

## Range of Delta Flows and Water Supply Implications under Integrated North Delta and South Delta Operational Measures

December 16, 2008

Several exploratory CalLite simulations were developed to better understand and present the trade-offs between North Delta bypass operational criteria and South Delta operational criteria. Table 1 summarizes the simulations developed for this purpose. A brief description of the assumptions is listed below. As shown in Table 1, existing and proposed operating criteria or requirements were layered on to help differentiate the areas where limited conflict occurs and where the conflict between north and south Delta operating criteria are significant. It should be noted, however, that the conflicts are often masked by the order of layering of options.

Table 1. Summary of North Delta - South Delta CalLite Simulations

### Main Scenario #1: North Delta Mid-Range Rule

Scen No.	Description
1	ND Mid-Rule
2	ND Mid-Rule + Rio Vista
3	ND Mid-Rule + Rio Vista + Salinity
4	ND Mid-Rule + Rio Vista + Salinity + Qwest
5	ND Mid-Rule + Rio Vista + Salinity + Qwest + OMR
6	ND Mid-Rule (1/2 Fract) + Rio Vista + Salinity + Qwest + OMR
7	ND Mid-Rule (No Fract) + Rio Vista + Salinity + Qwest + OMR

### Main Scenario #2: North Delta 5k Rule

Scen No.	Description
1	ND 5k-Rule
2	ND 5k-Rule + Rio Vista
3	ND 5k-Rule + Rio Vista + Salinity
4	ND 5k-Rule + Rio Vista + Salinity + Qwest
5	ND 5k-Rule + Rio Vista + Salinity + Qwest + OMR
6	ND 5k-Rule (1/2 Fract) + Rio Vista + Salinity + Qwest + OMR
7	ND 5k-Rule (No Fract) + Rio Vista + Salinity + Qwest + OMR

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### **North Delta Bypass Rule**

Two options considered at the request of the Integration Team:

- Mid-range North Delta diversion bypass rule as depicted in Figures 1 and 2,
- 5kcfs rule as depicted in Figure 3

### **Rio Vista Minimum Instream Flow Requirements**

- Per D-1641 during September through December
- 3,000 cfs during January through August to maintain minimum base flows when the Delta Cross Channel is open

### **Salinity Standards**

- In-Delta Agricultural and Municipal & Industrial standards per D-1641

### **San Joaquin River near Jersey Point (QWEST)**

- Maintain net positive downstream flow in all months, except in Critical years in which flows would be required to be greater than -2000 cfs

### **Old and Middle River Flows (OMR)**

- Require OMR flows to be greater than -3,500 cfs during December through June
- Require OMR flows to be greater than -5,000 cfs during July through November

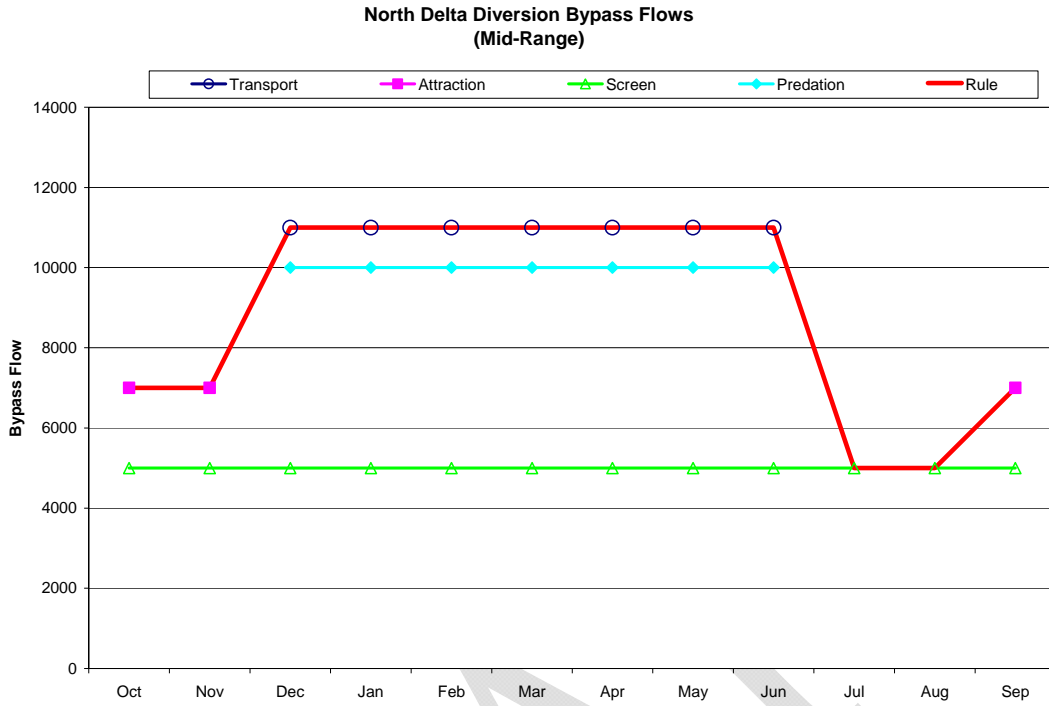


Figure 1. Minimum North Delta diversion bypass flows before diversions could occur (Mid-Range).

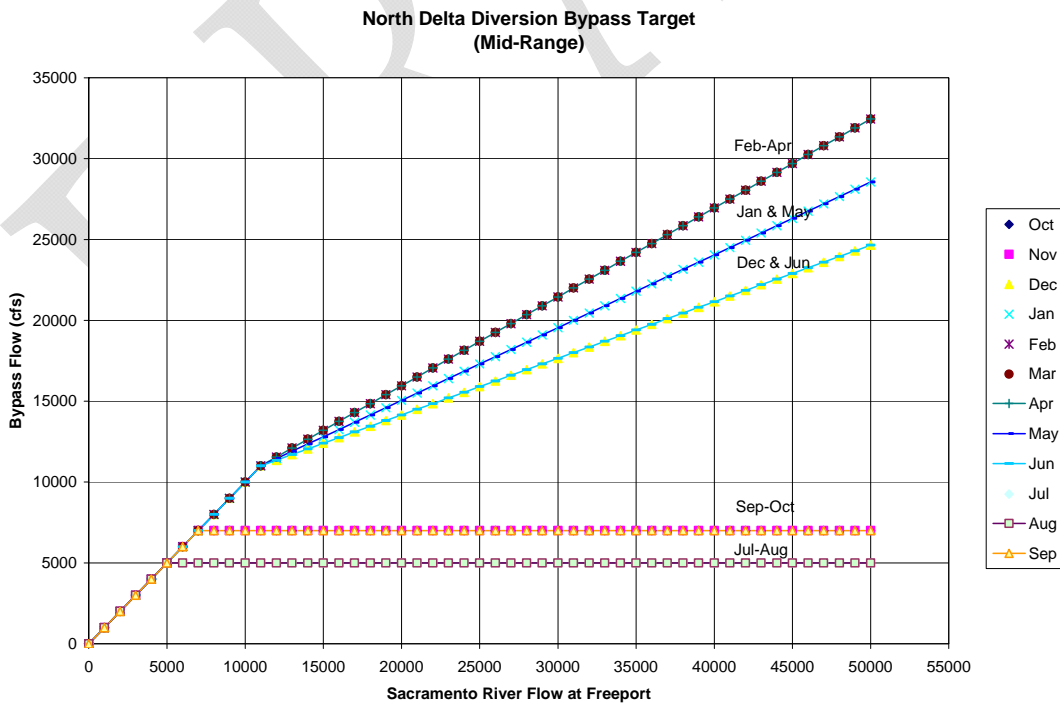


Figure 2. Minimum North Delta diversion bypass flows depicted as a function of Sacramento River flow (Mid-Range).

