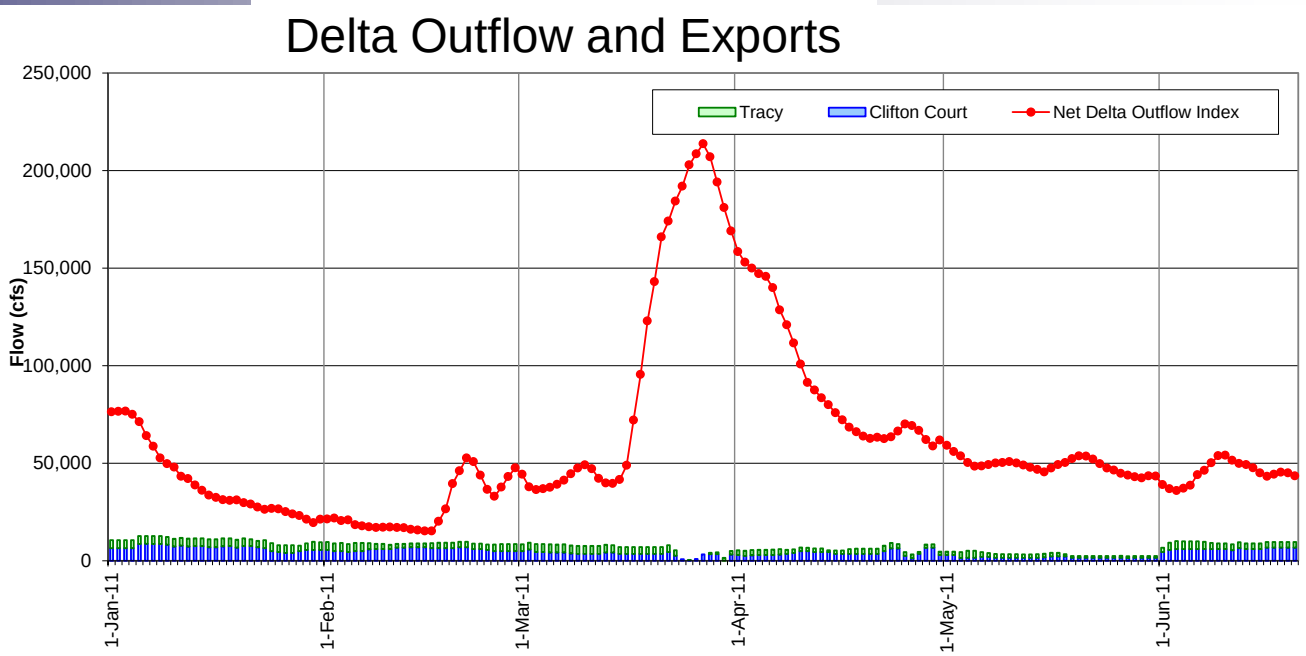
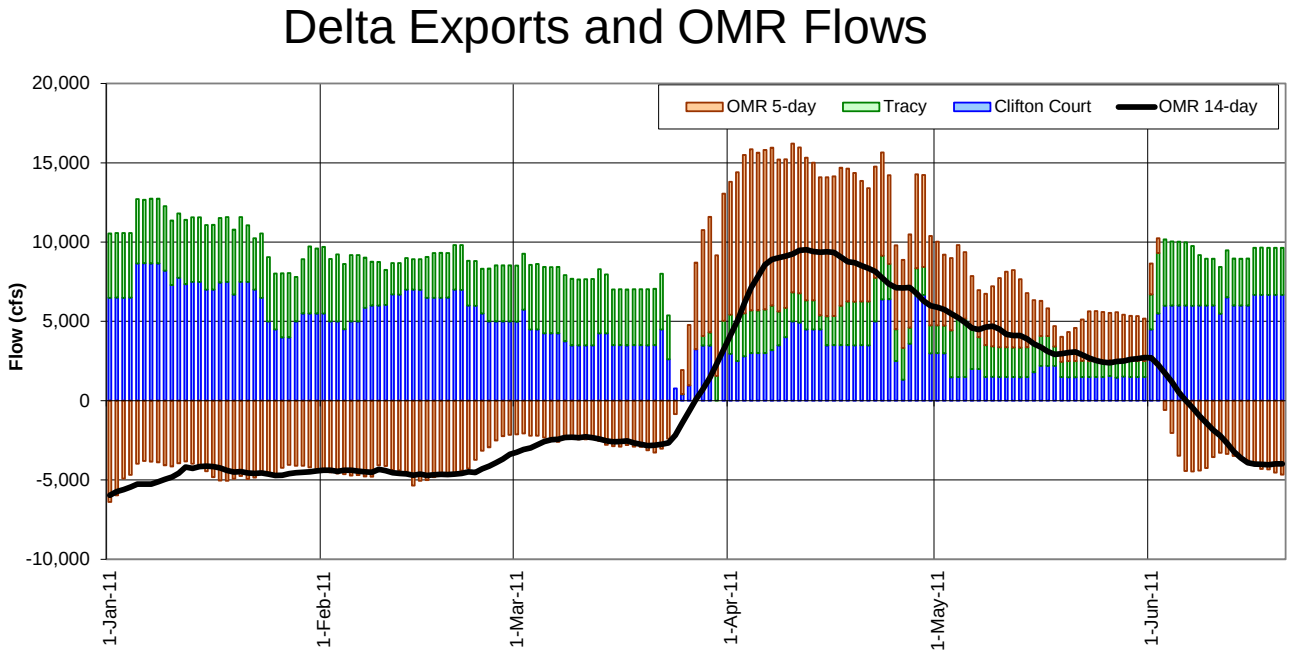
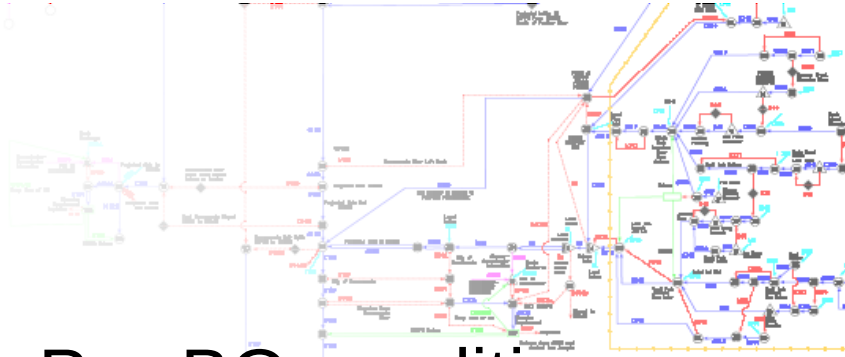
To
June 20, 2011





