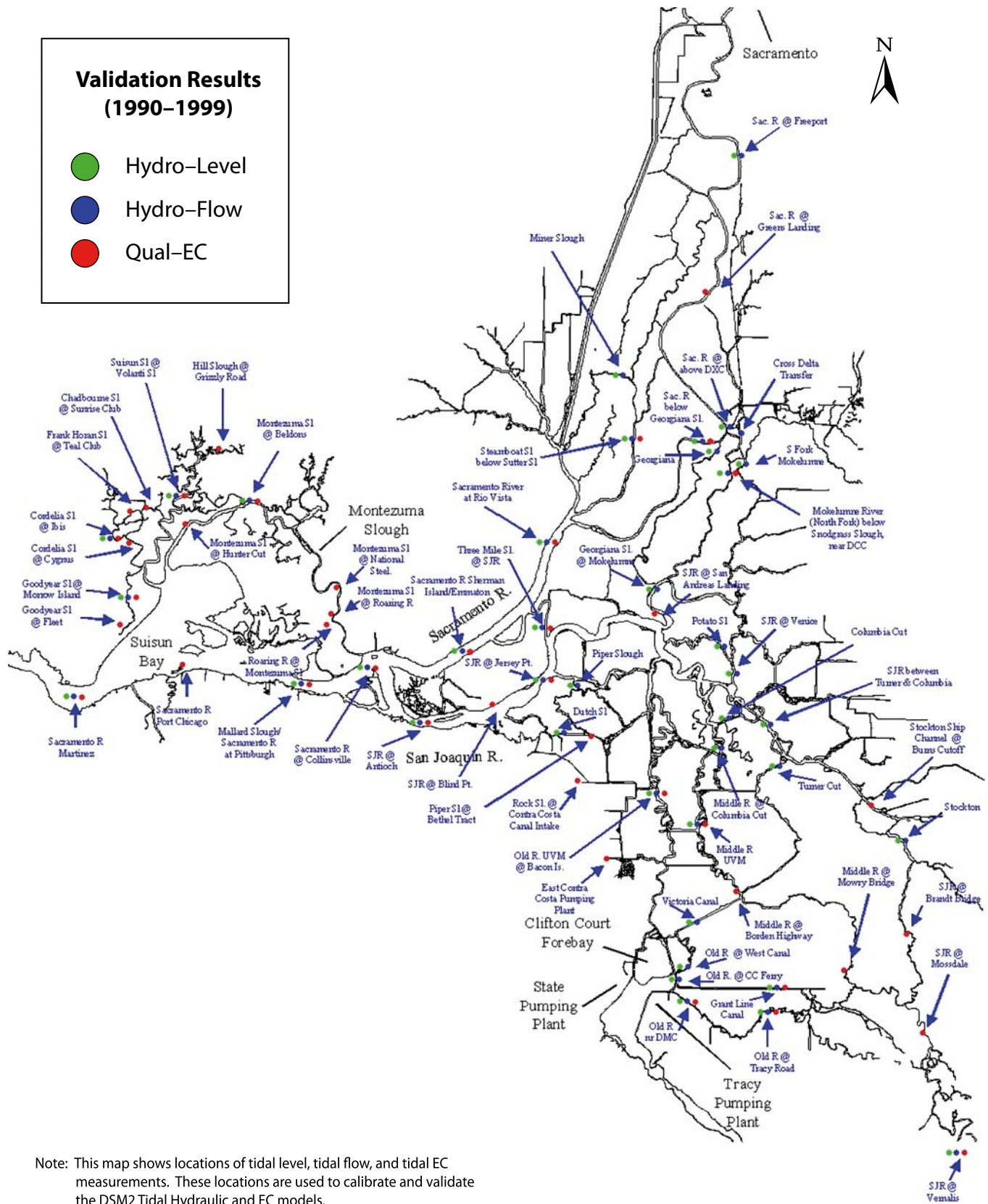


**Validation Results
(1990–1999)**

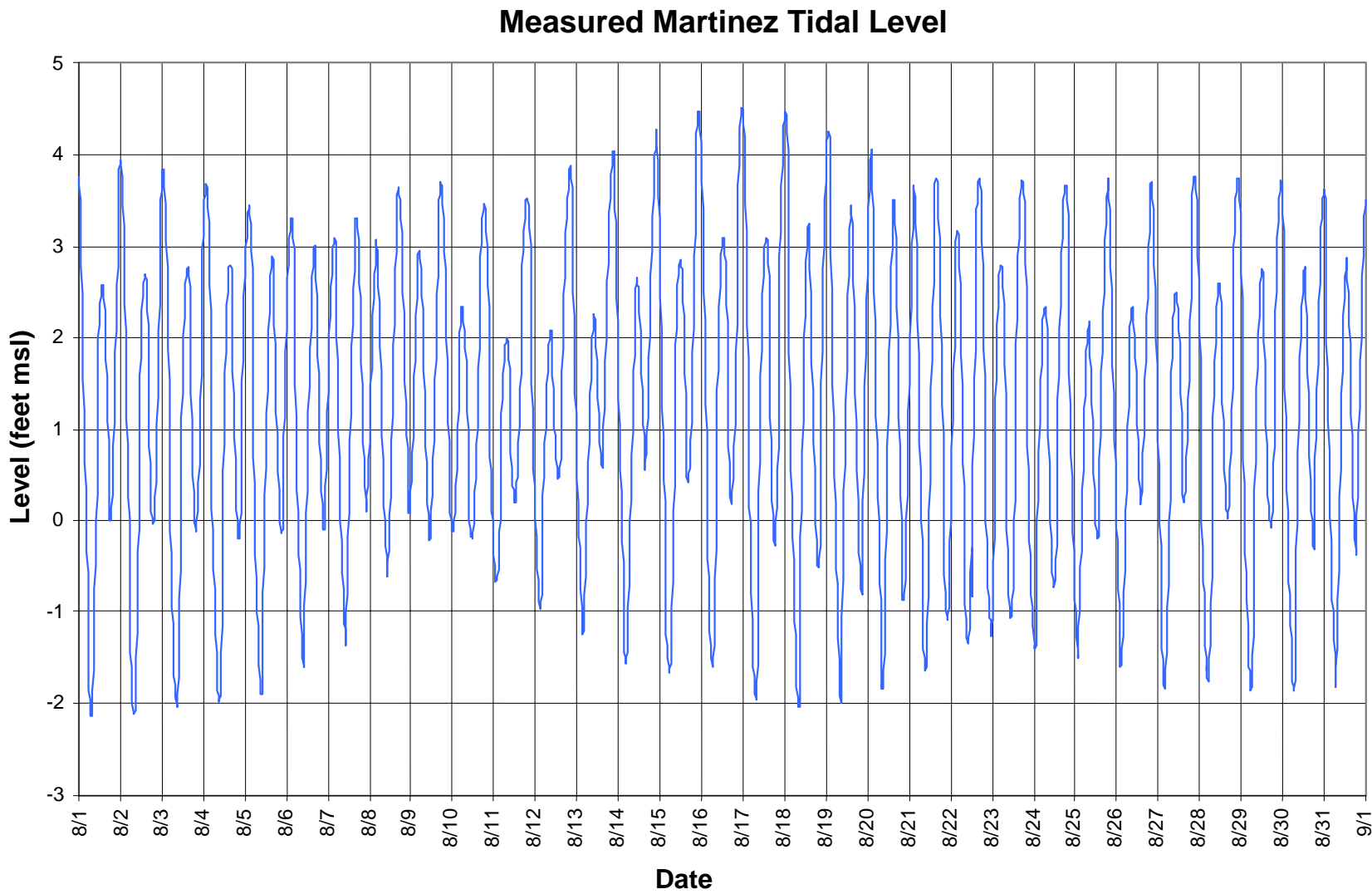
- Hydro–Level
- Hydro–Flow
- Qual–EC



Note: This map shows locations of tidal level, tidal flow, and tidal EC measurements. These locations are used to calibrate and validate the DSM2 Tidal Hydraulic and EC models.

Source: California Department of Water Resources 2002b.

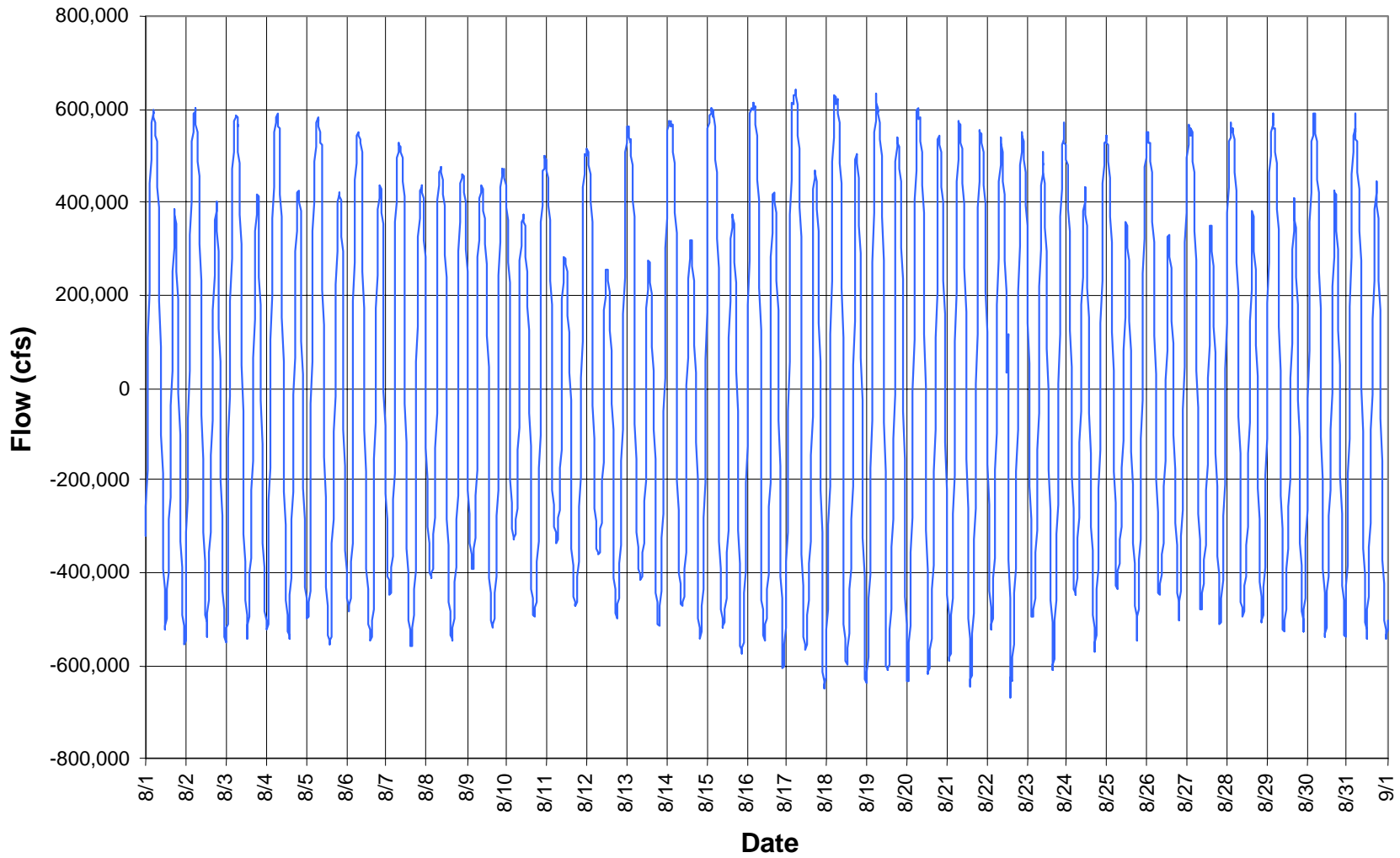
02053.02.101 (1/05) Public Draft



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Figure 5.2-2
Measured Tidal Level at Martinez, August 1997

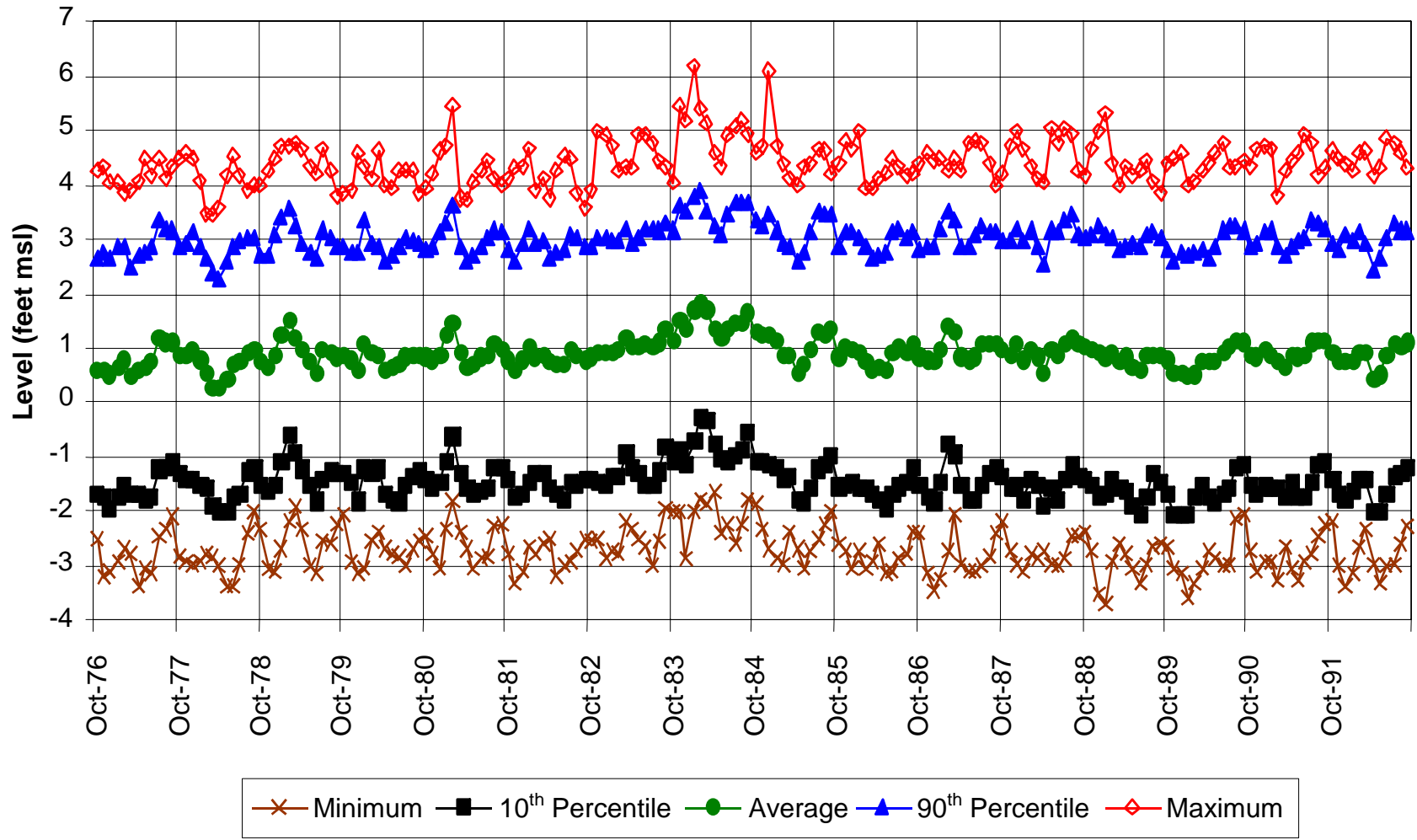
Martinez Simulated Tidal Flow



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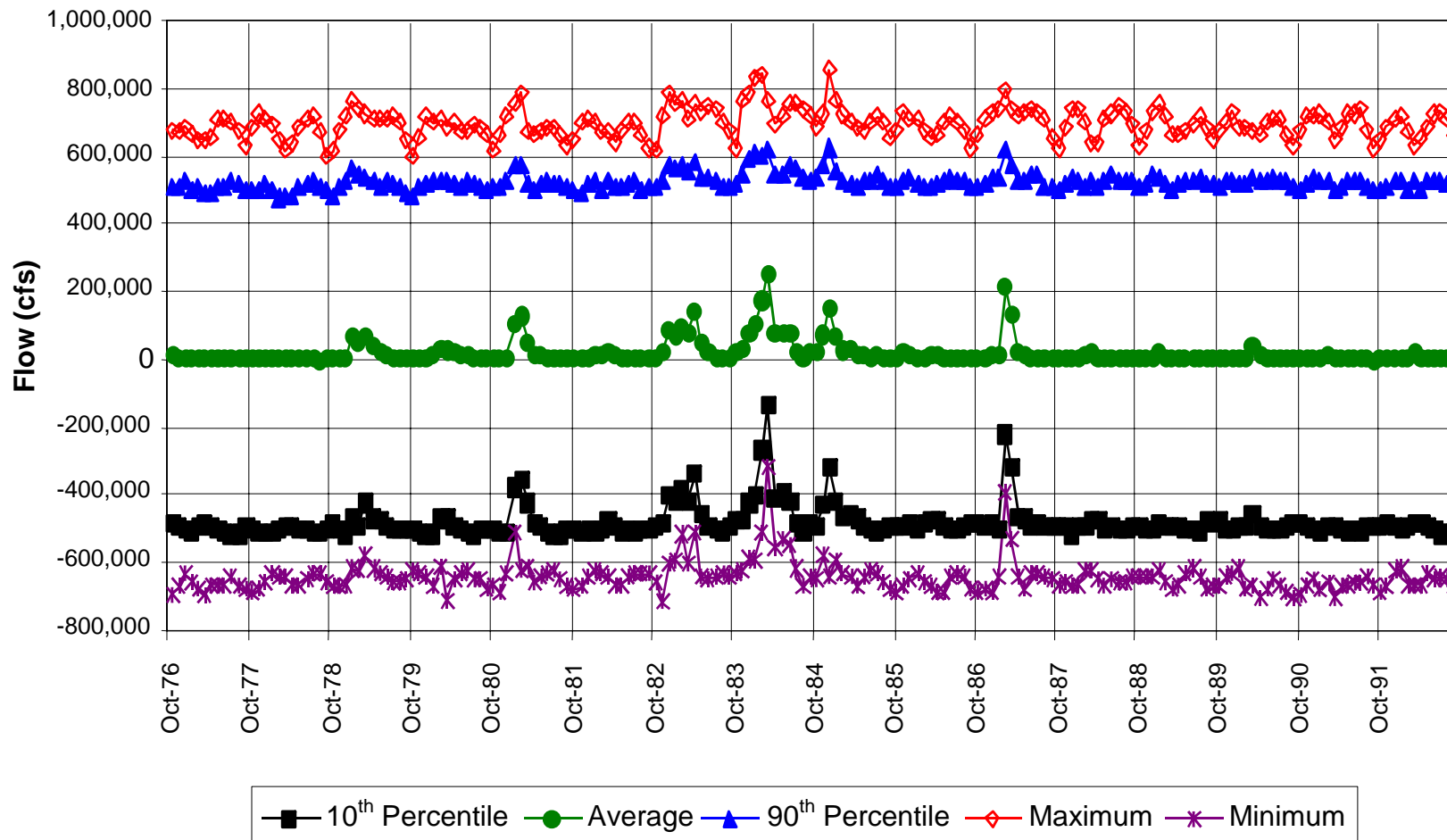
Figure 5.2-3
Simulated Tidal Flow at Martinez, August 1997

Tidal Level at Martinez



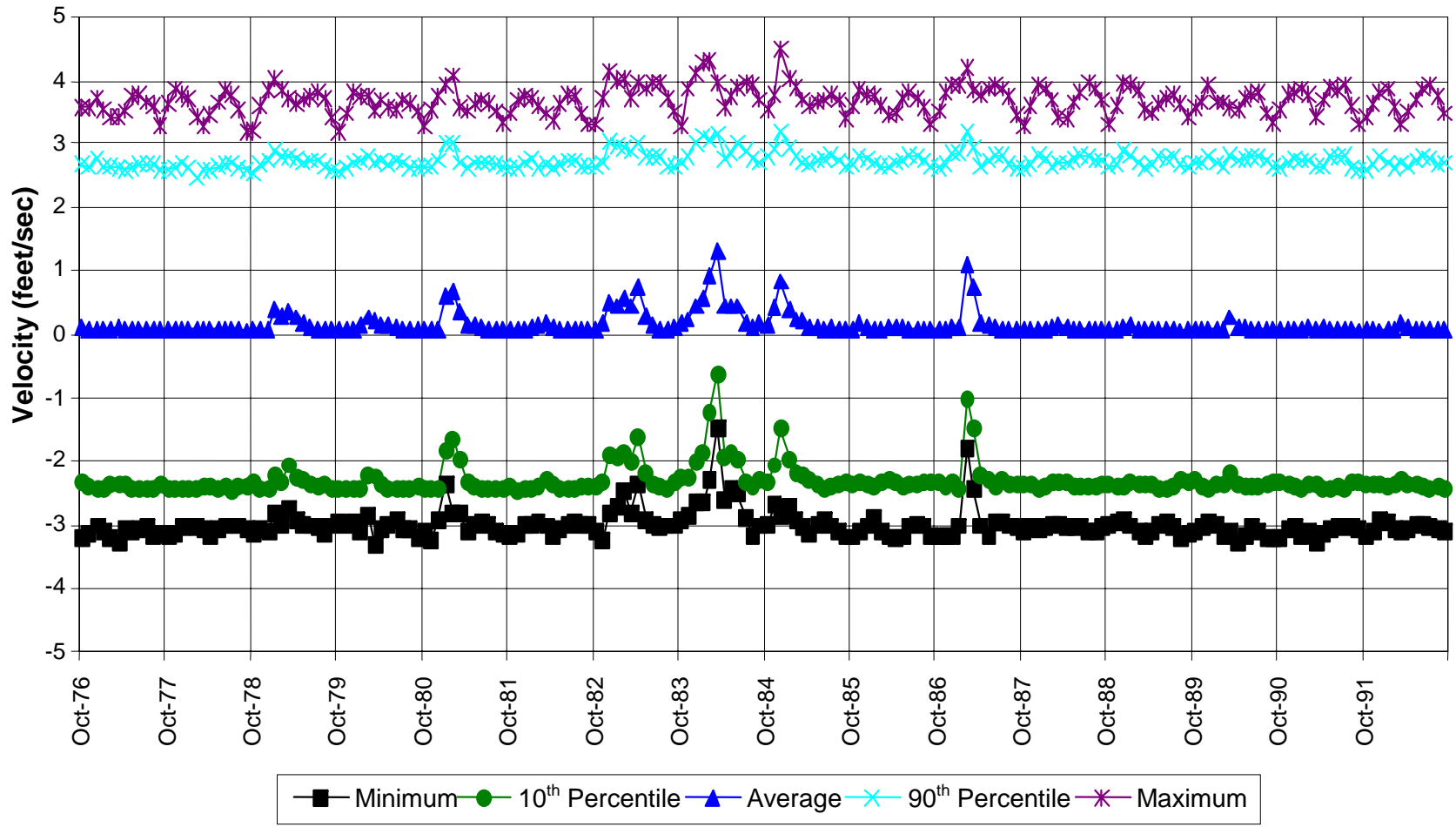
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Tidal Flows at Martinez



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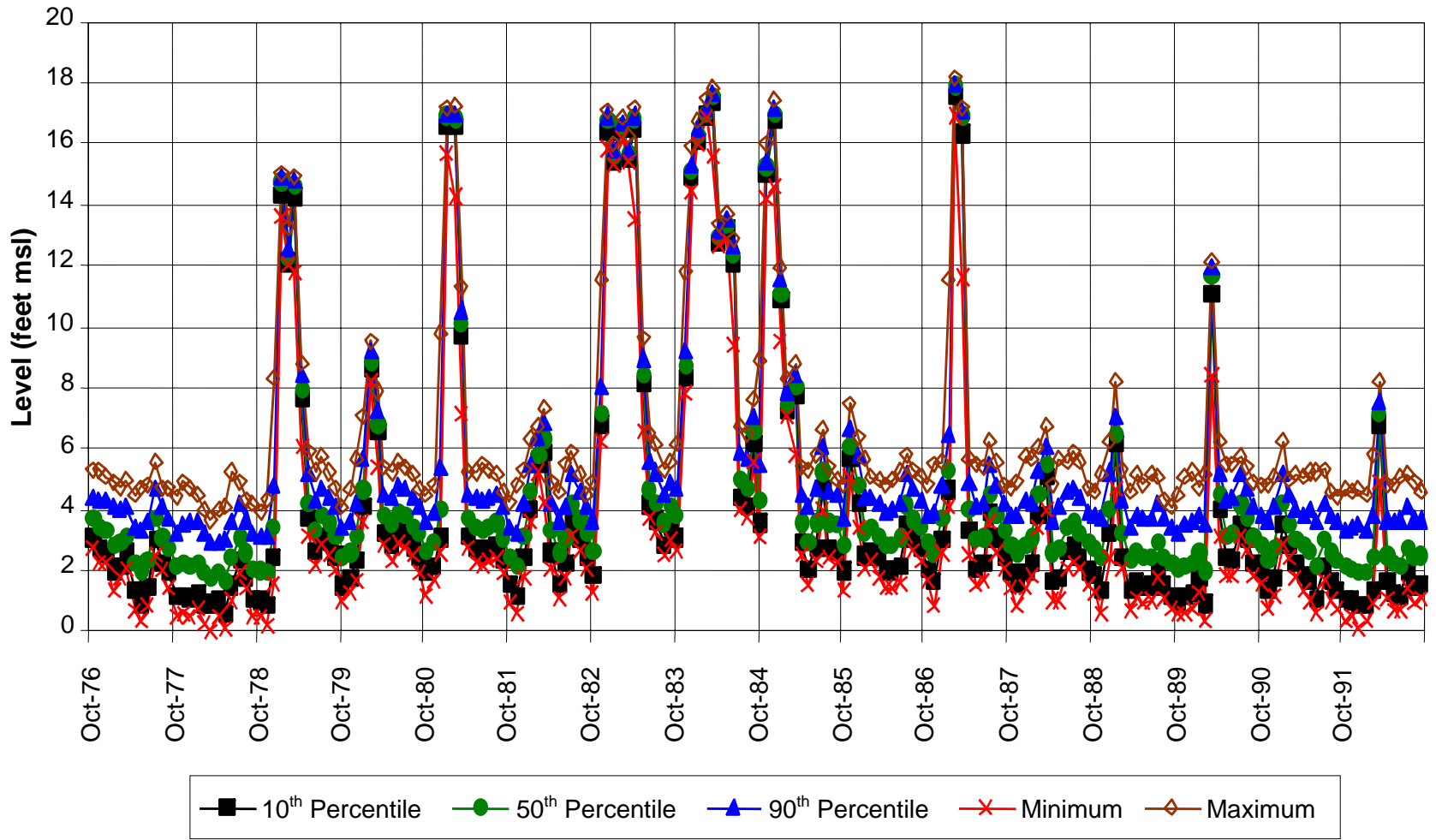
Tidal Velocity at Martinez



02053.02.101

Figure 5.2-6
Monthly Distribution of Simulated Tidal Velocities at Martinez, Water Years 1976–1991

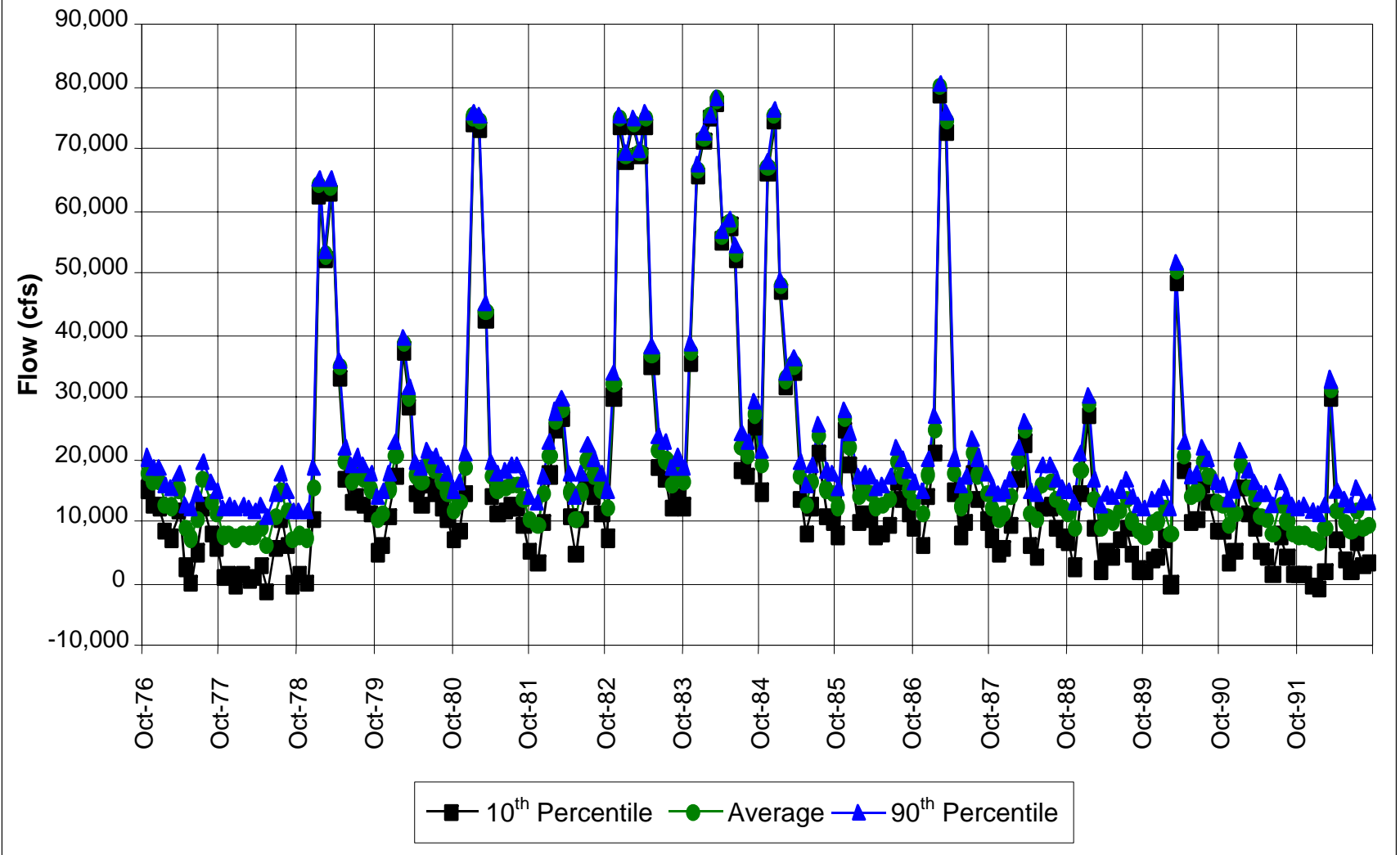
Sacramento River Level at Freeport



02053.02.101

Figure 5.2-7
Monthly Distribution of Simulated Level for the Sacramento River at Freeport, Water Years 1976–1991