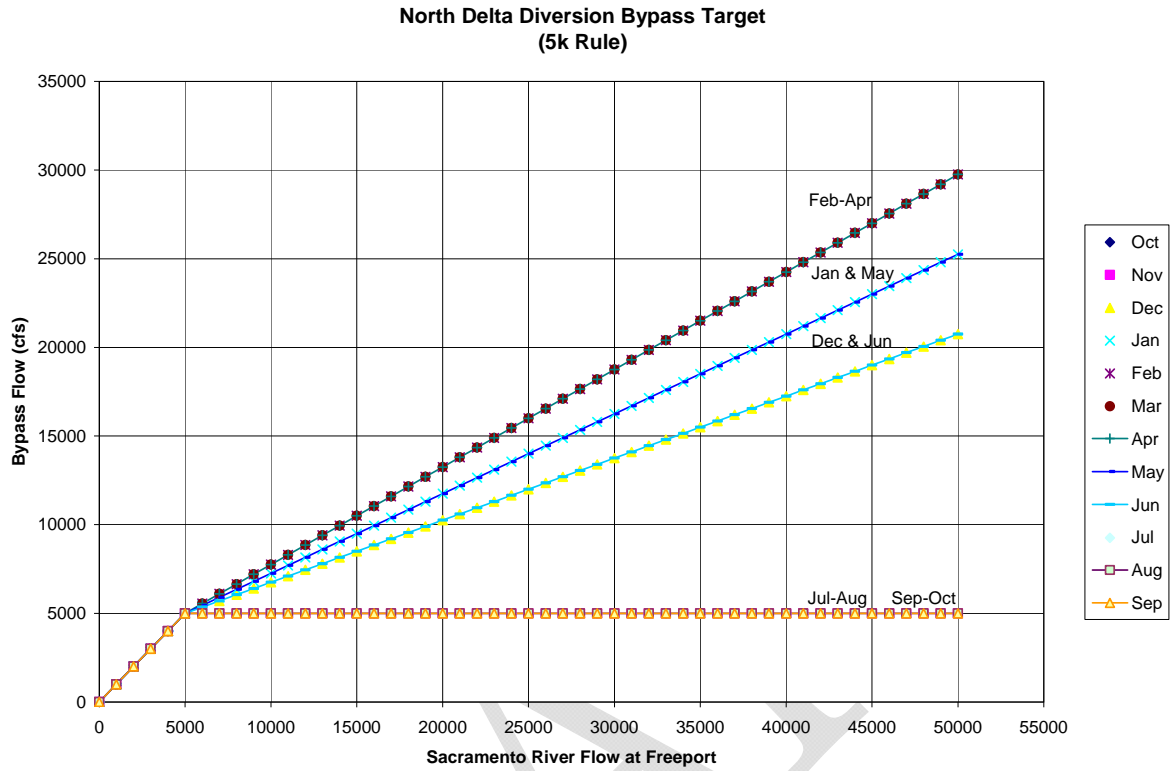


Figure 3. Minimum North Delta diversion bypass flows depicted as a function of Sacramento River flow for the 5kcfs rule.

Table 2. Range of changes in exports associated with North Delta – South Delta operating criteria

**Main Scenario #1: North Delta Mid-Range Rule**

Scen No.	Description	1922-2003	1929-34	1987-92
1	ND Mid-Rule	467	382	492
2	ND Mid-Rule + Rio Vista	461	368	485
3	ND Mid-Rule + Rio Vista + Salinity	292	27	96
4	ND Mid-Rule + Rio Vista + Salinity + Qwest	175	-9	-1
5	ND Mid-Rule + Rio Vista + Salinity + Qwest + OMR	122	-132	-98
6	ND Mid-Rule (1/2 Fract) + Rio Vista + Salinity + Qwest + OMR	198	-24	36
7	ND Mid-Rule (No Fract) + Rio Vista + Salinity + Qwest + OMR	251	36	82

**Main Scenario #2: North Delta 5k Rule**

Scen No.	Description	1922-2003	1929-34	1987-92
1	ND 5k-Rule	479	384	517
2	ND 5k-Rule + Rio Vista	469	360	517
3	ND 5k-Rule + Rio Vista + Salinity	373	115	151
4	ND 5k-Rule + Rio Vista + Salinity + Qwest	360	65	112
5	ND 5k-Rule + Rio Vista + Salinity + Qwest + OMR	355	30	215
6	ND 5k-Rule (1/2 Fract) + Rio Vista + Salinity + Qwest + OMR	390	65	176
7	ND 5k-Rule (No Fract) + Rio Vista + Salinity + Qwest + OMR	396	223	191

