Real Time Data and Forecasting Project
Water Quality Weekly Report
Volume 6, Issue 15 Monday April 13, 2009
Office of Water Quality, Municipal Water Quality Investigations
California Department of Water Resources

For questions contact Joe Christen, (916) 376 9710, email jchriste@water.ca.gov

# 1. Summary Comments, Observations and Interpretation

Updated modeled volumetric and constituent fingerprint graphs for the Clifton Court Forebay, Jones Pumping Plant, and Old River at Rock Slough locations are presented on pages 6-7. Measured DOC concentrations are significantly greater during the February-March period than the modeled values.

**Precipitation:** The NOAA River Forecast Center predicts slight chances of rain in the lower mountain areas for tonight and Tuesday.

**Flow:** As of ***April 12, 2009:*** The **Sacramento River at Freeport** *mean daily flow* has increased to 13,864 cfs and the NOAA River Forecast Center predicts that the Sacramento River flow will begin to decrease gradually today. The **San Joaquin River near Vernalis** *mean daily flow* has increased to 1,448 cfs. The NOAA River Forecast Center indicates the San Joaquin flow will decrease slightly during the week. The **H. O. Banks Pumping Plant** *mean daily* pumping rate has increased to 2,192 cfs. The **C. W. Jones Pumping Plant** *mean daily* pumping rate increased to 2,743 cfs. The **Barker Slough Pumping Plant** *mean daily* pumping rate has continued to be low, 9 cfs. The **Delta Total Outflow** *index* has increased to 11,219 cfs. The Delta cross-channel gate has been closed since December 22.

**Salinity and Anions:** The modeled salinity forecast predicts that daily EC averages will start to increase at the export locations. As of ***April 12, 2009:*** *mean daily* EC in the **Sacramento River at Hood** decreased to 143µS/cm. The **Barker Slough Pumping Plant** *mean daily* EC has decreased slightly to 439 µS/cm. The **San Joaquin River near Vernalis** *mean daily* EC has decreased to 608 µS/cm. The **H. O. Banks Pumping Plant** *mean daily* EC increased to 354 µS/cm. **Anion data:** At the **H. O. Banks Pumping Plant** the bromide concentration increased slightly to 0.14 mg/L. The bromide concentration in the **San Joaquin near Vernalis** decreased to 0.28 mg/L.

**Organic Carbon:** As of ***April 12, 2009:*** In the **Sacramento River at Hood** *mean daily* TOC (combustion) increased slightly to 2 mg/L; the DOC concentration was 1.4 mg/L. In the **San Joaquin near Vernalis** the *mean daily* TOC concentration decreased to 3.9 mg/L and the DOC concentration decreased to 2.9 mg/L. At the **H. O. Banks Pumping Plant** the *mean daily* TOC decreased to 6.1 mg/L and the DOC concentration was 5.6 mg/L. At the ***Jones Pumping Plant*** the TOC concentration was 5.5 mg/L and the DOC concentration decreased to 4.3 mg/L.

## 2. Modeling Conditions and Assumptions

The attached model run results cover the period of April 7, 2009 through April 27, 2009 and are based on the following assumptions:

**Base Case**

1. CCFB Gates operate on a Priority 3 schedule from the beginning of the forecast period through to the end of the forecast period.
2. On Monday December 22, 2008 at approximately 3:45 PM the Cross Channel Gates were closed and remained closed until end of the forecast period.
3. All three ag. barriers are removed.
4. The head of Old River barrier is removed.
5. Suisun Marsh salinity control flashboards are installed and the boatlock is open for fish passage beginning October 2, 2008. The Suisun Marsh salinity control gates operations were suspended starting Feb 27, 2009 to the end of the forecast period.
6. San Joaquin River flow at Vernalis is assumed to decrease from about 1,115 cfs to about 1,000 cfs by the end of the forecast period.
7. San Joaquin River EC at Vernalis is projected to increase from 768 µS/cm at the beginning of the forecast period to 856 µS/cm at the end of forecast period.
8. CCFB intake begins at 1,125 cfs and increases to 1,130 cfs by the end of the forecast period.
9. Jones pumping begins at 859 cfs and increases to 900 cfs by the end of the forecast period.
10. Sacramento River flow at Freeport is around 12,035 cfs near the beginning of the forecast period and increases to 12,250 cfs by the end of the forecast period.

## 3. Temporary Barriers Update

**STATUS AS OF: April 9, 2009**

**Head of Old River (HOR) Barrier:**

The spring Head of Old River rock barrier will not be installed this season. Instead a Non-Physical Barrier (NPB) or "bubble barrier" is being installed. Installation began April 7. This experimental barrier—placed near the channel bottom and extending across the entrance to Old River—will use a combination of bubbles, lights, and sound to guide outmigrating Chinook salmon smolts away from Old River to continue their migration down the San Joaquin River. Underwater receivers will be installed to detect tagged smolts during the upcoming VAMP experiment fish releases to study the effectiveness of this NPB. The NPB will be removed at the end of May after the VAMP experiment ends.

**Agricultural Barriers (Old River near Tracy [ORT], Middle River [MR], Grant Line Canal [GLC]):**

Ag barriers are planned for installation in early May in accordance with past schedules. However, we are working closely with the U.S. Fish and Wildlife Agency to obtain a needed biological opinion for the construction impacts before we begin work.

http://baydeltaoffice.water.ca.gov/sdb/tbp/index_tbp.cfm

# 4. General Information

This weekly water quality report is produced by the Department of Water Resources, Office of Water Quality. Any questions, comments or suggestions are welcome. Please contact Joe Christen by email jchriste@water.ca.gov or by phone, (916) 376 9710. Each weekly issue is sent out electronically as an email attachment in Adobe Acrobat format. The corresponding data are also available as an Excel XP file at the MWQI Web site at http://www.wq.water.ca.gov/mwqi/RTDF/RTDF_weekly.cfm This report is part of the
Real Time Data and Forecasting (RTDF) project. The goal is to bring real time, near real time, and forecasted water quality data to source water managers, treatment plant operators, scientists, and other stakeholders.

If you find the information useful, feel free to share it with others. If you do not wish to receive this report in the future, please contact Joe Christen and you will be removed from the address list. Conversely, anyone interested in receiving this report can send a request to be added to the list.

This weekly report is a work in progress. The RTDF Steering Committee has provided guidance and this report will continue to evolve and provide more useful information.

Calculated Delta Inflow (Section 17) is the sum of CDEC flow data from the following stations:

Sacramento River at Freeport
San Joaquin River near Vernalis
Yolo Bypass near Woodland
Cosumnes River at Michigan Bar
Mormon Slough at Bellota (Calaveras River)
Camanche Reservoir (Mokelumne River)

**Useful links**:

| | |
|---|---|
| Station Meta Data, Maps and Related Data at | http://cdec.water.ca.gov/staMeta.html |
| CDEC Plotter at | http://cdec.water.ca.gov/cgi-progs/histPlot |
| Other Historical Water Quality Data at | http://wdl.water.ca.gov/wq-gst/ |
| IEP Maps of Delta Monitoring Stations | http://www.iep.ca.gov/dss/all/ |

***This report contains preliminary data and is subject to revision.***

***All figures except the EC forecasts and San Luis Storage represent mean daily data.***

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## 5. Other Information for the Week

**Instruments:**

The Pacheco Pumping Plant water quality station is offline. The Barker Slough Pumping Plant was offline due to the high organic carbon concentrations in the North Bay Aqueduct. Pumping resumed March 16th but since has continued at a very low rate (< 20cfs).

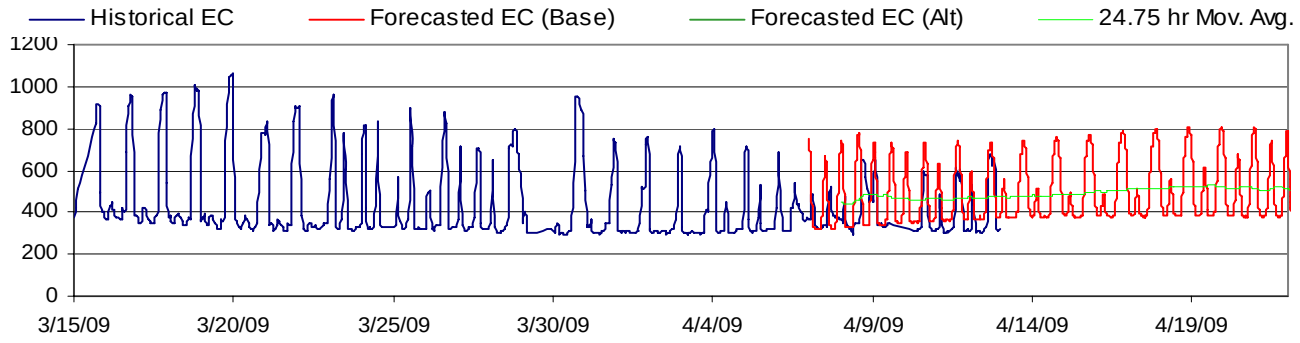
The MWQI field unit has had the Shimadzu carbon analyzer up and running at the Jones Pumping Plant. Data can be accessed on CDEC, station ID “TRP”.

**This Report:**

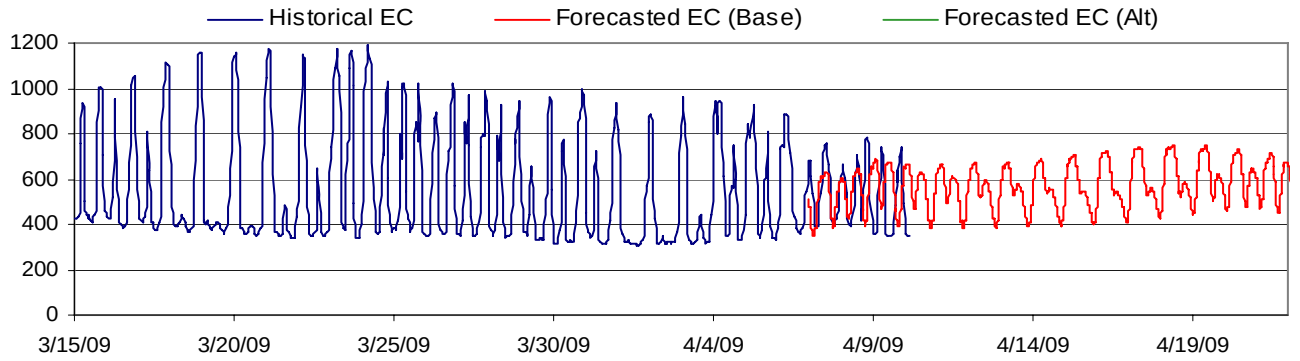
Starting with this issue we are now presenting modeled fingerprints for the Jones Pumping Plant and Old River at Rock Slough locations. “CCPP” is for Contra Costa Pumping Plant, “Old River RS’ the RS is for Rock Slough. The “Bacon Is” and “CCPP” DOC data are from the MWQI sampling program’s monthly field runs.