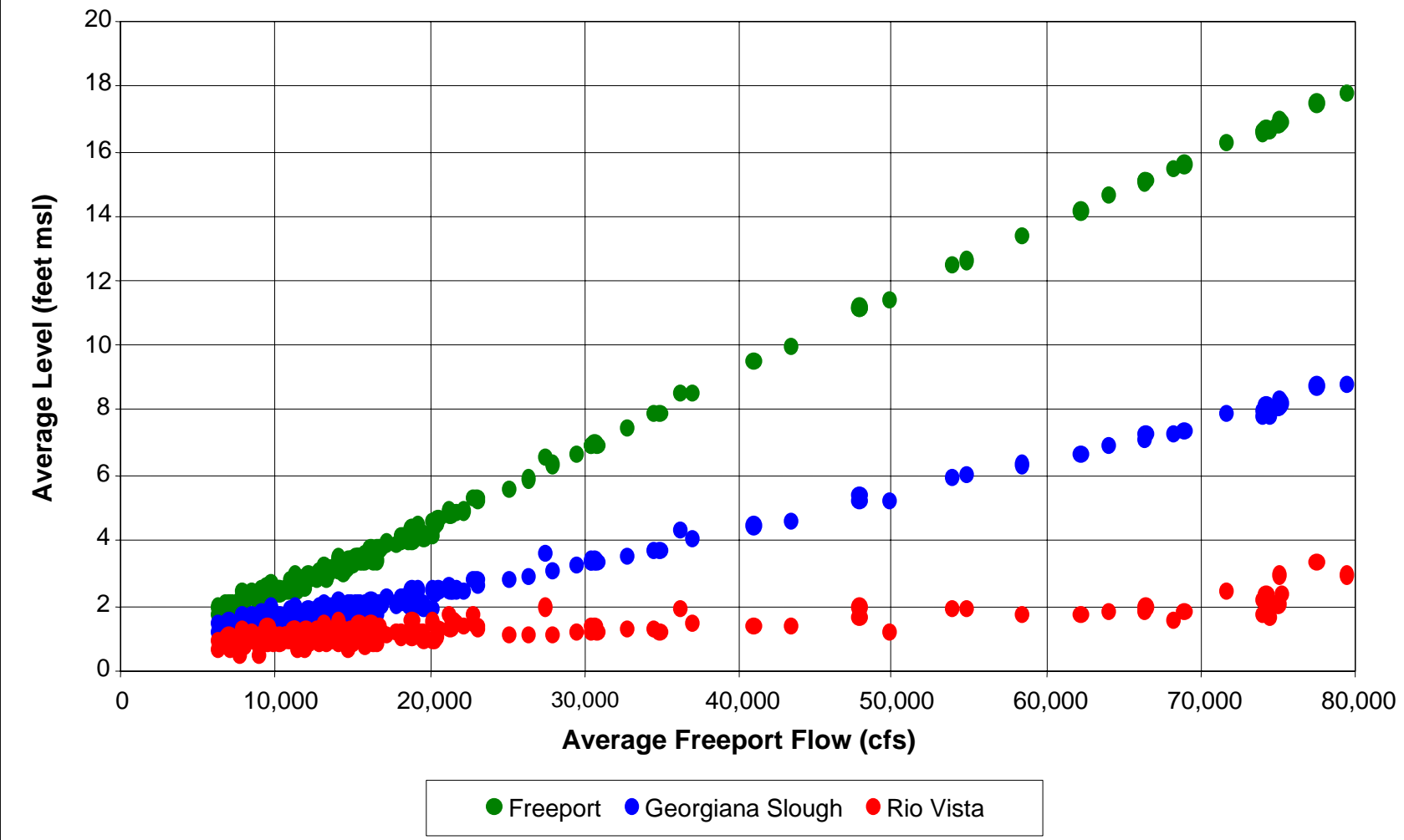
Sacramento River Flow at Freeport



02053.02.101

Figure 5.2-8
Monthly Distribution of Simulated Flow
in the Sacramento River at Freeport, Water Years 1976–1991

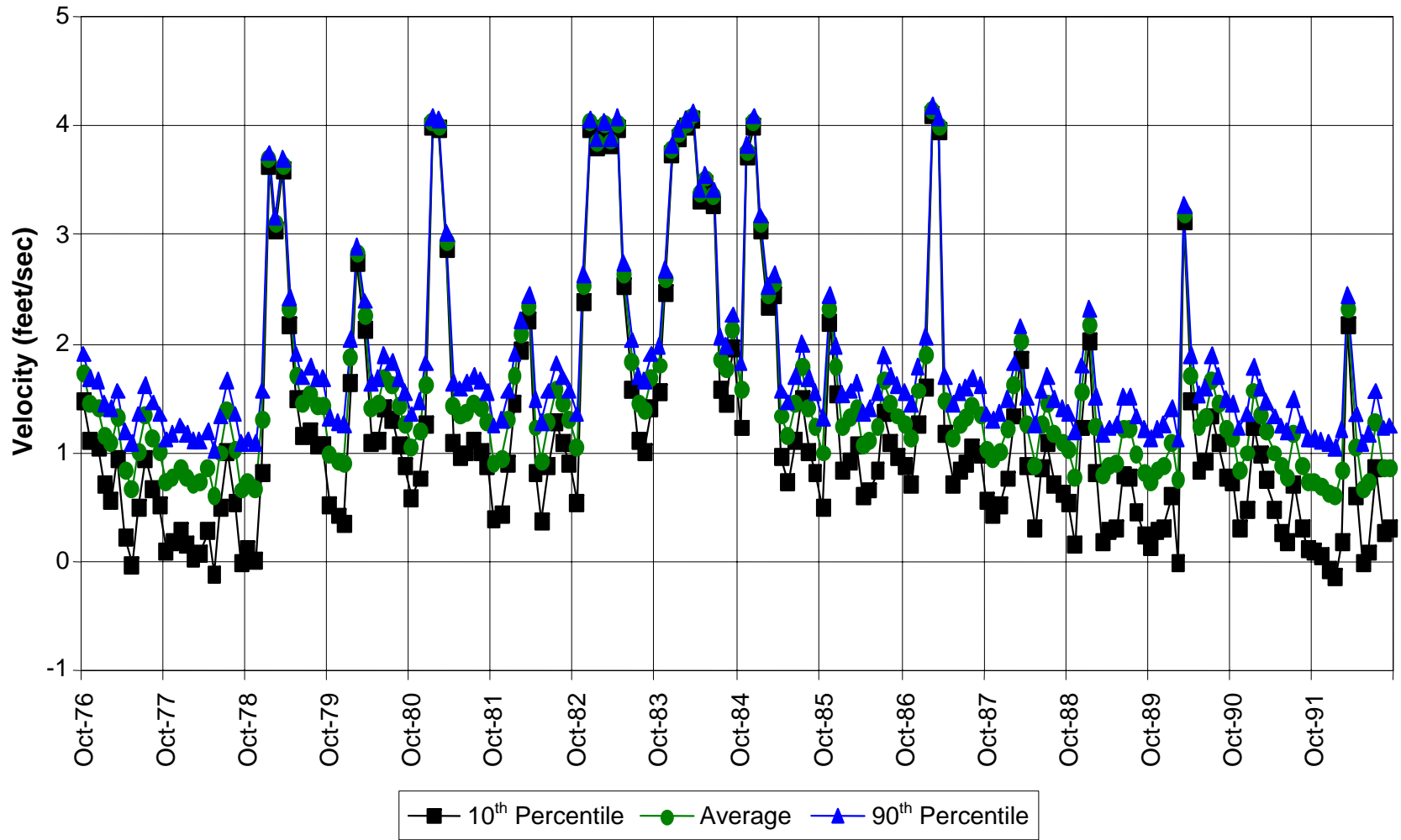
Sacramento River Level—Discharge Relationships



02053.02.101

Figure 5.2-9
Comparison of Sacramento River Levels and Flows, Water Years 1976–1991

Tidal Velocities in Sacramento River at Freeport



02053.02.101

Figure 5.2-10

Monthly Distribution of Simulated Tidal Velocities in the Sacramento River at Freeport, Water Years 1976–1991

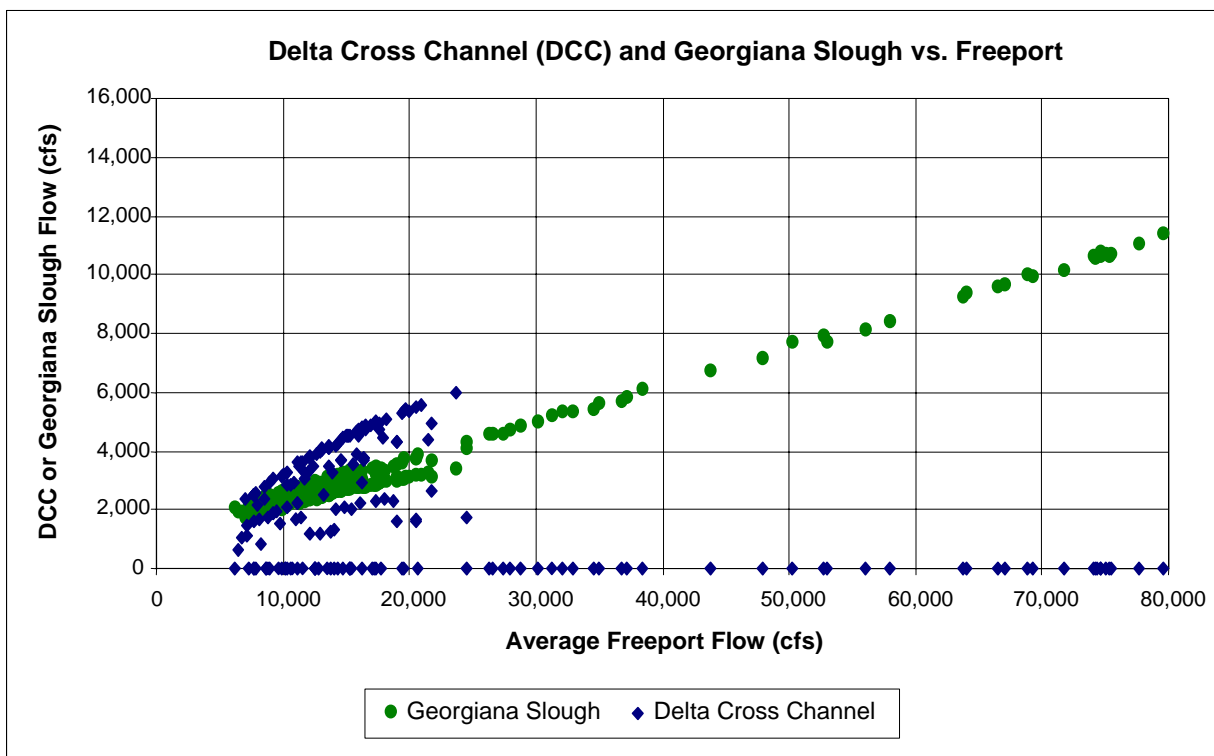


Figure 5.2-11a. Flows in the Delta Cross Channel and Georgiana Slough as a Function of Average Flow in the Sacramento River at Freeport, Water Years 1976–1991

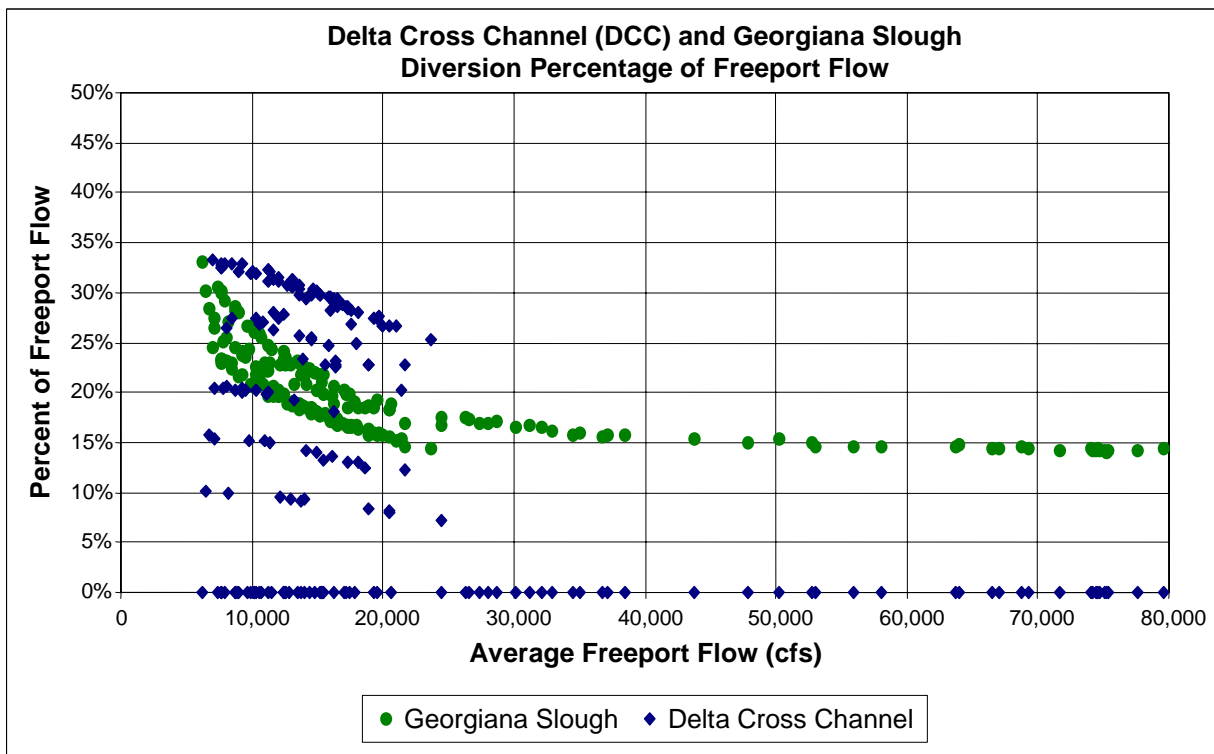
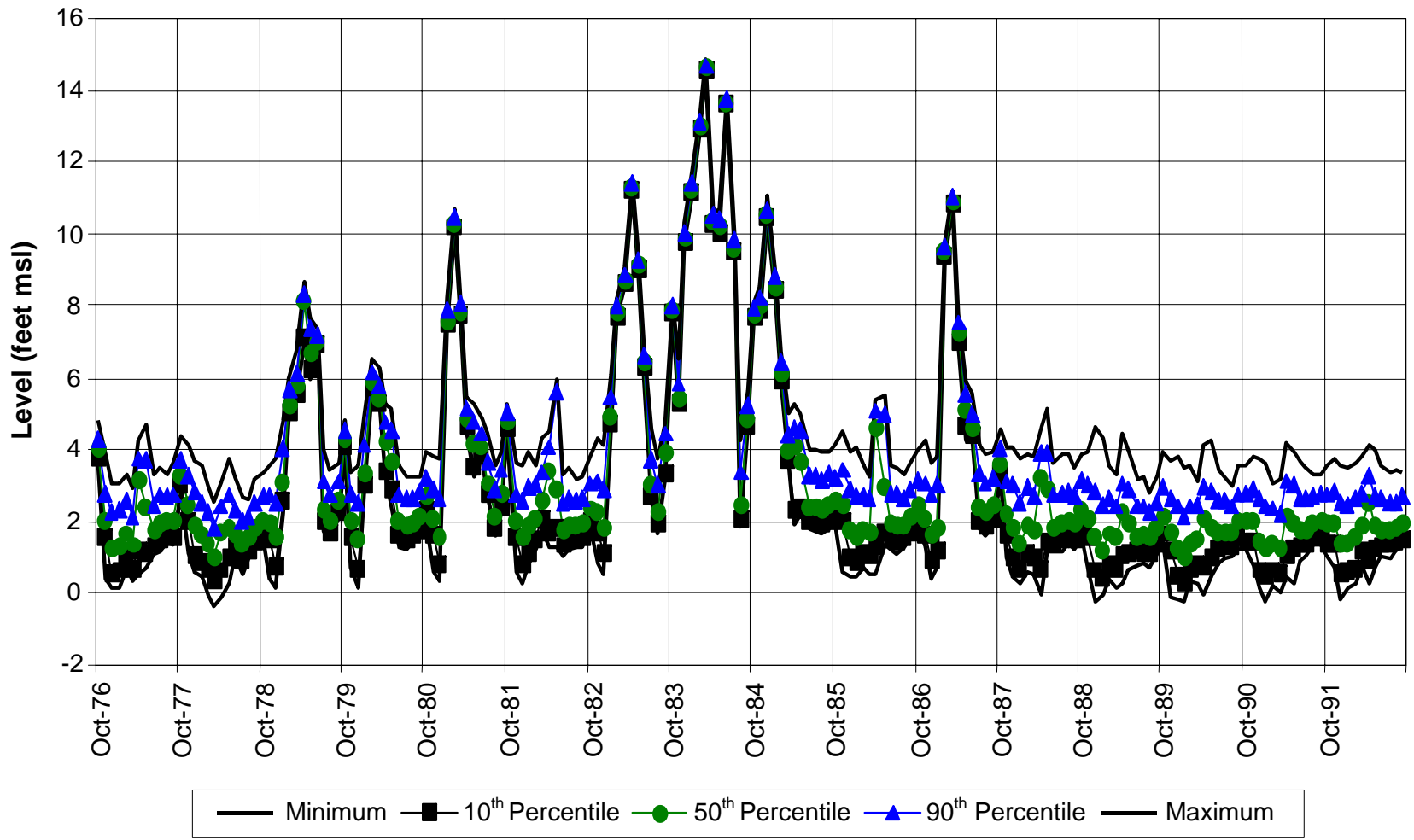


Figure 5.2-11b. Flows in the Delta Cross Channel and Georgiana Slough as a Percent of Average Flow in the Sacramento River at Freeport, Water Years 1976–1991

02053.02.101

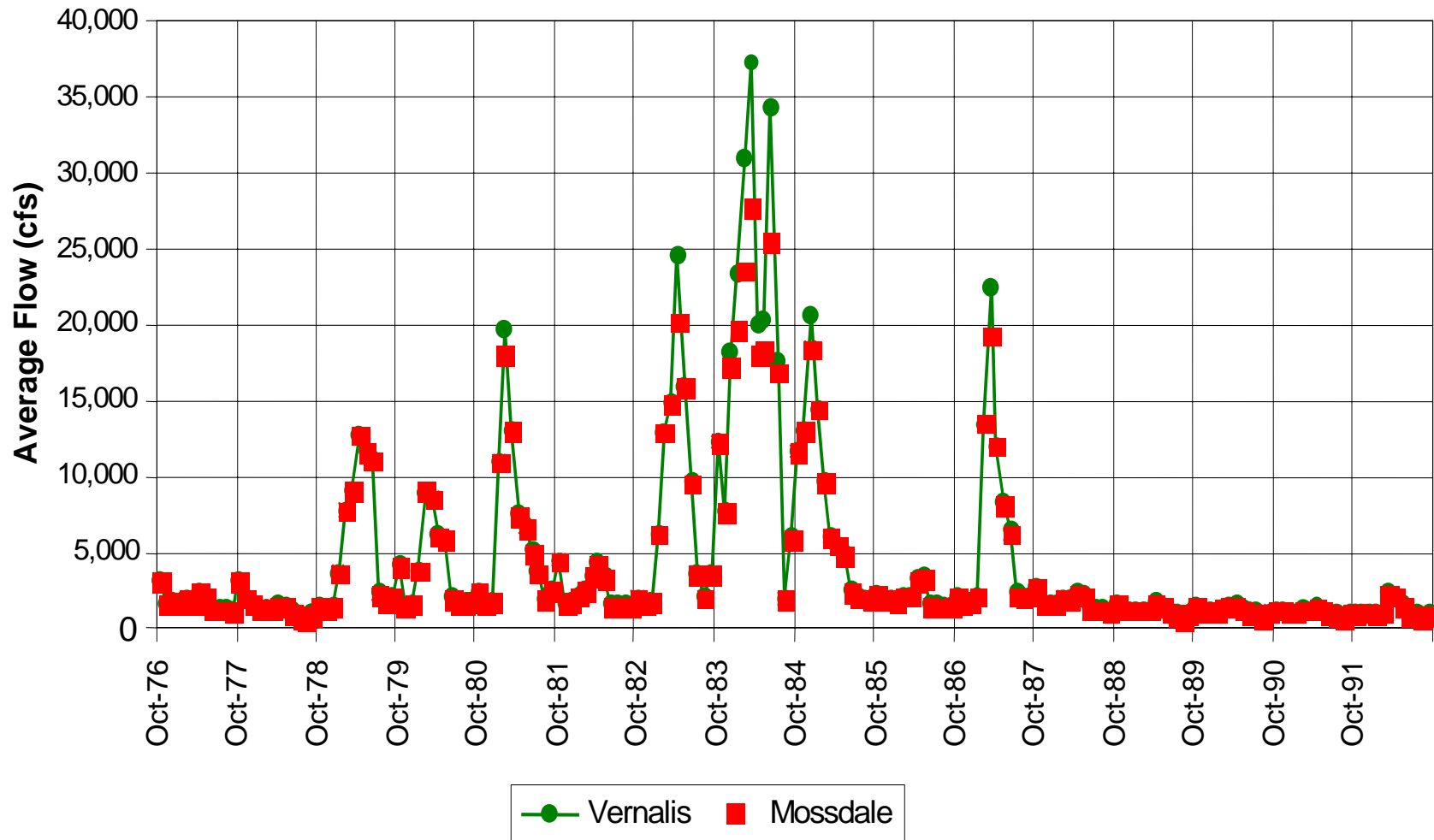
San Joaquin River at Mossdale



02053.02.101

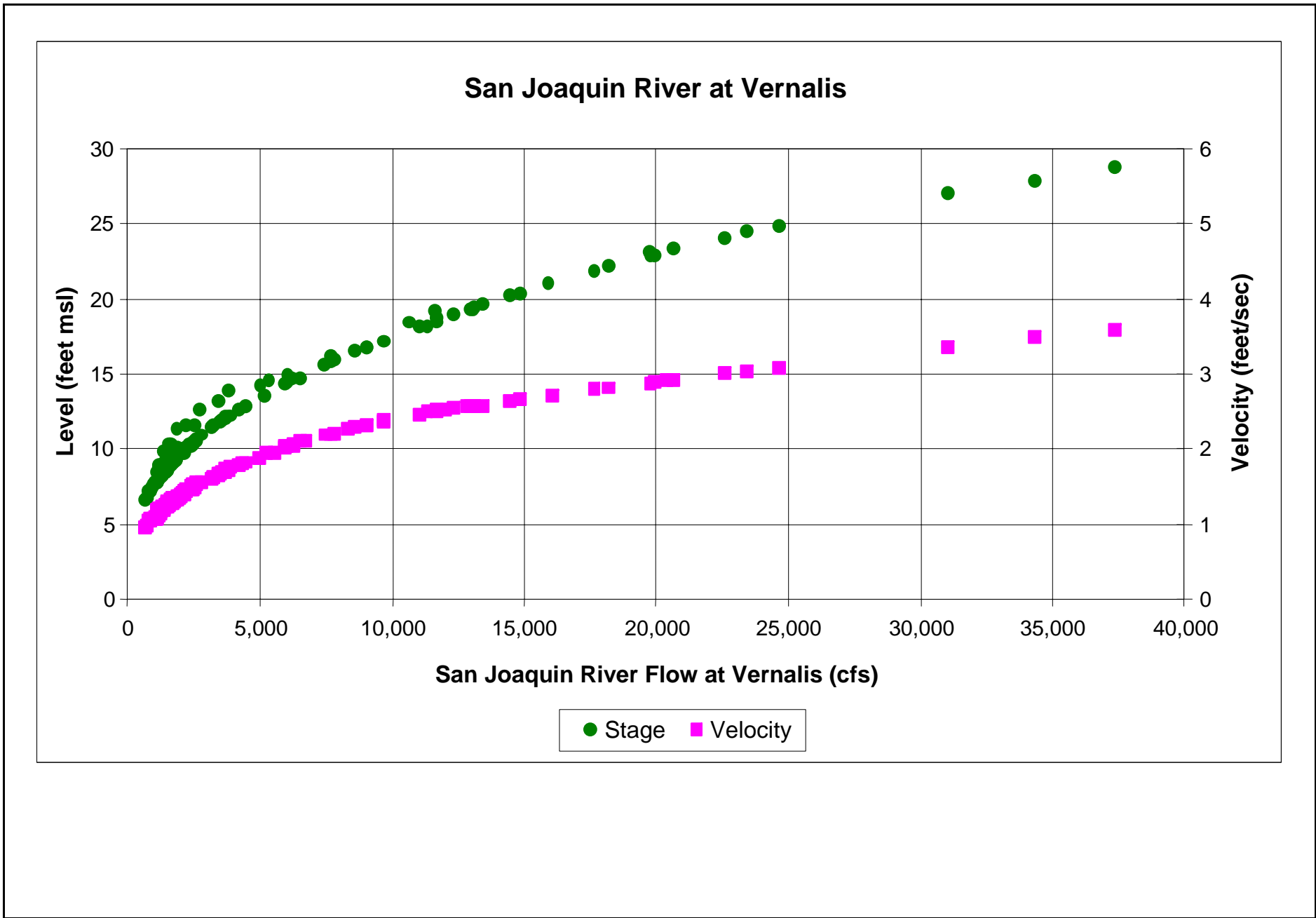
Figure 5.2-12
Monthly Distribution of Simulated Tidal Levels
for the San Joaquin River at Mossdale, Water Years 1976–1991

San Joaquin River at Vernalis and Mossdale



02053.02.101

Figure 5.2-13
Simulated Monthly Average Flow in the
San Joaquin River at Vernalis and Mossdale, Water Years 1976–1991



02053.02.101

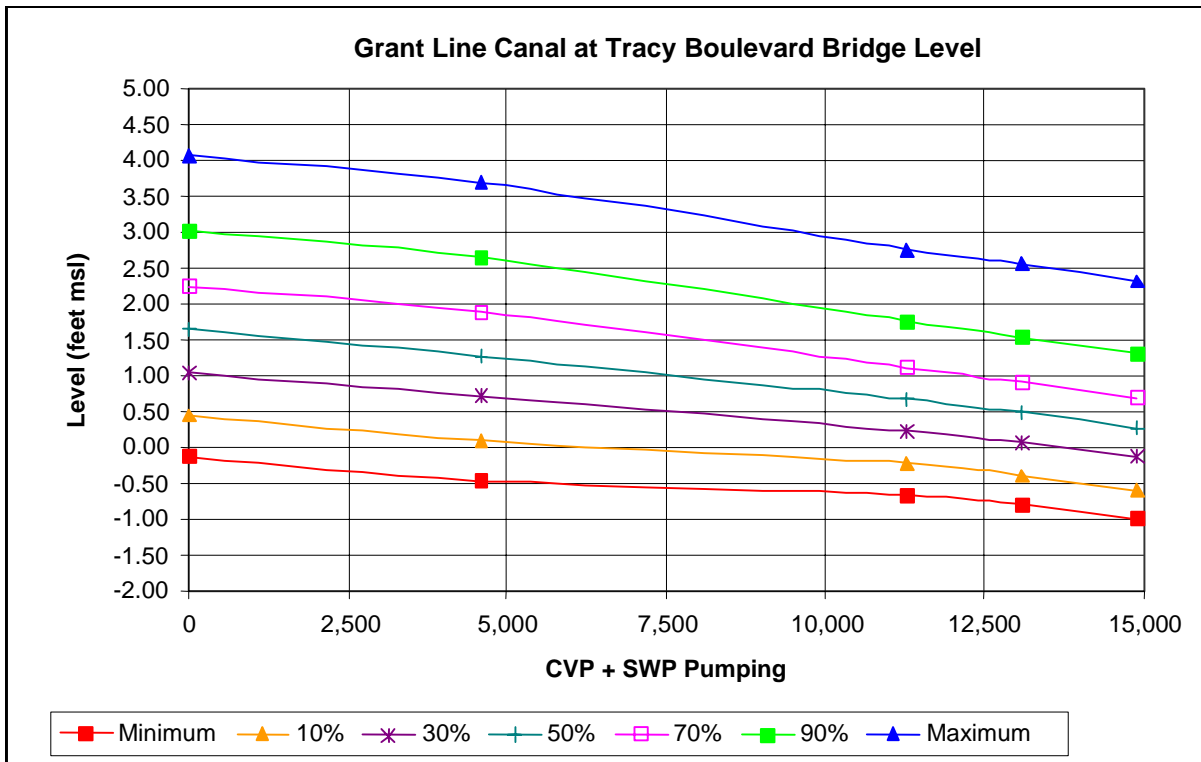


Figure 5.2-15a. Simulated Range of Tidal Levels for Grant Line Canal at Tracy Boulevard Bridge for the Full Range of Potential CVP and SWP Pumping

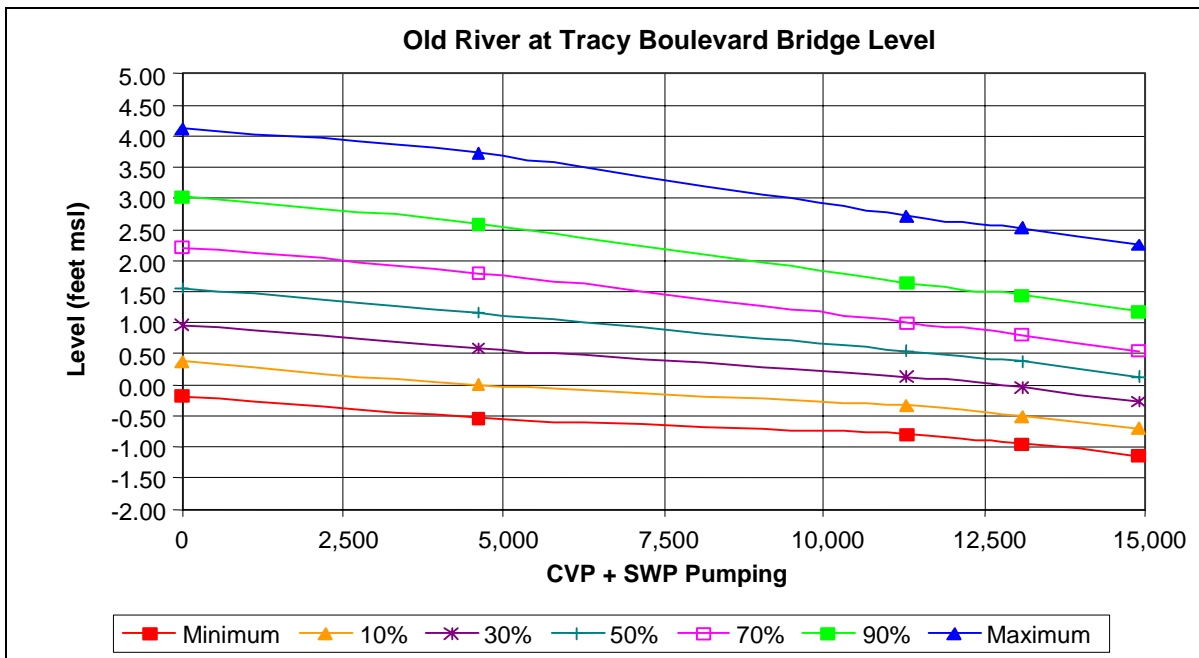


Figure 5.2-15b. Simulated Range of Tidal Levels for Old River at Tracy Boulevard Bridge for the Full Range of Potential CVP and SWP Pumping