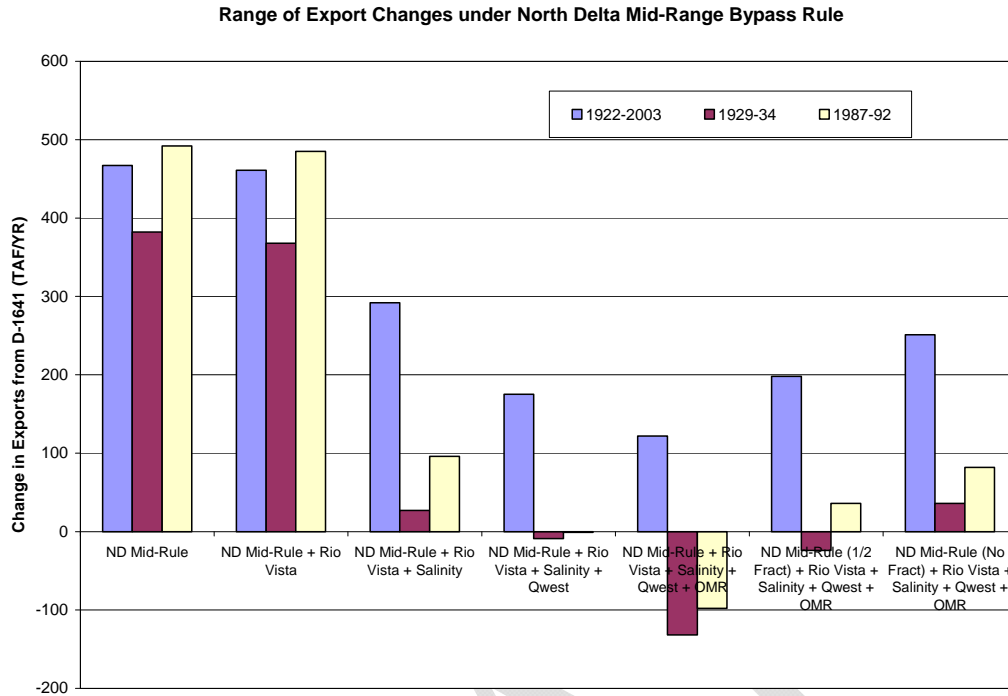


Figure 4. Range of export changes under mid-range North Delta diversion bypass rule.

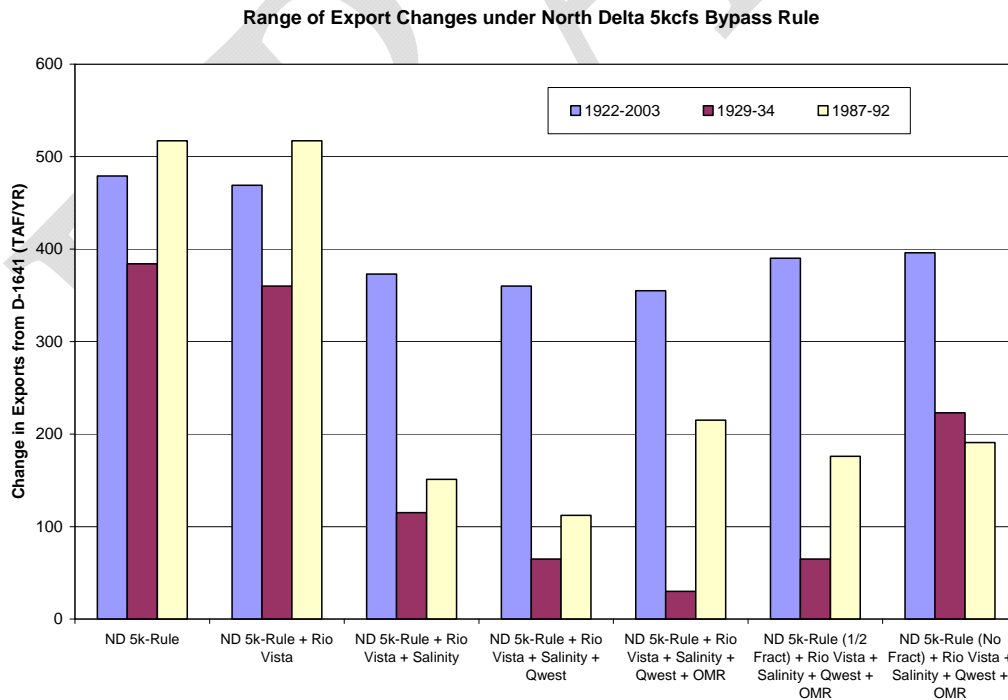
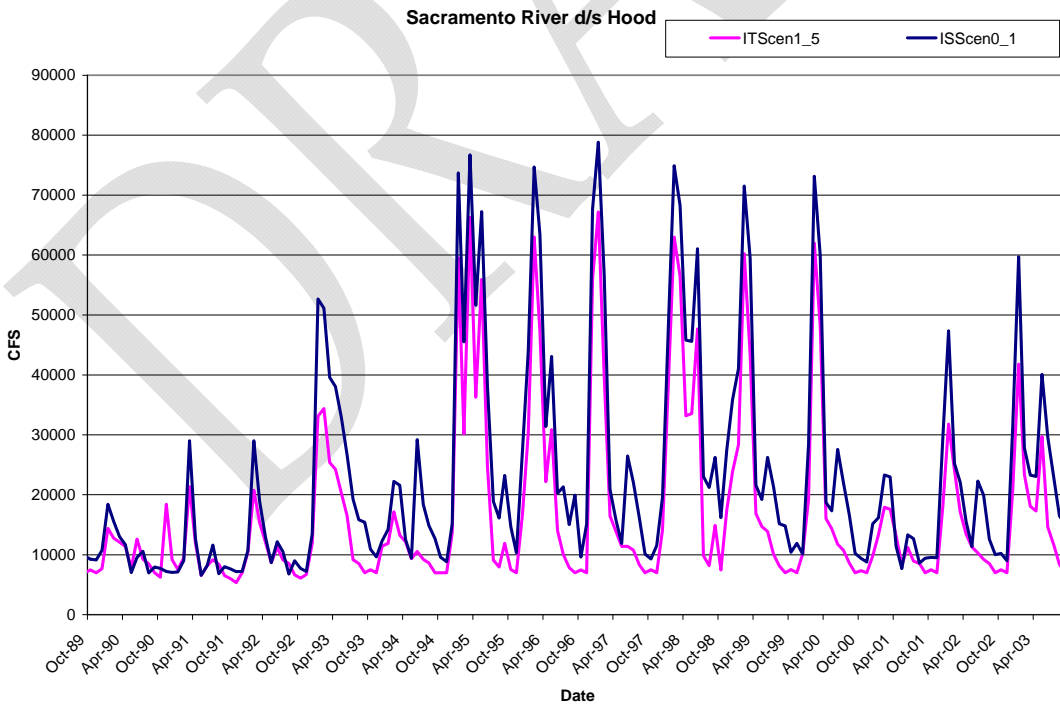
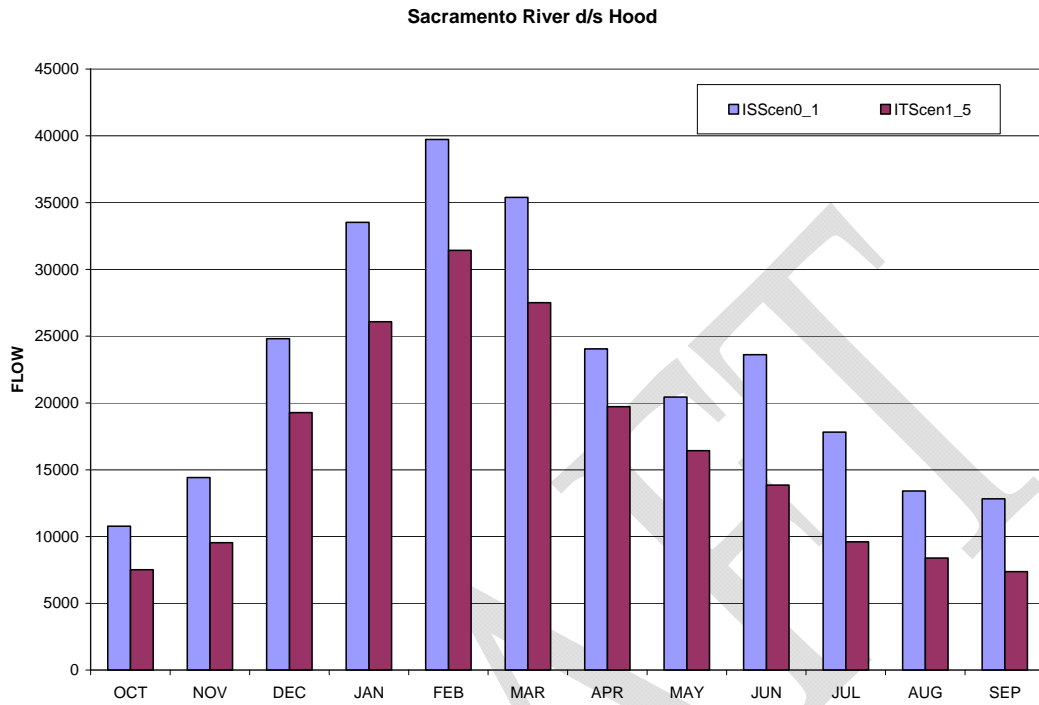
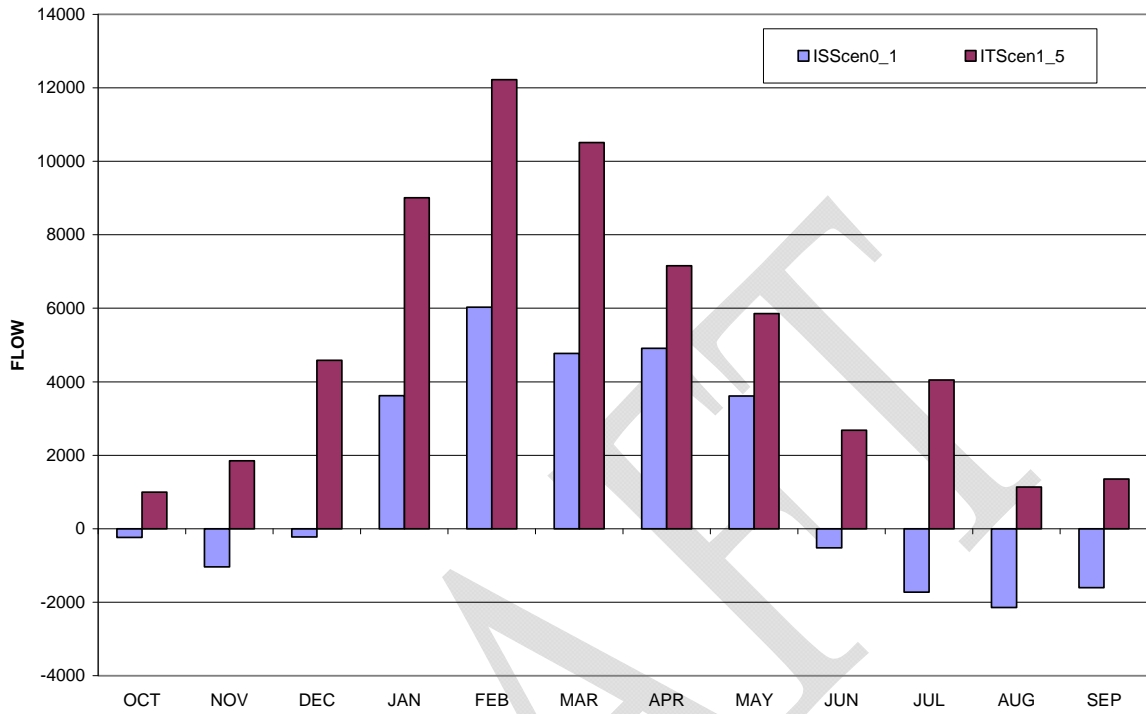