# 7. Forecasted EC at Export and Diversion Locations

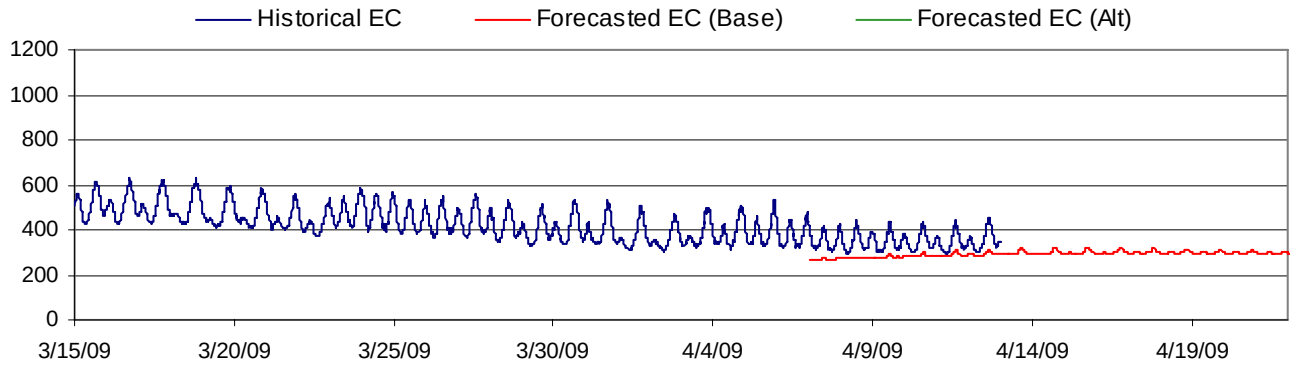
Clifton Court Gates (µS/cm)



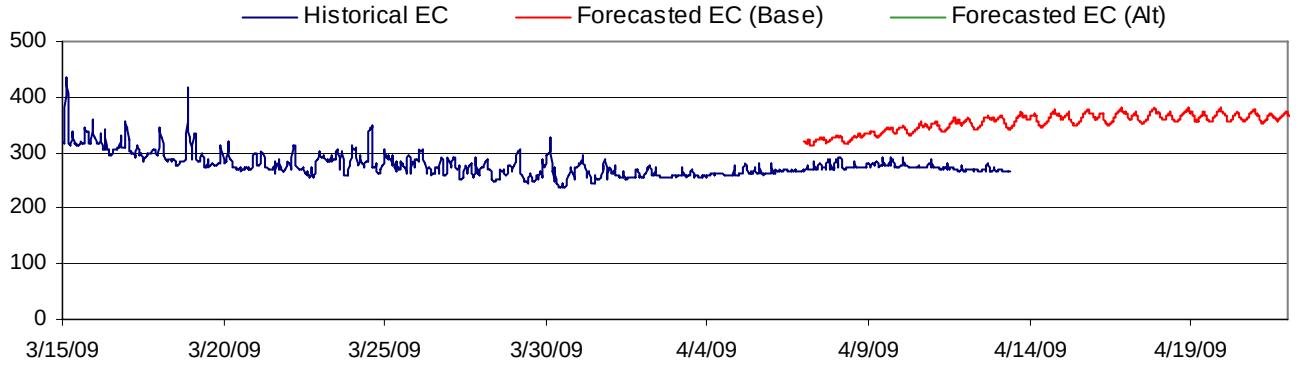

Jones Pumping Plant (µS/cm)




Rock Slough at Old River (µS/cm)

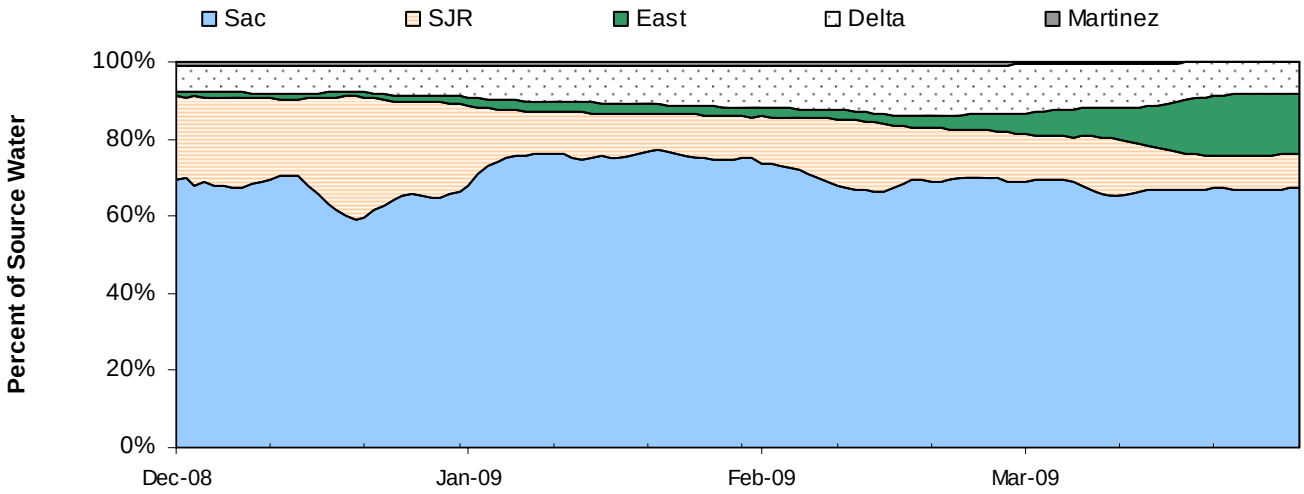



Old River at Los Vaqueros Reservoir Intake (µS/cm)

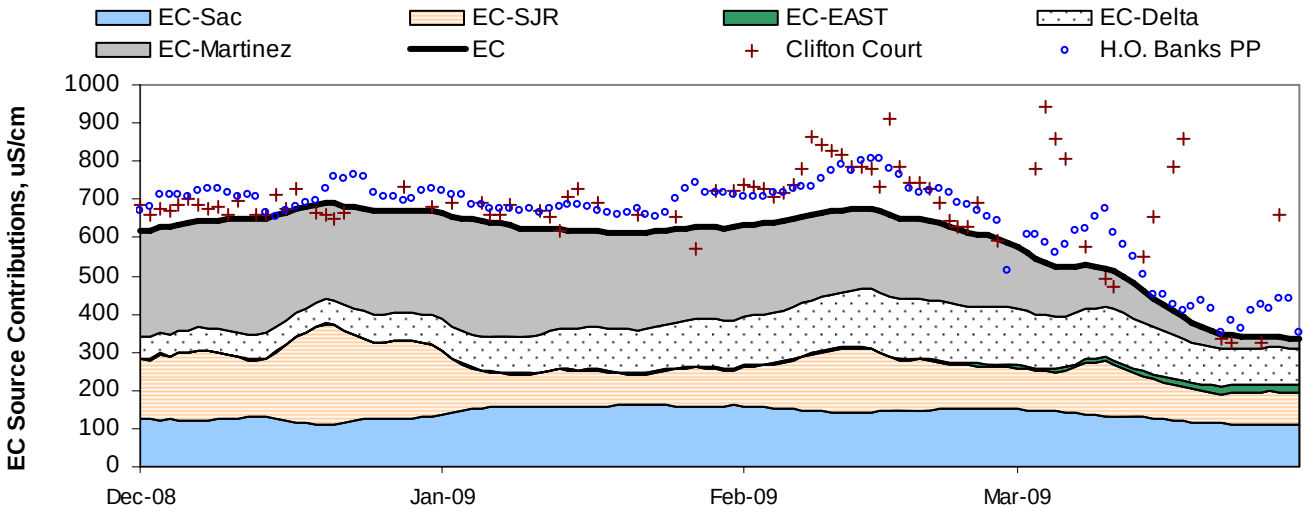


# 6. Volumetric and Constituent Fingerprints

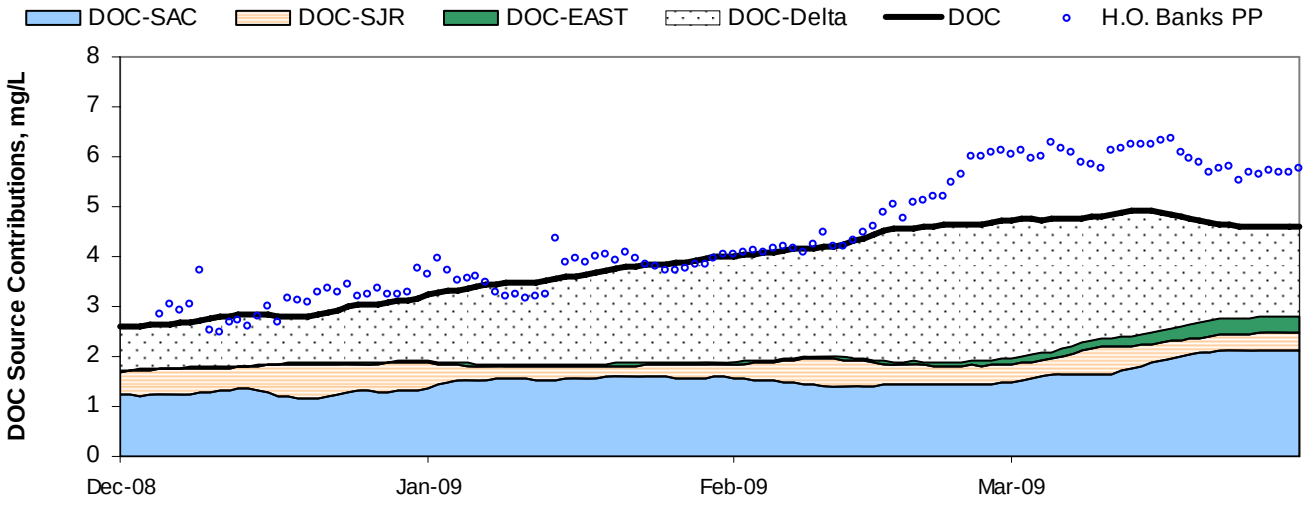
Modeled Volumetric Fingerprint at Clifton Court Forebay (SWP)




Modeled EC Fingerprint at Clifton Court Forebay (SWP)

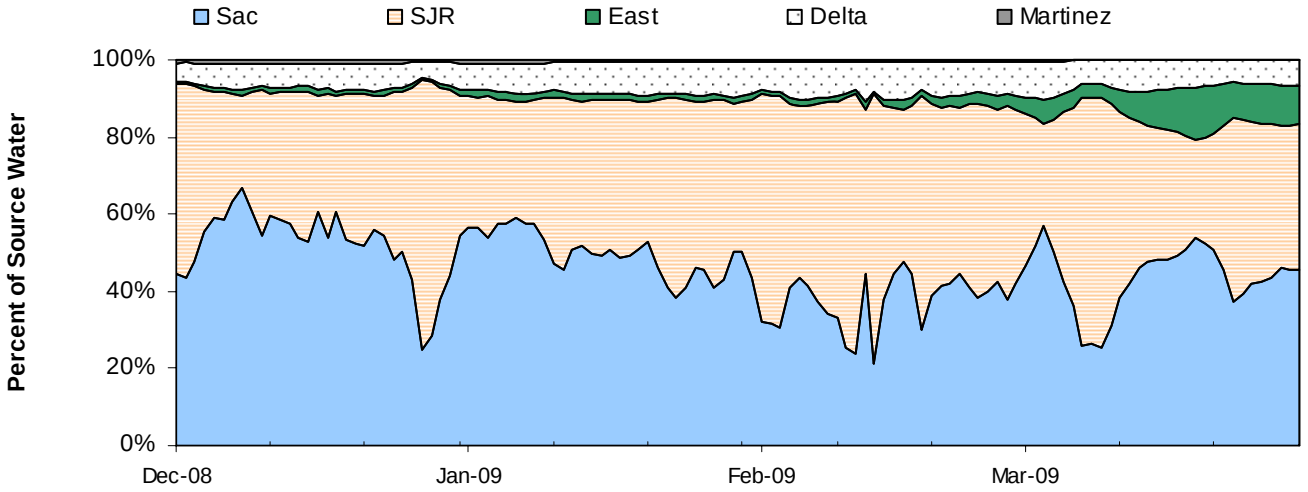



Modeled DOC Fingerprint at Clifton Court Forebay (SWP)