02053.02 101

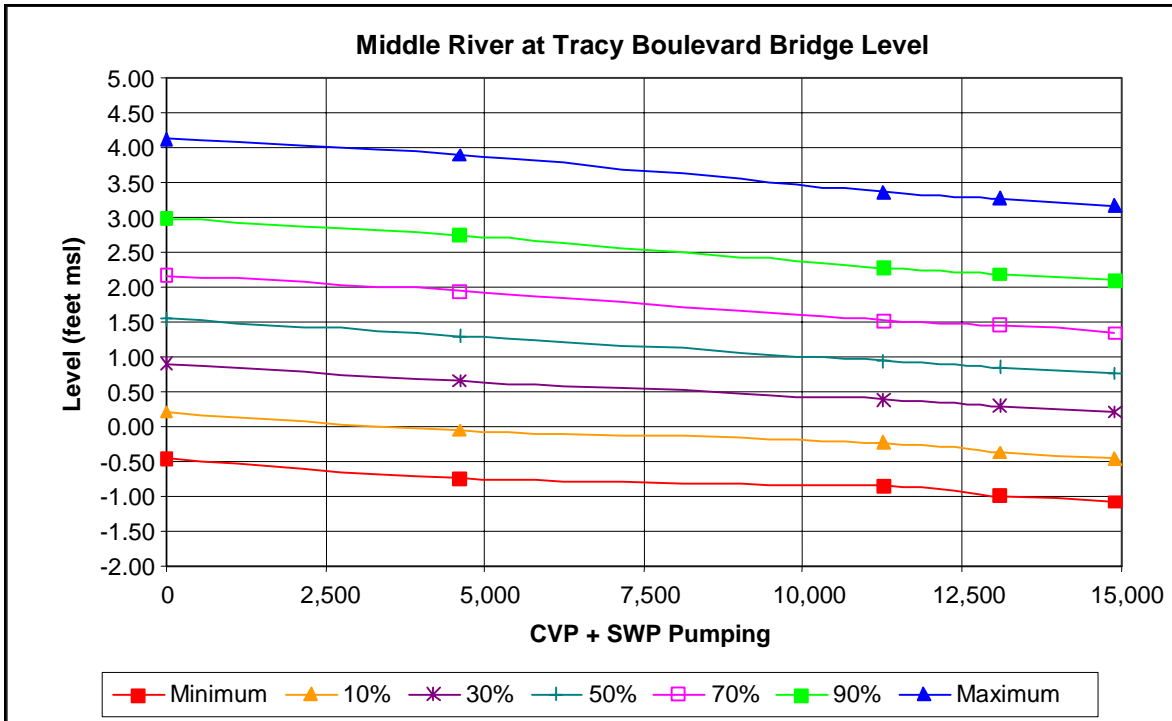


Figure 5.2-16a. Simulated Range of Tidal Levels for Middle River at Tracy Boulevard Bridge for the Full Range of Potential CVP and SWP Pumping

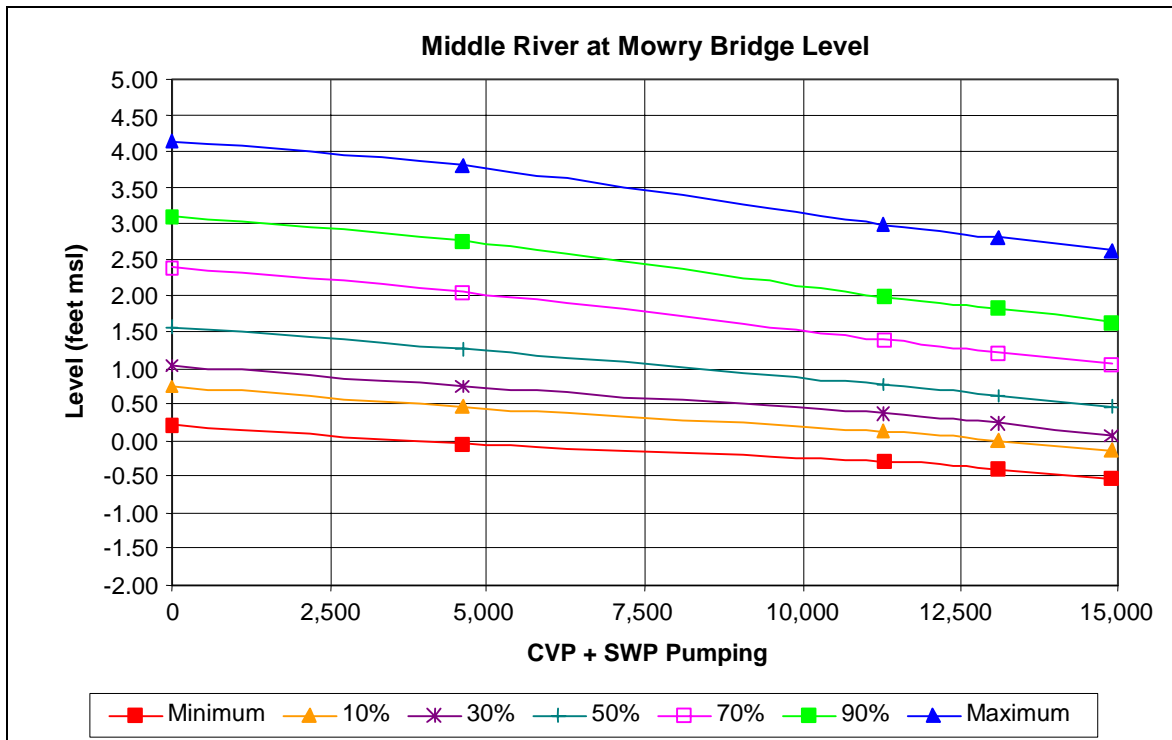


Figure 5.2-16b. Simulated Range of Tidal Levels for Middle River at Mowry Bridge for the Full Range of Potential CVP and SWP Pumping

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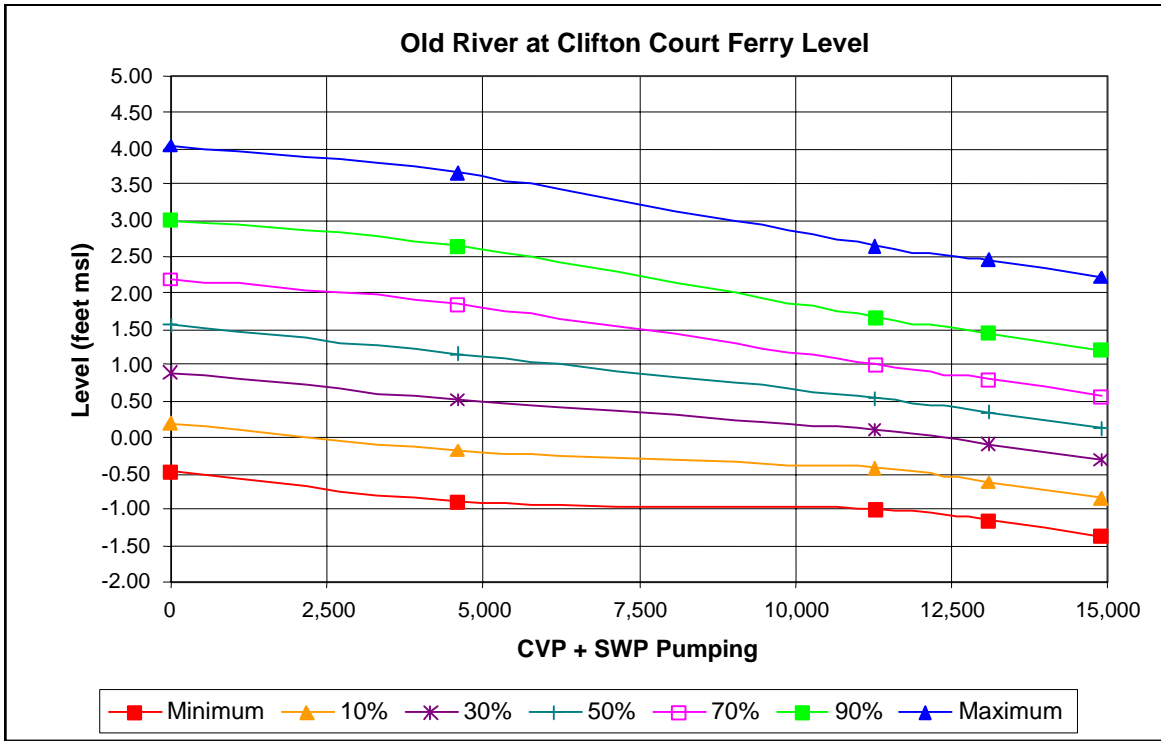


Figure 5.2-17a. Simulated Range of Tidal Levels for Old River at Clifton Court Ferry for the Full Range of Potential CVP and SWP Pumping

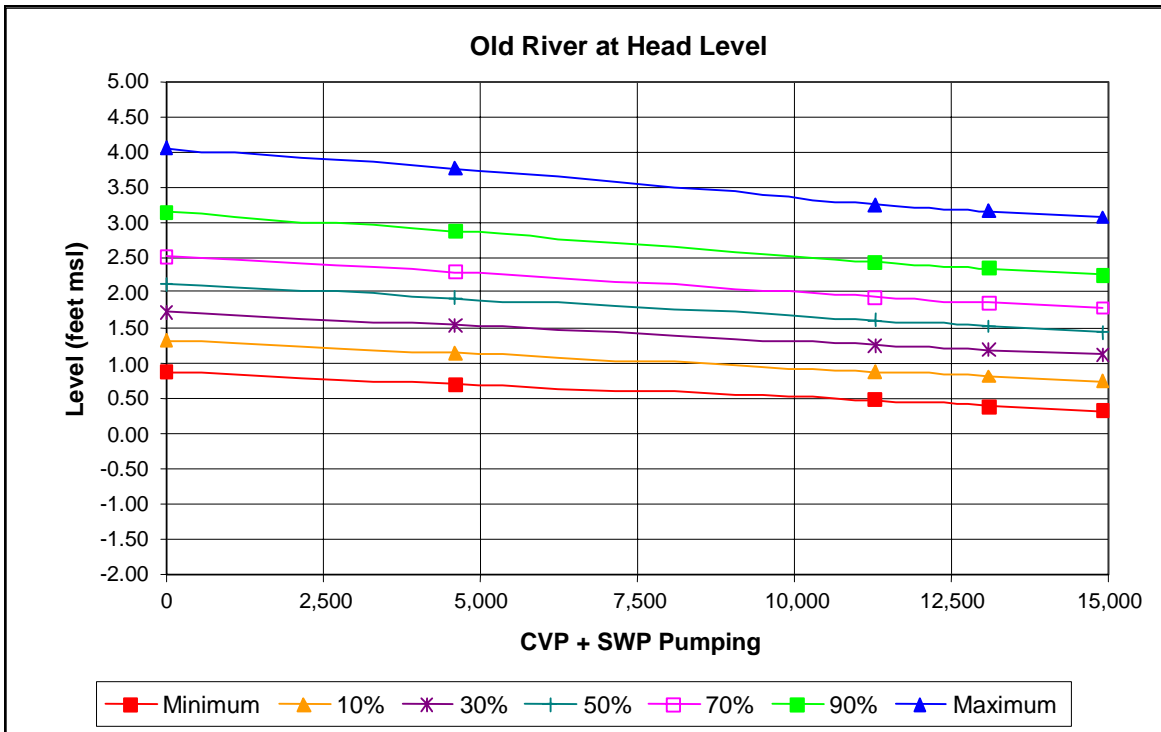
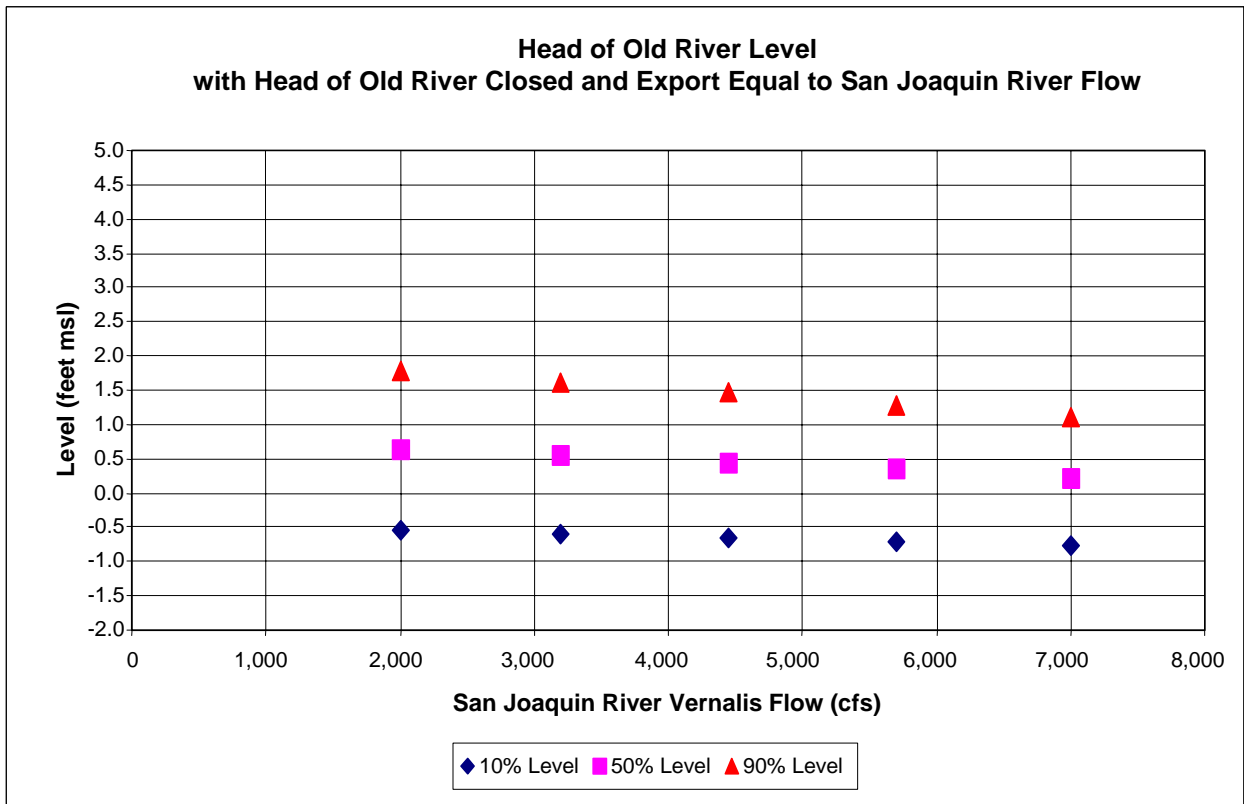
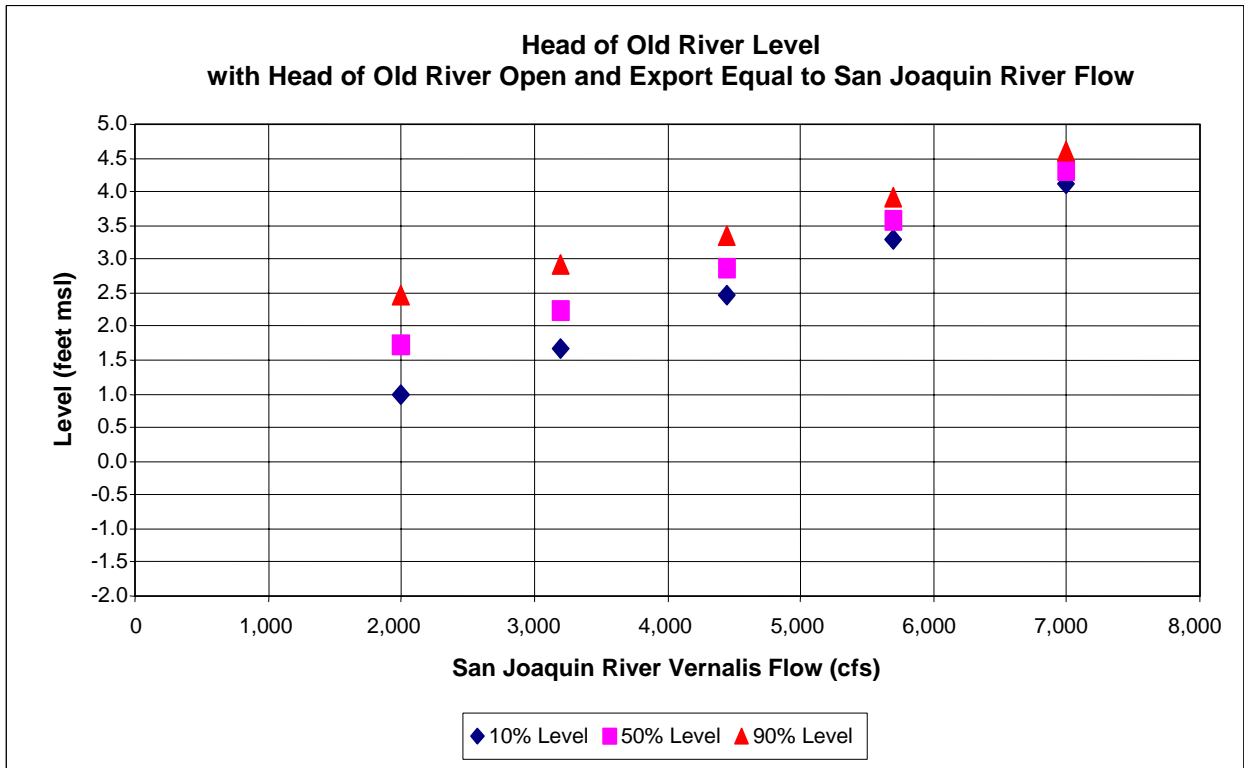


Figure 5.2-17b. Simulated Range of Tidal Levels for Old River at Head for the Full Range of Potential CVP and SWP Pumping

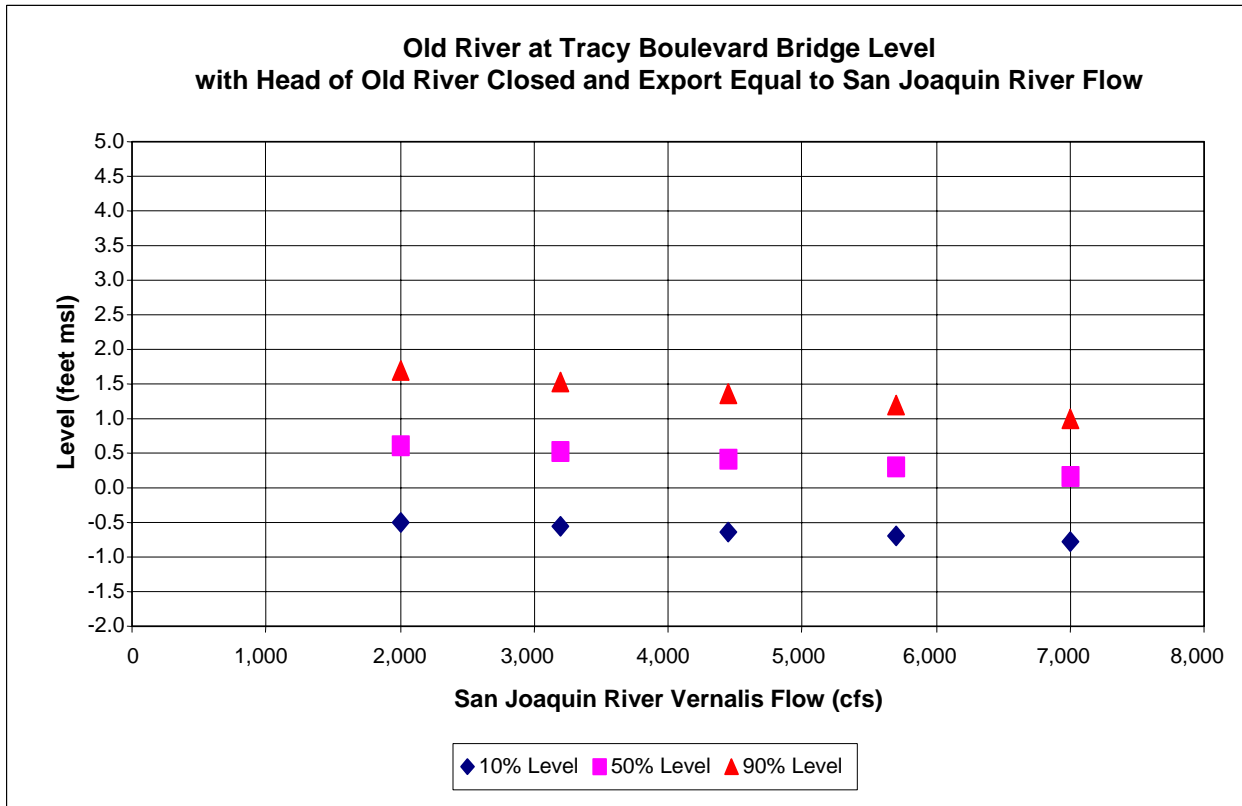
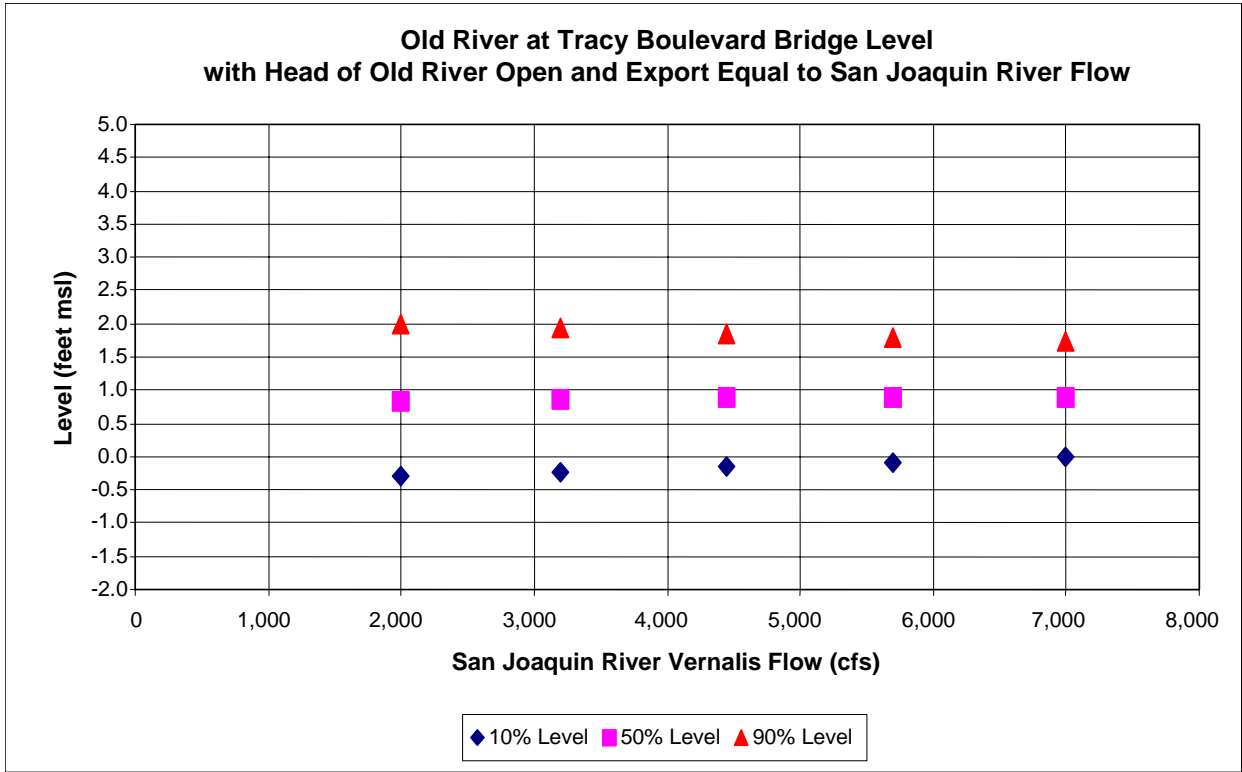
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Figure 5.2-18

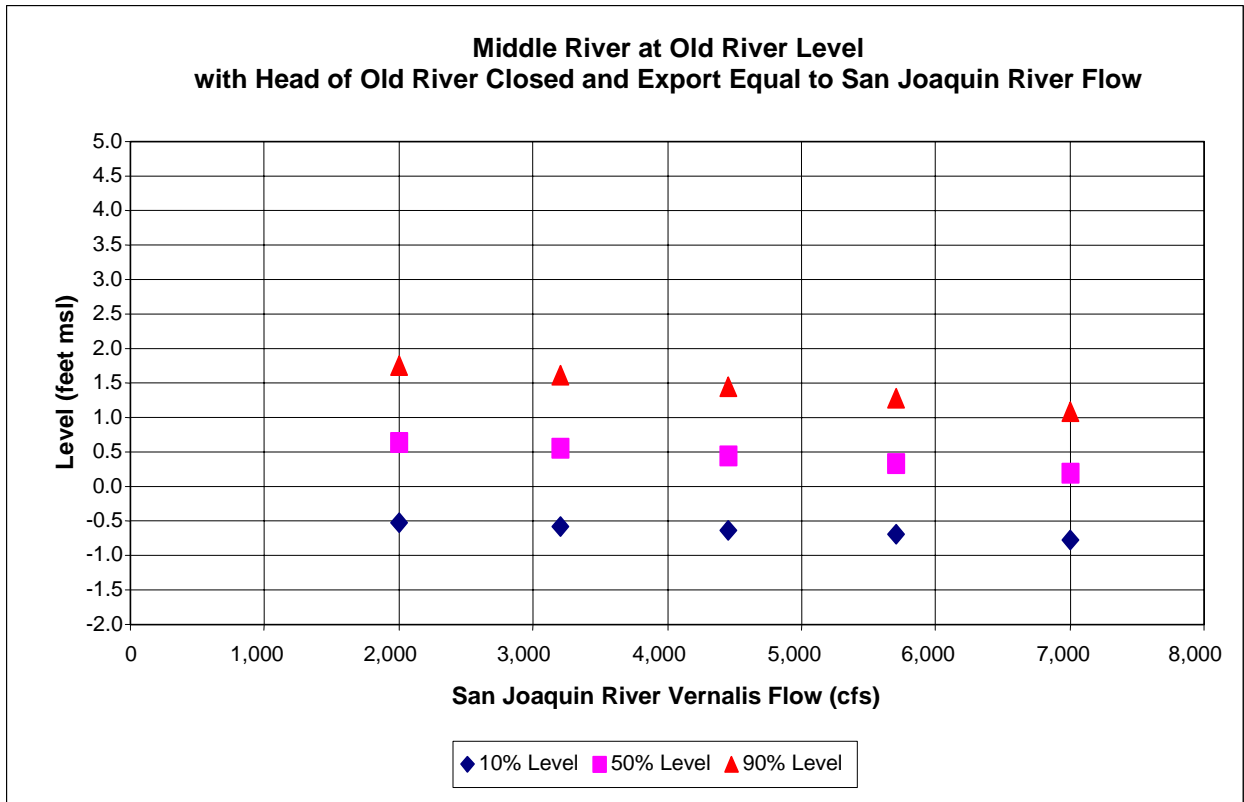
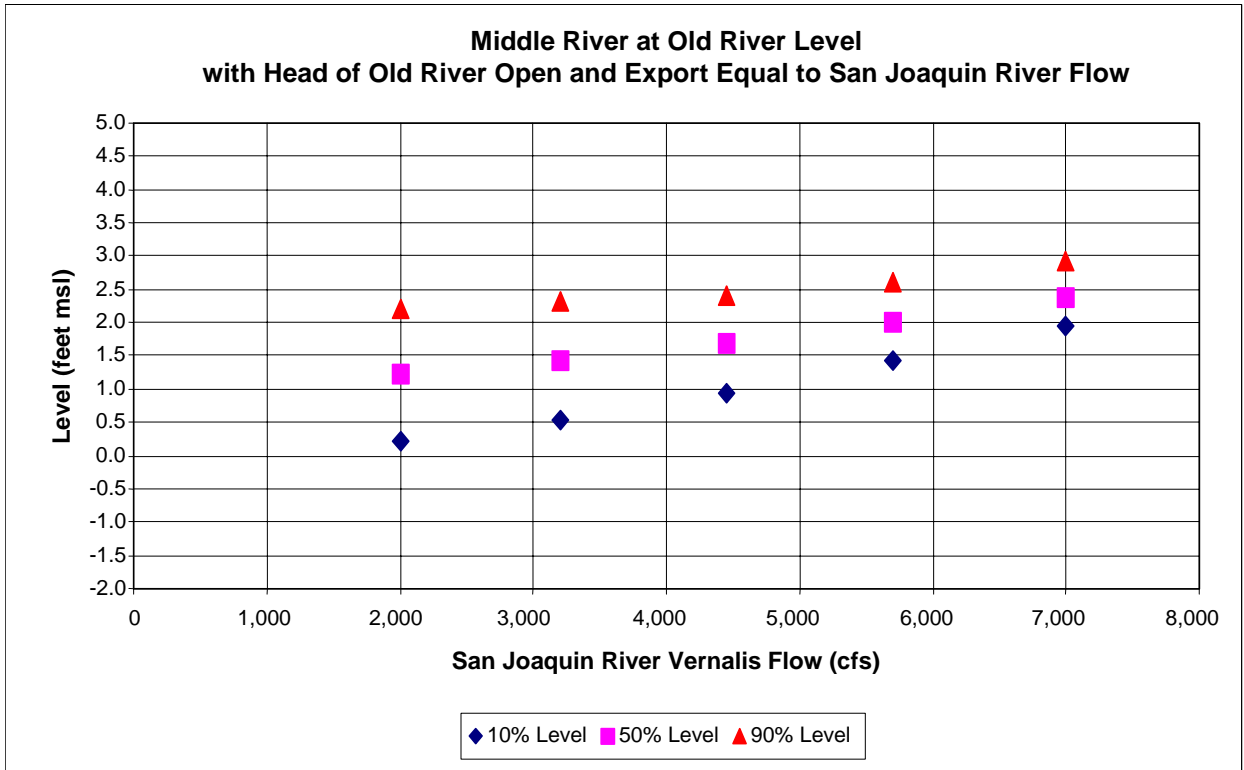
Summary of Effects of VAMP Exports and San Joaquin River Flows and the Head of Old River Gate Closure on Tidal Level Downstream of the Head of Old River Barrier