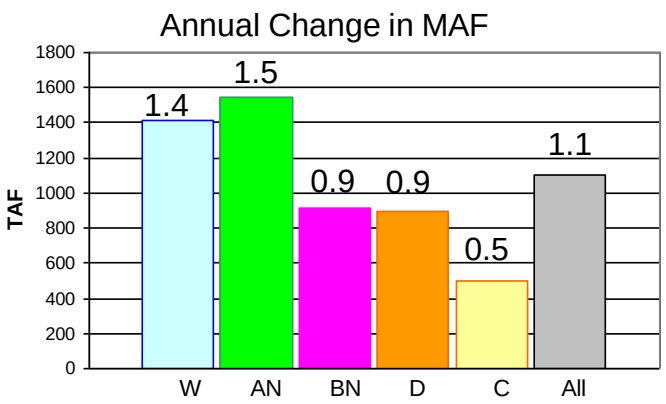
Modeling

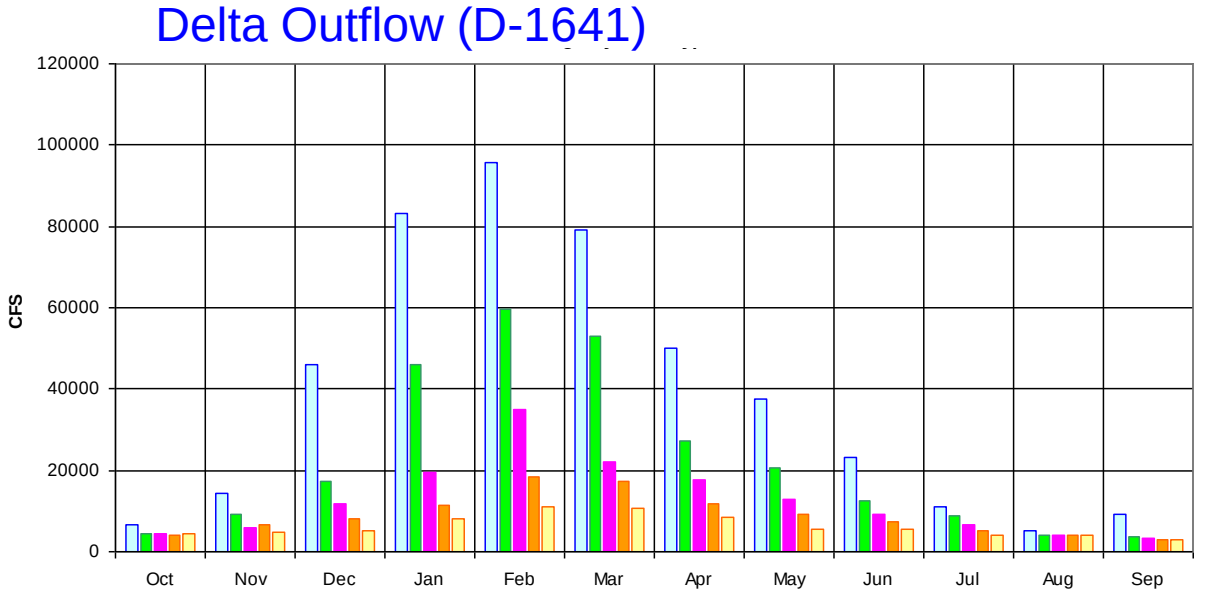


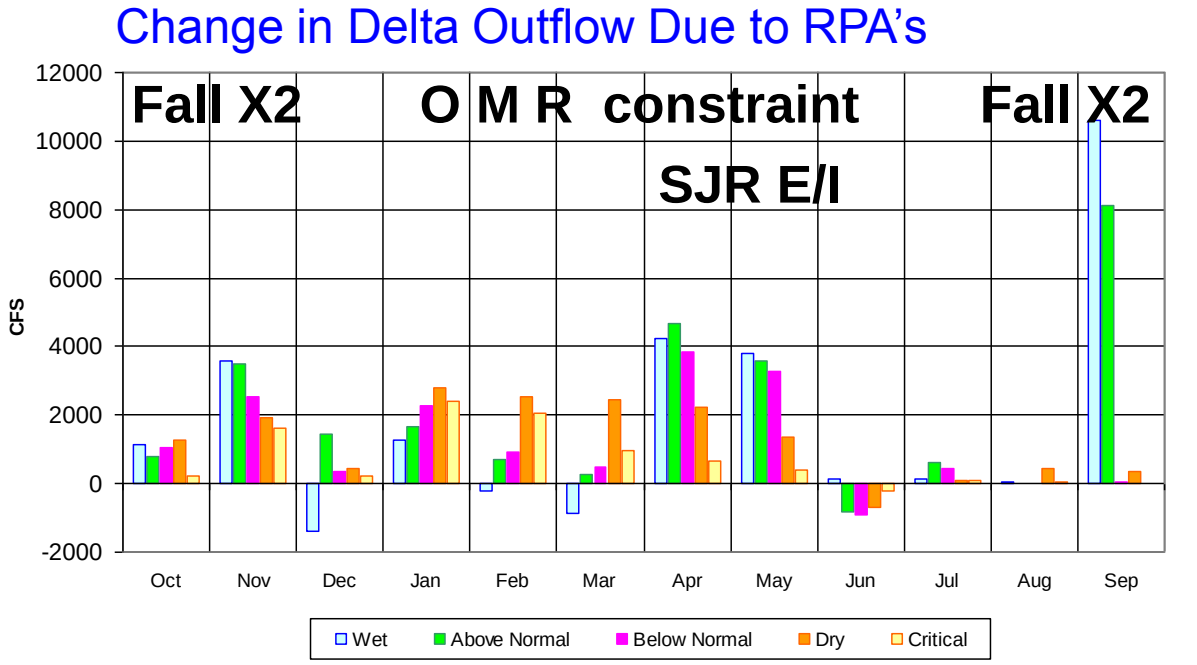
- Model system operations with Pre-BO conditions
- Model system operation with Salmon and Smelt BO's
- Compare model runs to assess operational changes to CVP/SWP system
- Use State Water Project Delivery Reliability Report CalSim II modeling
- These results were submitted to the SWRCB for the Delta outflow proceeding

Delta Outflow

- Based on SWP Reliability Study models
- Increase due to BO's
  - Additional exports restrictions
  - Additional required outflow