Figure 5. Range of export changes under 5kcfs North Delta diversion bypass rule.

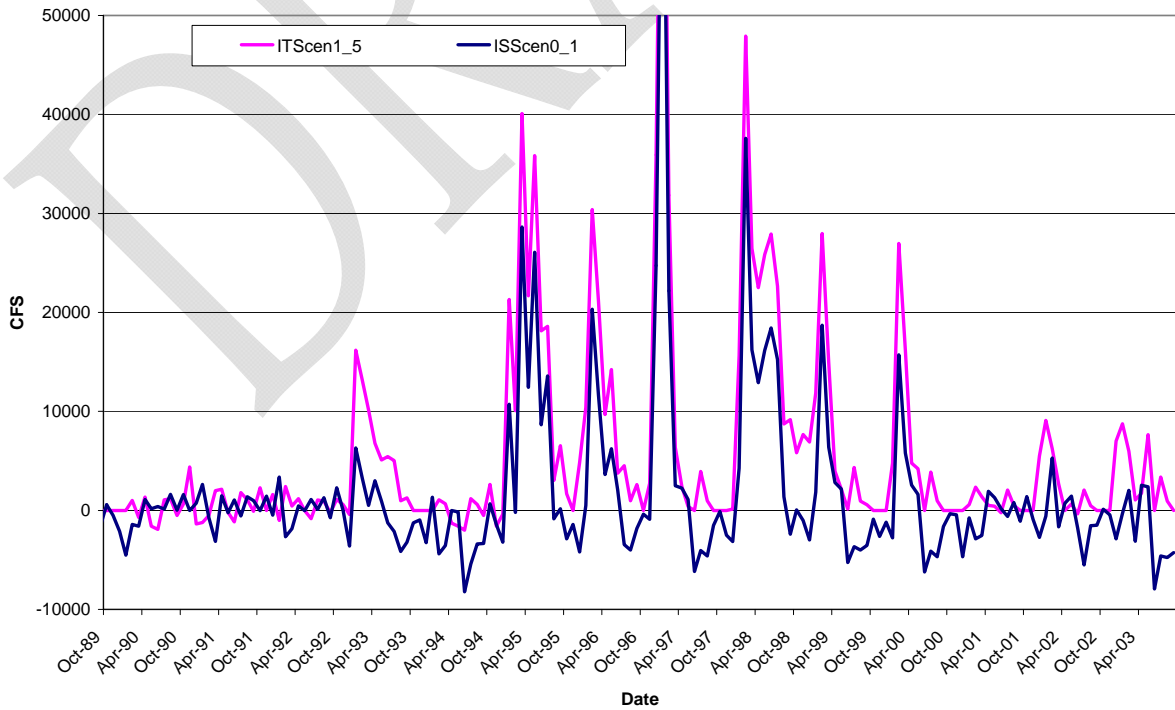
## Range of Flows for the Mid-Range North Delta Diversion Rule (Scen1 5)