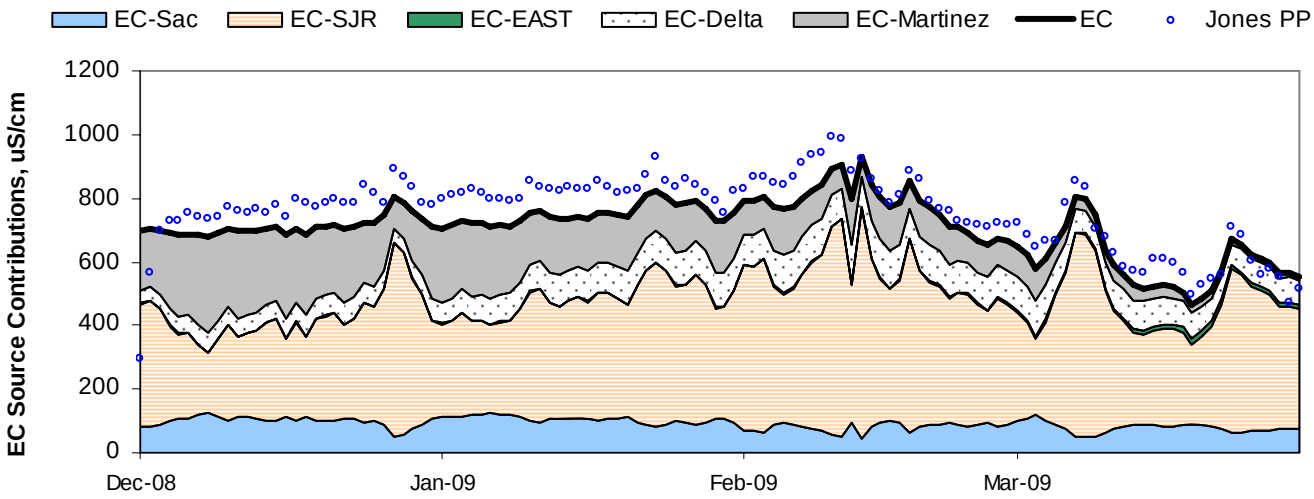


# 6. Volumetric and Constituent Fingerprints

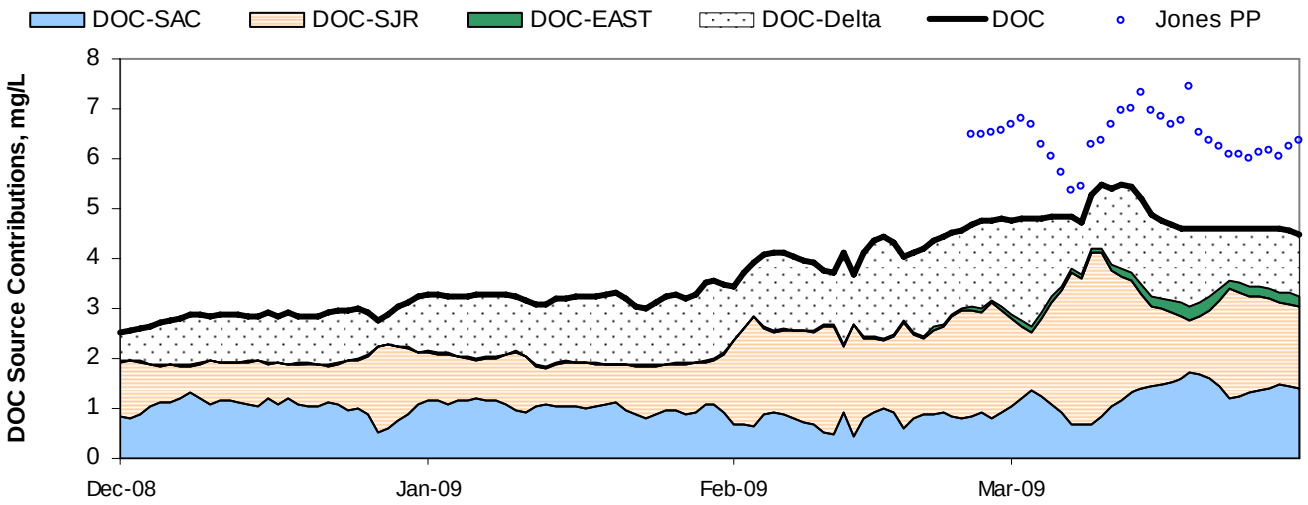
Modeled Volumetric Fingerprint at Jones Pumping Plant (CVP)




Modeled EC Fingerprint at Jones Pumping Plant (CVP)

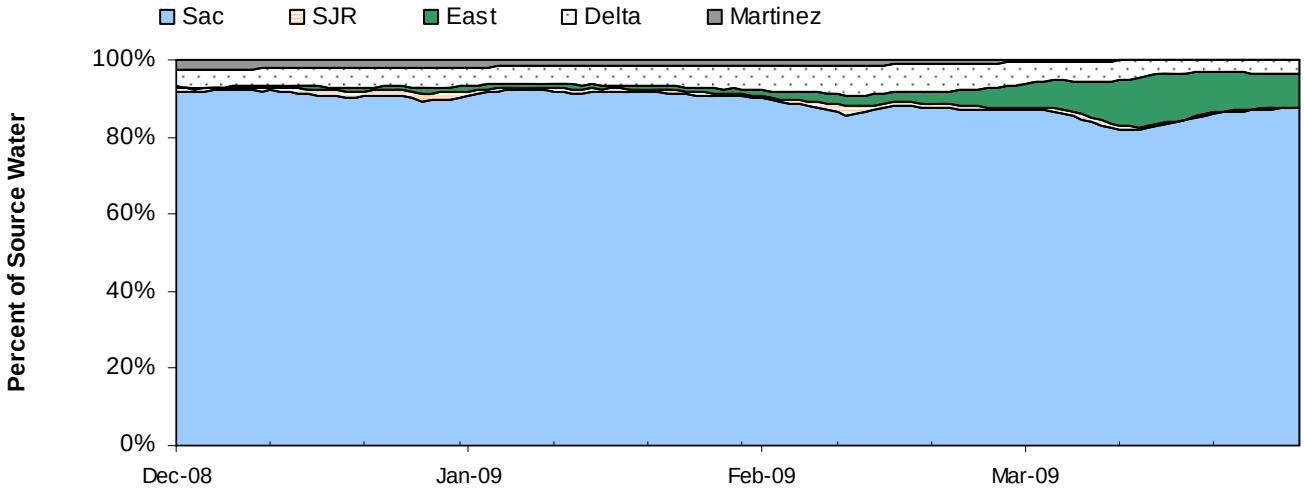



Modeled DOC Fingerprint at Jones Pumping Plant (CVP)

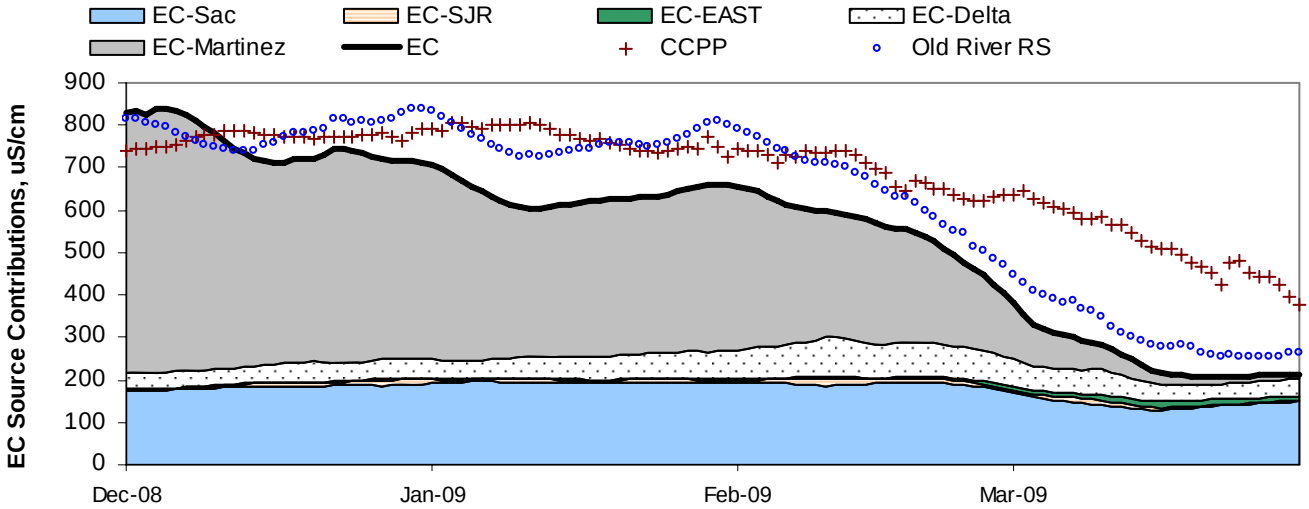


# 6. Volumetric and Constituent Fingerprints

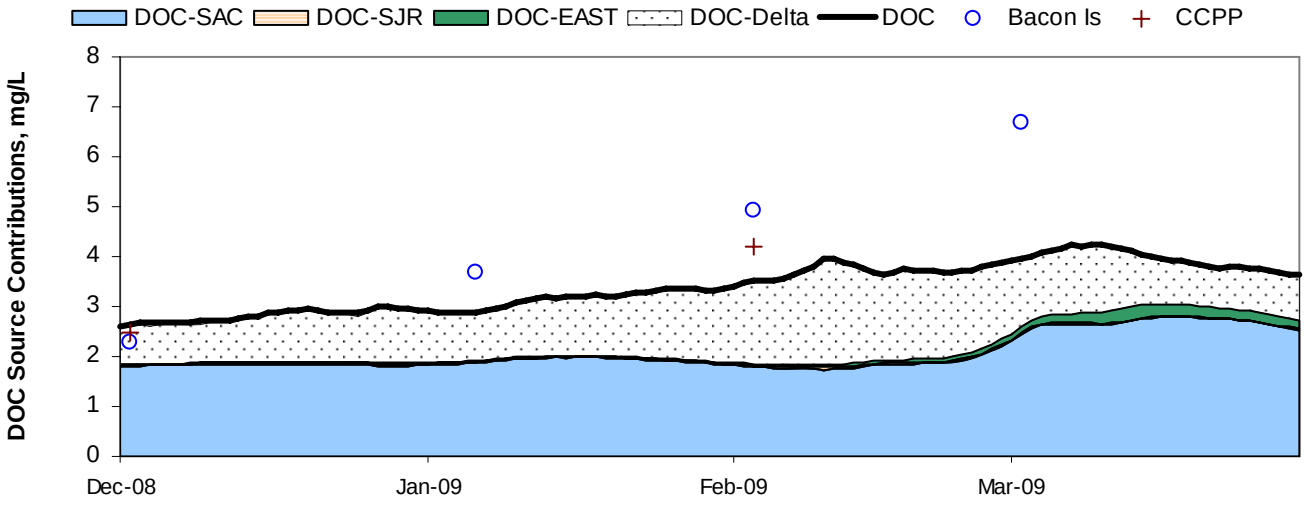
Modeled Volumetric Fingerprint Old River at Rock Slough