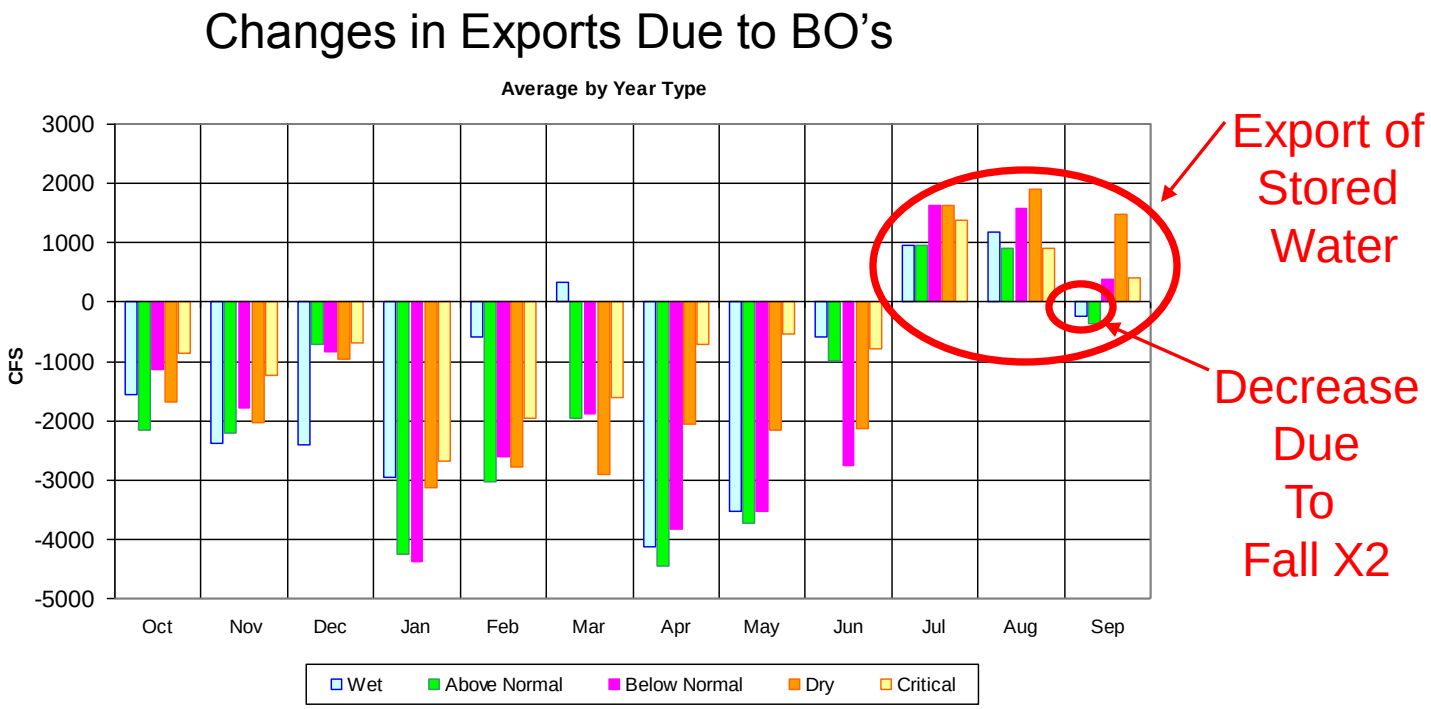




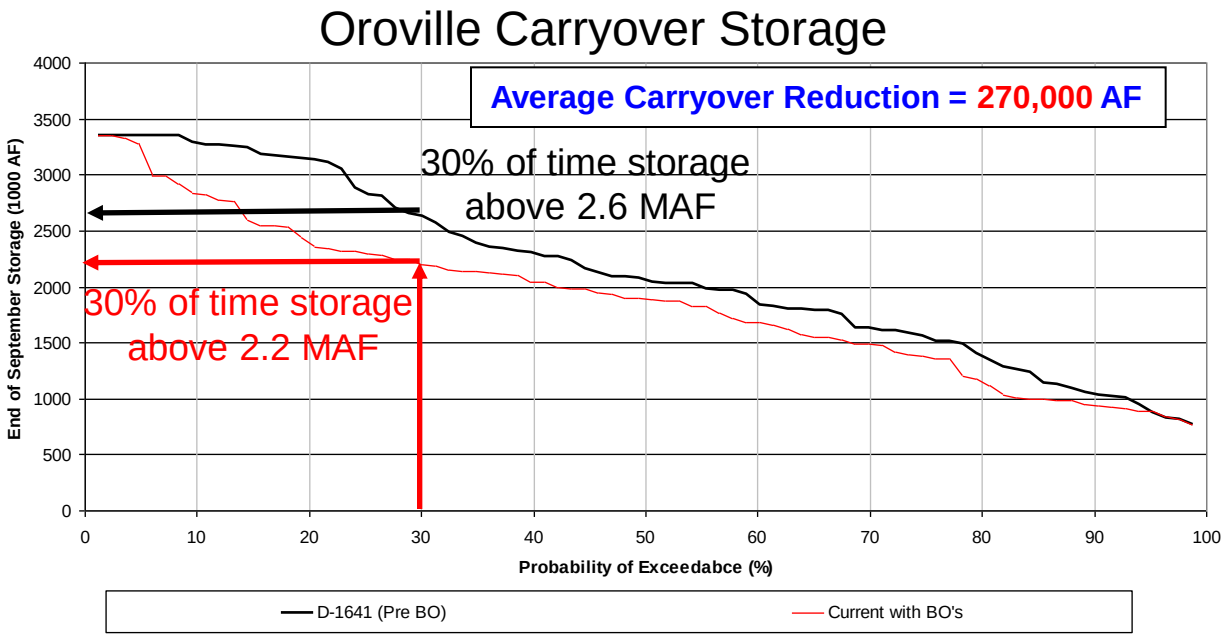


Delta Exports

- Exports restricted most when outflow is generally higher (December – June)