San Joaquin River near Jersey Pt (QWEST)

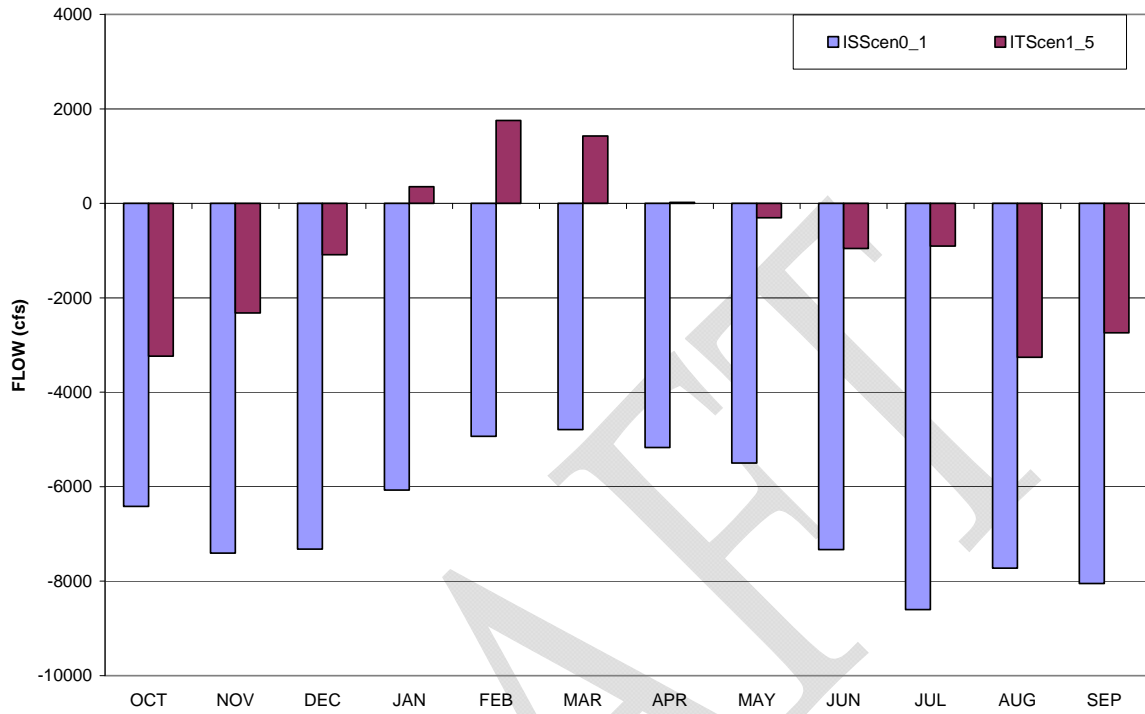


QWEST  
Monthly Average

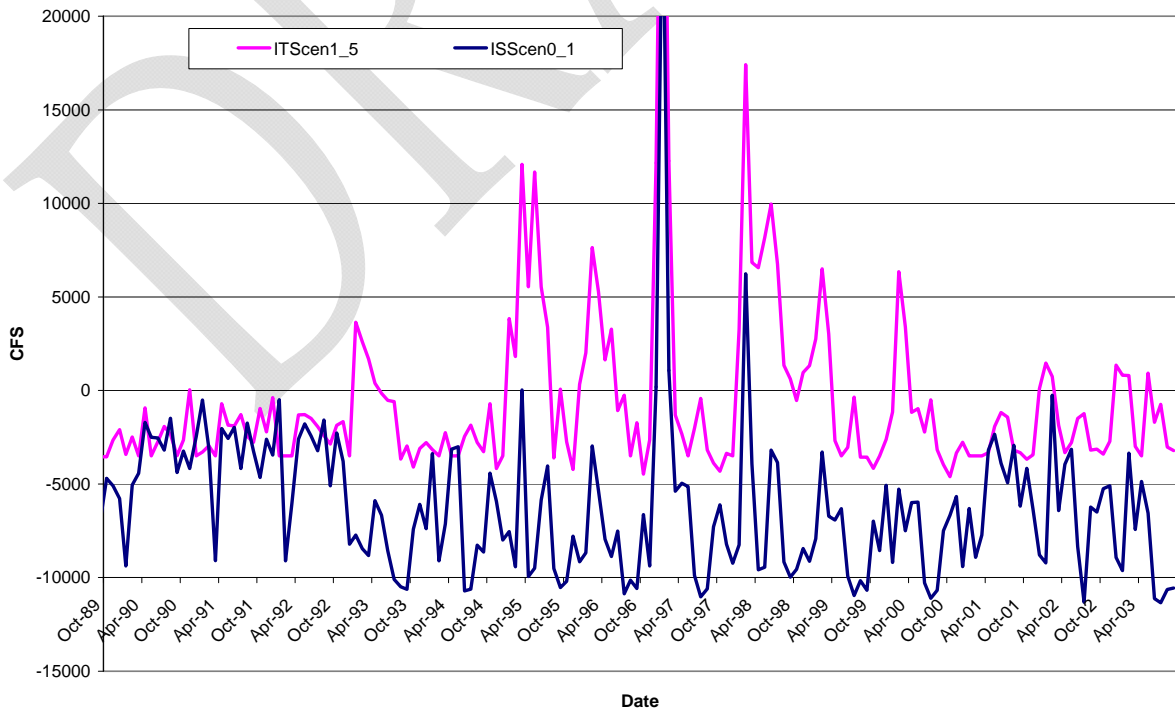




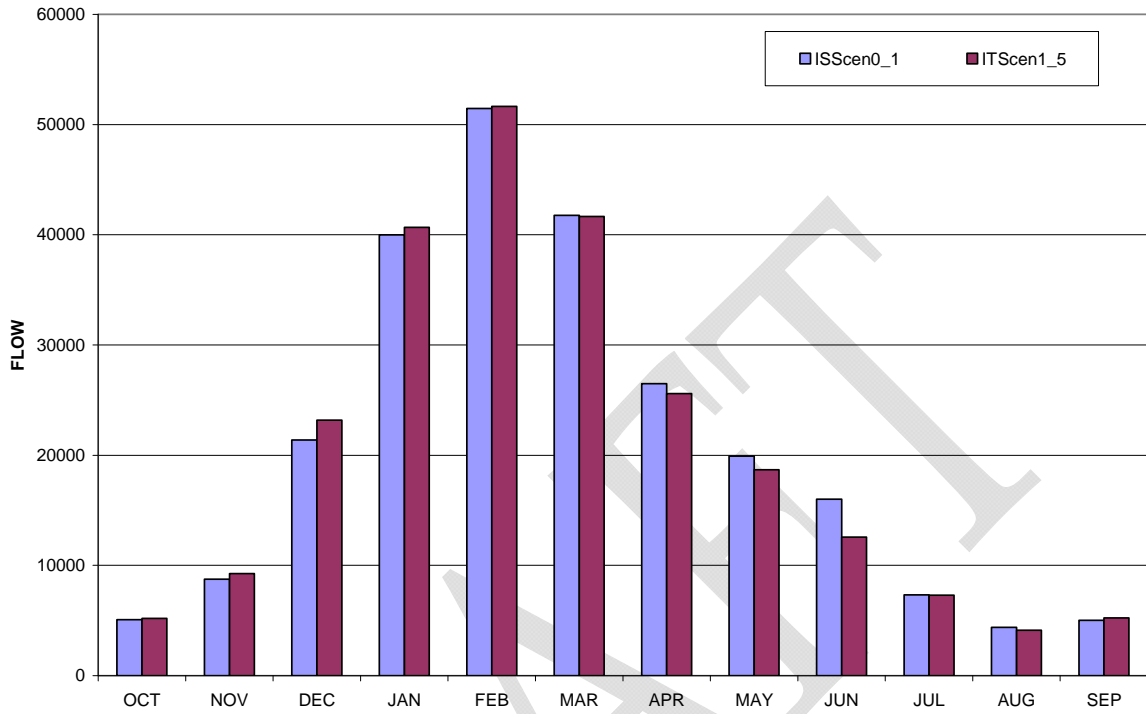