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Figure 5.2-19

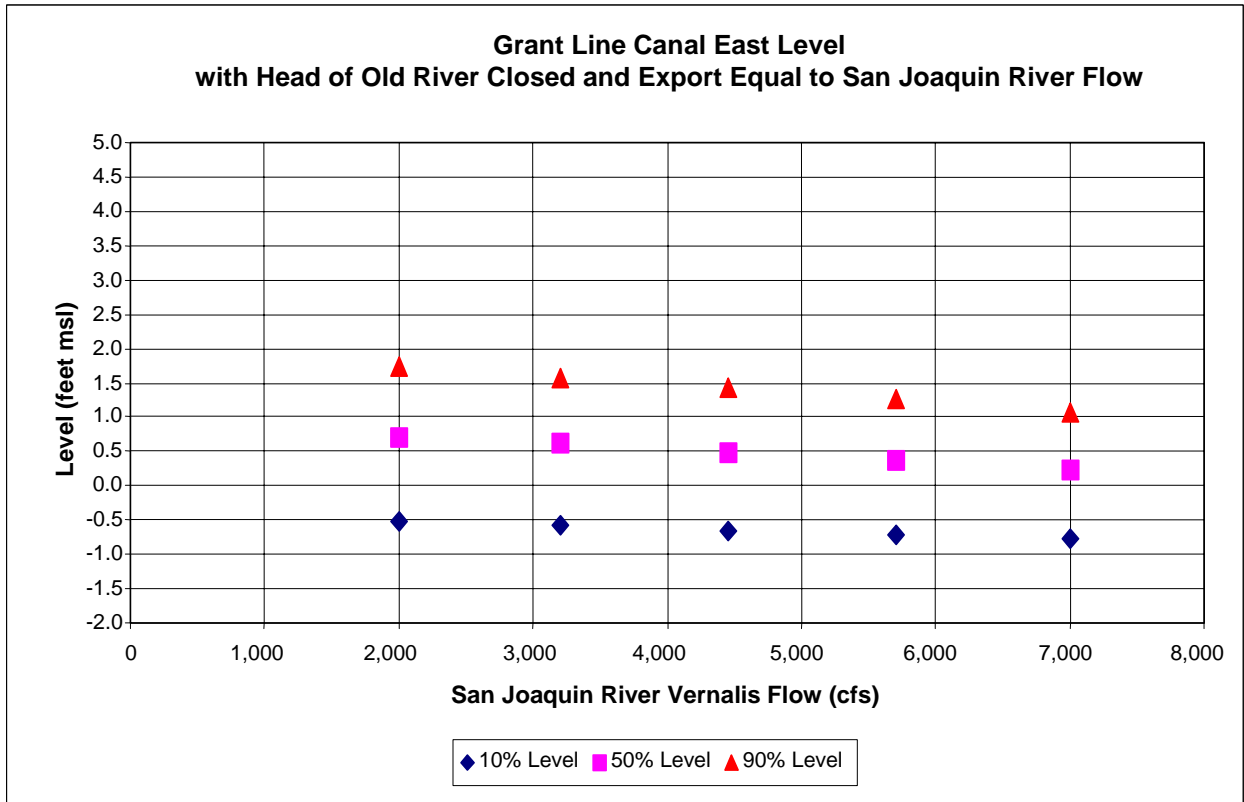
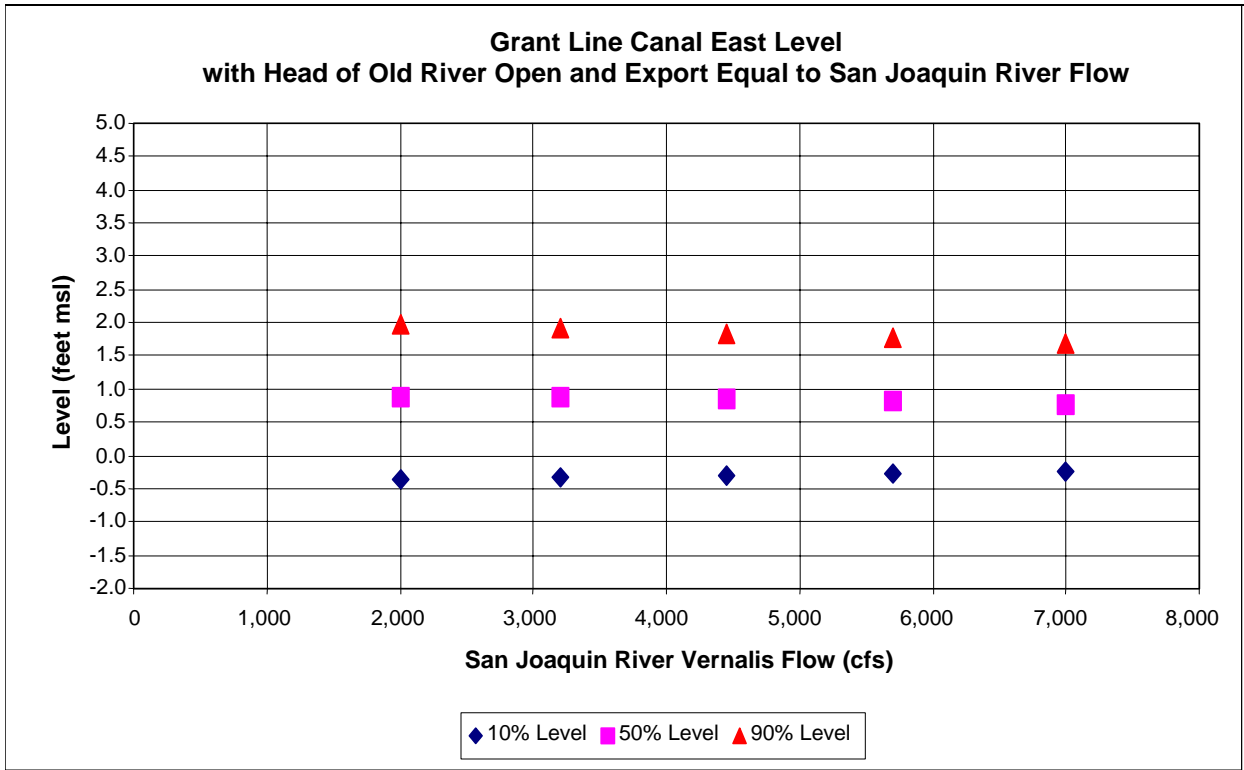
Summary of Effects of VAMP Exports and San Joaquin River Flows and the Head of Old River Gate Closure on Tidal Level for Old River at Tracy Boulevard Bridge



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Figure 5.2-20

Summary of Effects of VAMP Exports and San Joaquin River Flows and the Head of Old River Gate Closure on Tidal Level for Middle River at Old River (near Mowry Bridge)



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Figure 5.2-21

Summary of Effects of VAMP Exports and San Joaquin River Flows and the Head of Old River Gate Closure on Tidal Level for Grant Line Canal at Tracy Boulevard Bridge

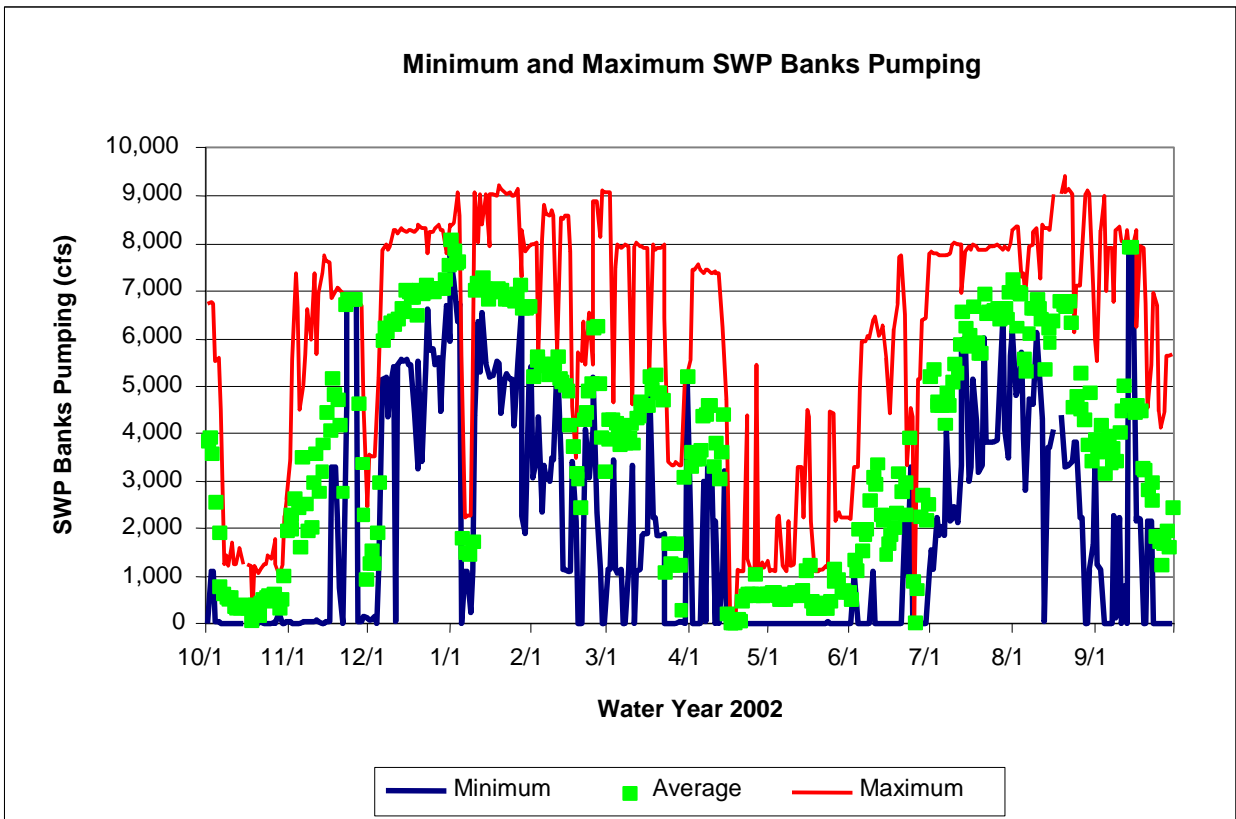


Figure 5.2-22a. Daily Minimum and Maximum SWP Banks Pumping for Water Year 2002

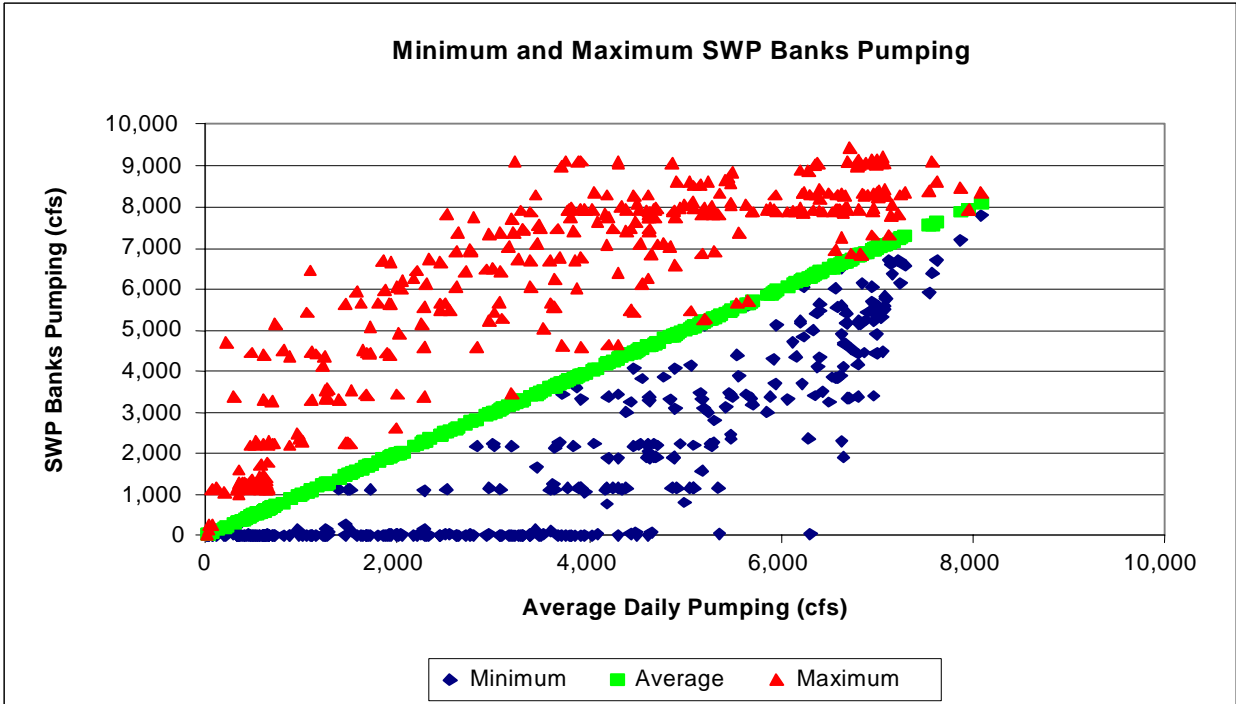


Figure 5.2-22b. Variation of On-Peak and Off-Peak SWP Banks Pumping for Water Year 2002

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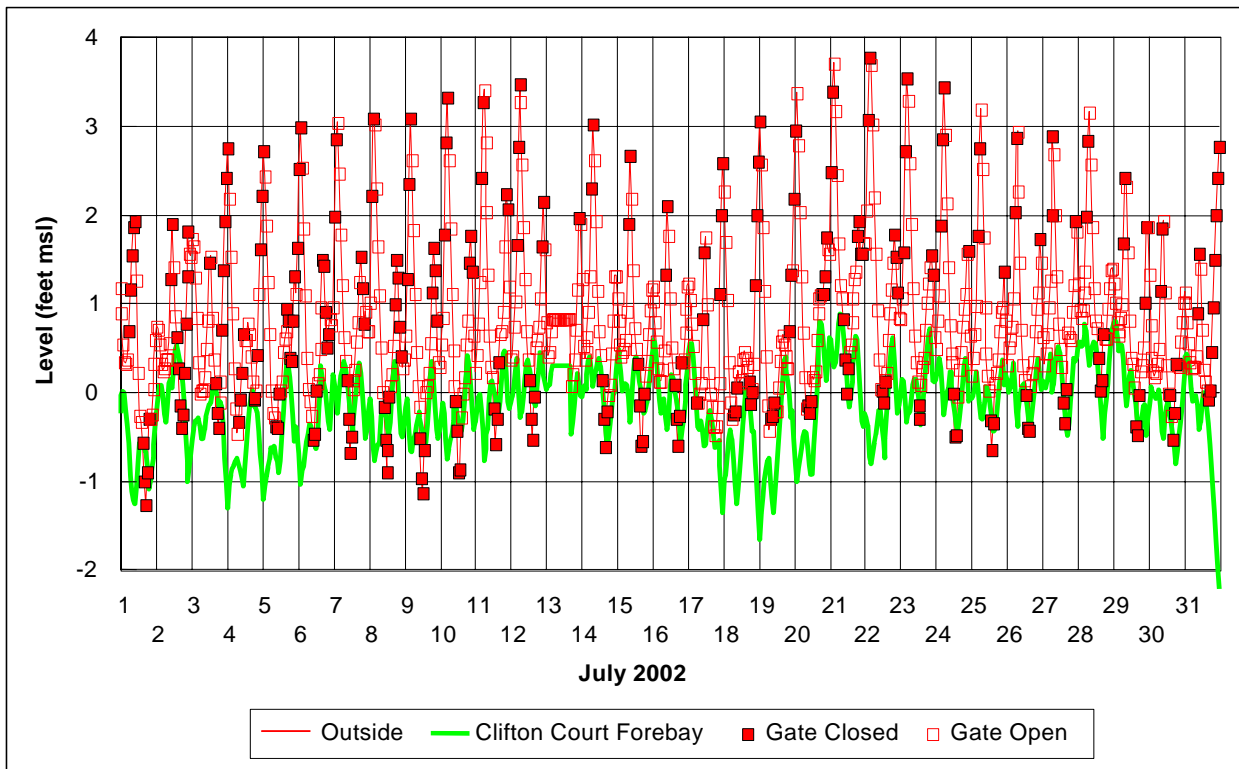


Figure 5.2-23a. Historical Clifton Court Forebay Level and Old River Tidal Level with Gate Operations (Priority 3—Closed during Higher-High Flood Tide) for July 2002

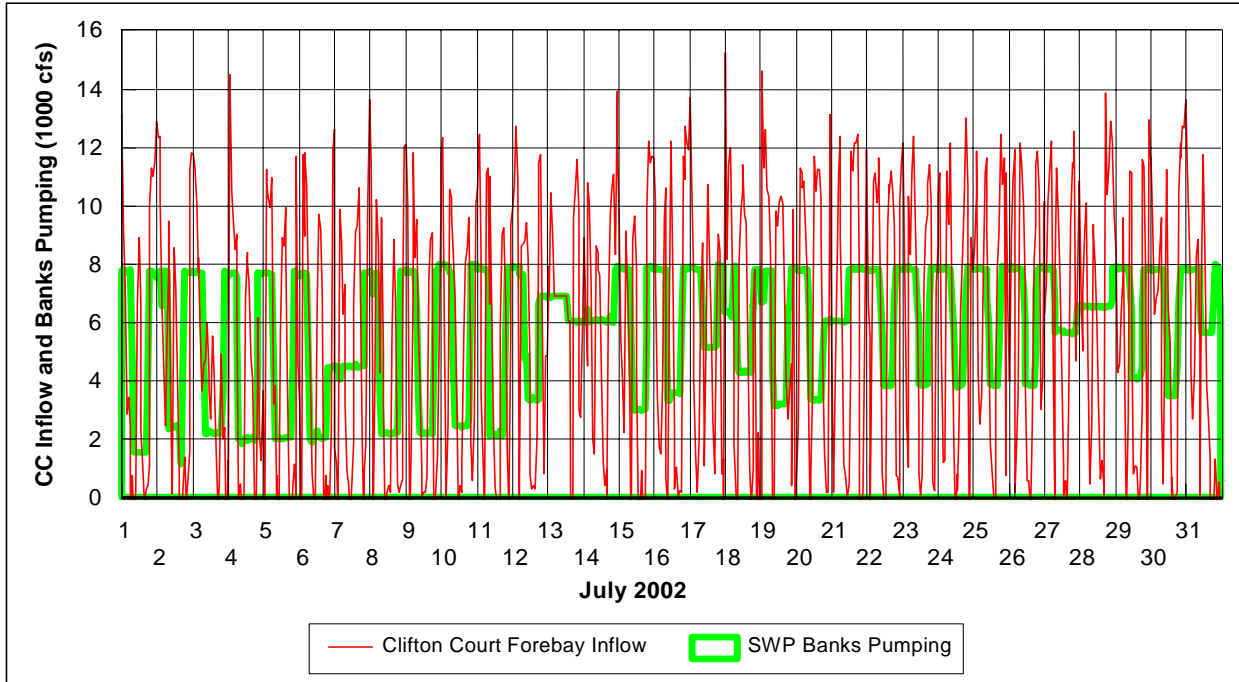
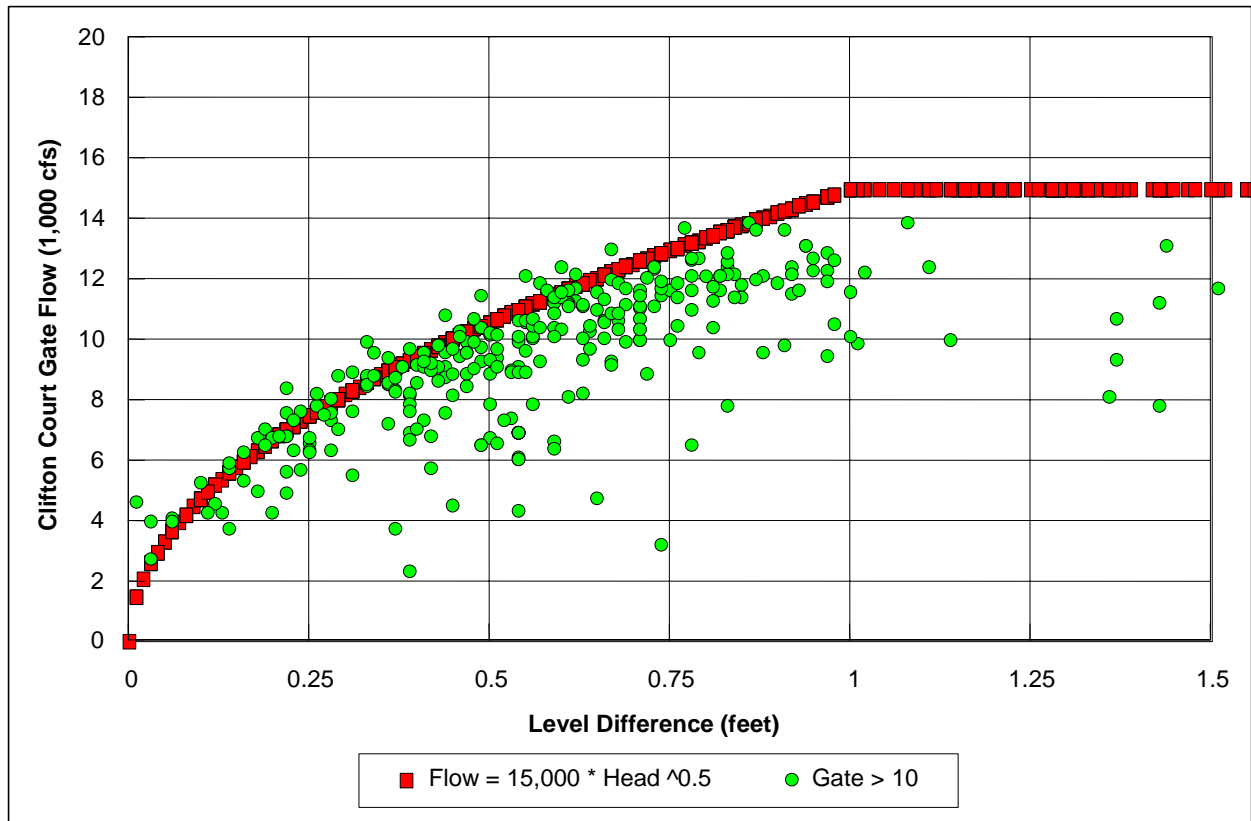


Figure 5.2-23b. Historical Hourly SWP Banks Pumping with Calculated Clifton Court Forebay Gate Inflows during July 2002

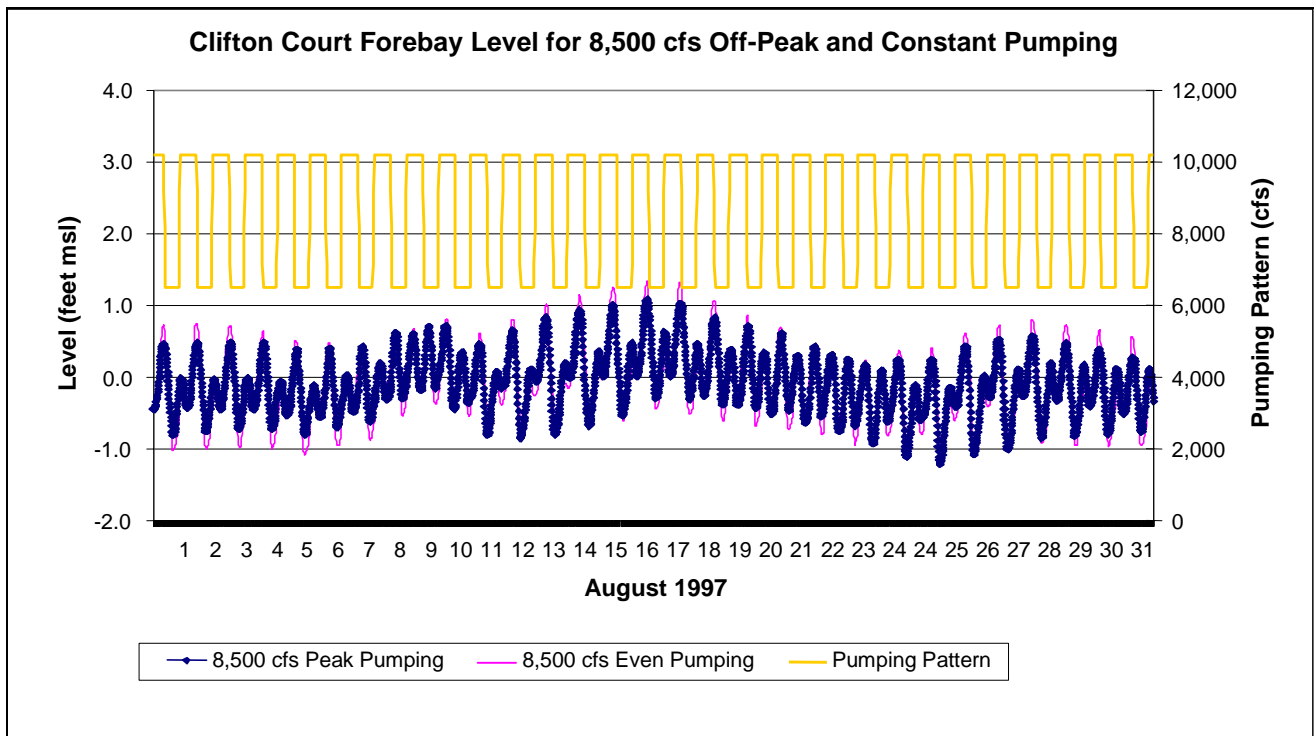
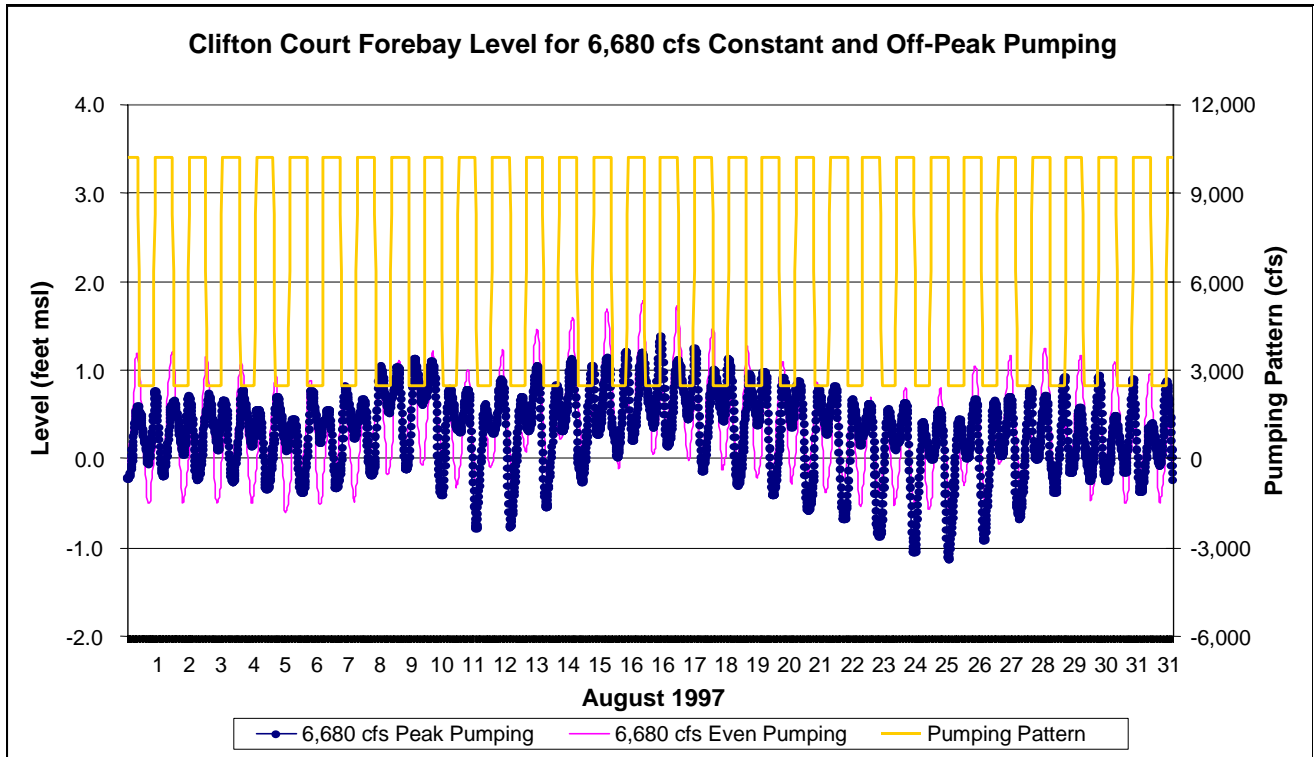
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Note: Hourly Clifton Court Forebay inflow was calculated from the hourly increase in Clifton Court Forebay water level plus SWP Banks pumping.