- Exports increase during summer months (July – September)

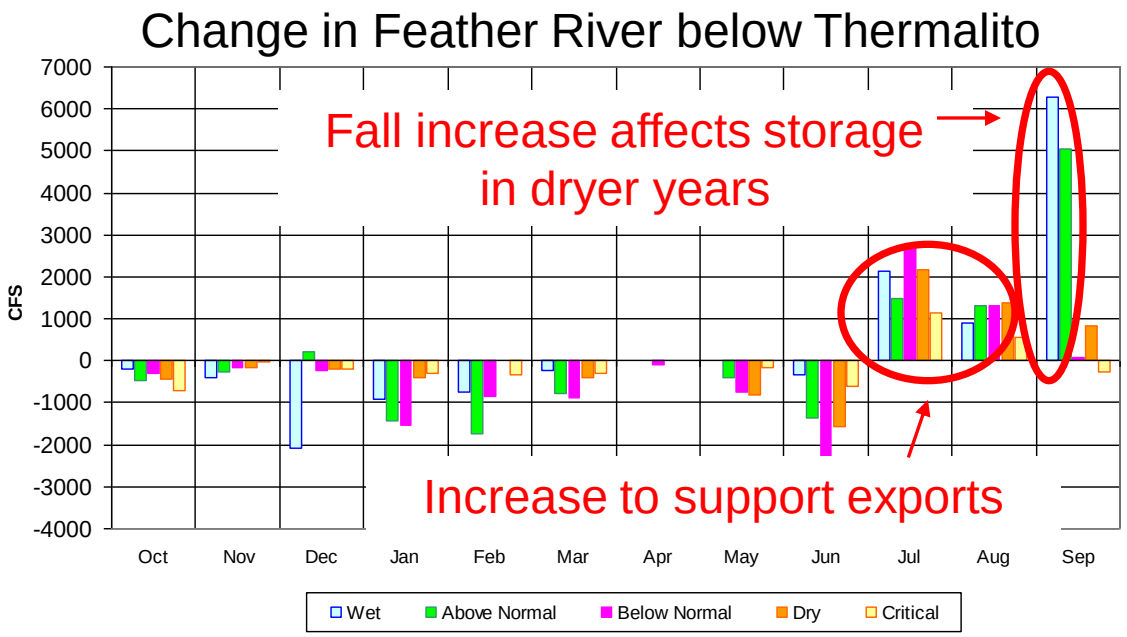


SWP Changes Due to BO's



Change in SWP South of Delta deliveries Conservative estimate (1000 AF)