Combined Old and Middle River Flows



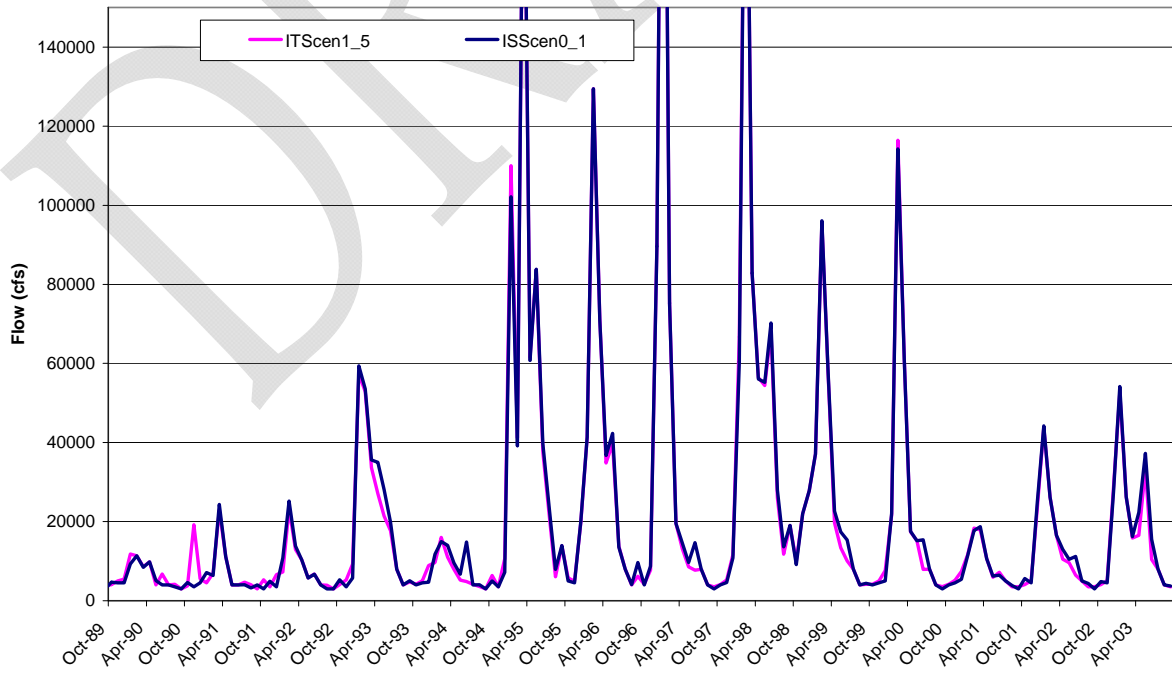
Combined Old and Middle River Flows



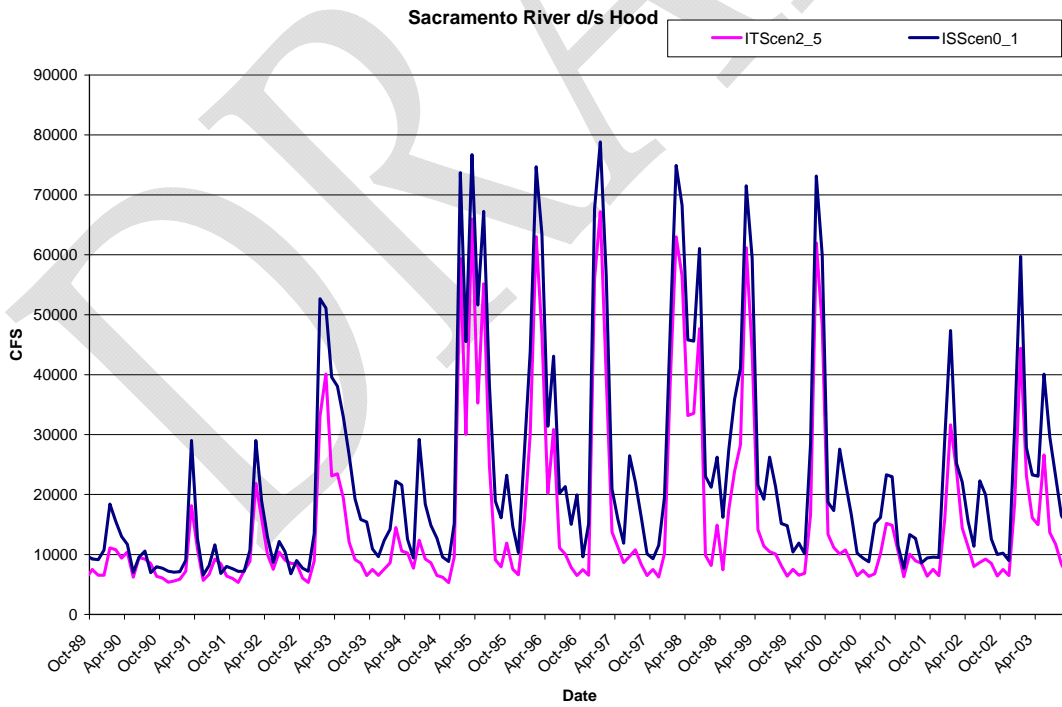
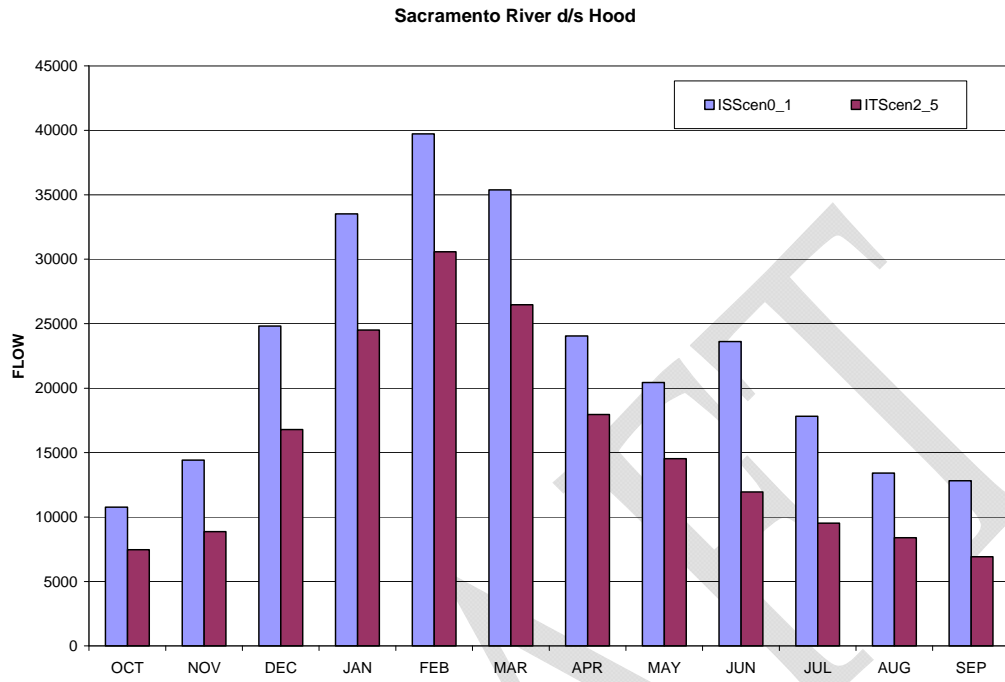
Delta Outflow