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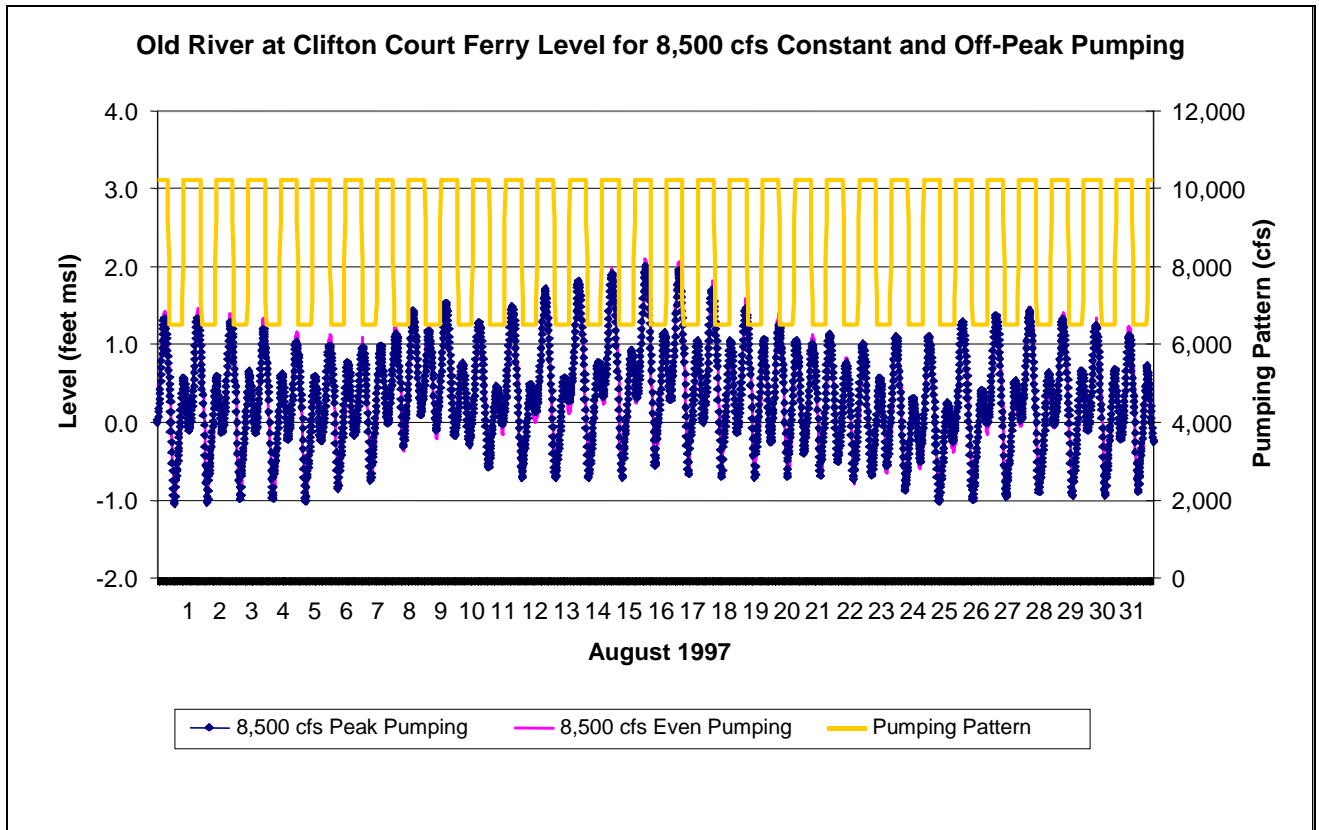
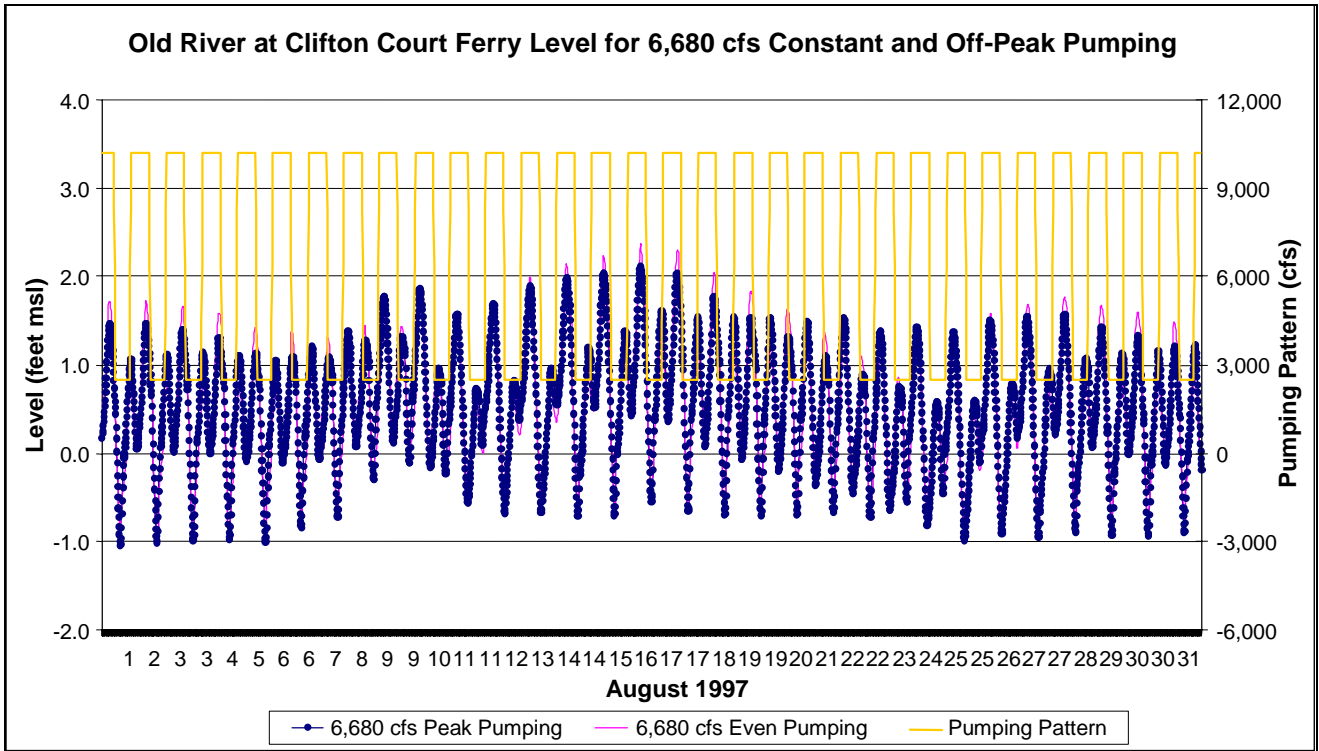
Figure 5.2-24
Calculated Hourly Clifton Court Forebay
Gate Inflow as a Function of Water Level Difference
between Old River and Clifton Court Forebay



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Figure 5.2-25a

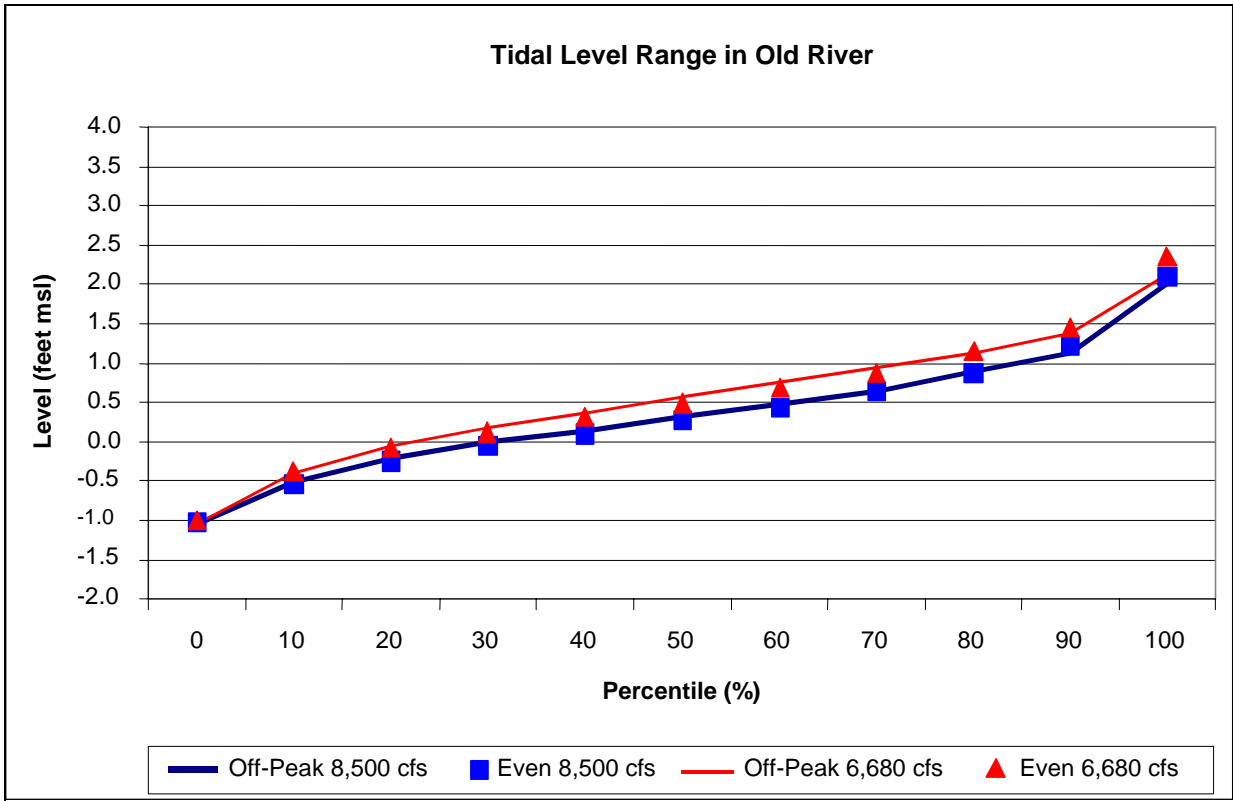
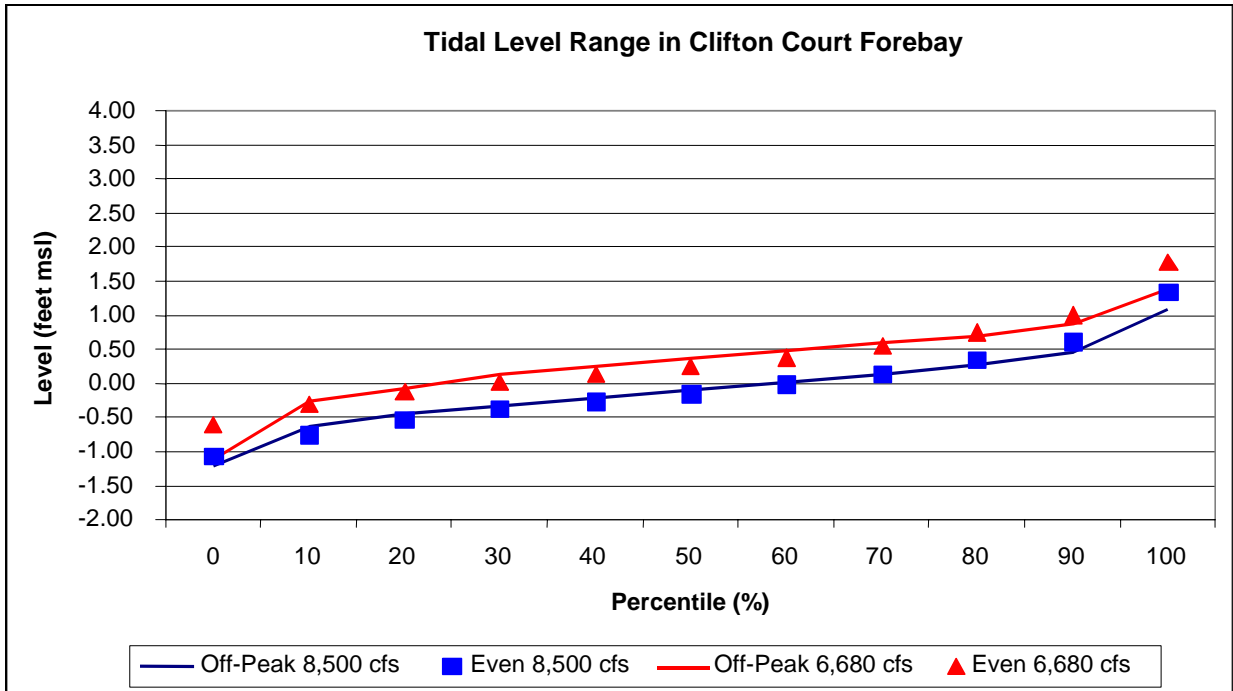
Comparison of Clifton Court Forebay Level for 6,680-cubic feet per second (cfs) and 8,500-cfs Constant (Even) and Off-Peak SWP Banks Pumping



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Figure 5.2-25b

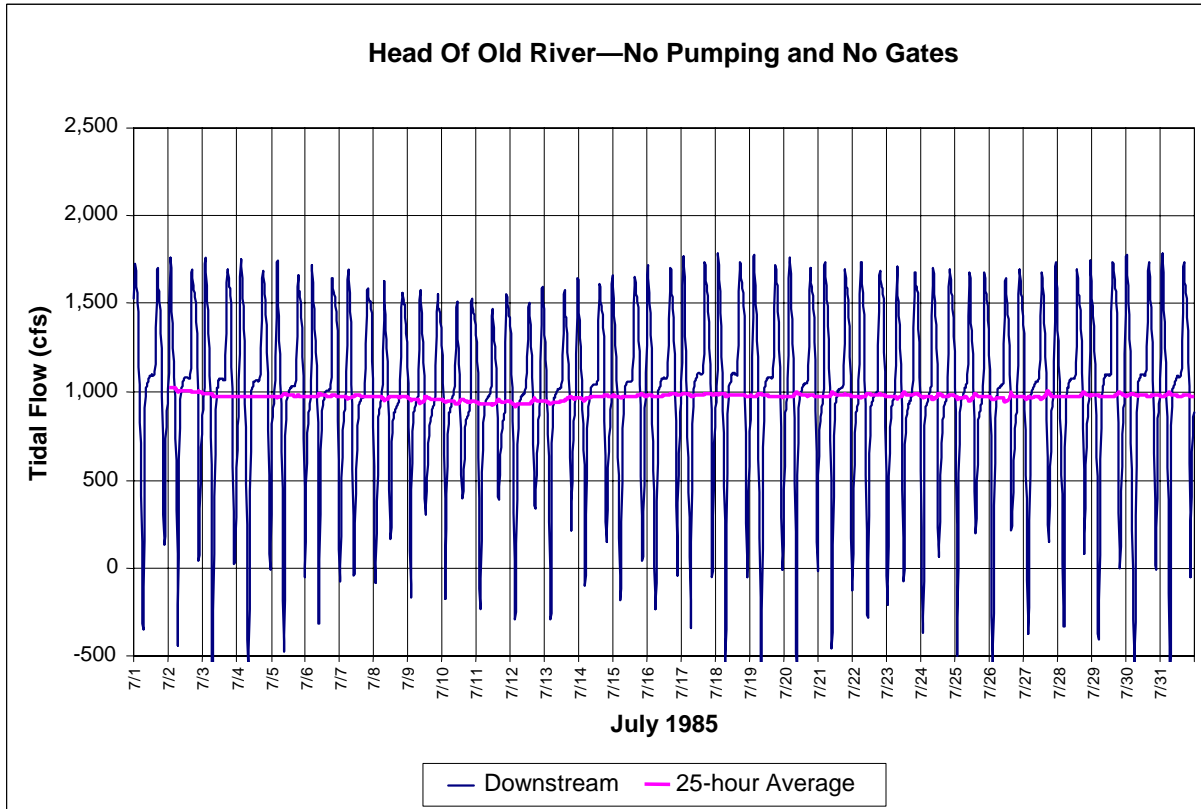
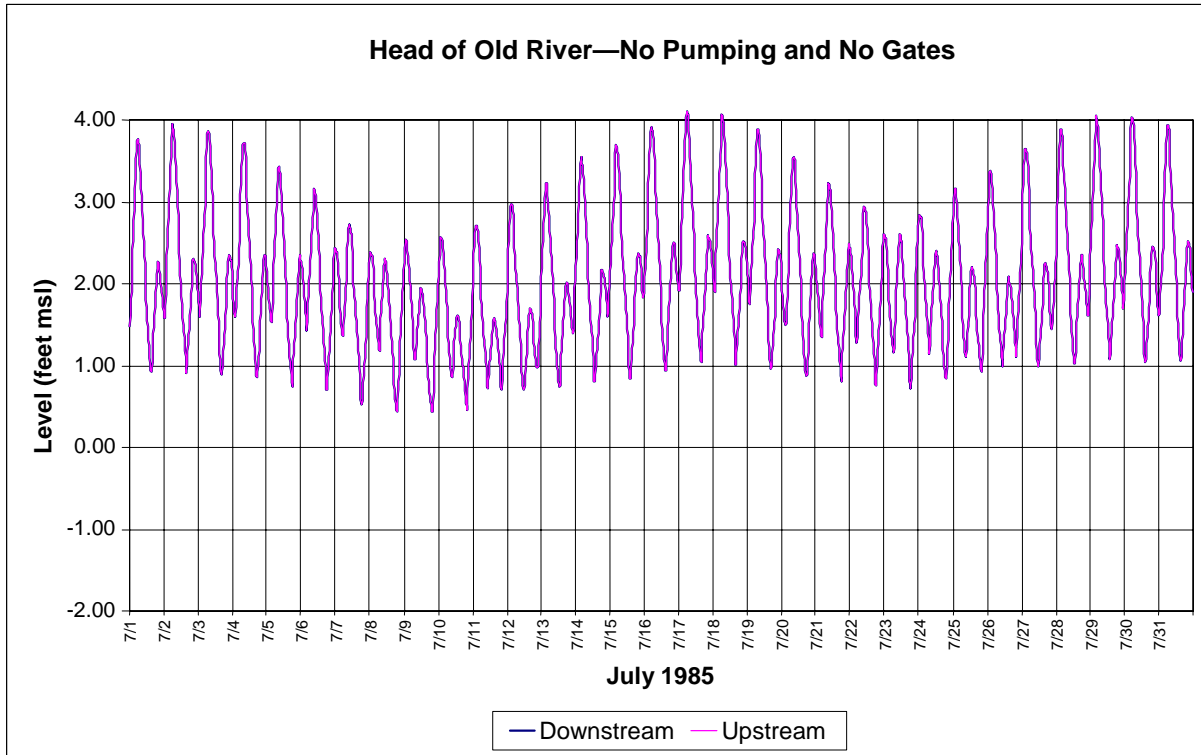
Comparison of Old River at Clifton Court Ferry Tidal Level for 6,680-cubic feet per second (cfs) and 8,500-cfs Constant (Even) and Off-Peak SWP Banks Pumping



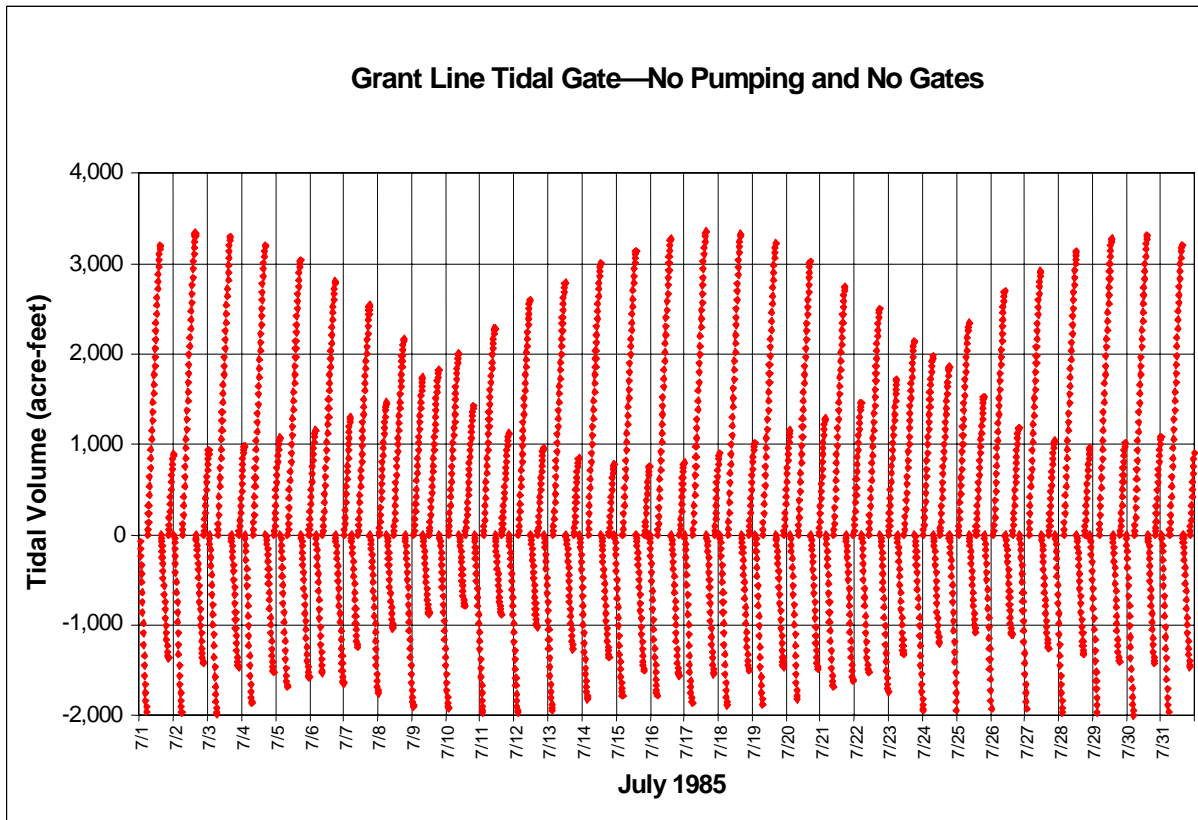
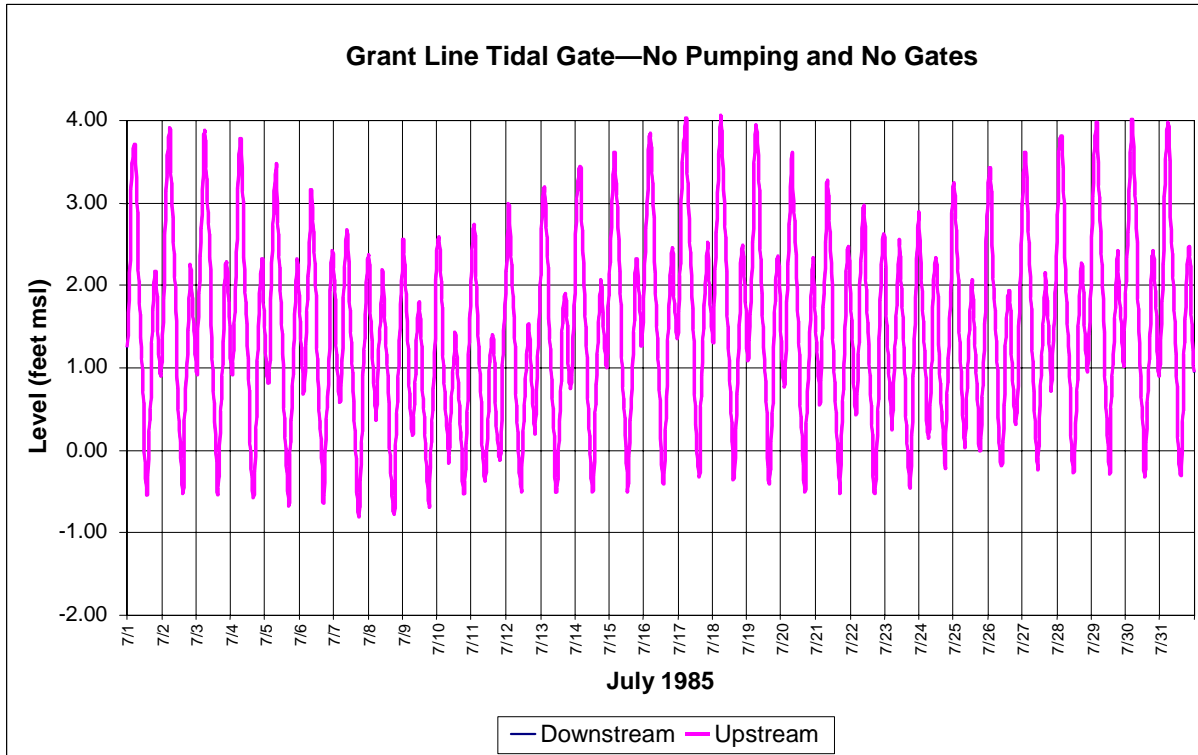
02053.02 101

Figure 5.2-26

DSM2-Simulated Range of Water Levels for Clifton Court Forebay and Old River at Clifton Court Ferry for 6,680-cubic feet per second (cfs) and 8,500-cfs Constant (Even) and Off-Peak SWP Banks Pumping for August 1997 Tidal Conditions



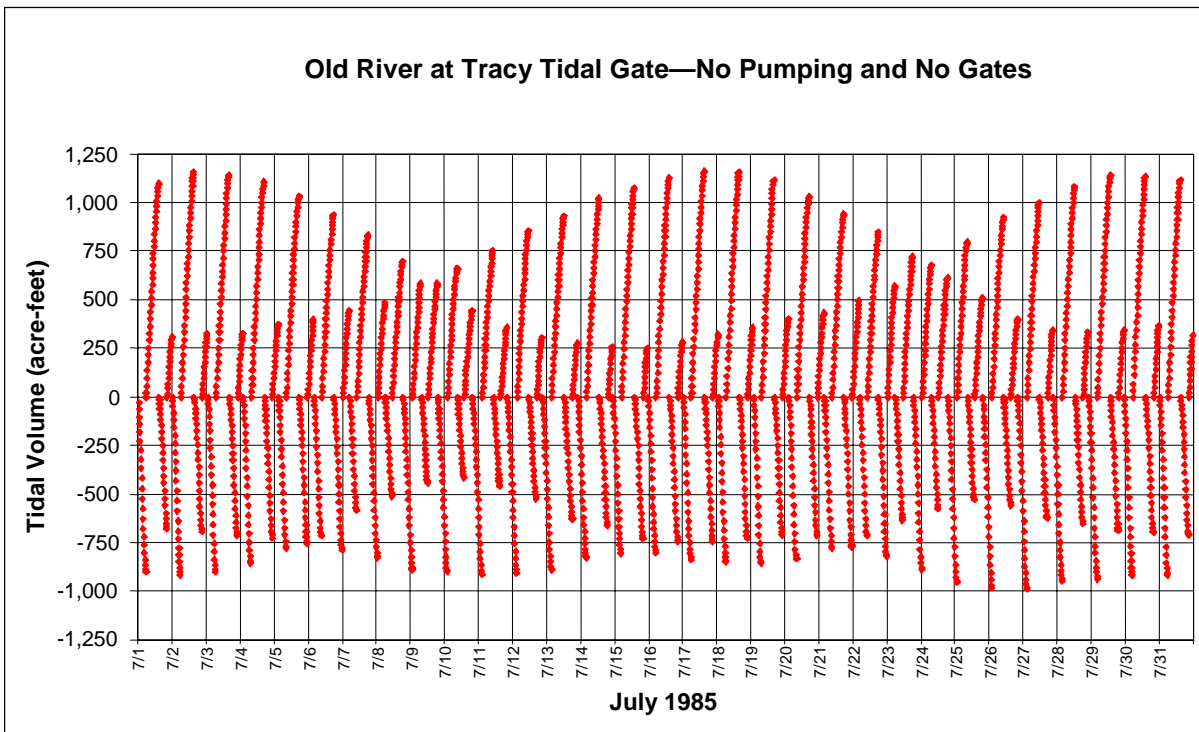
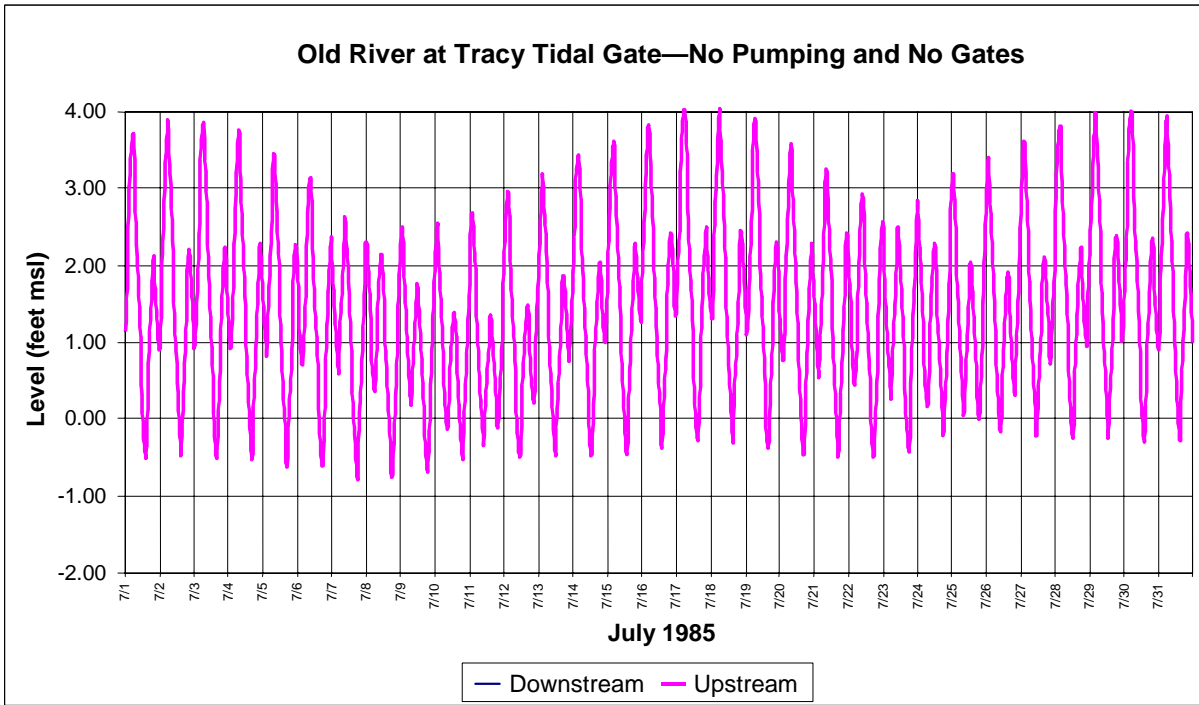
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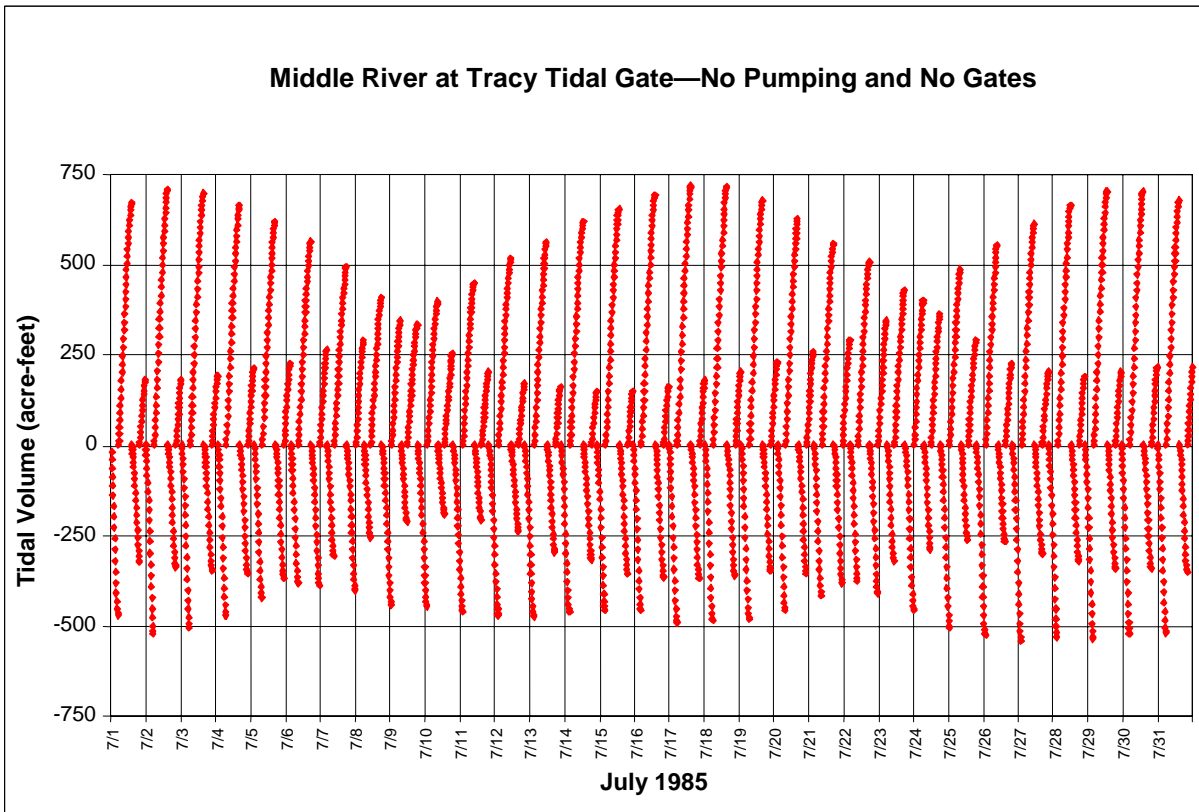
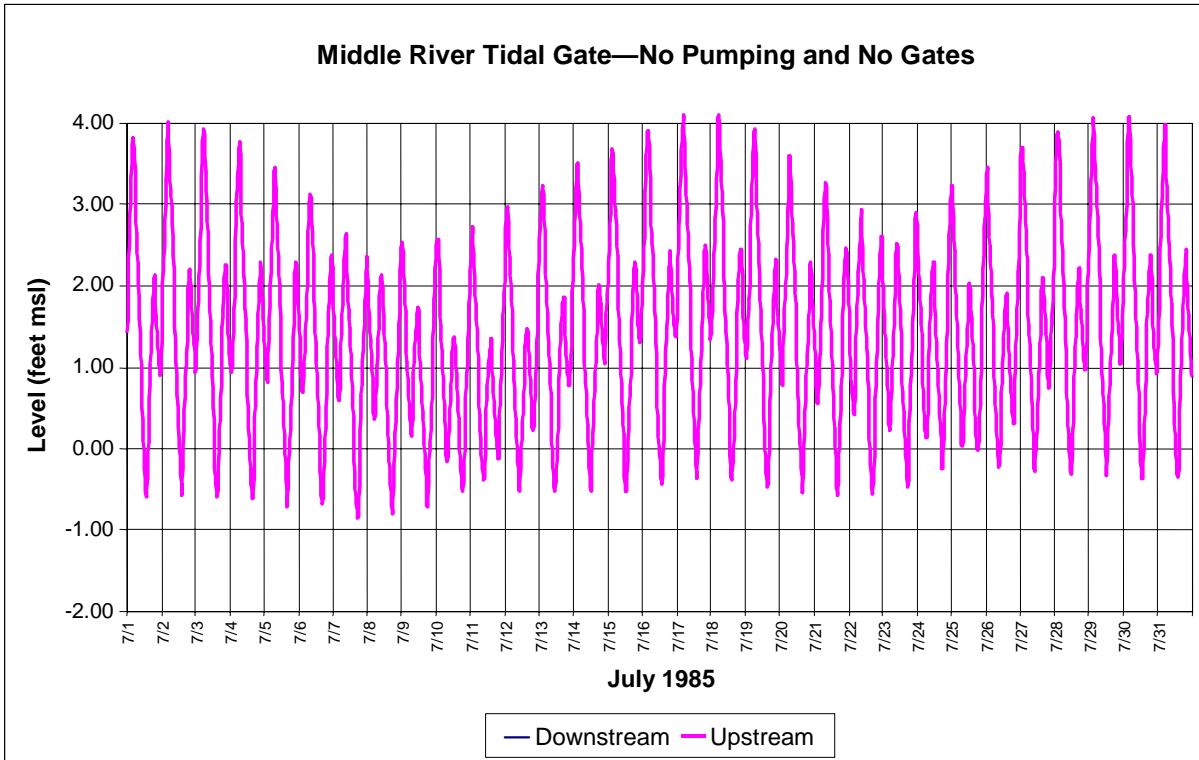
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Figure 5.2-28