Modeled EC Fingerprint Old River at Rock Slough

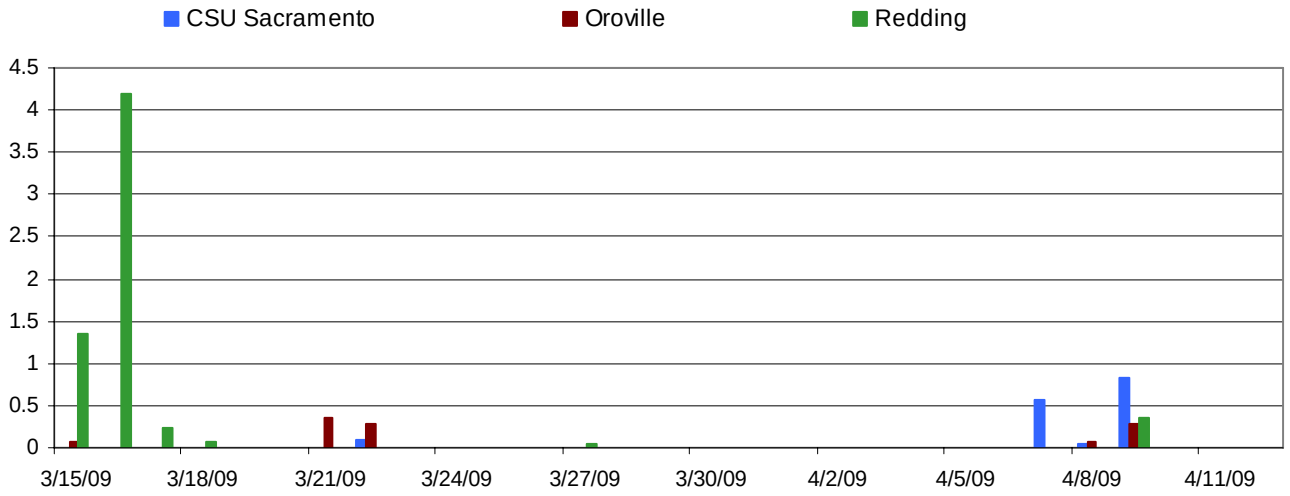



Modeled DOC Fingerprint Old River at Rock Slough

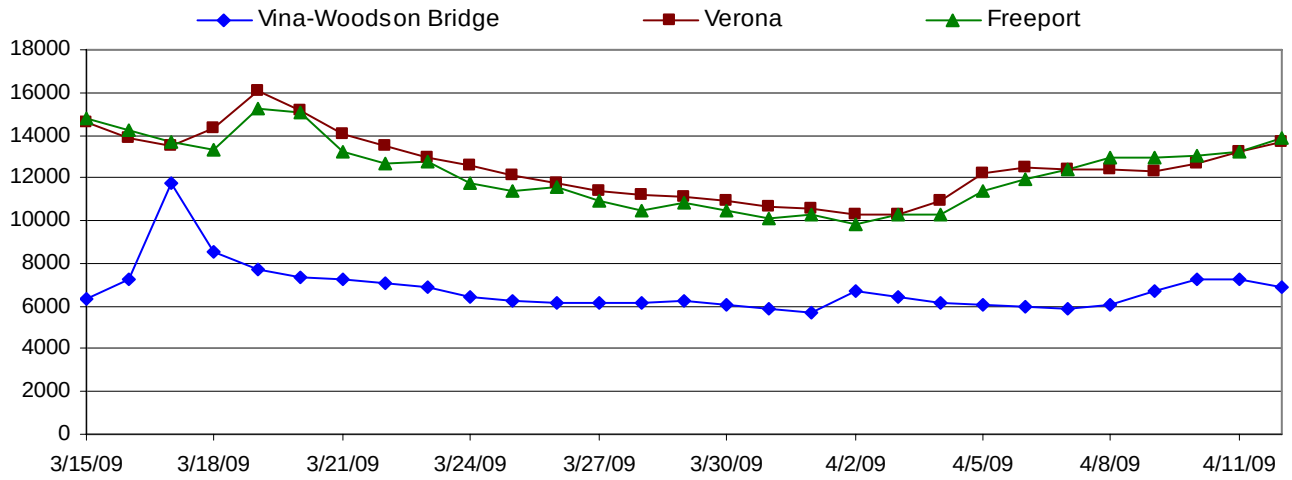


# 8. Precipitation, Flow, and EC - Sacramento River

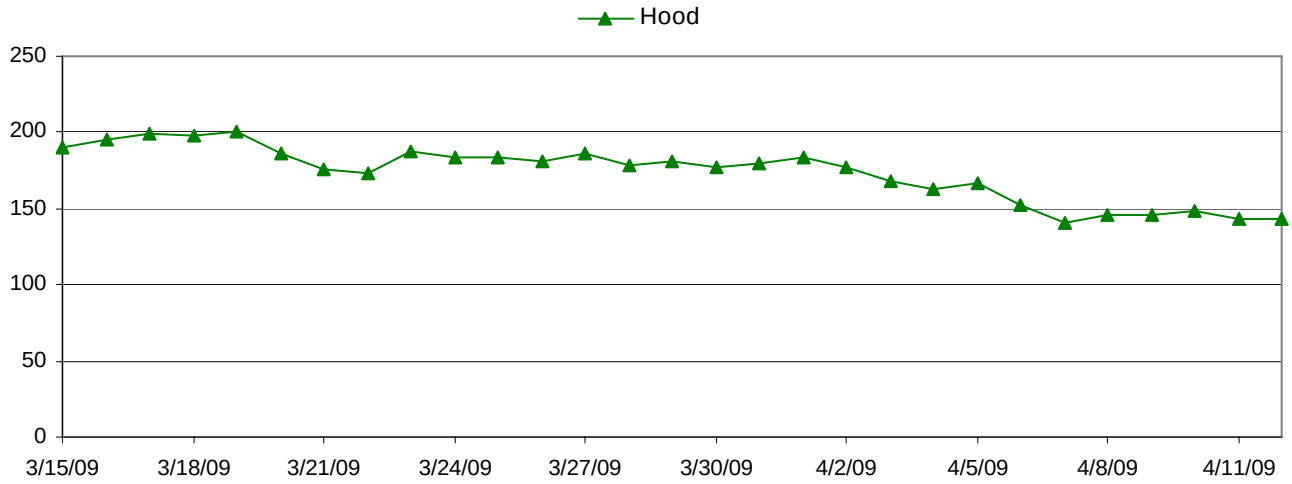
Sacramento River Watershed Precipitation (inches)




Sacramento River Flows (cfs)

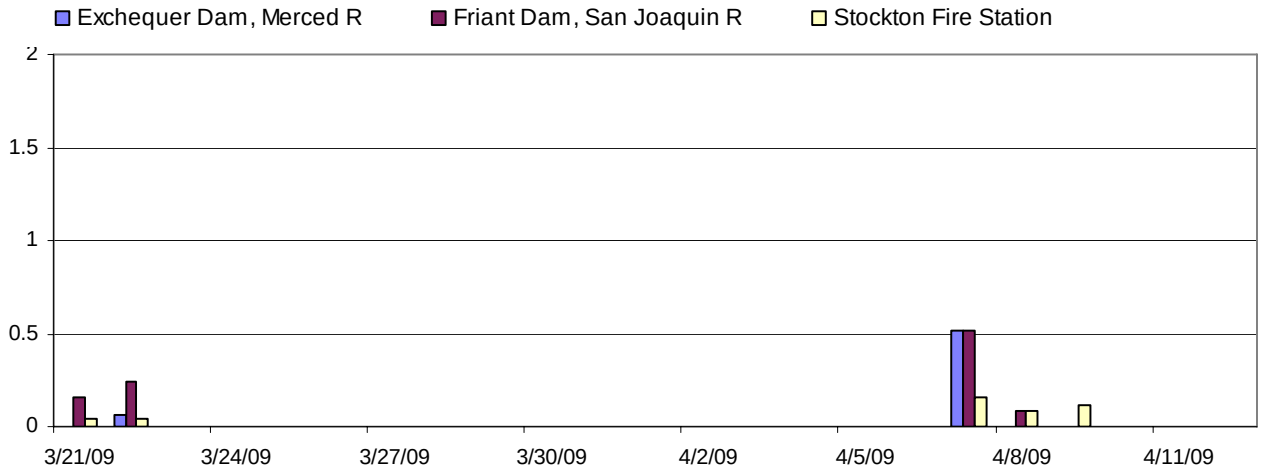



Sacramento River Electrical Conductance (µS/cm)

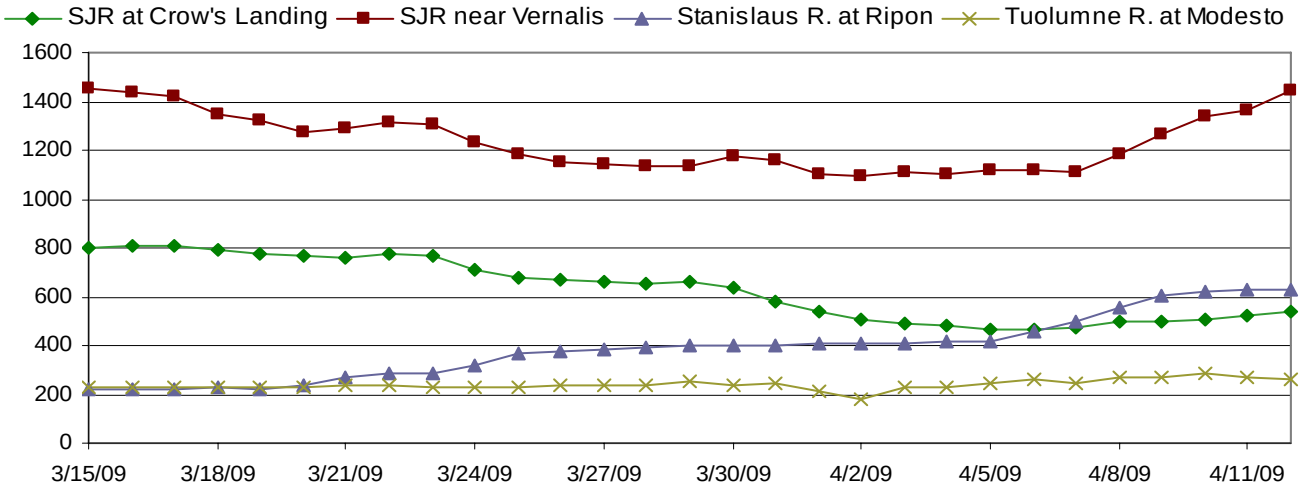


# 9. Precipitation, Flow, and EC - San Joaquin River

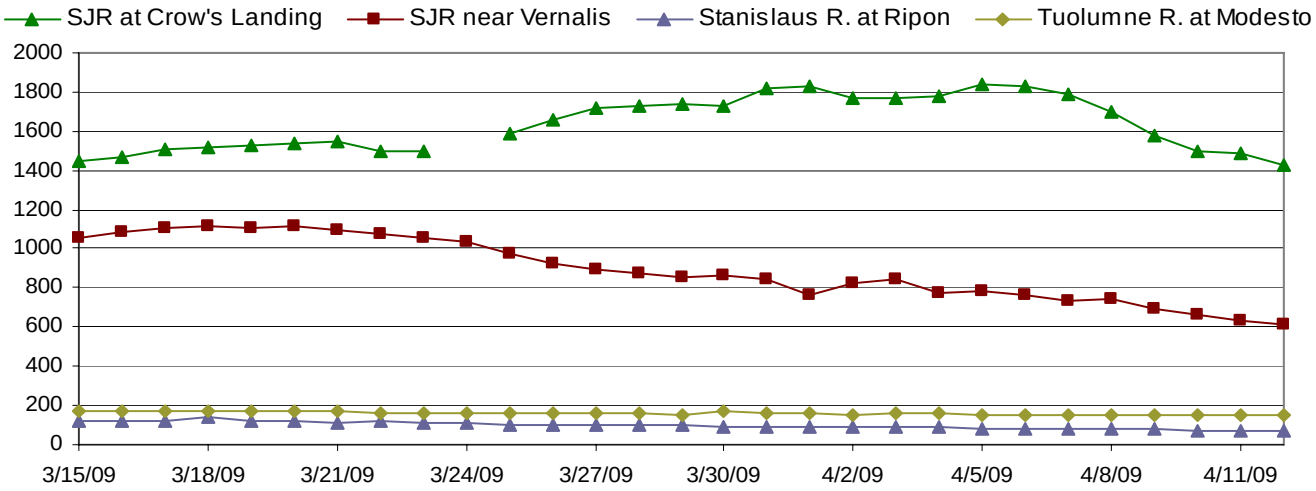
San Joaquin River Watershed Precipitation (inches)




San Joaquin River Flows (cfs)

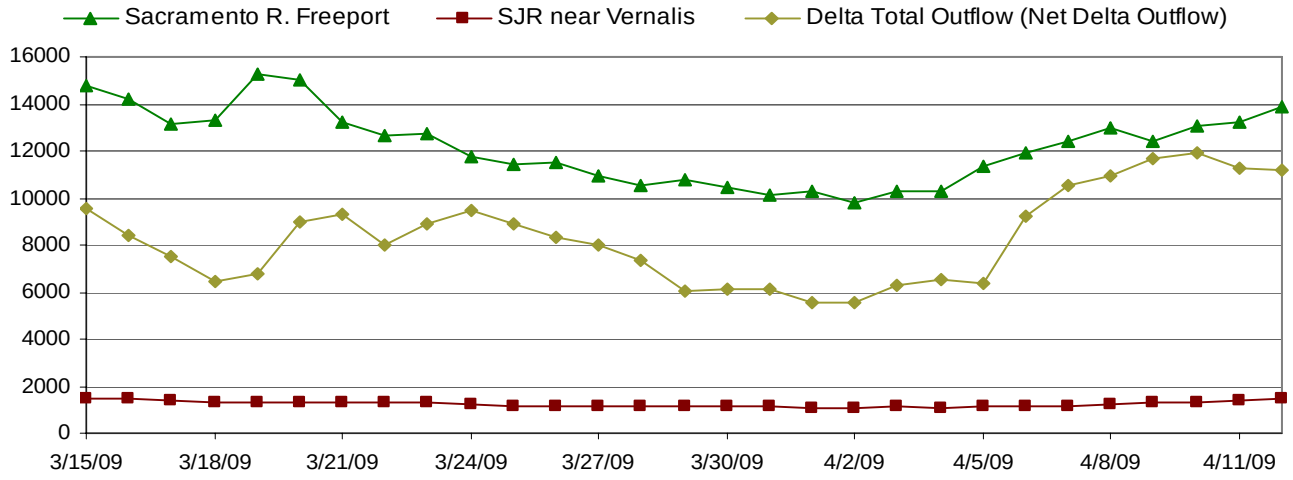



San Joaquin River Electrical Conductance (µS/cm)