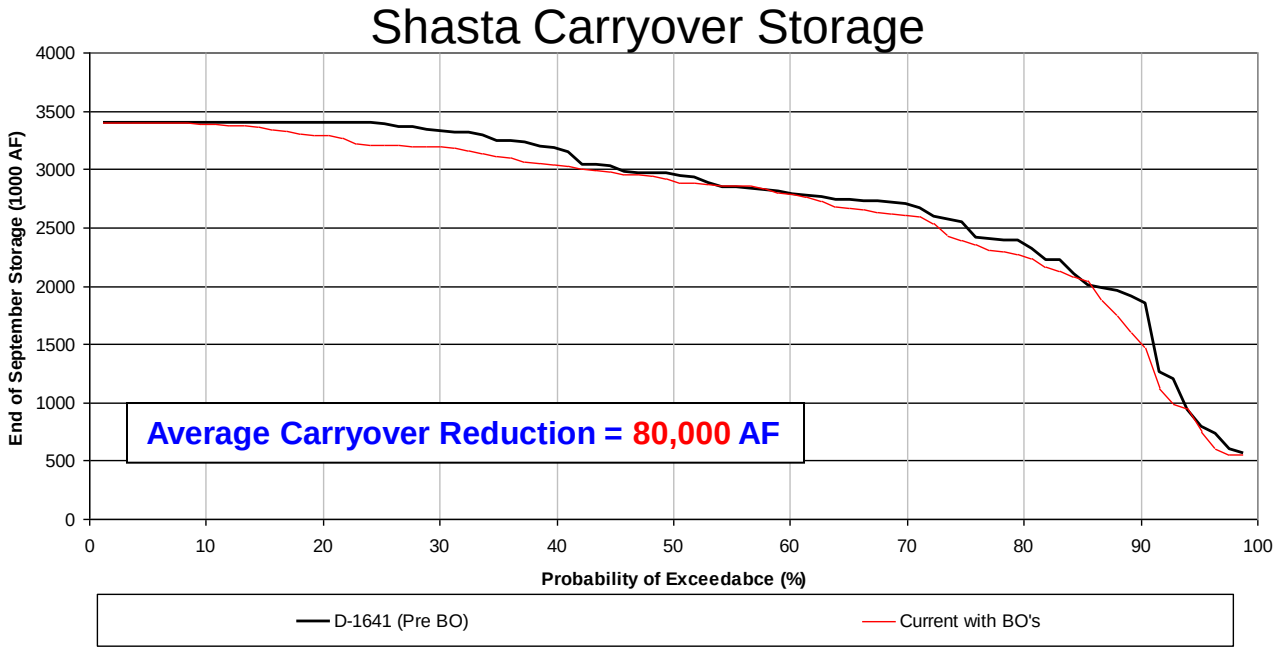
Table A = -260,000
Article 21 = -380,000
Article 56 = -50,000
Total = -690,000



SWP operational changes

- Pre BO: SWP relied on exporting surplus flows and used Oroville Reservoir for dry year reliability
- Post BO: SWP ability to divert surplus is limited, therefore the SWP relies on Oroville storage release to support exports during July – September
- Increase Fall release causing lower carryover and dryer year impacts

CVP Changes Due to BO's

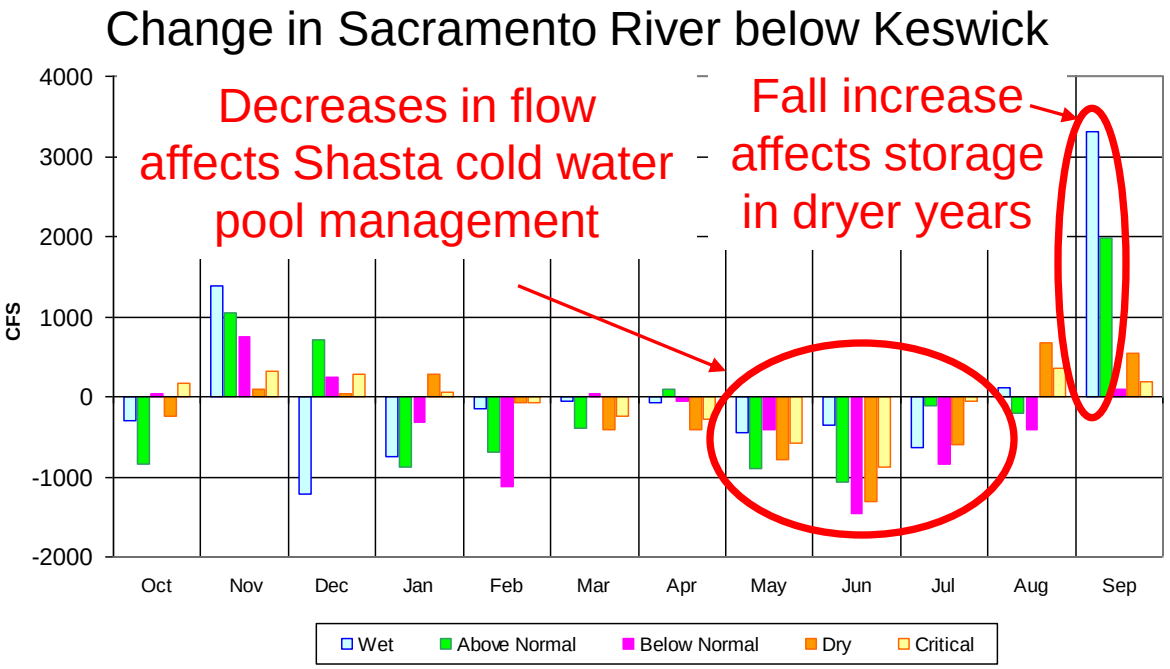


Change in CVP Deliveries (1000 AF)