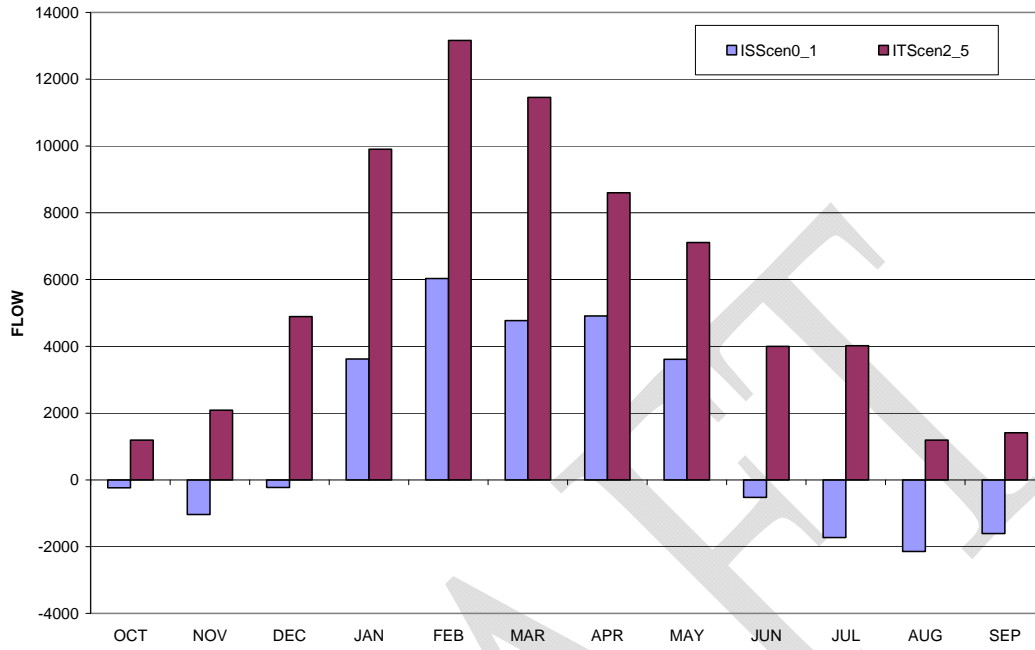
Delta Outflow Monthly Average



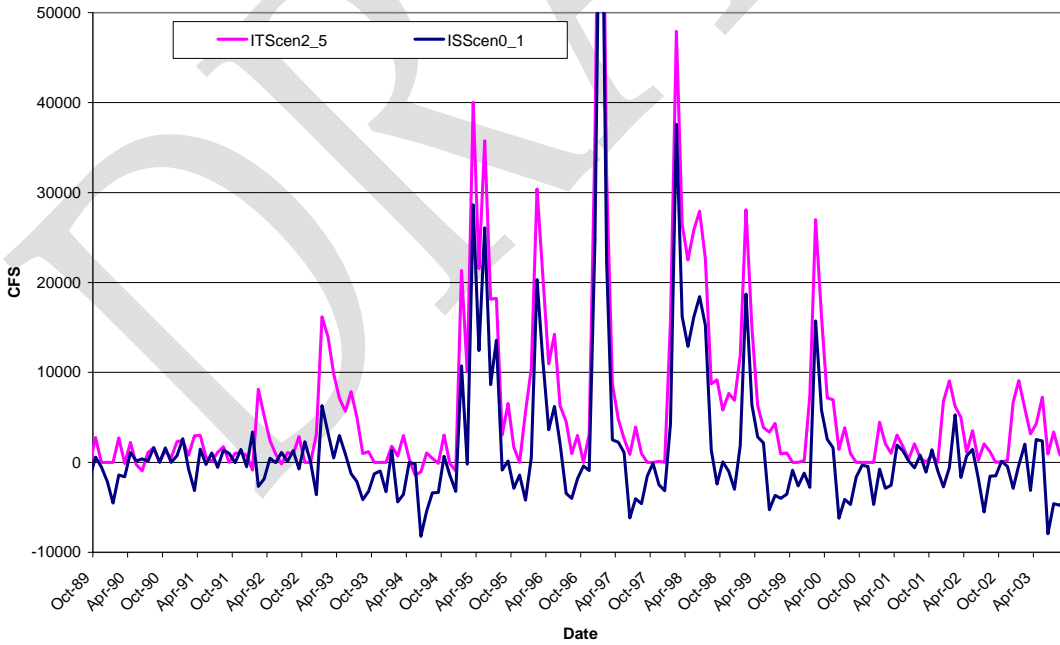
## Range of Flows for the 5kcfcs North Delta Diversion Rule (Scen2 5)