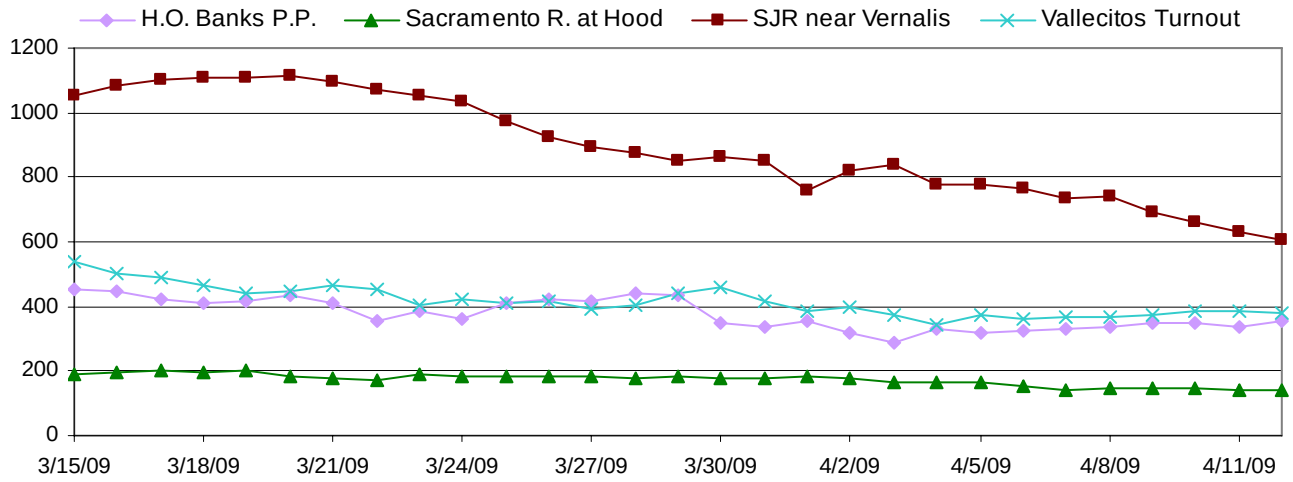


# 10. Flow, EC, and TOC - Sacramento, San Joaquin, and Banks

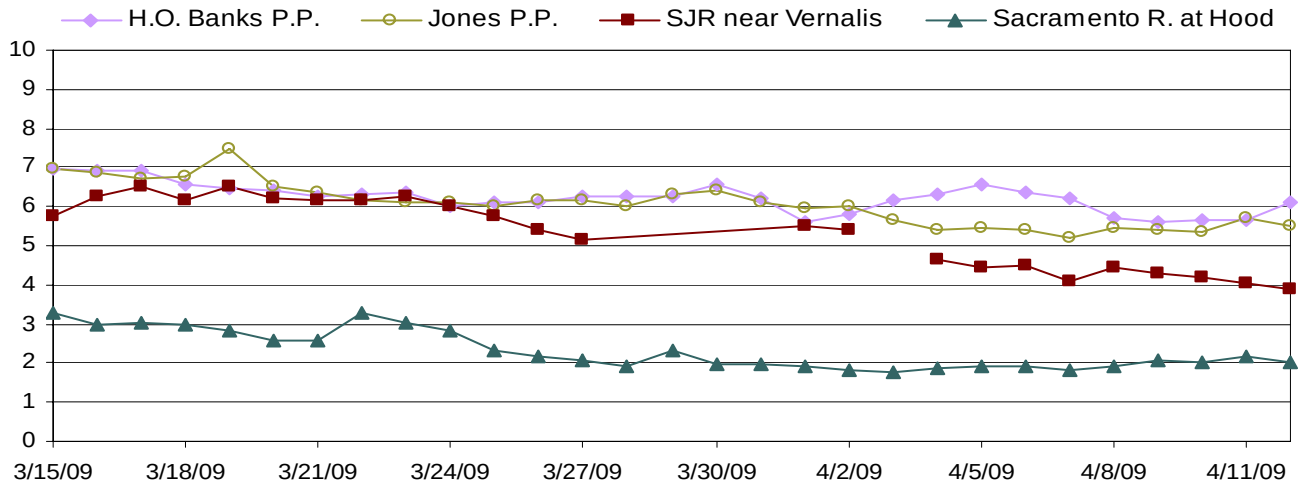
Flow (cfs)




Electrical Conductance (µS/cm)

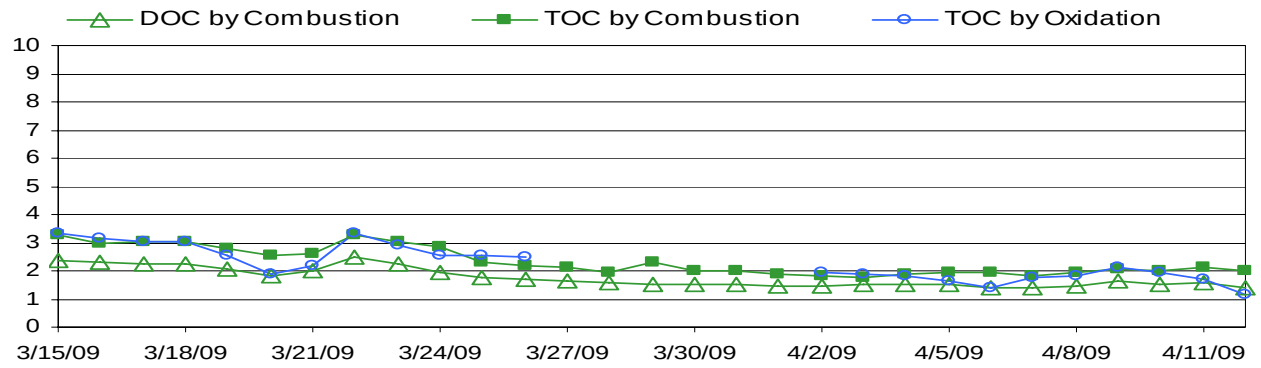



Total Organic Carbon by Combustion (mg/L)

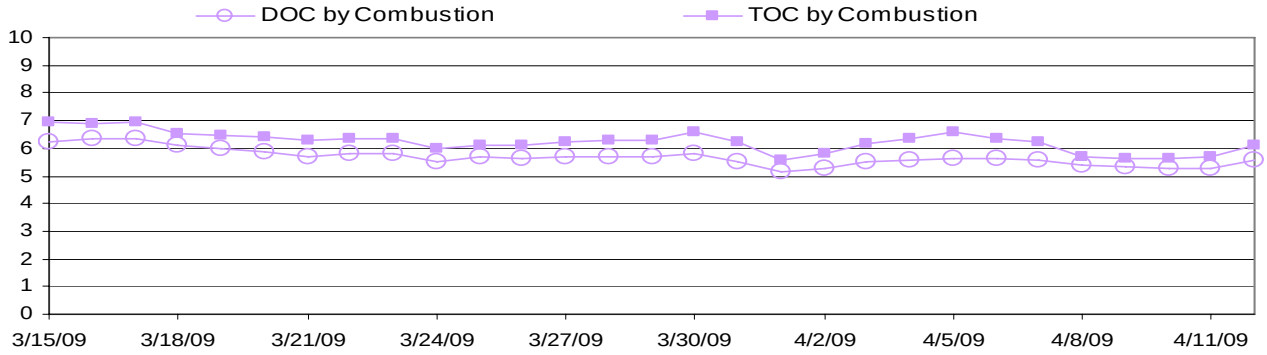


# 11. Total and Dissolved Organic Carbon

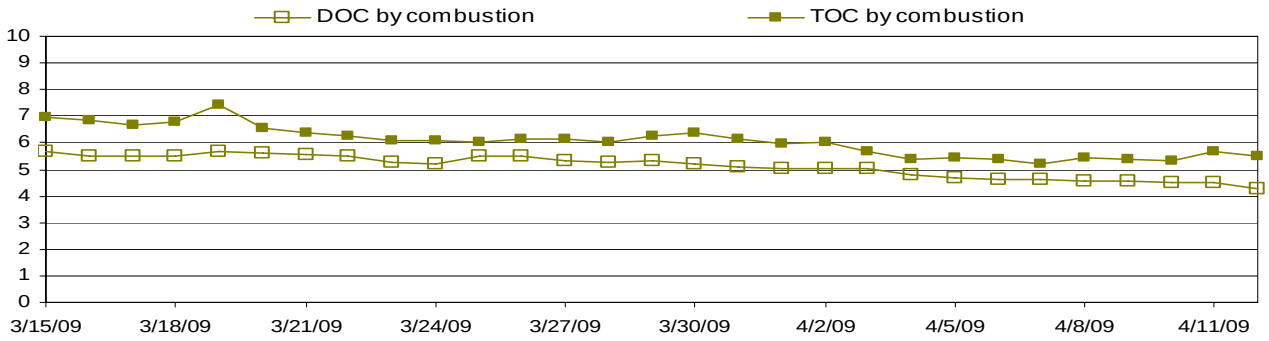
Sacramento River at Hood (mg/L)



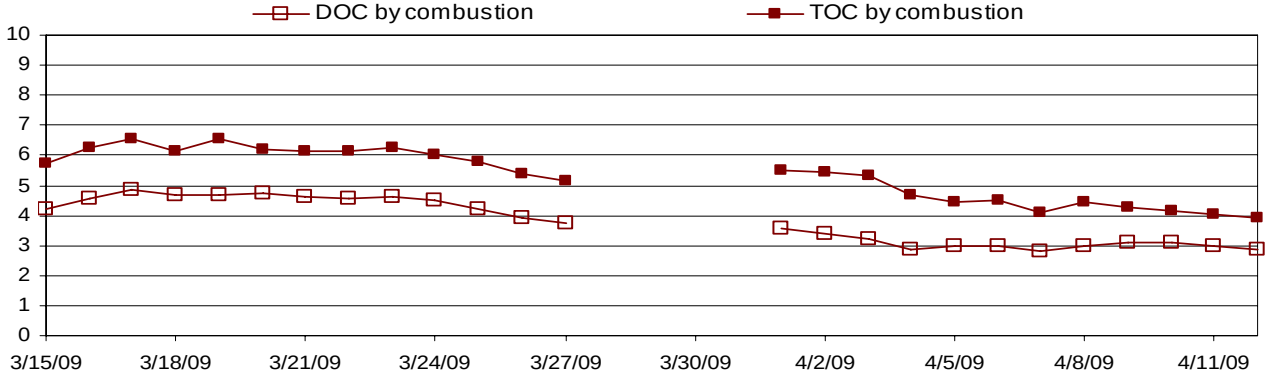

H.O. Banks Pumping Plant (mg/L)




Jones Pumping Plant (mg/L)

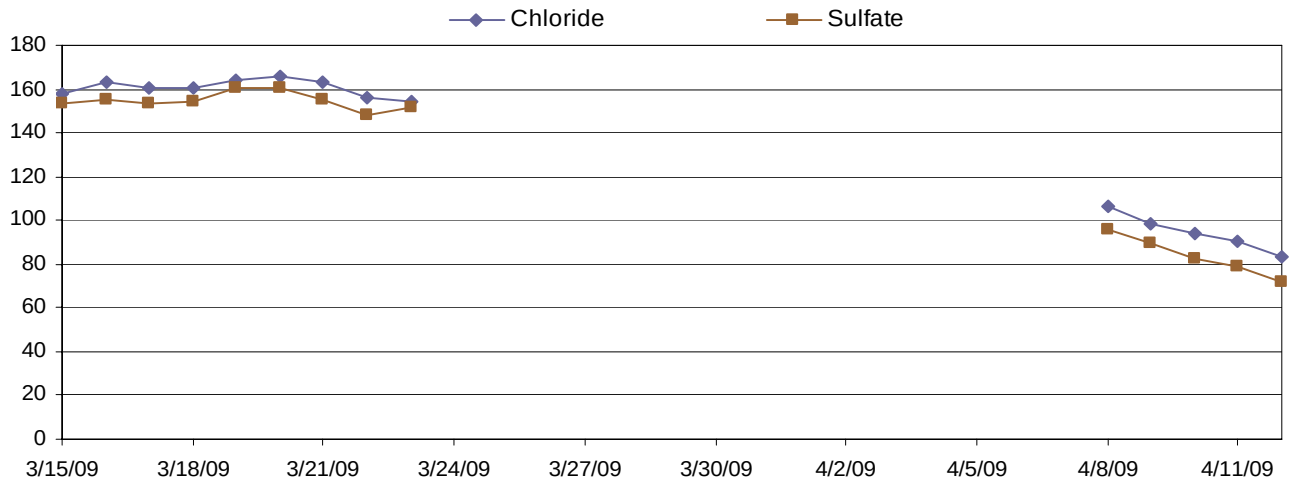



San Joaquin River at Vernalis (mg/L)