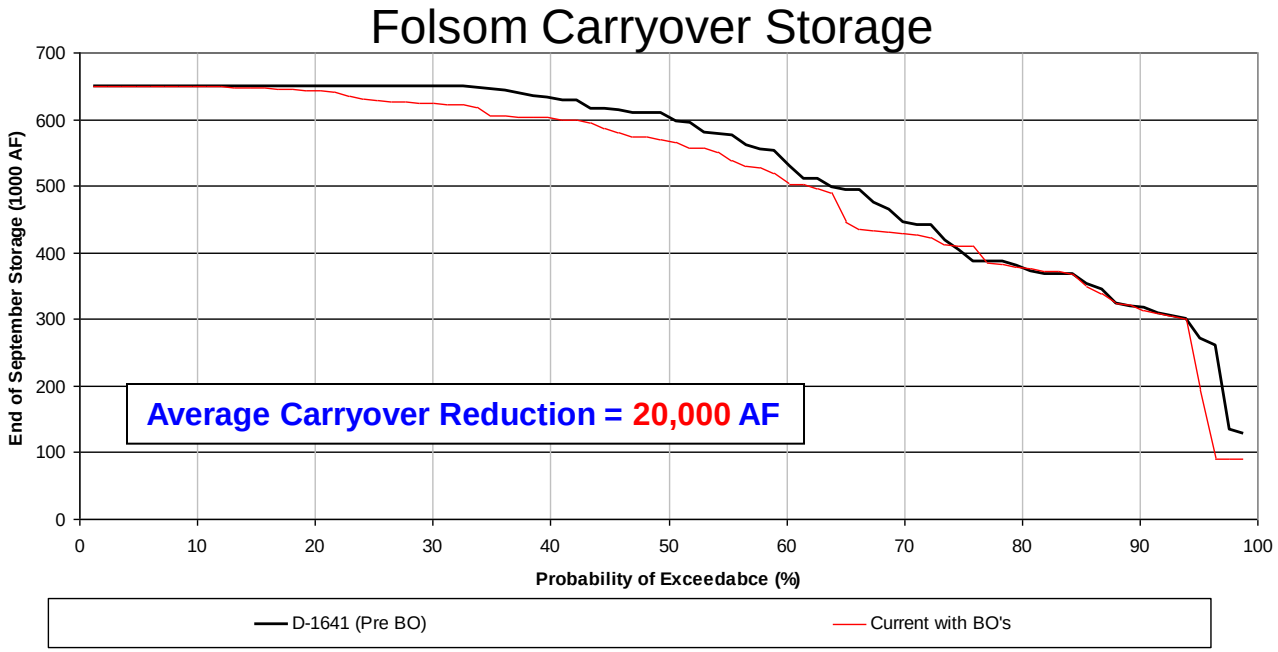
North of Delta = -20,000

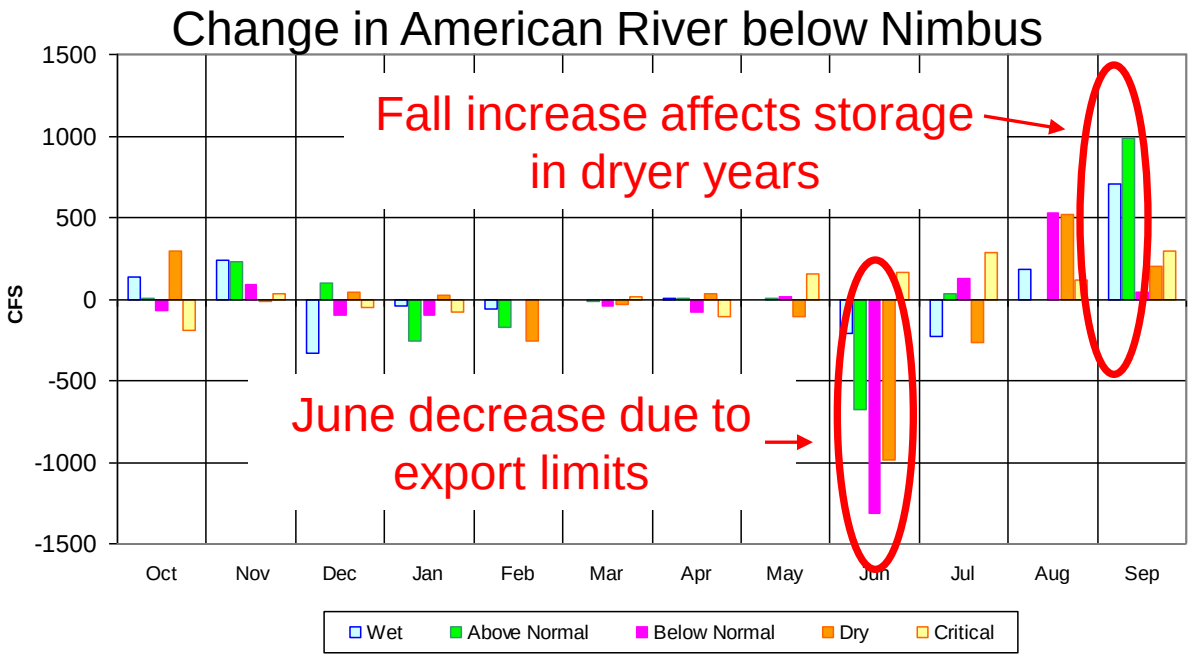
South of Delta = -225,000

Total = -245,000



CVP Changes Due to BO's





CVP operational changes

- Pre BO: CVP relied on exporting surplus flows and less on upstream storage releases
- Post BO: increased released from Folsom and sometimes Shasta Reservoirs to support exports during July – September
  - Not as extreme as SWP changes
- Increase Fall release causing lower carryover and dryer year impacts