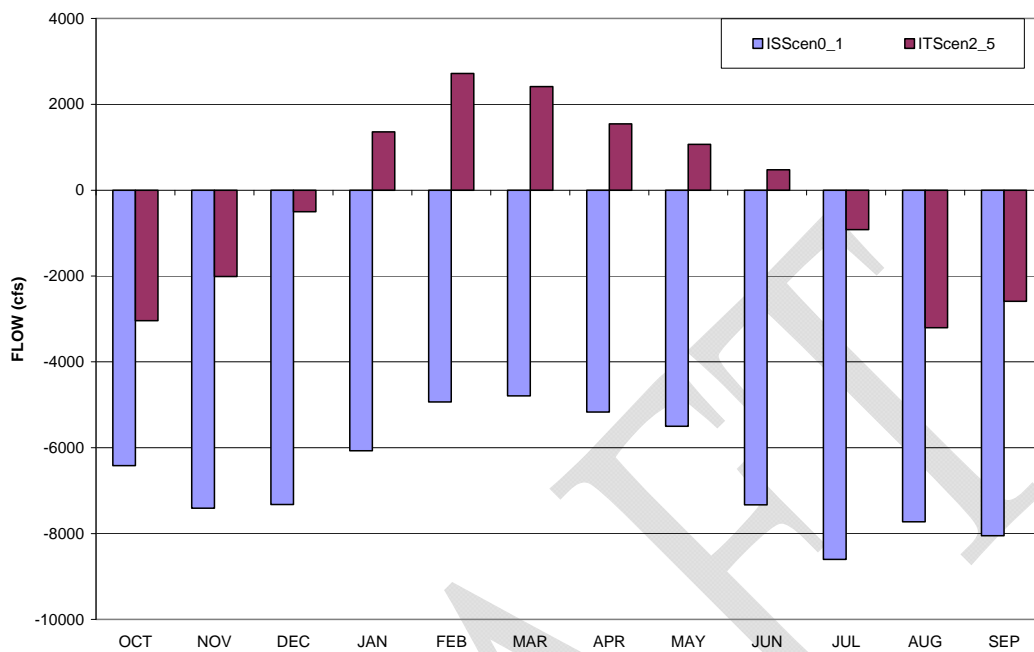
San Joaquin River near Jersey Pt (QWEST)



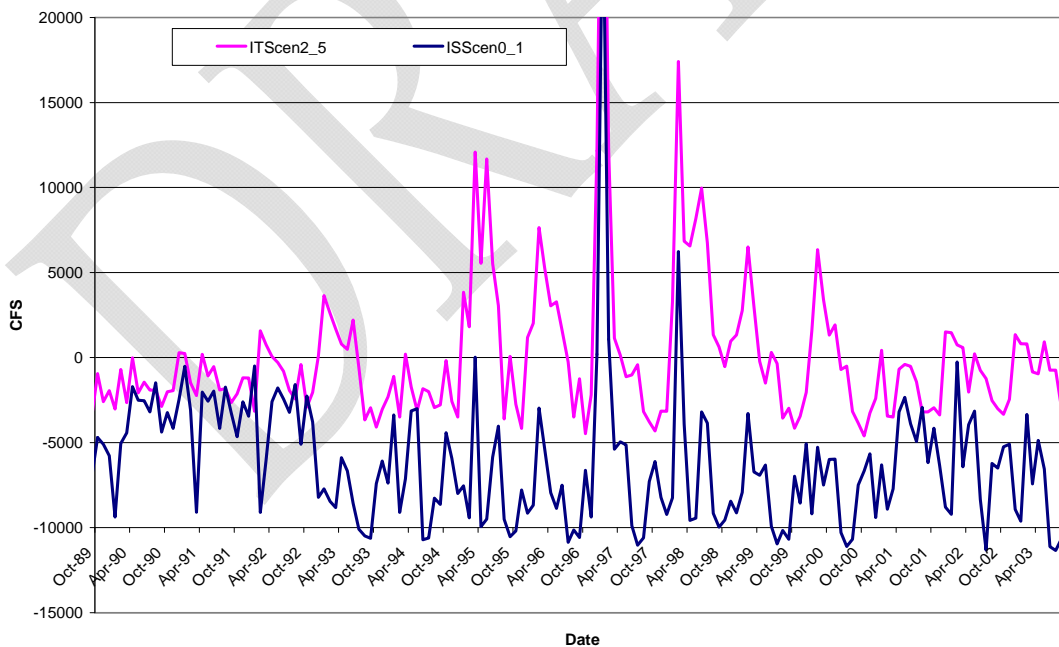
QWEST Monthly Average



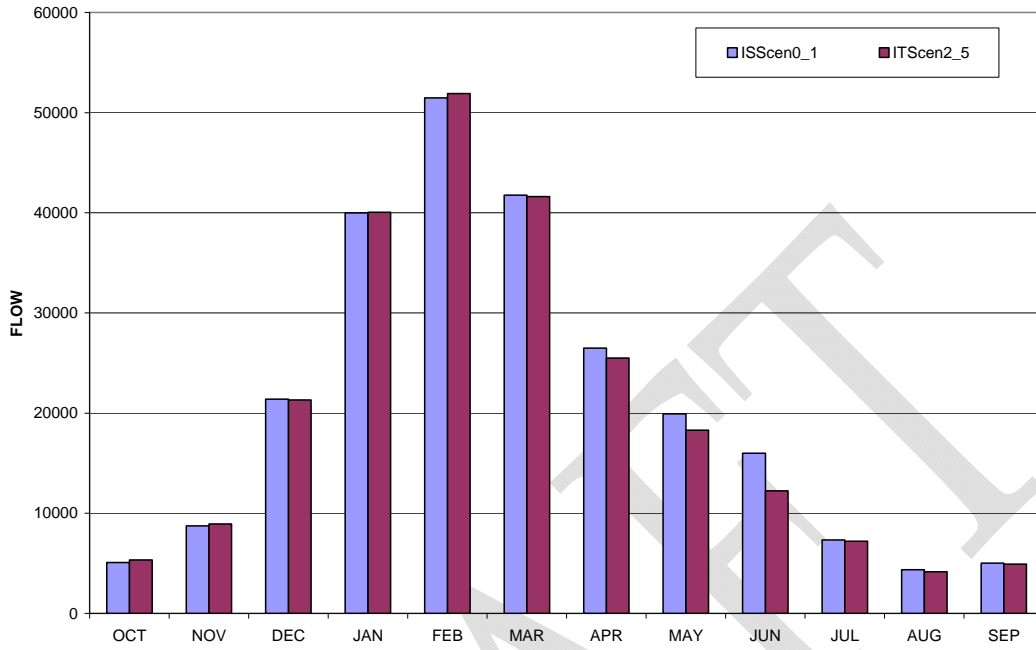
Combined Old and Middle River Flows



Combined Old and Middle River Flows



Delta Outflow



Delta Outflow  
Monthly Average