DSM2-Simulated Tidal Level and Tidal Volume at Grant Line Canal Tidal Gates with No CVP Tracy Pumping and No SWP Banks Pumping (No Tidal Gates)



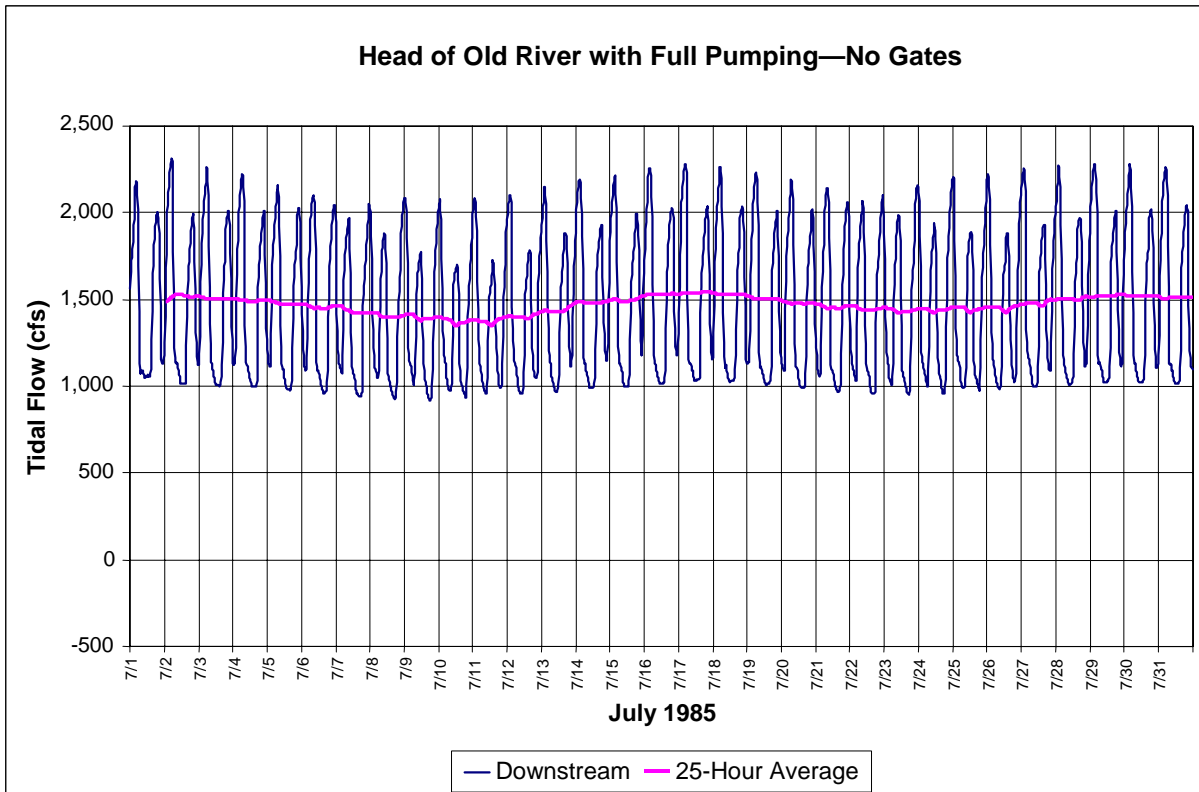
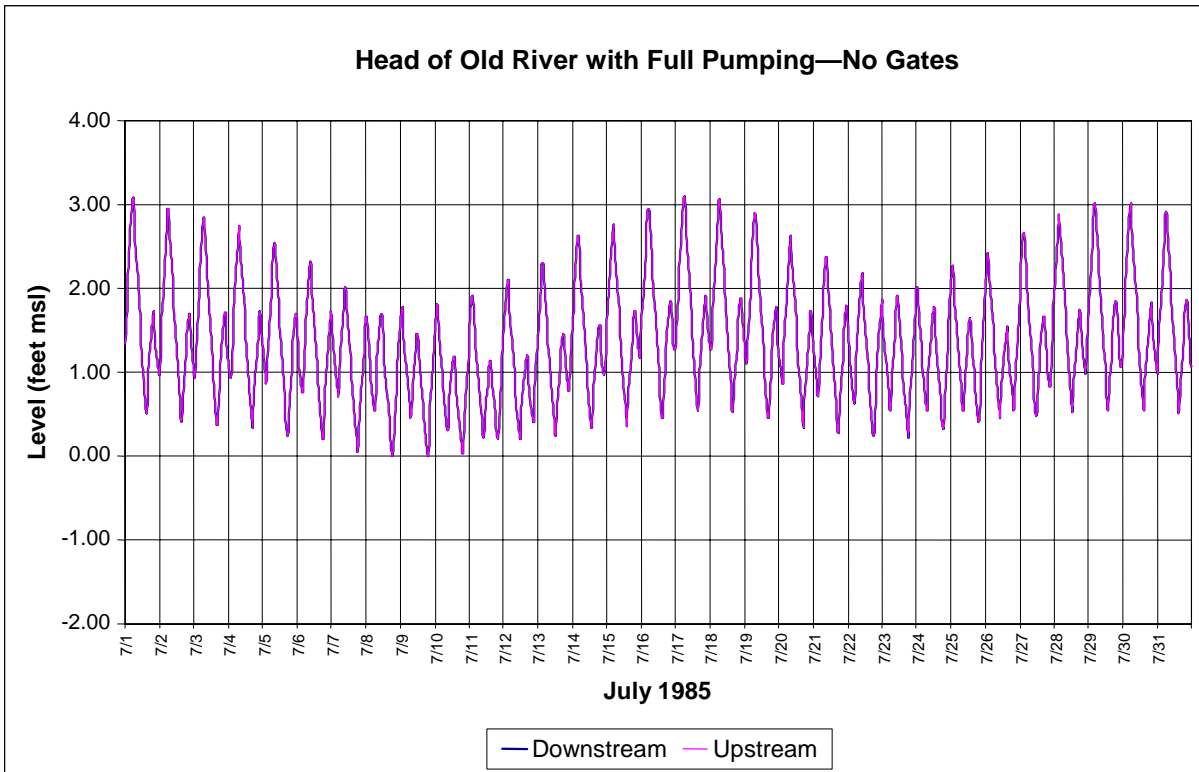
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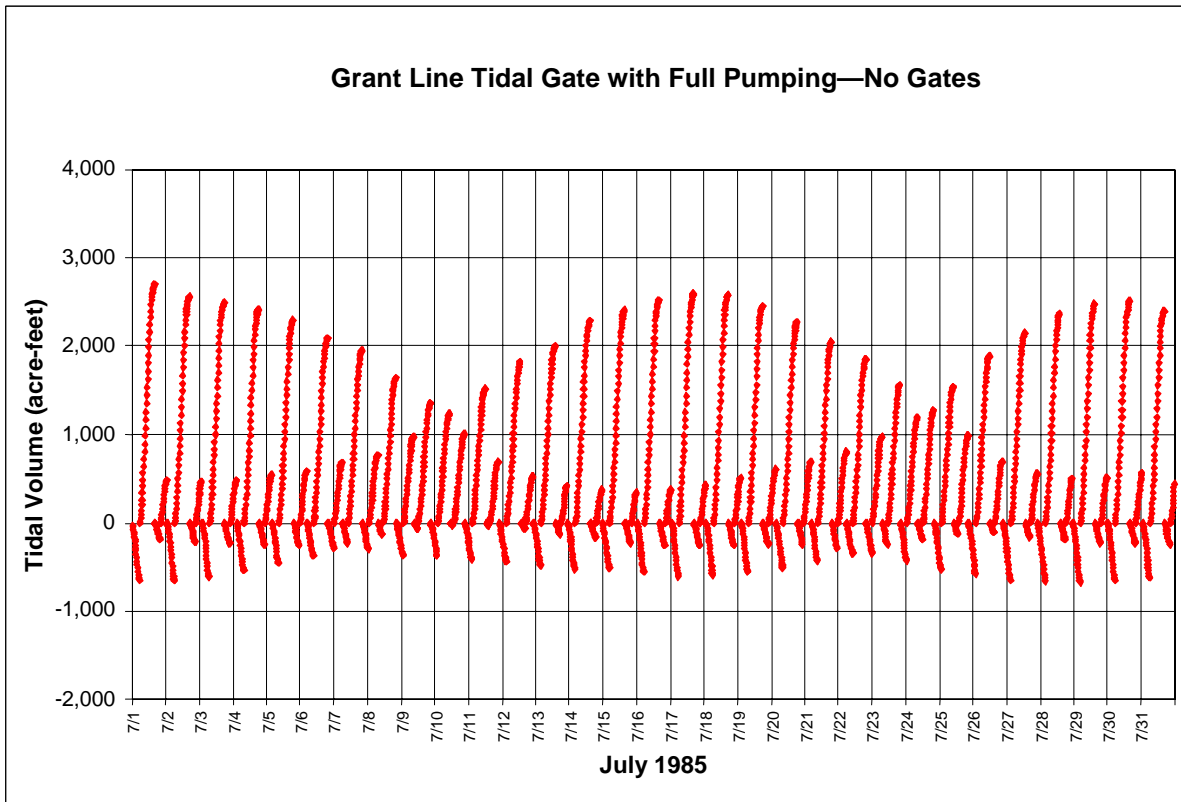
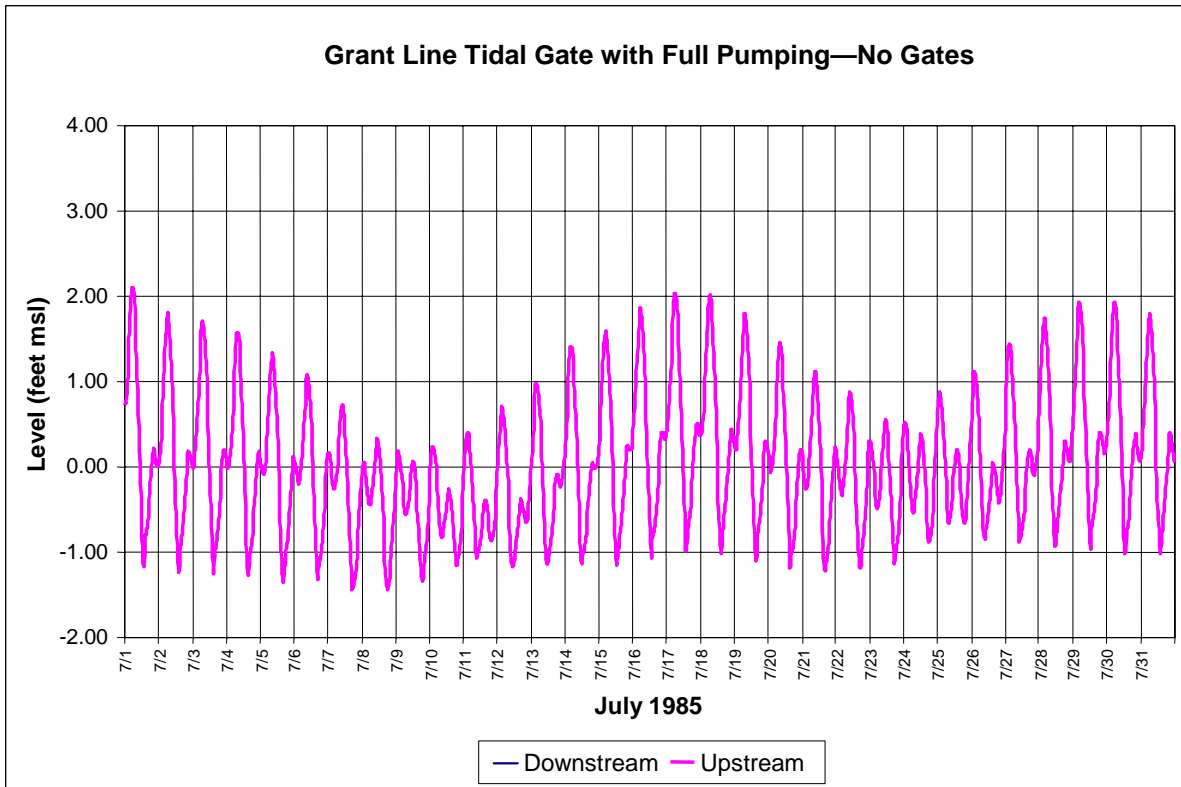
Figure 5.2-30

DSM2-Simulated Tidal Level and Tidal Volume at Old River Tidal Gates for July 1985 with No CVP Tracy Pumping and No SWP Banks Pumping (No Tidal Gates)



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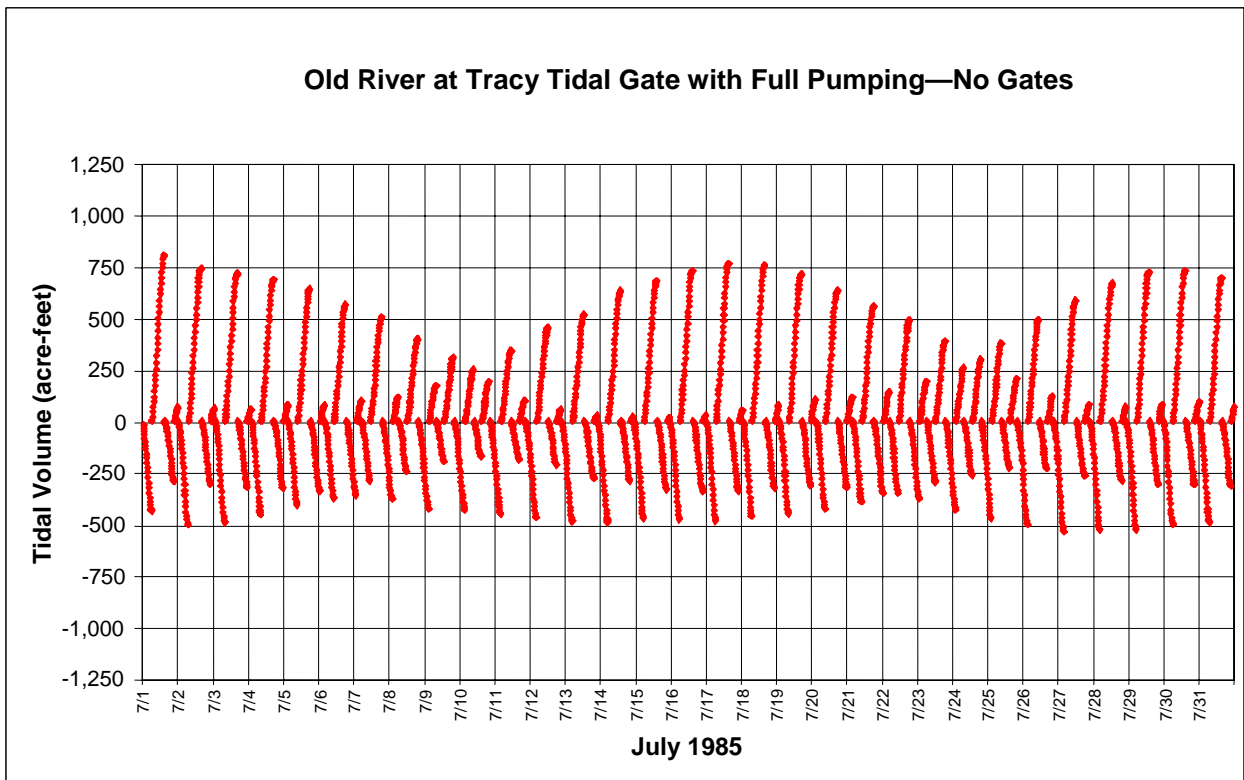
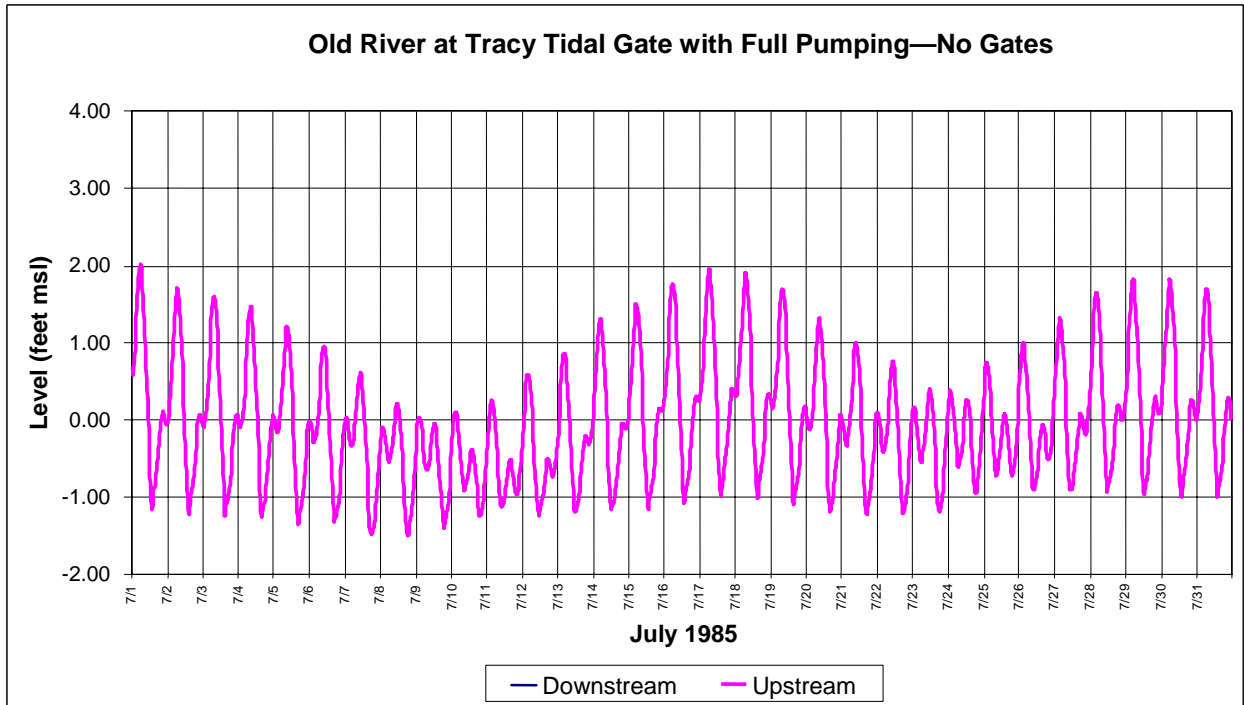
DSM2-Simulated Tidal Level and Tidal Flow at Head of Old River for July 1985 with 4,600 cfs CVP Tracy Pumping and 8,500 cfs SWP Banks Pumping (San Joaquin River Flow of 1,640 cfs)



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Figure 5.2-32

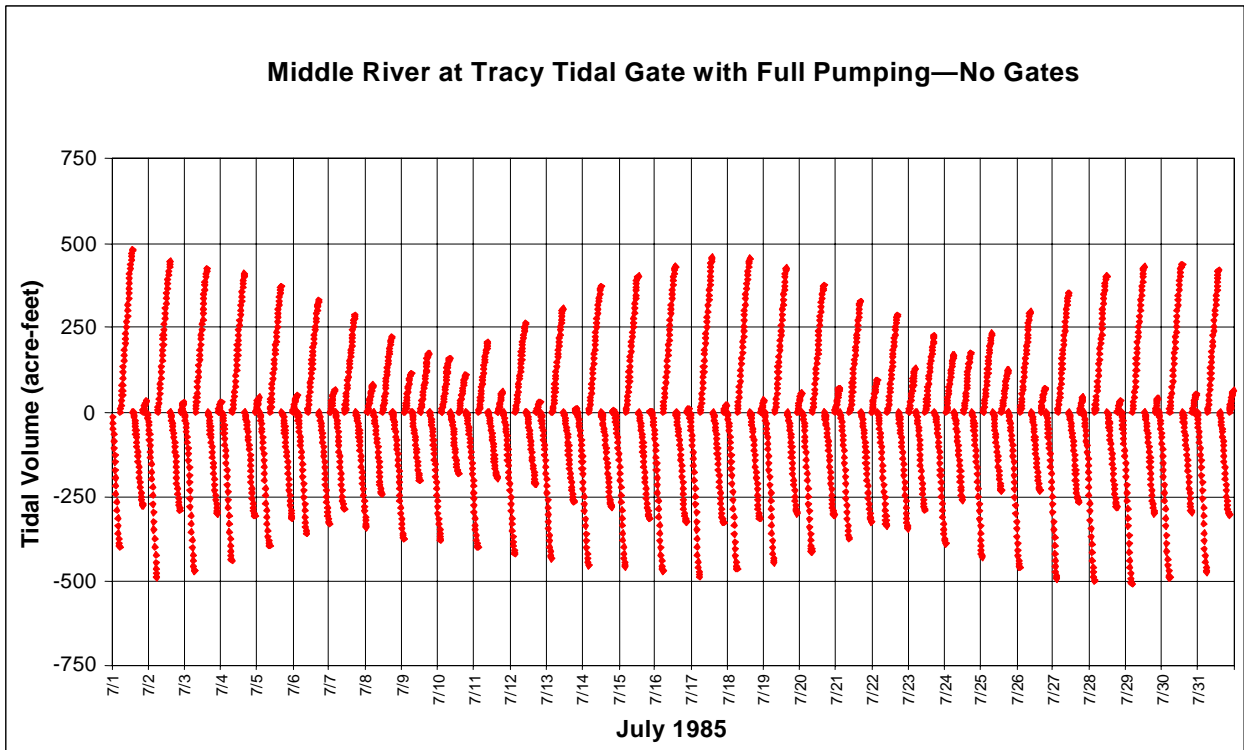
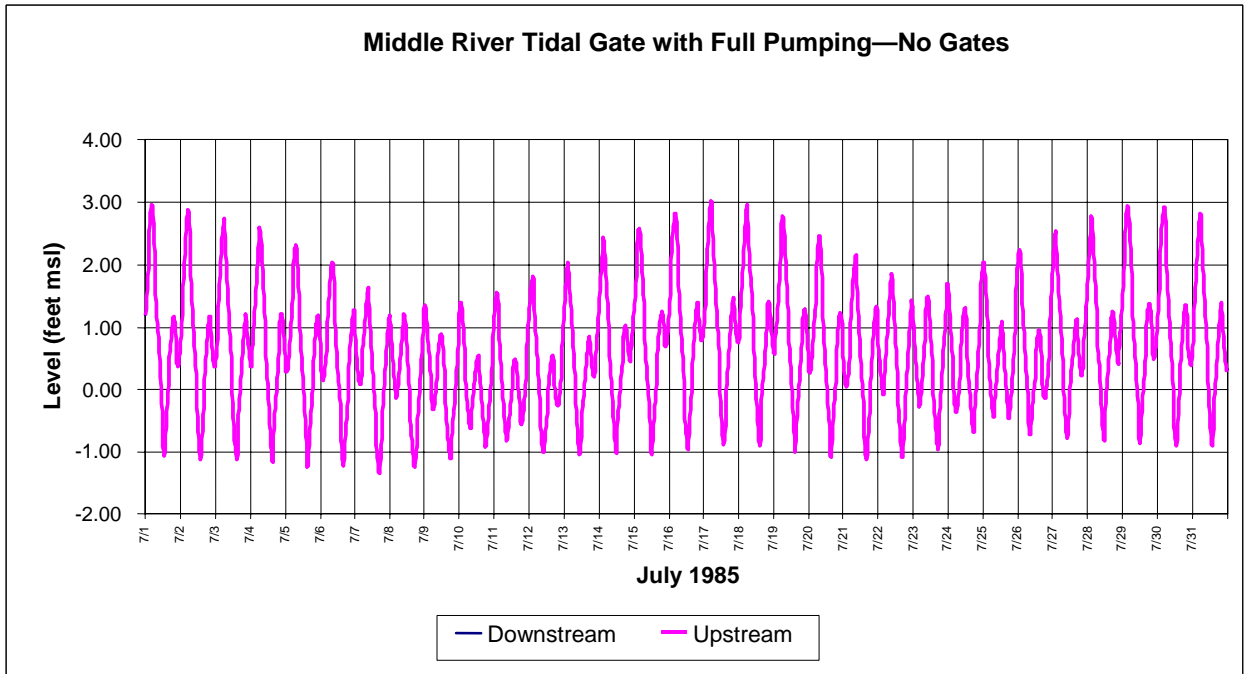
**DSM2-Simulated Tidal Level and Tidal Volume
at Grant Line Canal Tidal Gate Location with 4,600 cfs
CVP Tracy Pumping and 8,500 cfs SWP Banks Pumping (No Tidal Gates)**



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Figure 5.2-33

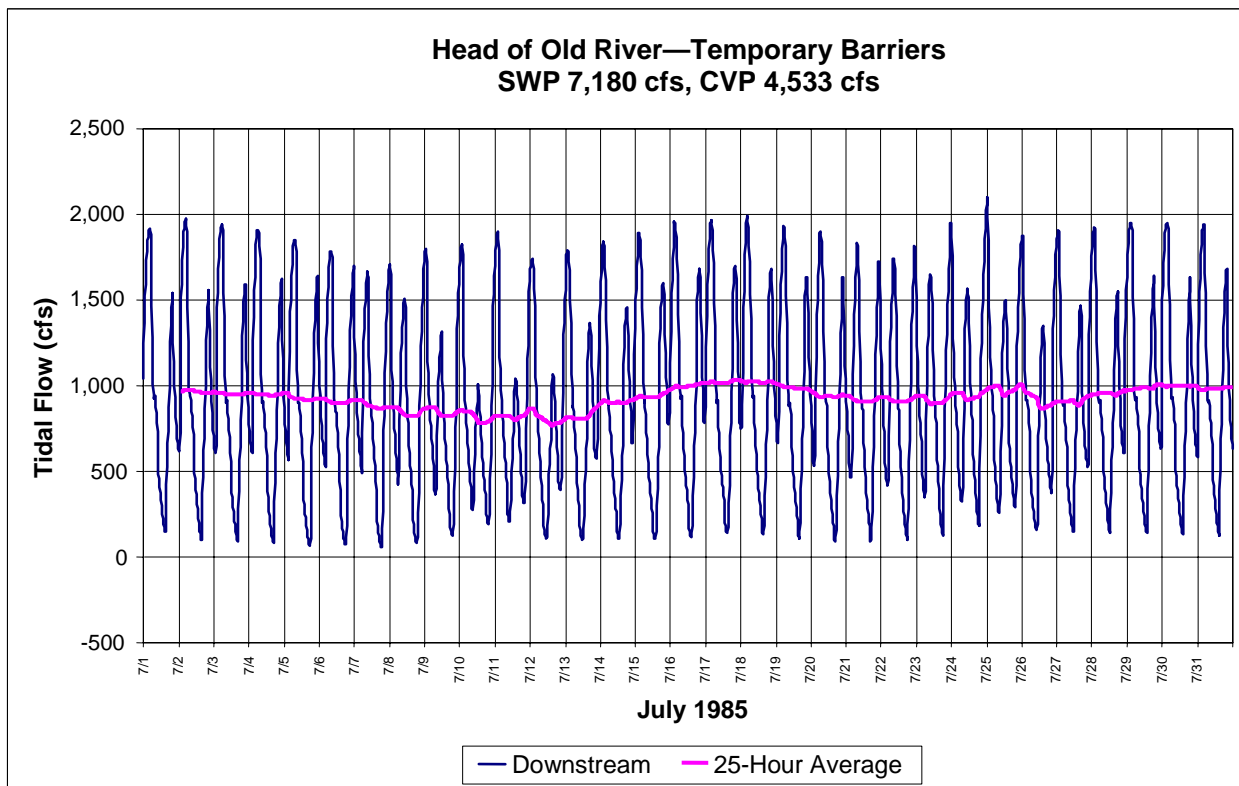
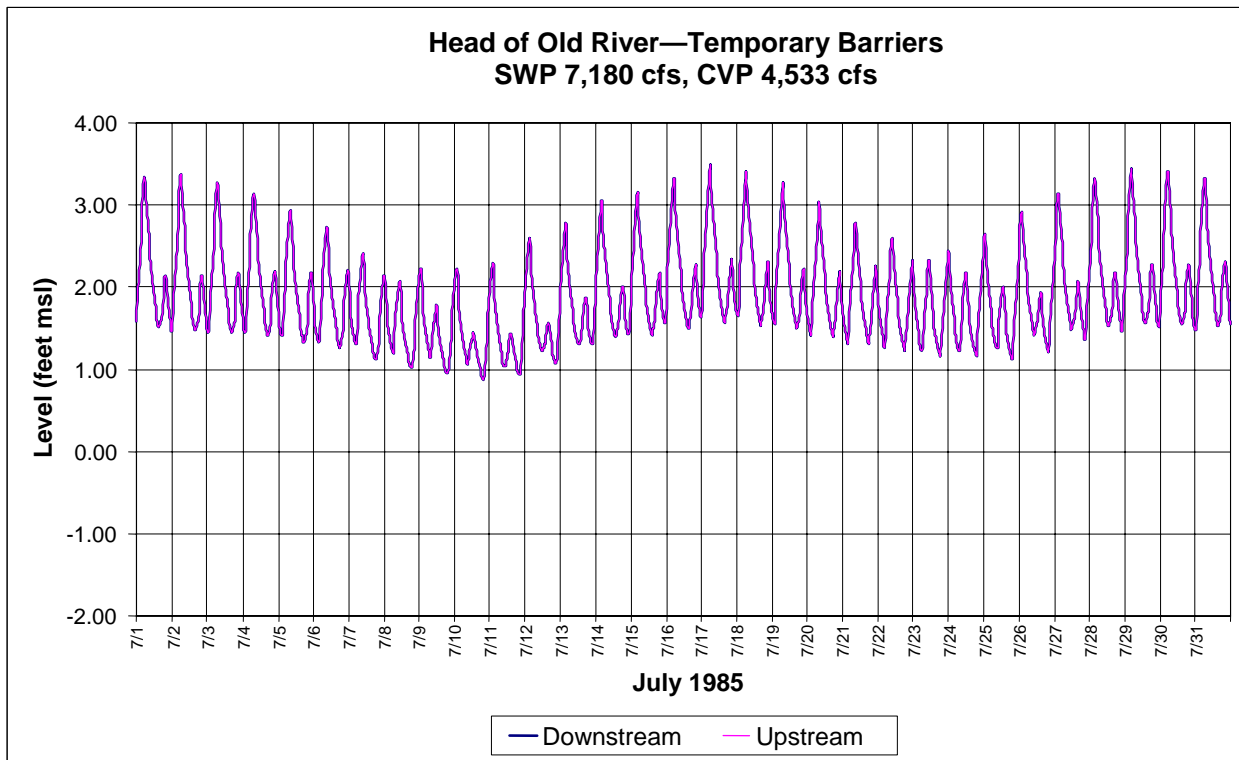
DSM2-Simulated Tidal Level and Tidal Volume for Old River Gate Location with 4,600 cfs CVP Tracy Pumping and 8,500 cfs SWP Banks Pumping (No Tidal Gates)