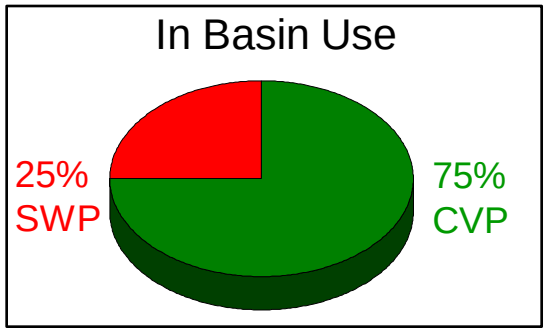
Other Effects

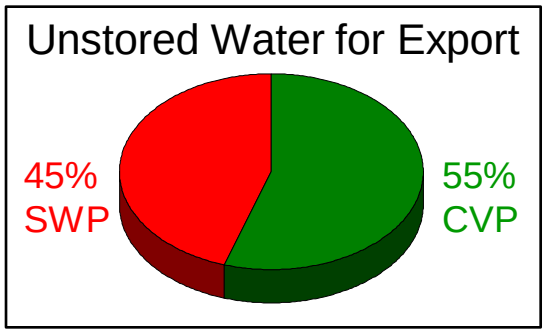
- Water management planning
  - Decrease in water supply reliability
- Groundwater use and levels
- Institutional agreements
  - Coordinated Operation Agreement
- Decrease in ability to transfer water
- Economic

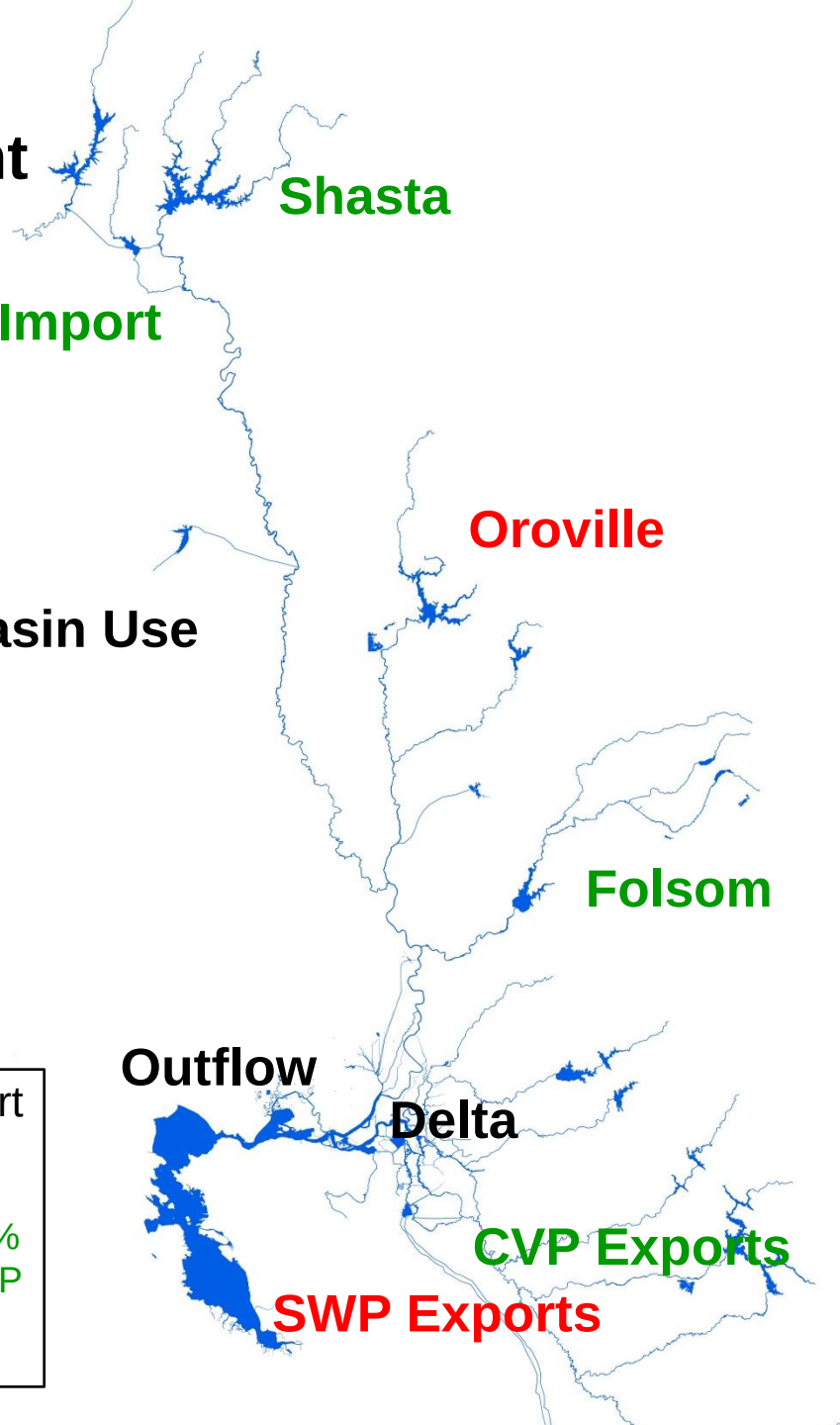
Coordinated Operation Agreement Facilities And Sharing

COA does not describe sharing associated with:

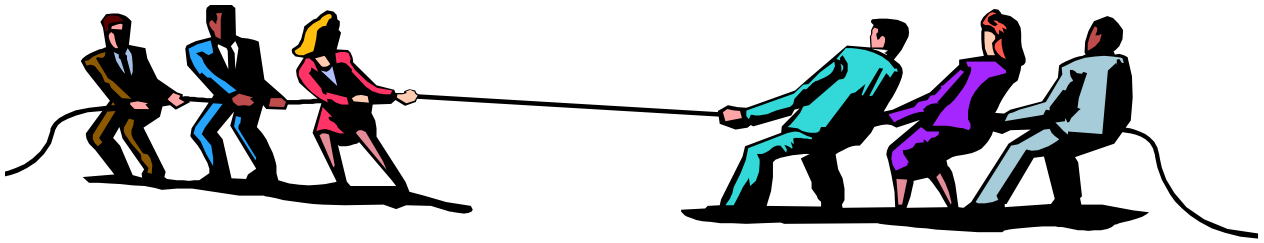
- D-1641 export restrictions (EI ratio)
- OMR export restrictions
- SJR inflow/export restriction
- Responsibility for meeting increased outflow