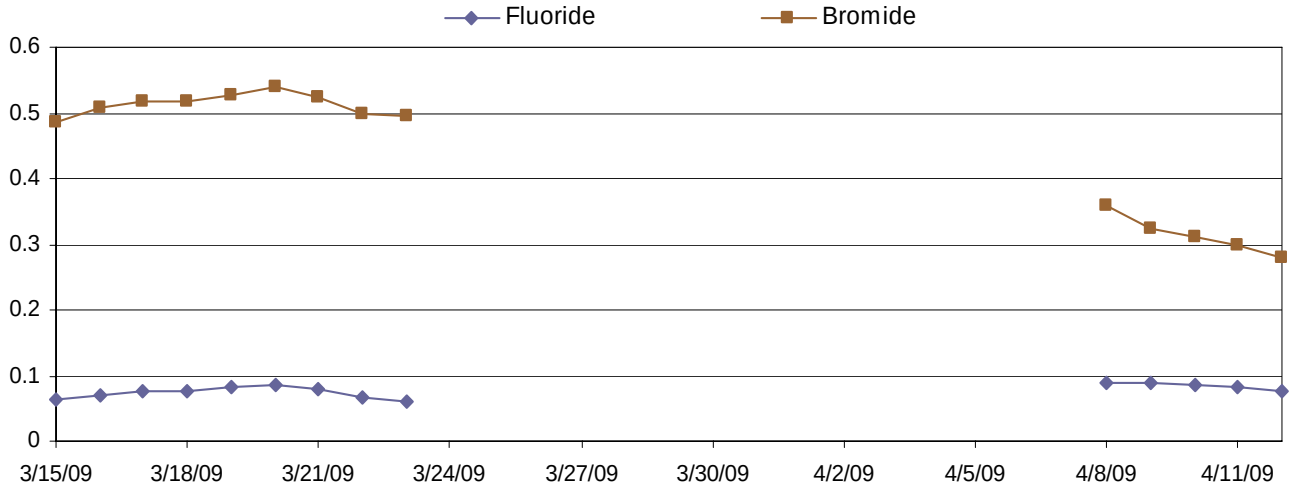


# 12. Anion Concentrations - San Joaquin River at Vernalis

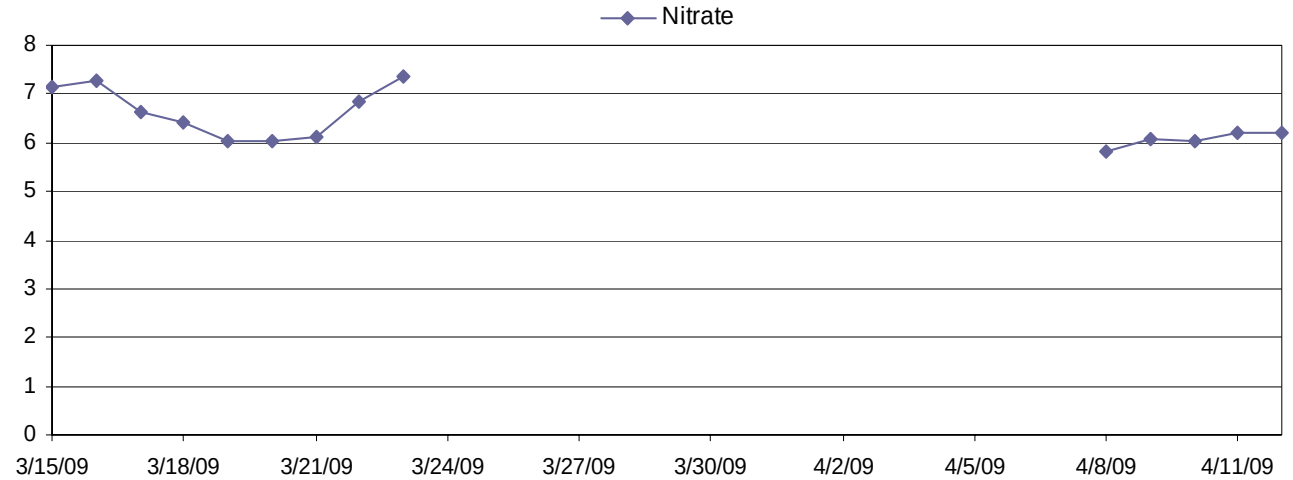
Chloride and Sulphate ($SO4^{-2}$) (ppm)




Fluoride and Bromide (ppm)

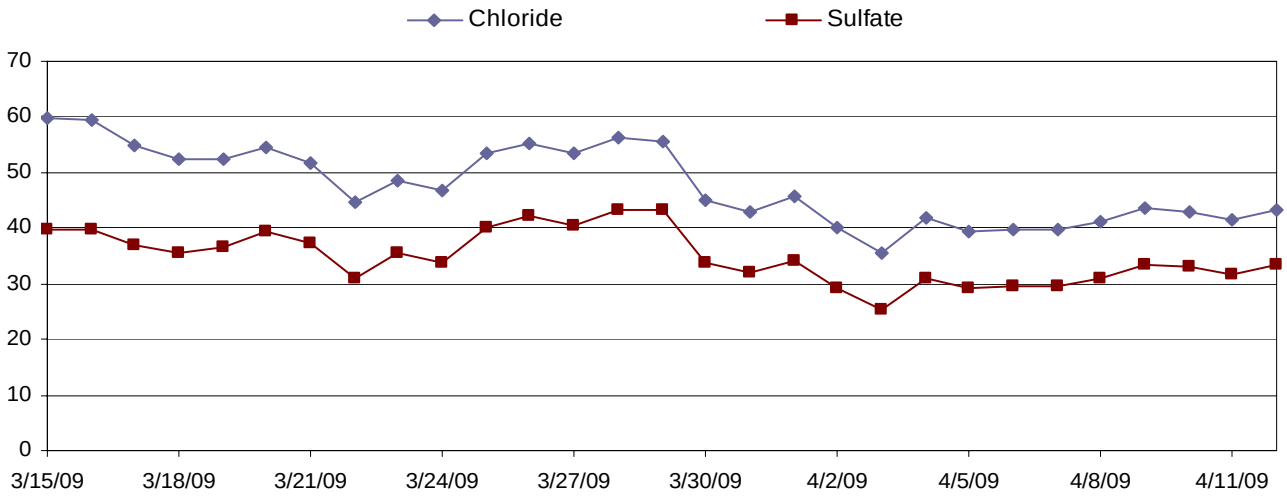



Nitrate (ppm as $NO3^{-}$)

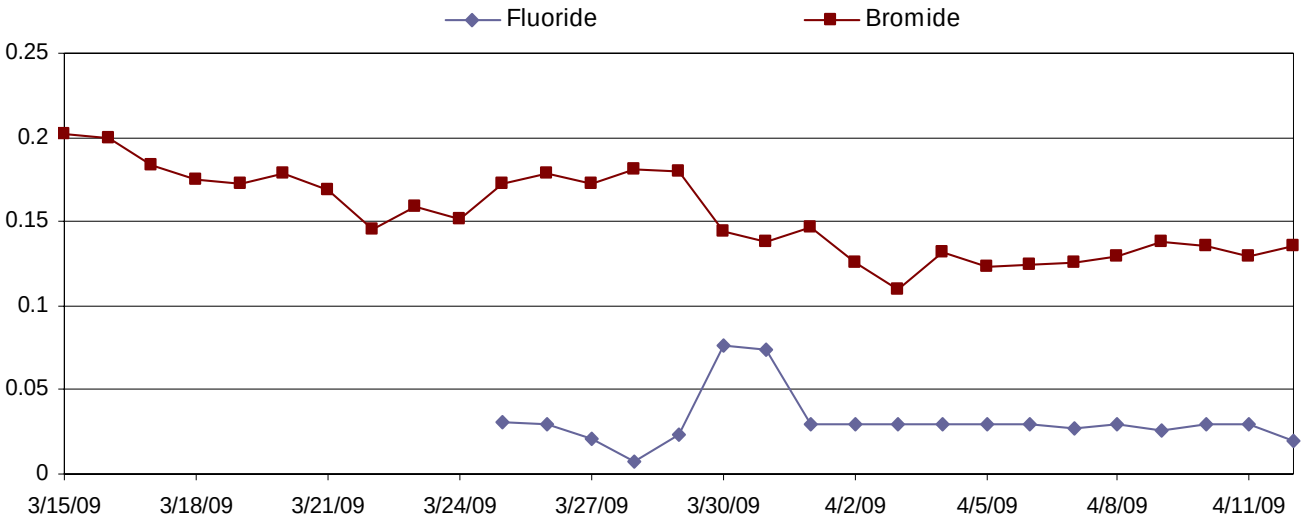


# 13. Anion Concentrations - Harvey O. Banks Pumping Plant

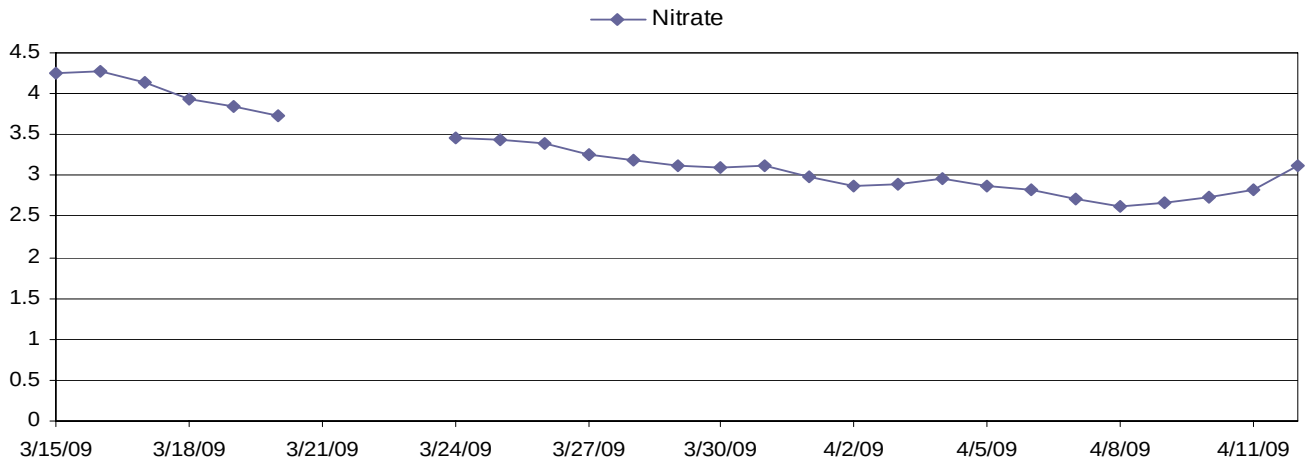
Chloride and Sulphate ($SO4^{-2}$) (ppm)




Fluoride and Bromide (ppm)

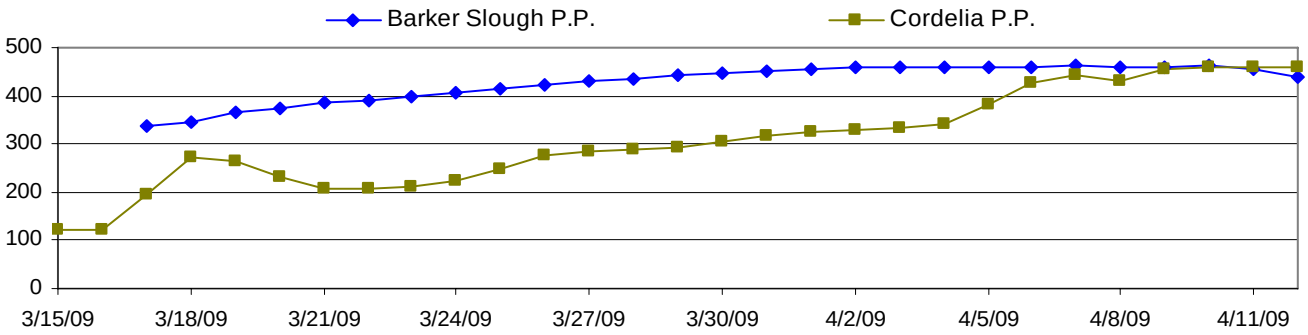



Nitrate (ppm as $NO3^{-}$)