02053.02.101

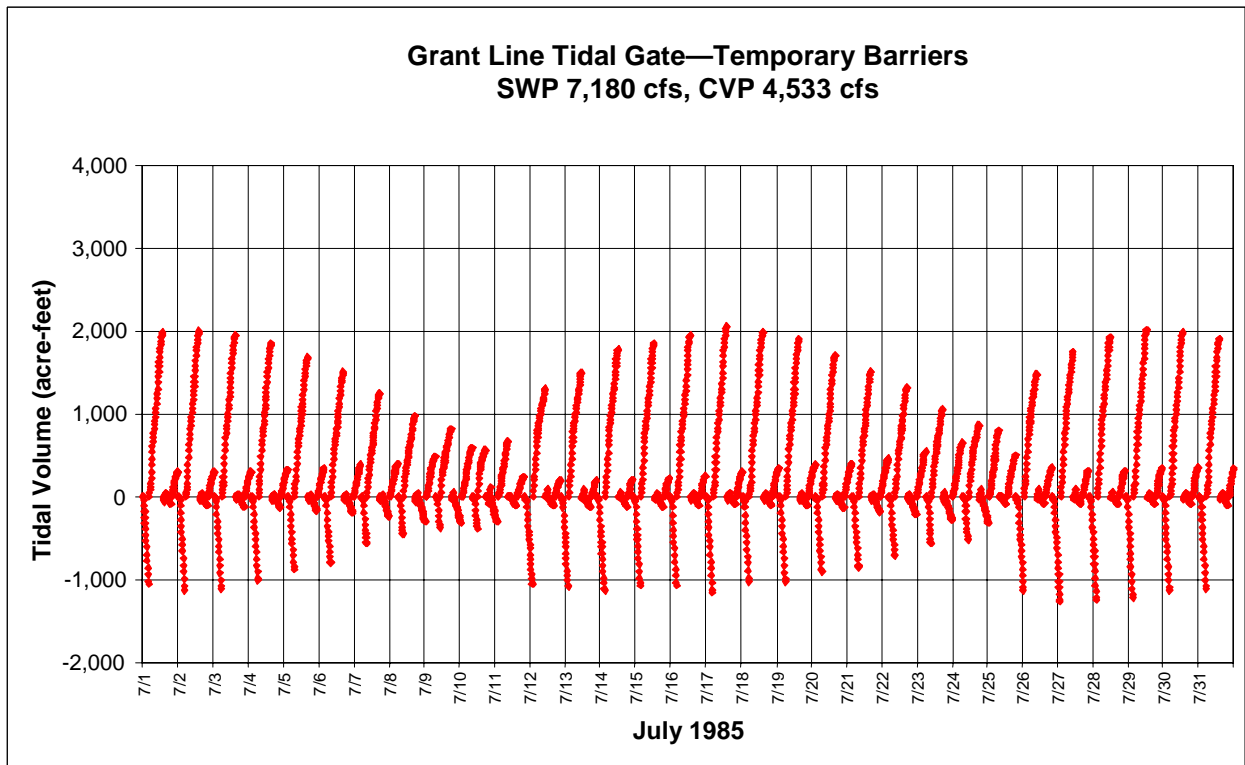
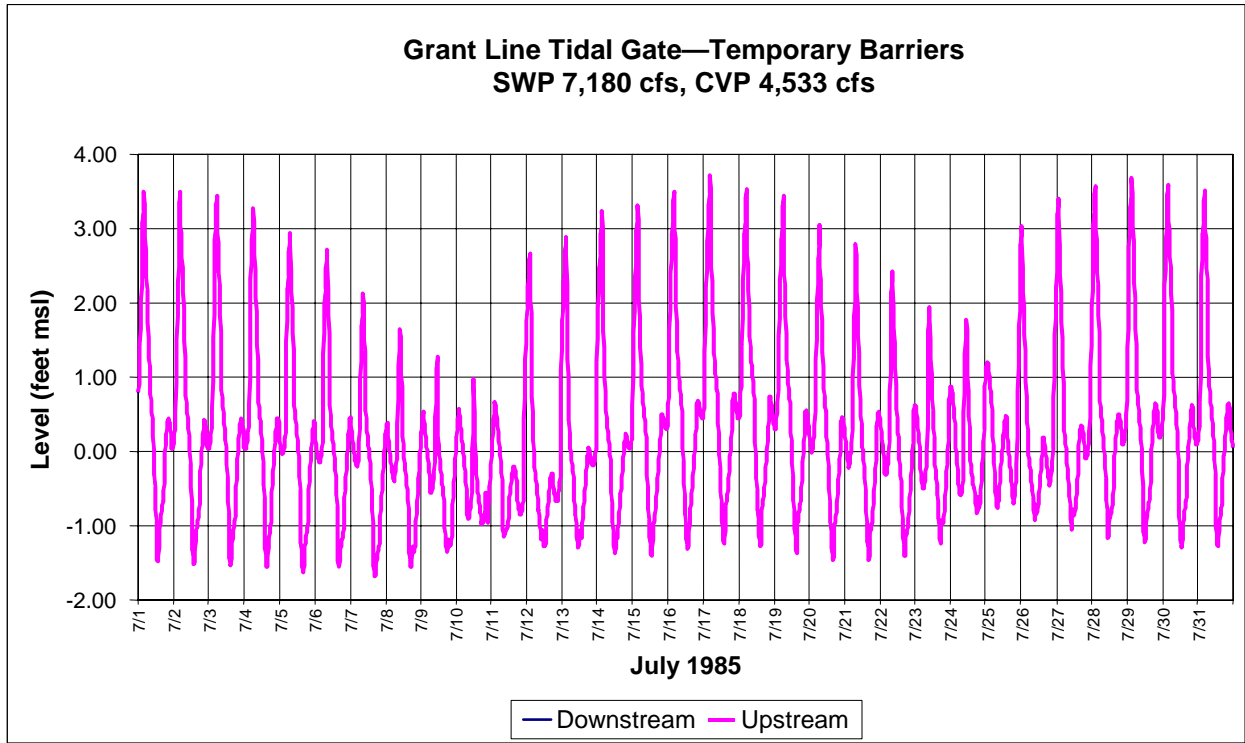
Figure 5.2-34

DSM2-Simulated Tidal Level and Tidal Volume for Middle River Gate Location with 4,600 cfs CVP Tracy Pumping and 8,500 cfs SWP Banks Pumping (No Tidal Gates)



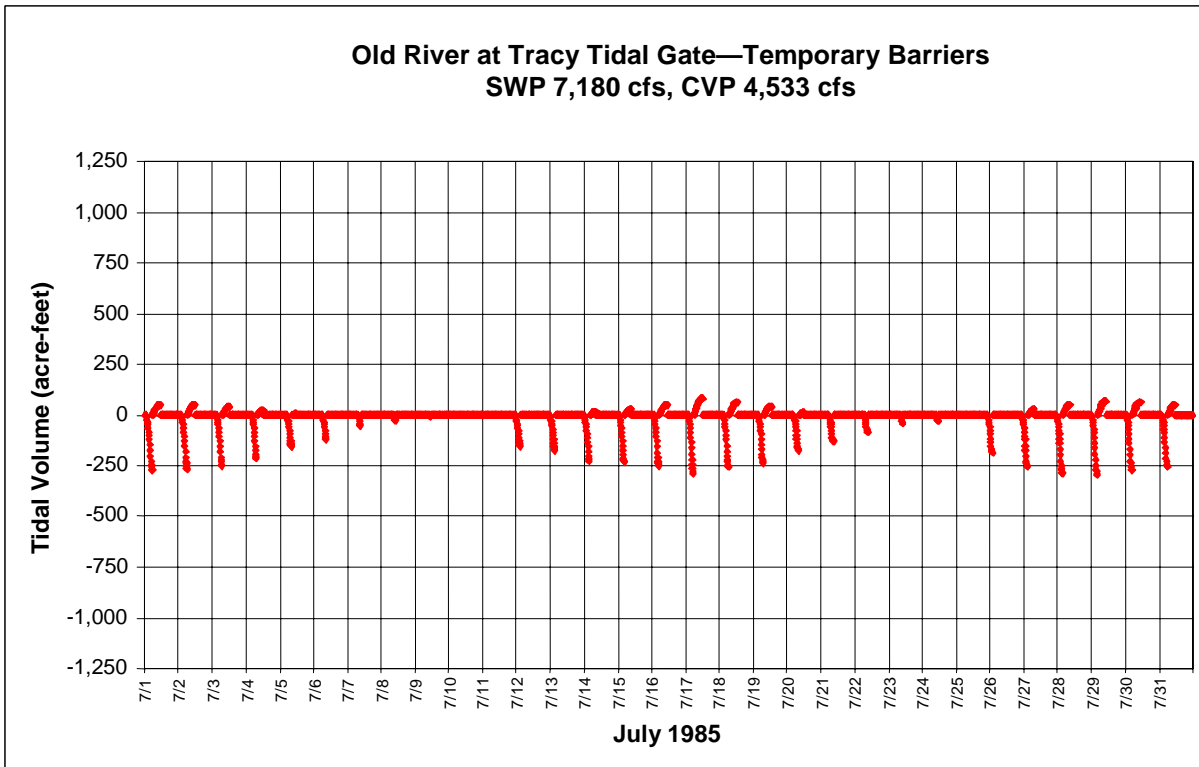
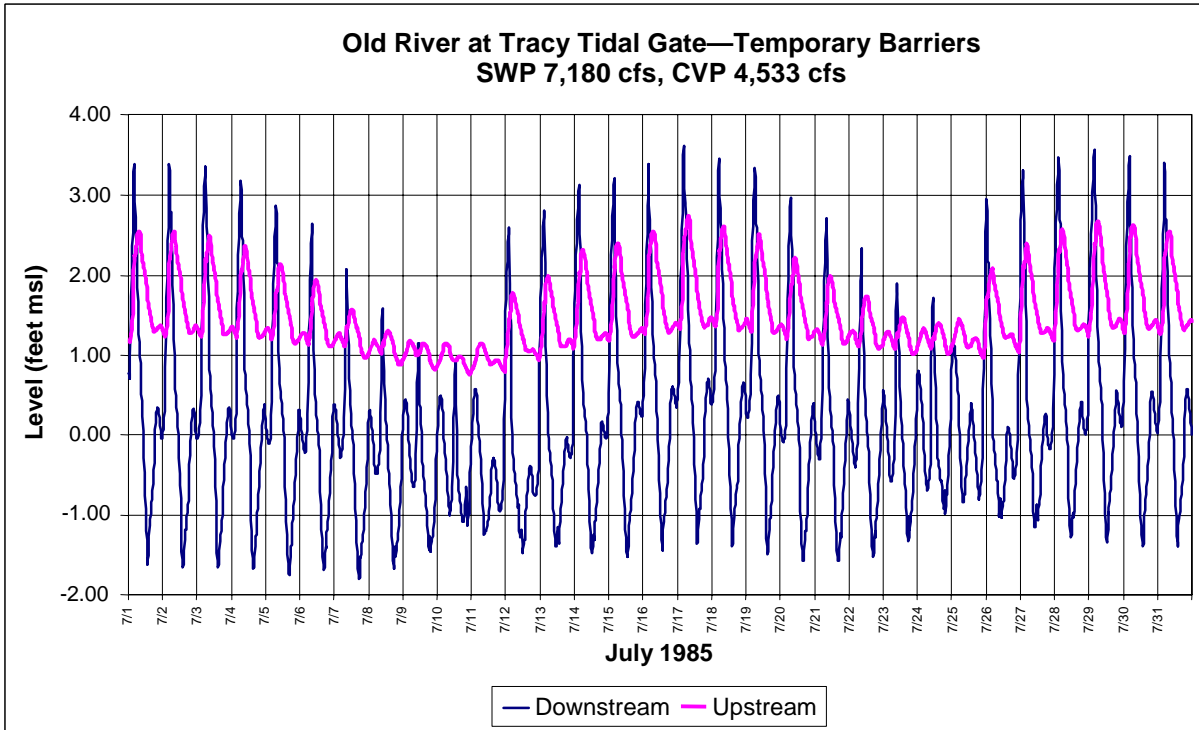
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DSM2-Simulated Tidal Level and Tidal Flow at Head of Old River Tidal Gates with 4,533 cubic feet per second (cfs) CVP Tracy Pumping and 7,180 cfs SWP Banks Pumping (Clifton Court Forebay Gates Closed on Higher High Tide) and with Temporary Barriers



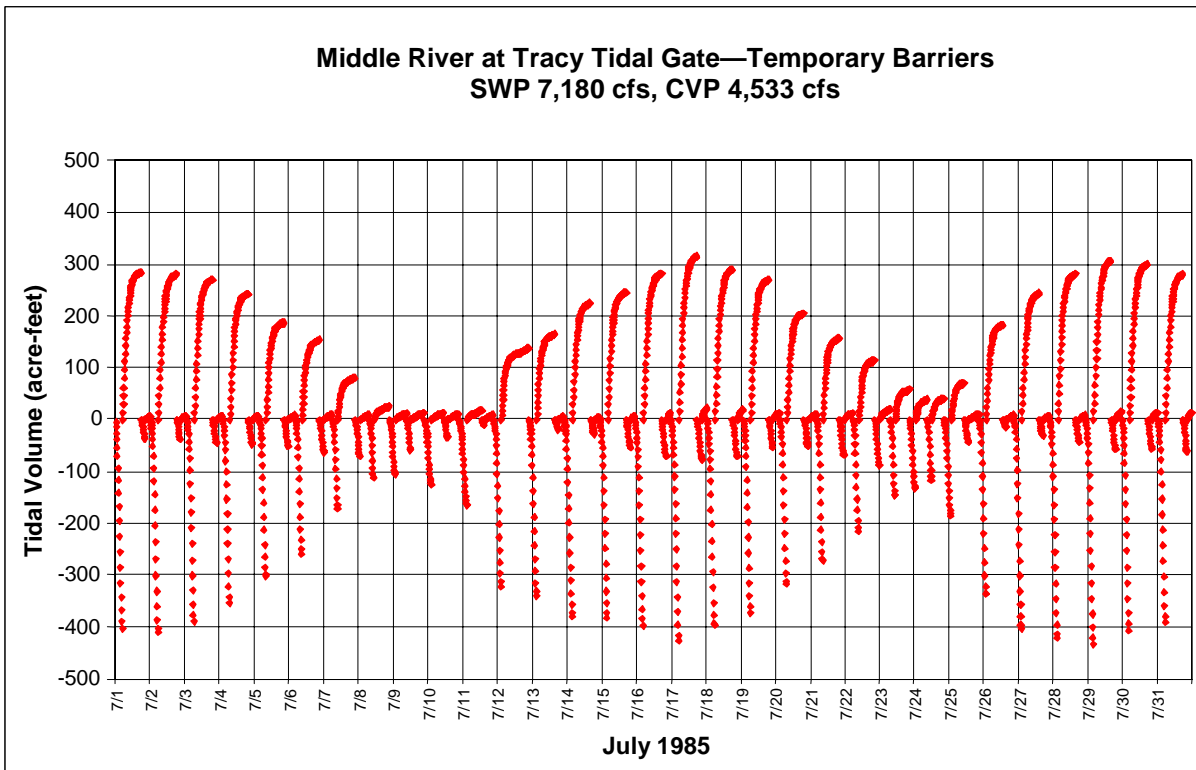
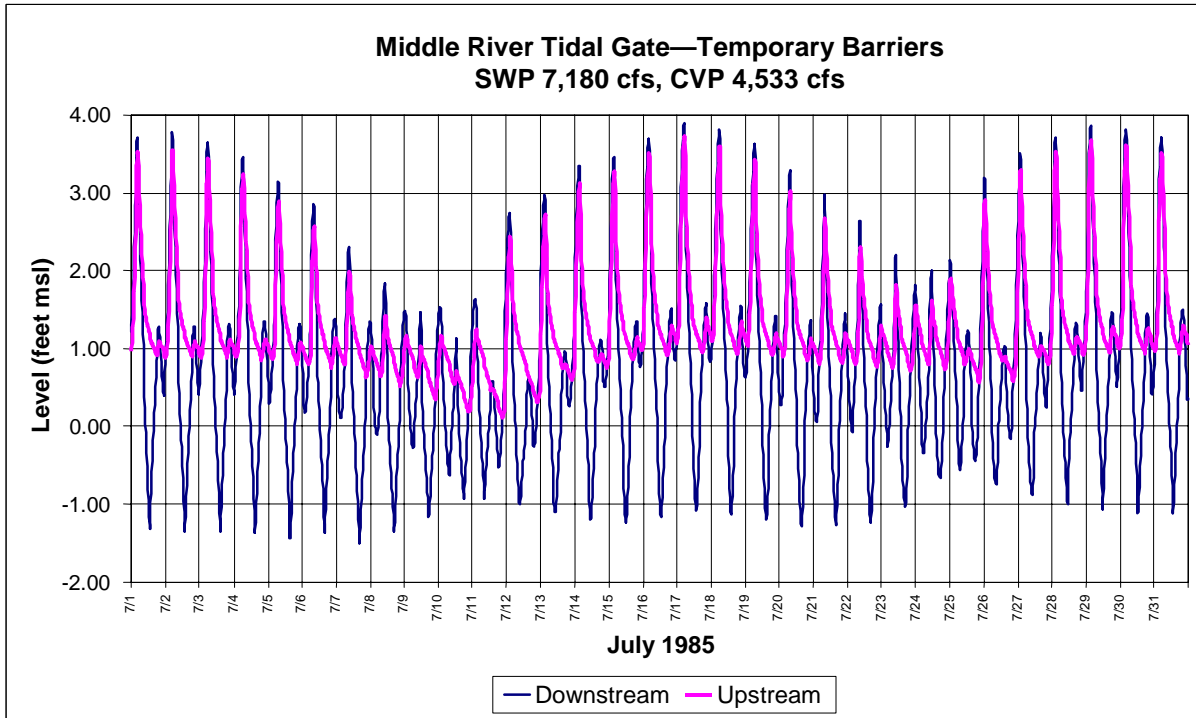
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DSM2-Simulated Tidal Level and Tidal Volume at Grant Line Canal Tidal Gates with 4,533 cubic feet per second (cfs) CVP Tracy Pumping and 7,180 cfs SWP Banks Pumping (Clifton Court Forebay Gates Closed on Higher High Tide) and with Temporary Barriers



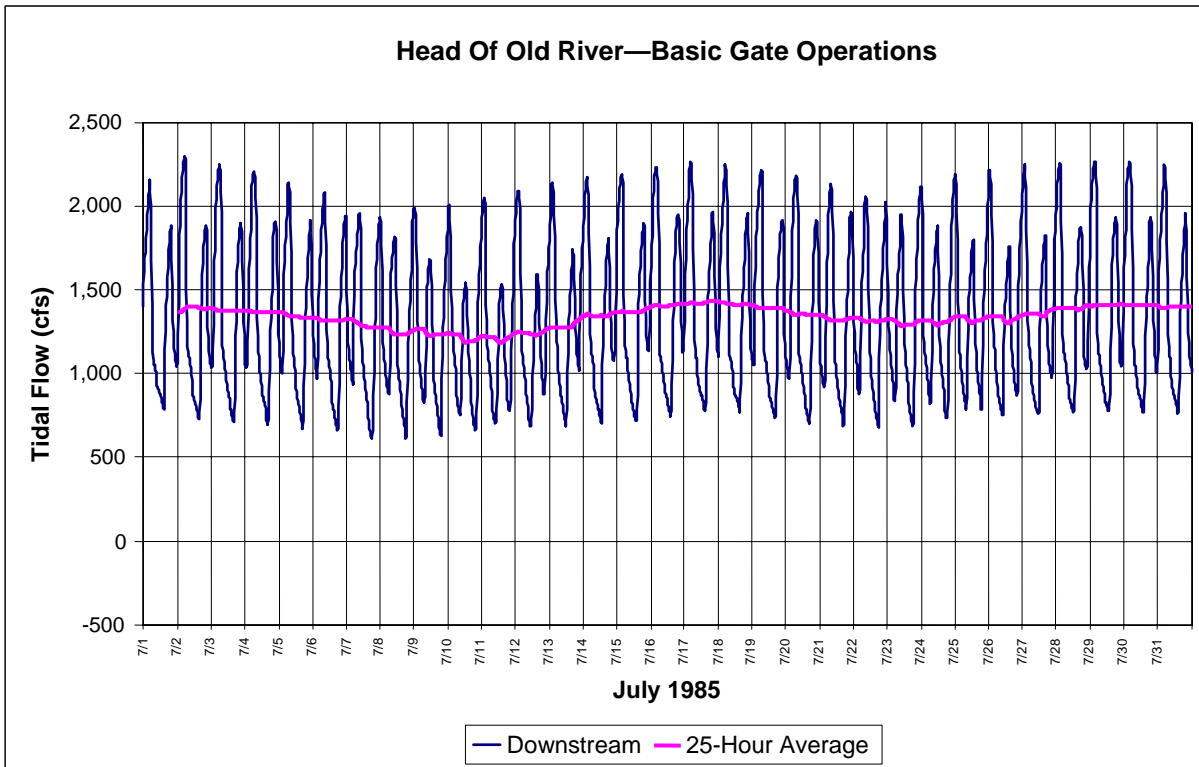
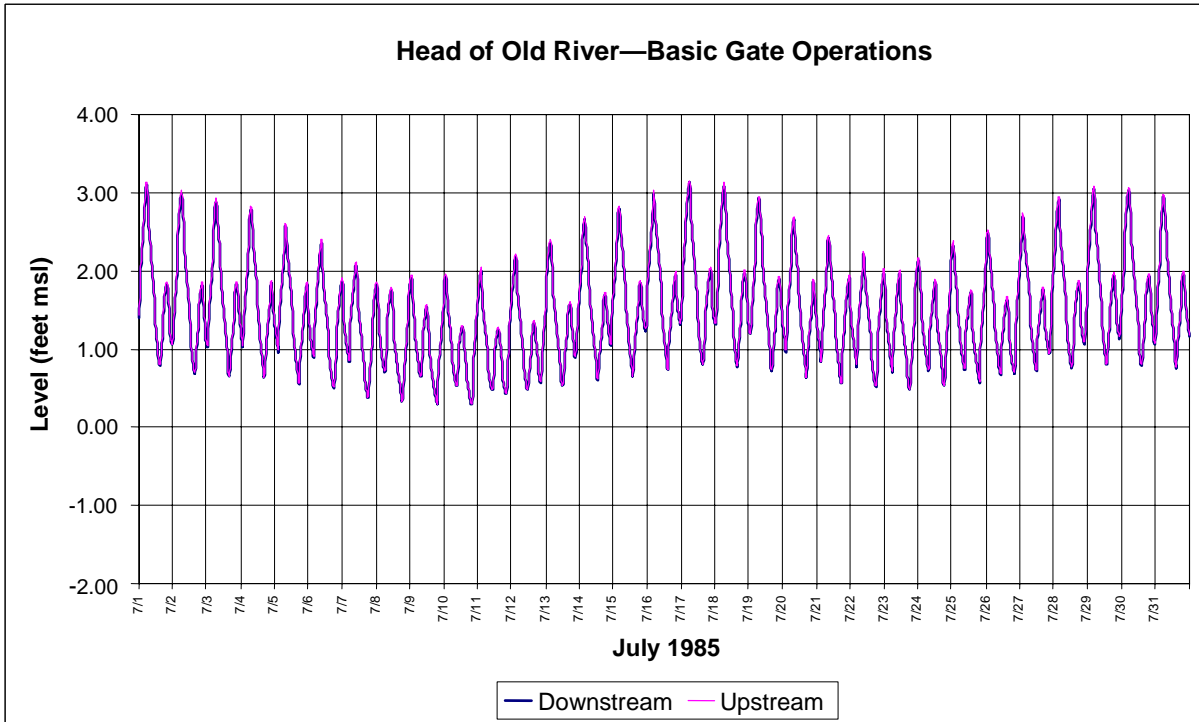
02053.02 101

DSM2-Simulated Tidal Level and Tidal Volume at Old River Temporary Barrier (Crest Elevation at 2.0 feet above mean sea level) with 4,533 cubic feet per second (cfs) CVP Tracy Pumping and 7,180 cfs SWP Banks Pumping (Clifton Court Forebay Gates Closed on Higher High Tide)



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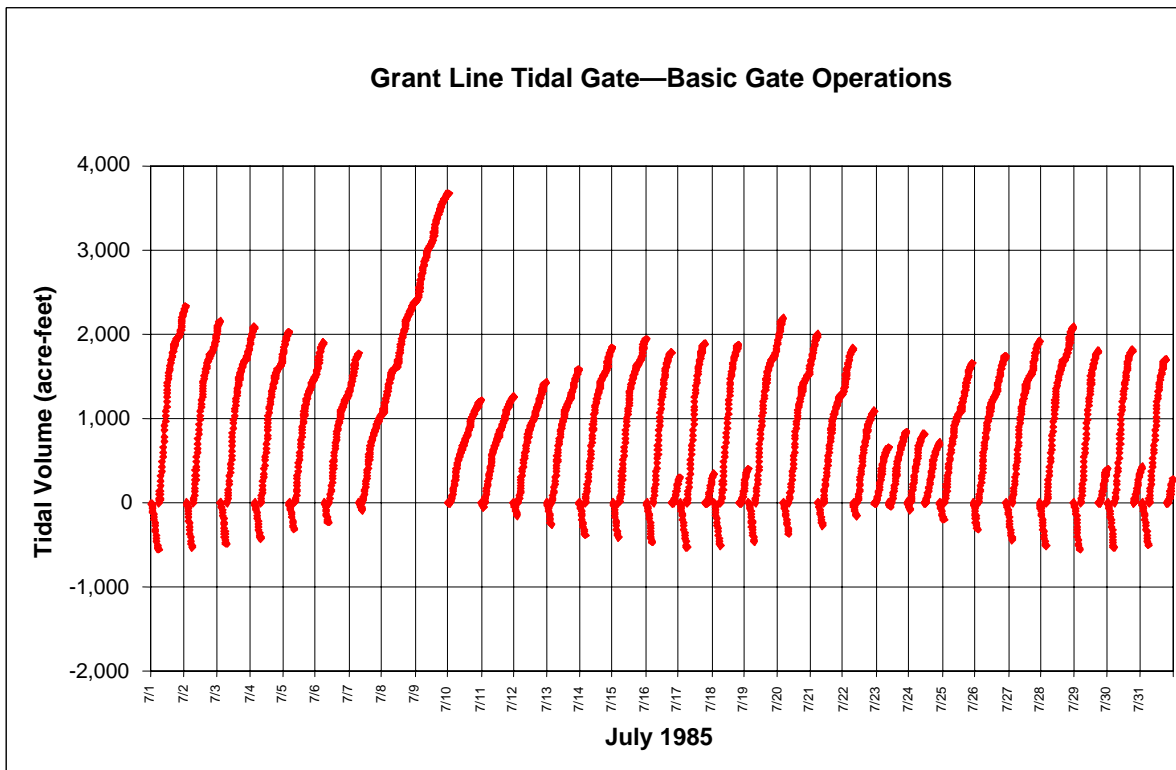
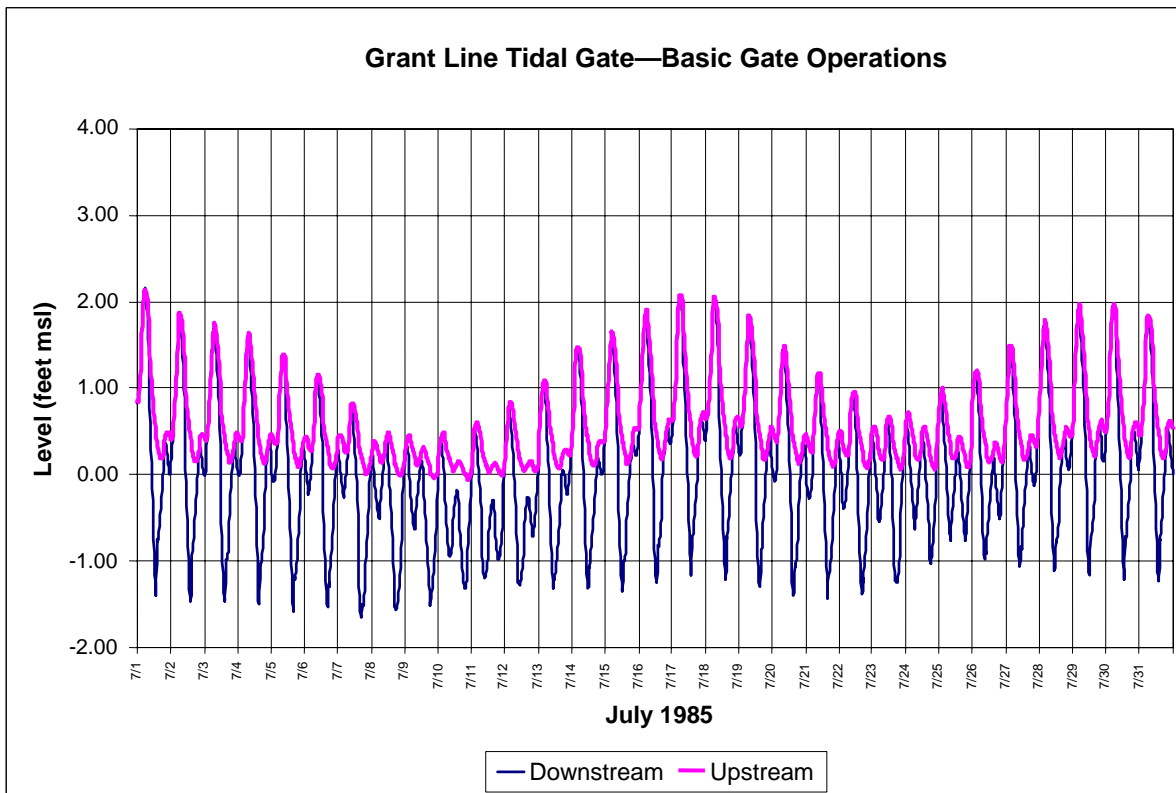
DSM2-Simulated Tidal Level and Tidal Volume at Middle River Temporary Barrier (Crest at 1.0 feet above mean sea level) with 4,533 cubic feet per second (cfs) CVP Tracy Pumping and 7,180 cfs SWP Banks Pumping (Clifton Court Forebay Gates Closed on Higher High Tide)



Note: The average diversion into Old River is 1,308 cubic feet per second (90% of San Joaquin River flow).