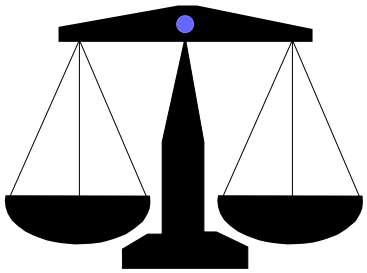
Smelt RPA's and Salmon RPA's Compete For Same Water



Upstream habitat vs. Delta outflow

- The challenge is developing criteria to balance the system
  - One criterion does not fit all hydrologic conditions

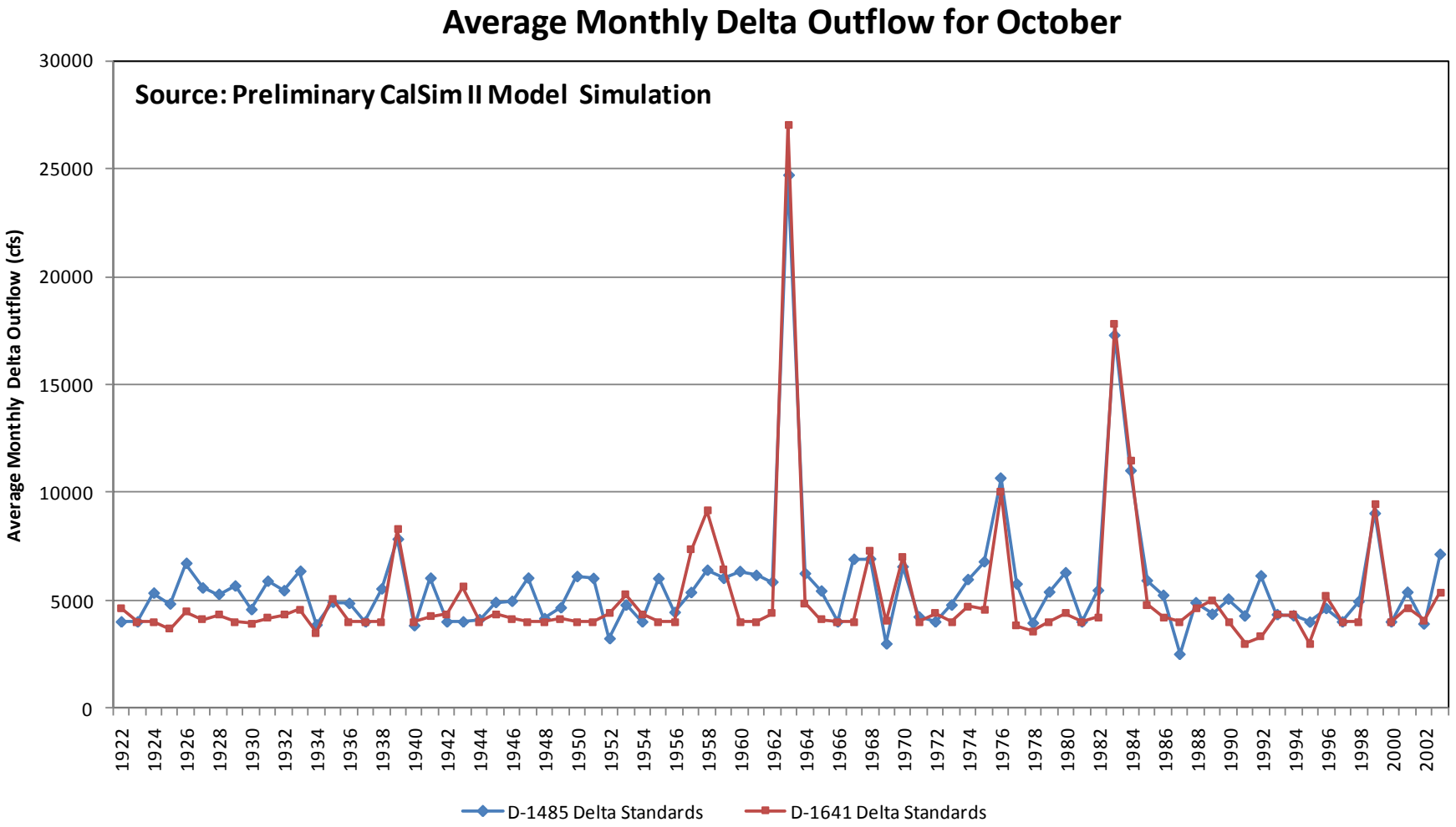
Tradeoffs



Water Deliveries	Delta Outflow
Delta Flow Requirements	Upstream Environmental Benefit
CVP North of Delta Delivery	CVP South of Delta Delivery
Shasta Storage	Folsom Storage
Oroville Storage	SWP SOD Storage
American River Fisheries	Sacramento River Fisheries
North of Delta Storage	South of Delta Storage
Stream Temperature	Stream Habitat
Power	Water Supply
Species A	Species B

Example of Tradeoffs

Fall Delta Outflow Variation is Affected by Spring Flow Requirements



Summary

- RPA's cause change in operational strategy for SWP and CVP
- Operation of the entire Delta watershed is affected when one component is changed
- Very difficult to develop criteria to protect individual species without impacting others