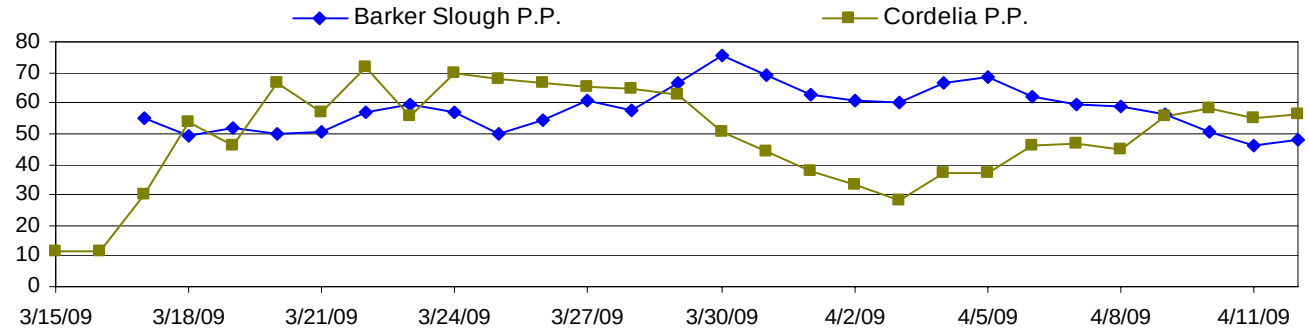


# 14. EC, Turbidity, Temperature, Flow - North Bay Aqueduct

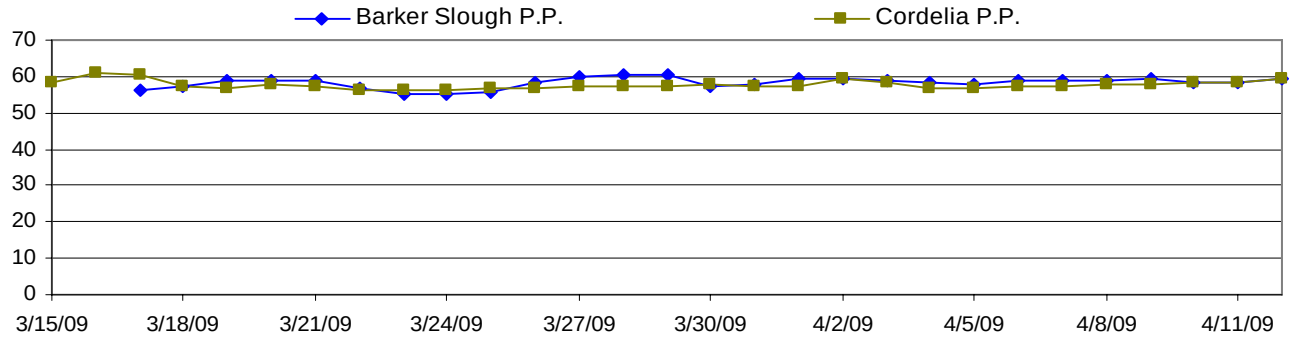
Electrical Conductance (µS/cm)



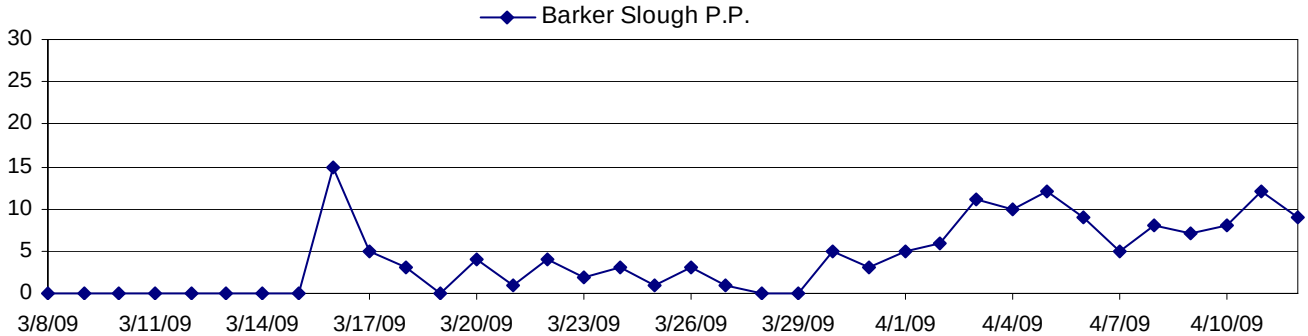

Turbidity (NTU)




Water Temperature (F°)

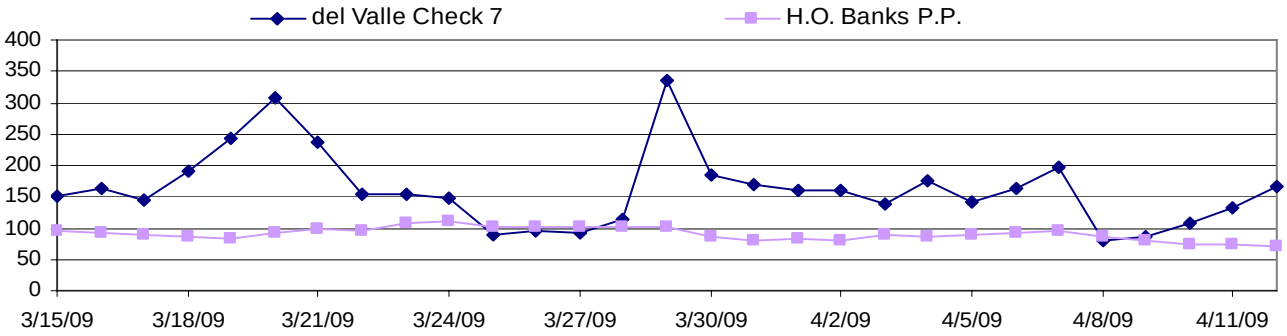



Flow (cfs)

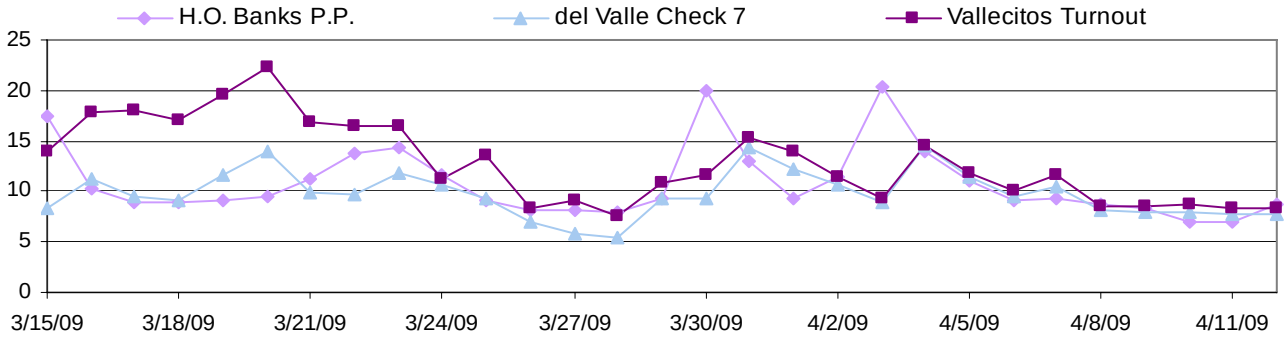


# 15. Fluorescence, Turbidity, Temperature, Flow - South Bay Aqueduct

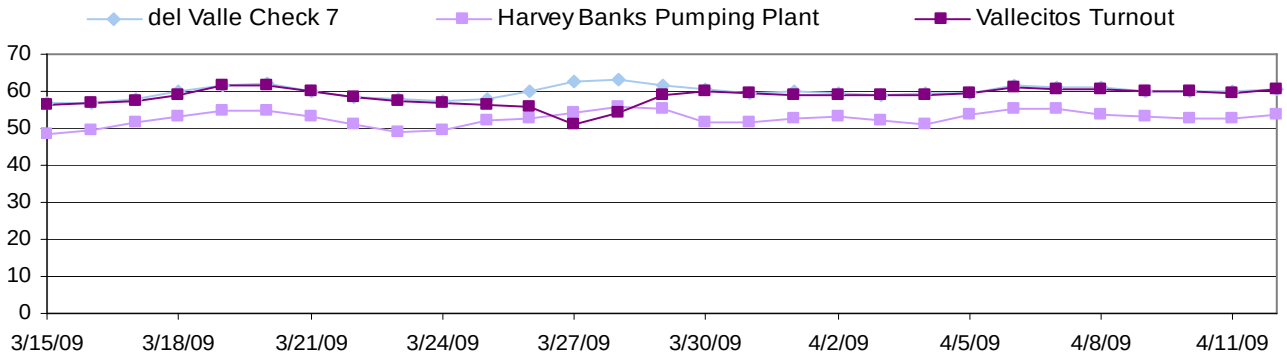
Fluorescence



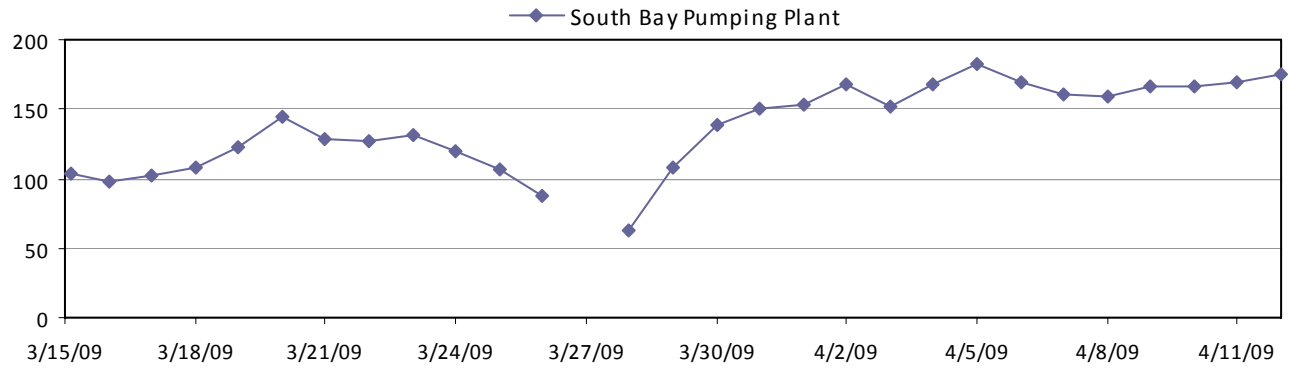

Turbidity (NTU)




Water Temperature (F°)

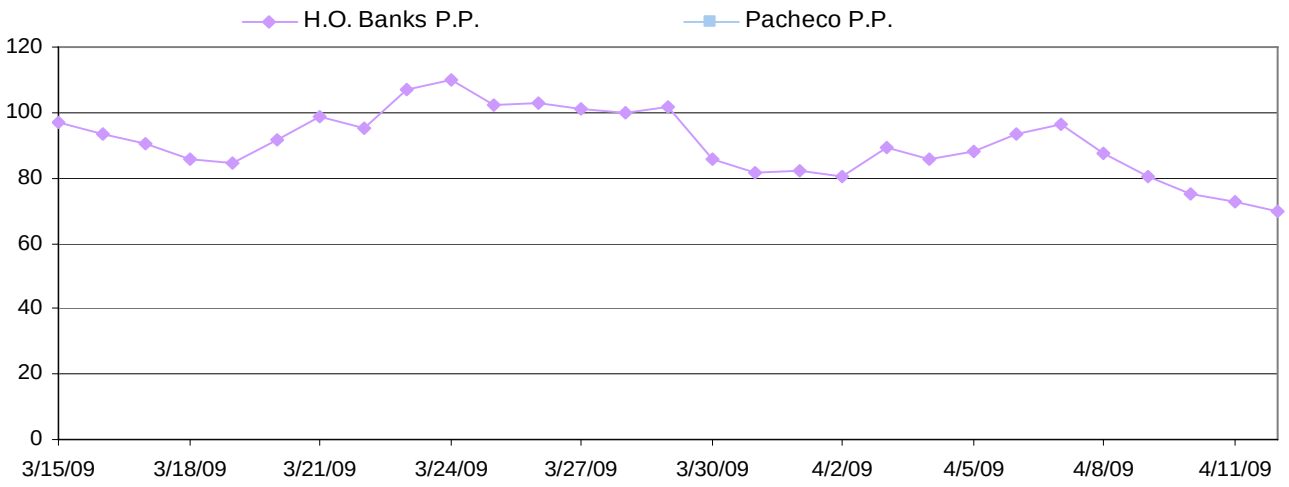



Flow (cfs)

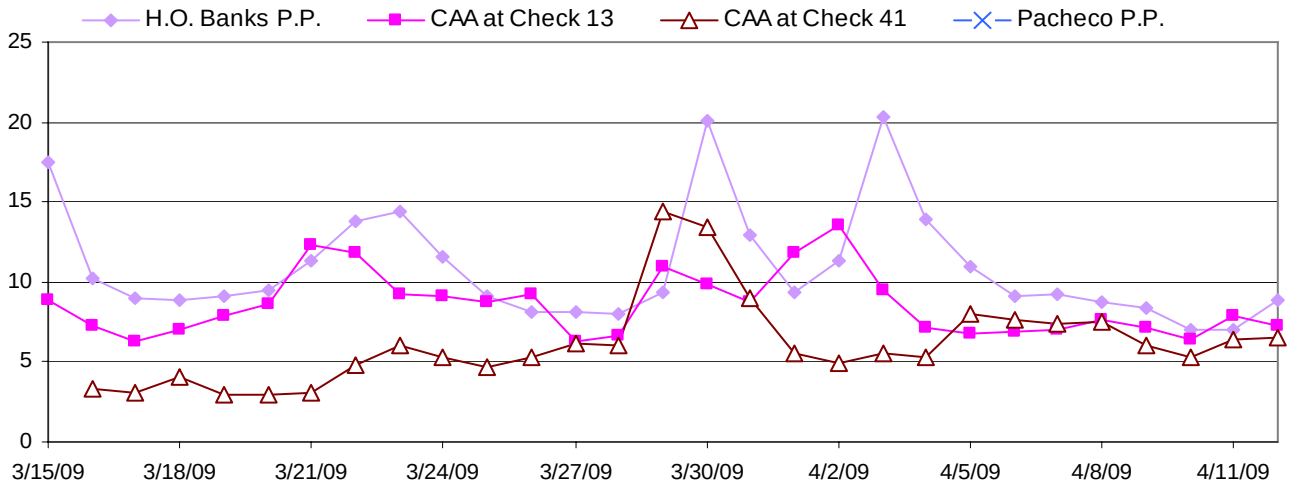


# 16. Fluorescence, Turbidity, and UV Absorption - CA Aqueduct

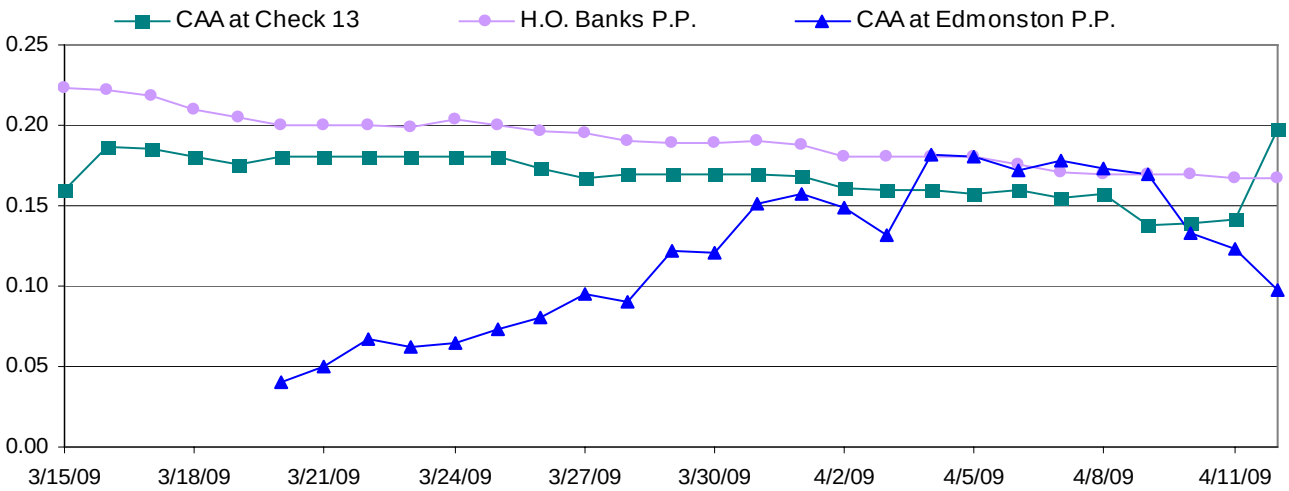
Fluorescence




Turbidity (NTU)

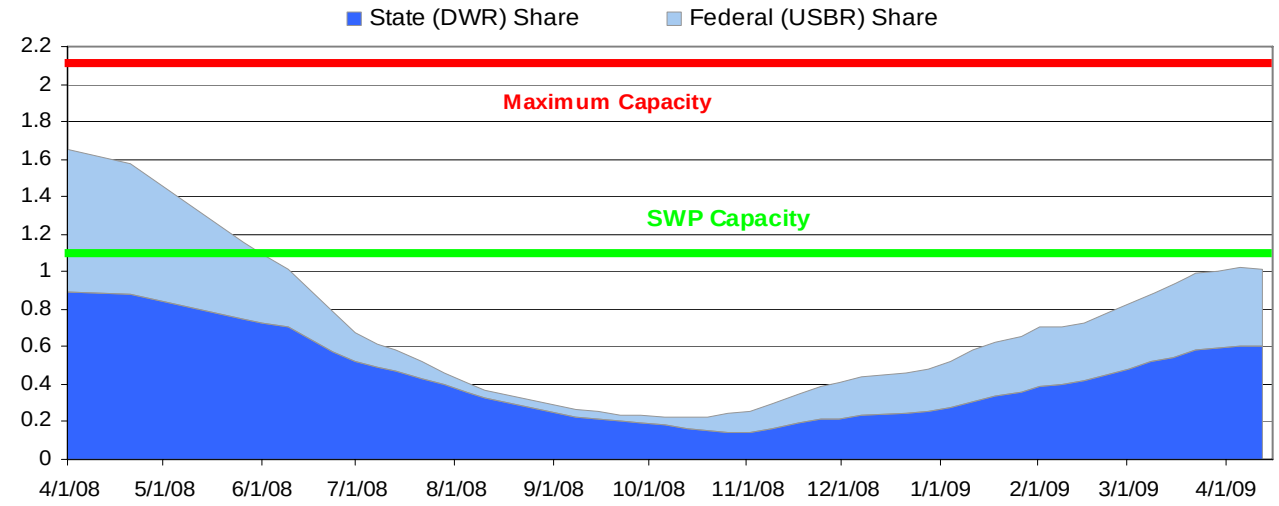



UVA ($cm^{-1}$)

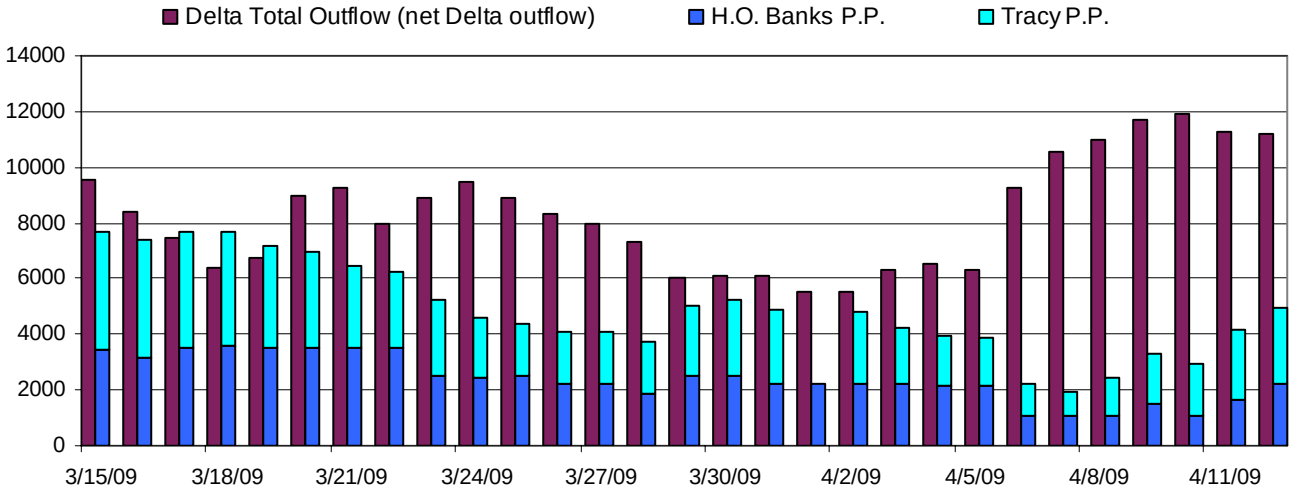


# 17. San Luis Reservoir Storage, Delta Pumping, Inflow and Outflow

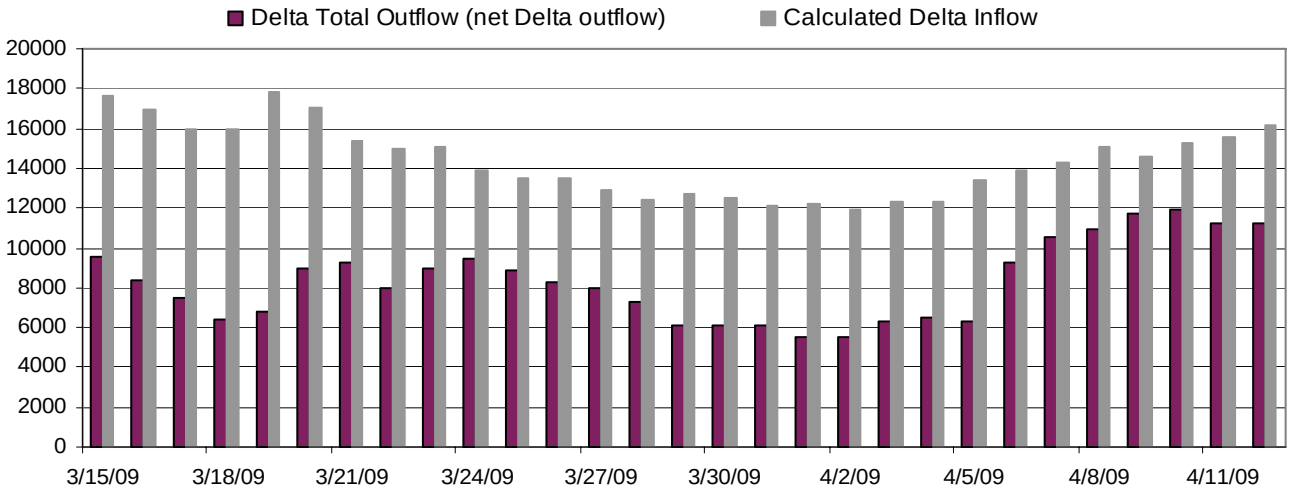
San Luis Reservoir Storage Shares (millions of acre feet)




H.O. Banks and Tracy Pumping plus Delta Total Outflow (cfs)




Calculated Delta Inflow and Delta Total Outflow (cfs)



# 18. Delta Operations Summary

EXECUTIVE OPERATIONS SUMMARY for April 13, 2009
PRELIMINARY DATA, SUBJECT TO REVISION WITHOUT NOTICE
This summary can also be found at:
http://wwwoco.water.ca.gov/cmplmon/reports/deltaops.pdf

SCHEDULED EXPORTS FOR TODAY

| | | |
|---|---|---|
| Clifton Court Inflow | = | 2,000 cfs |
| Jones Pumping Plant | = | 2,700 cfs |

ESTIMATED DELTA HYDROLOGY

| | | |
|---|---|---|
| Total Delta Inflow | ~ | 16,433 cfs |
| Sacramento River | = | 13,878 cfs |
| San Joaquin River | = | 1,448 cfs |

DELTA OPERATIONS

| | | |
|---|---|---|
| Delta Conditions | = | Balanced Condition. |
| Delta x-channel Gates | = | Closed |
| Outflow Index | ~ | 11,100 cfs |
| % Inflow Diverted | = | 29.1% (3-day avg) |
| X2 Position | = | 72.4 km |

Operational Comments:
Delta Smelt Expanded Salvage Data for WY 2009:

| | CVP | SWP | Total |
|---|---|---|---|
| Daily total (s) ----------> | 0 | 0 | 0 |
| Monthly total (April) ----------> | 0 | 0 | 0 |
| Season total for both facilities -----> | 12 | 12 | 24 |

Note: Last larva detection for Delta smelt at CVP on: 10-Apr

Longfin Smelt Expanded Salvage Data for WY 2009:

| | CVP | SWP | Total |
|---|---|---|---|
| Daily total (s) ----------> | 0 | 0 | 0 |
| Monthly total (April) ----------> | 12 | 0 | 12 |
| Season total for both facilities -----> | 44 | 4 | 48 |

Note: Last larva detection for Longfin at SWP on: 7-Apr

RESERVOIR STORAGES (AS OF MIDNIGHT)

| | | |
|---|---|---|
| Shasta Reservoir | = | 2,981 TAF |
| Folsom Reservoir | = | 771 TAF |
| Oroville Reservoir | = | 2,040 TAF |
| San Luis Res. Total | = | 1,013 TAF |
| SWP Share | = | 606 TAF |

RESERVOIR RELEASES

| | | |
|---|---|---|
| Keswick | = | 5,500 cfs |
| Nimbus | = | 3,250 cfs |
| Oroville | = | 3,000 cfs |

# 19. Acknowledgements

Data for this report has been provided by:

California Department of Water Resources

Division of Environmental Services
Office of Water Quality

Division of Flood Management
California Data Exchange Center

Division of Operation and Maintenance
Environmental Assessment Branch
Operations Control Office
Field Divisions

Division of Planning and Local Assistance
California Irrigation Management Information System
Northern District
San Joaquin District

Contra Costa Water District

United States Department of the Interior

Bureau of Reclamation

U.S. Geological Survey

National Oceanic and Atmospheric Administration

National Weather Service
California Nevada River Forecast Center