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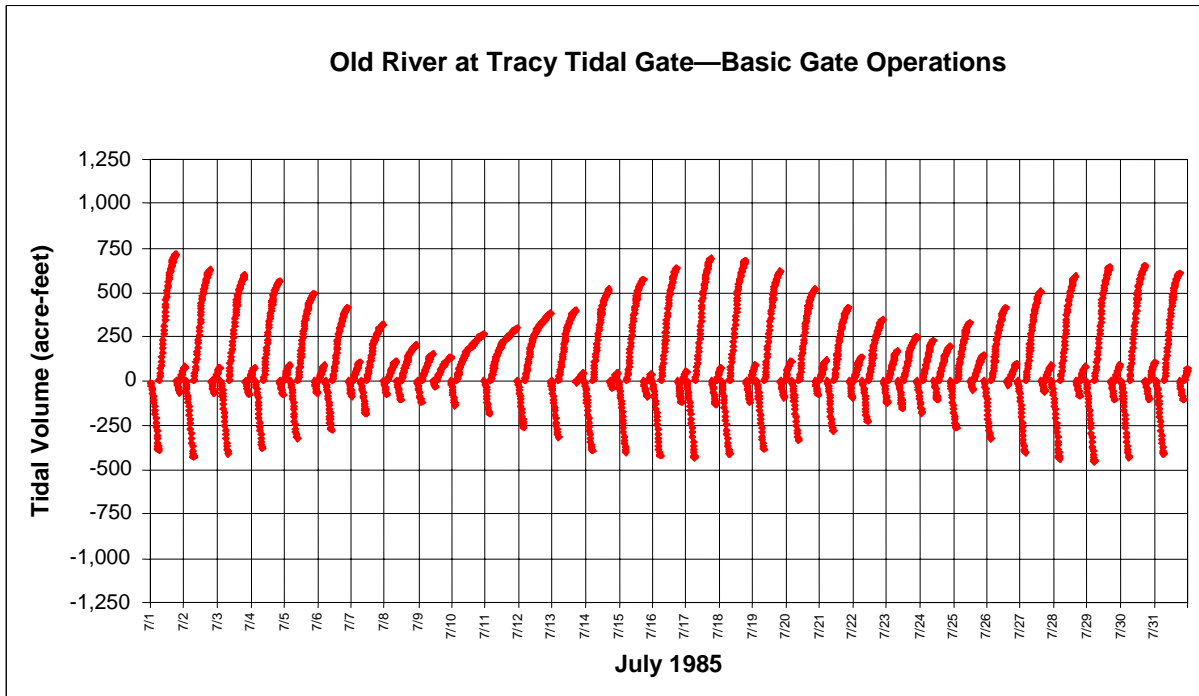
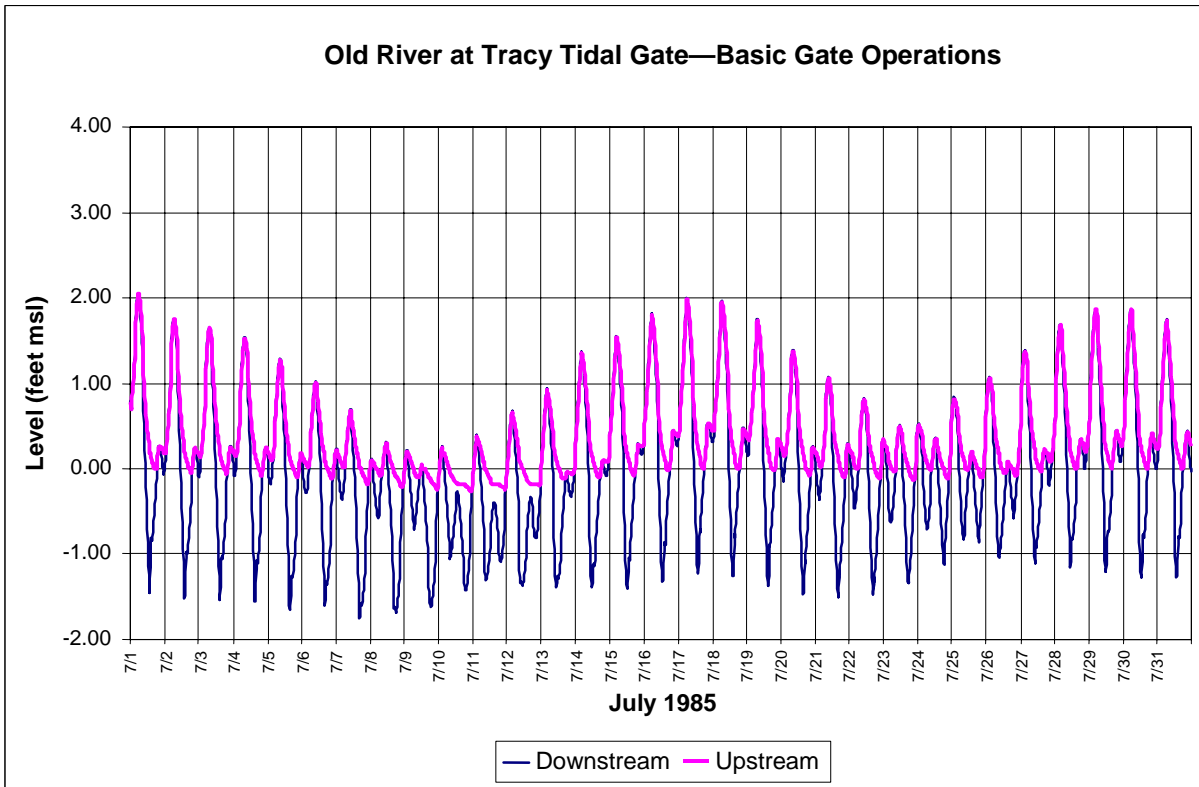
DSM2-Simulated Tidal Level and Tidal Flow at Head of Old River Tidal Gate (Gate Open) Using Basic Gate Operations with 4,600 cubic feet per second (cfs) CVP Tracy Pumping and 8,500 cfs SWP Banks Pumping



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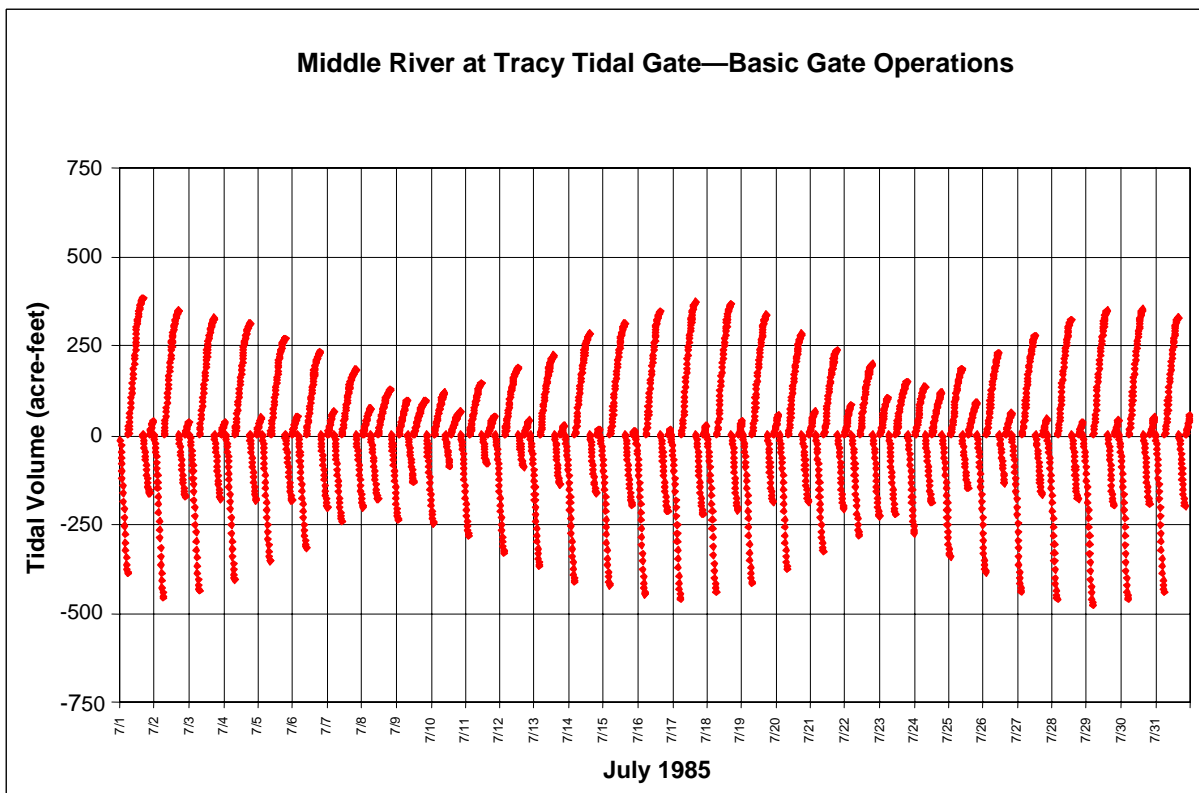
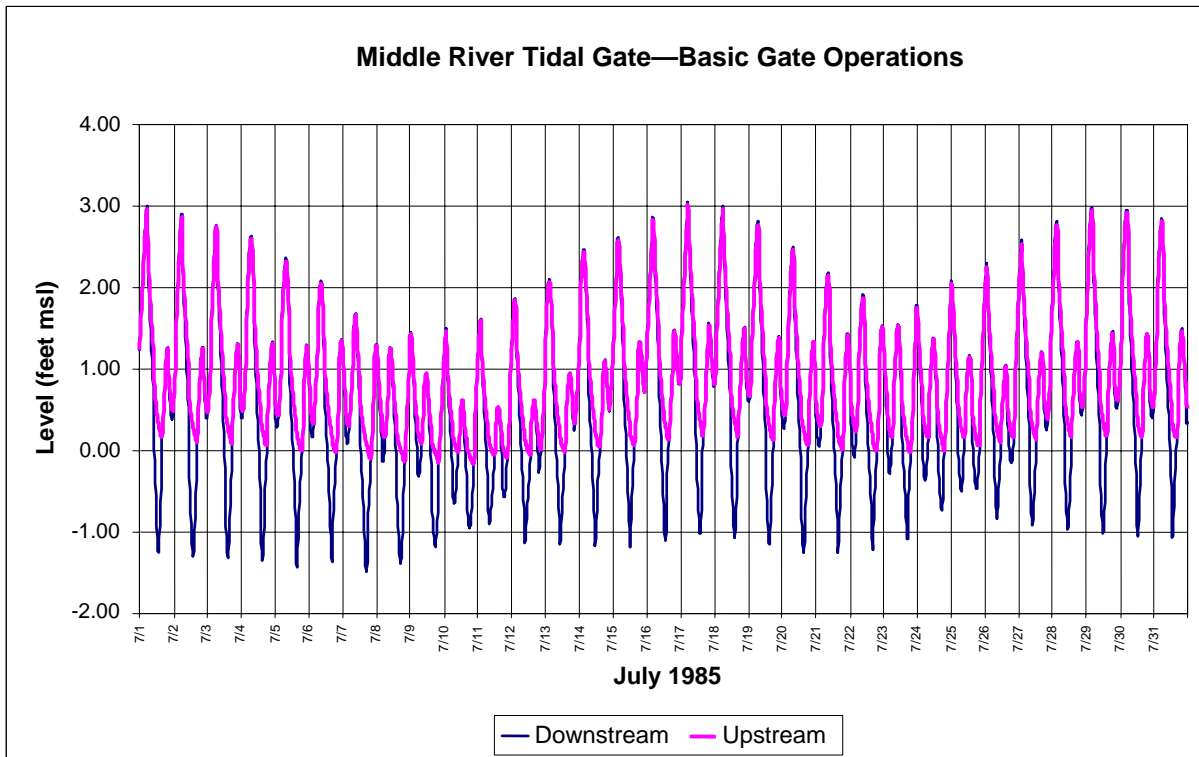
Figure 5.2-40

DSM2-Simulated Tidal Level and Tidal Flow Volume at Grant Line Canal Tidal Gates Using Basic Gate Operations with 4,600 cubic feet per second (cfs) CVP Tracy Pumping and 8,500 cfs SWP Banks Pumping

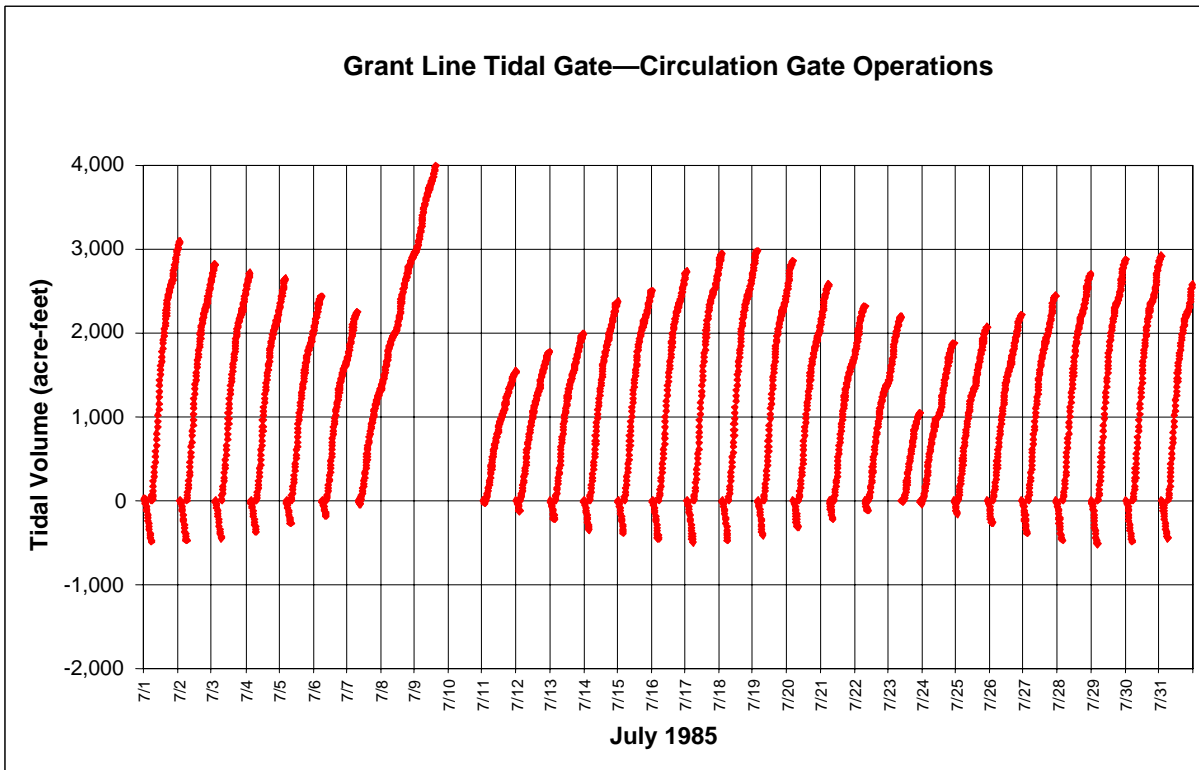
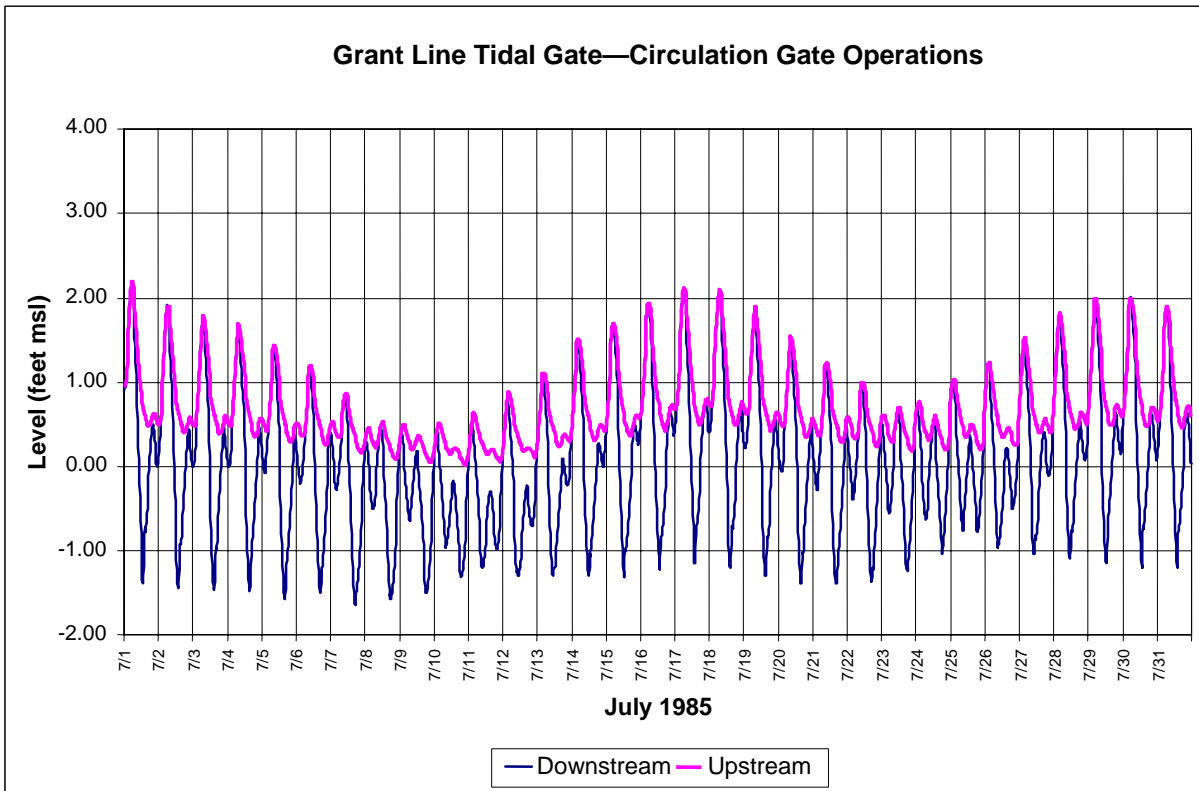


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Figure 5.2-41
DSM2-Simulated Tidal Level and Tidal Flow Volume
at Old River at Tracy Tidal Gates Using Basic Gate Operations
with 4,600 cubic feet per second (cfs) CVP Tracy Pumping
and 8,500 cfs SWP Banks Pumping



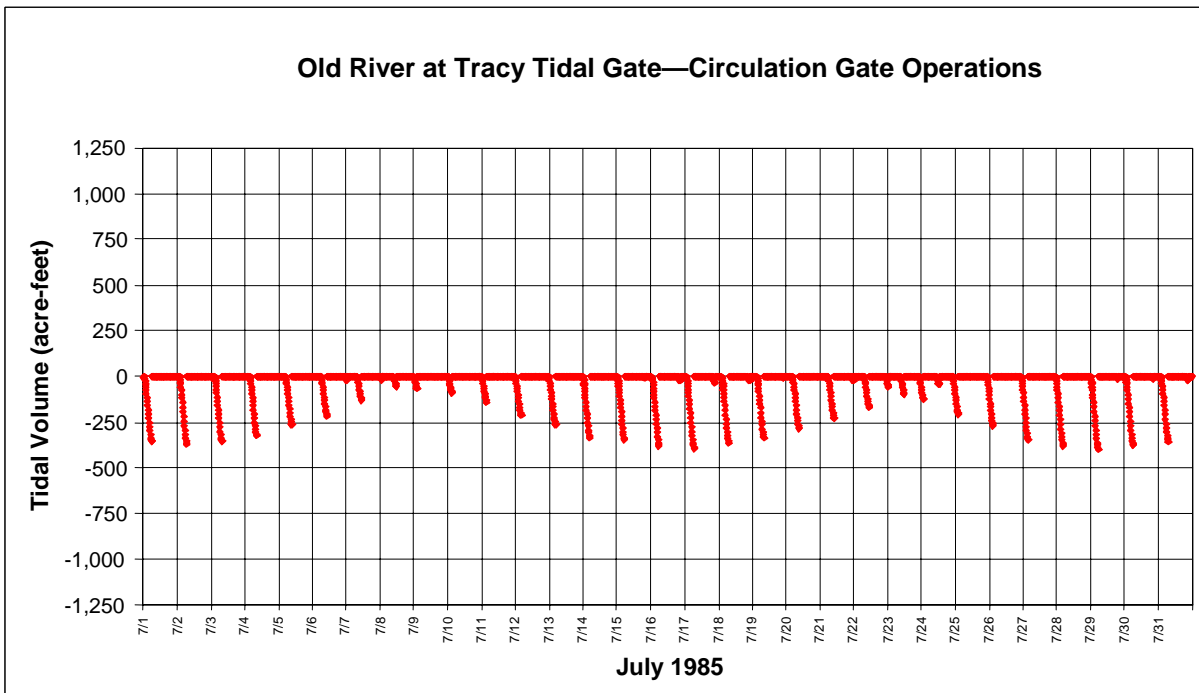
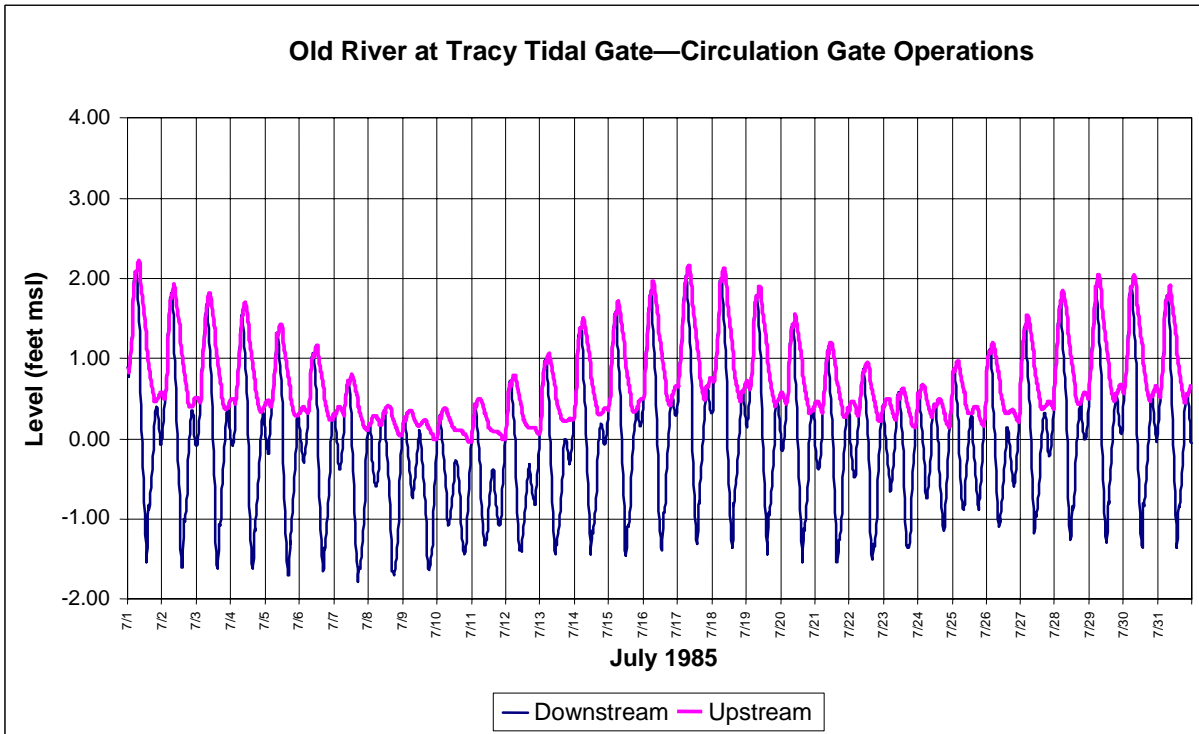
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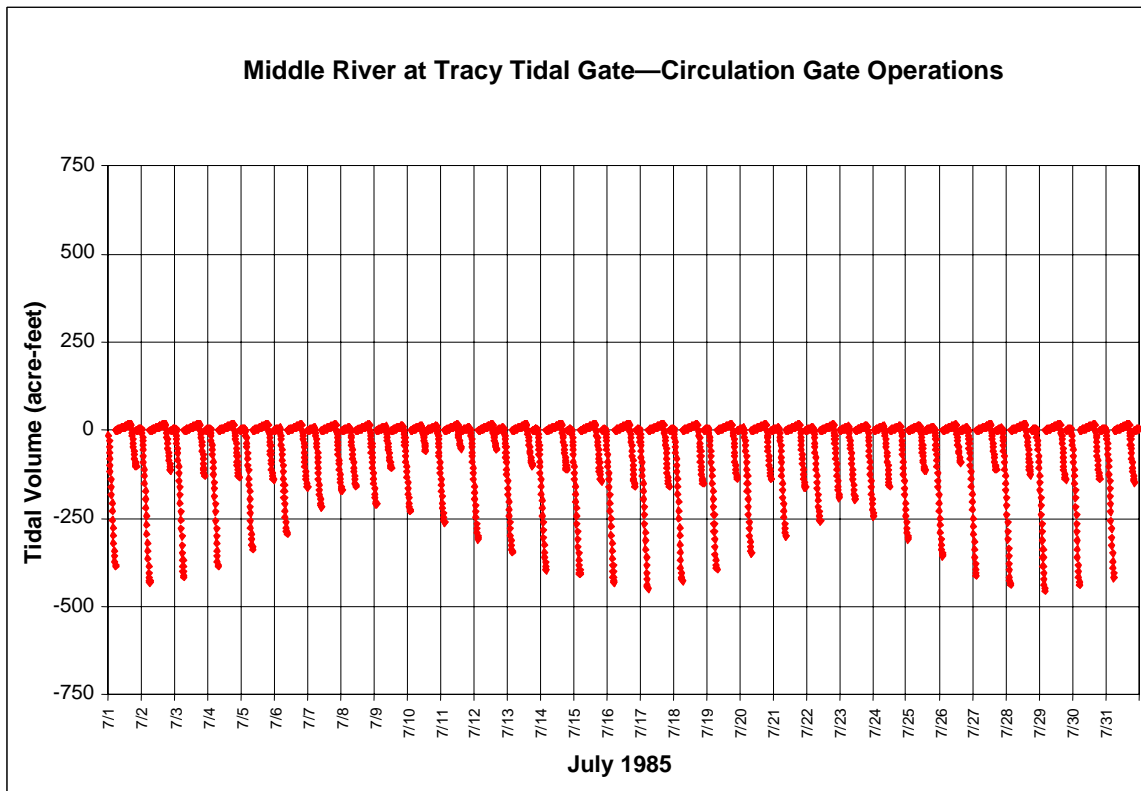
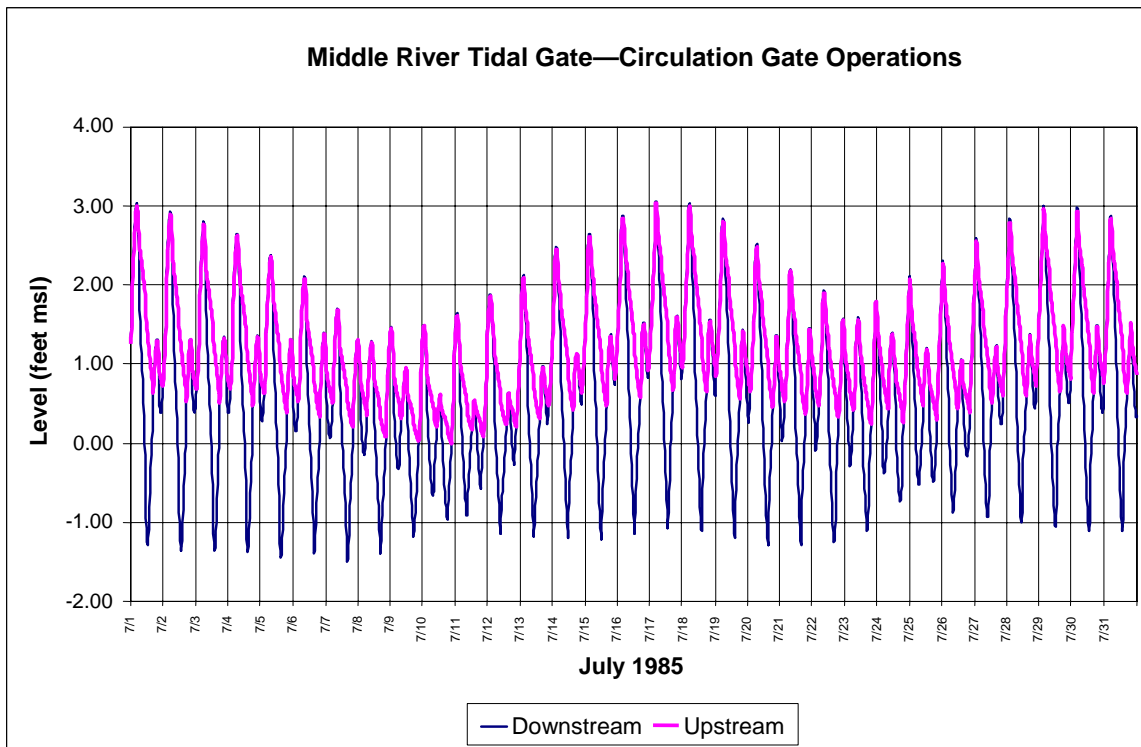
Figure 5.2-43

DSM2-Simulated Tidal Level and Tidal Flow Volume at Grant Line Canal Tidal Gates Using Circulation Gate Operations with 4,600 cubic feet per second (cfs) CVP Tracy Pumping and 8,500 cfs SWP Banks Pumping



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DSM2-Simulated Tidal Level and Tidal Flow Volume at Old River at Tracy Tidal Gates Using Circulation Gate Operations with 4,600 cubic feet per second (cfs) CVP Tracy Pumping and 8,500 cfs SWP Banks Pumping

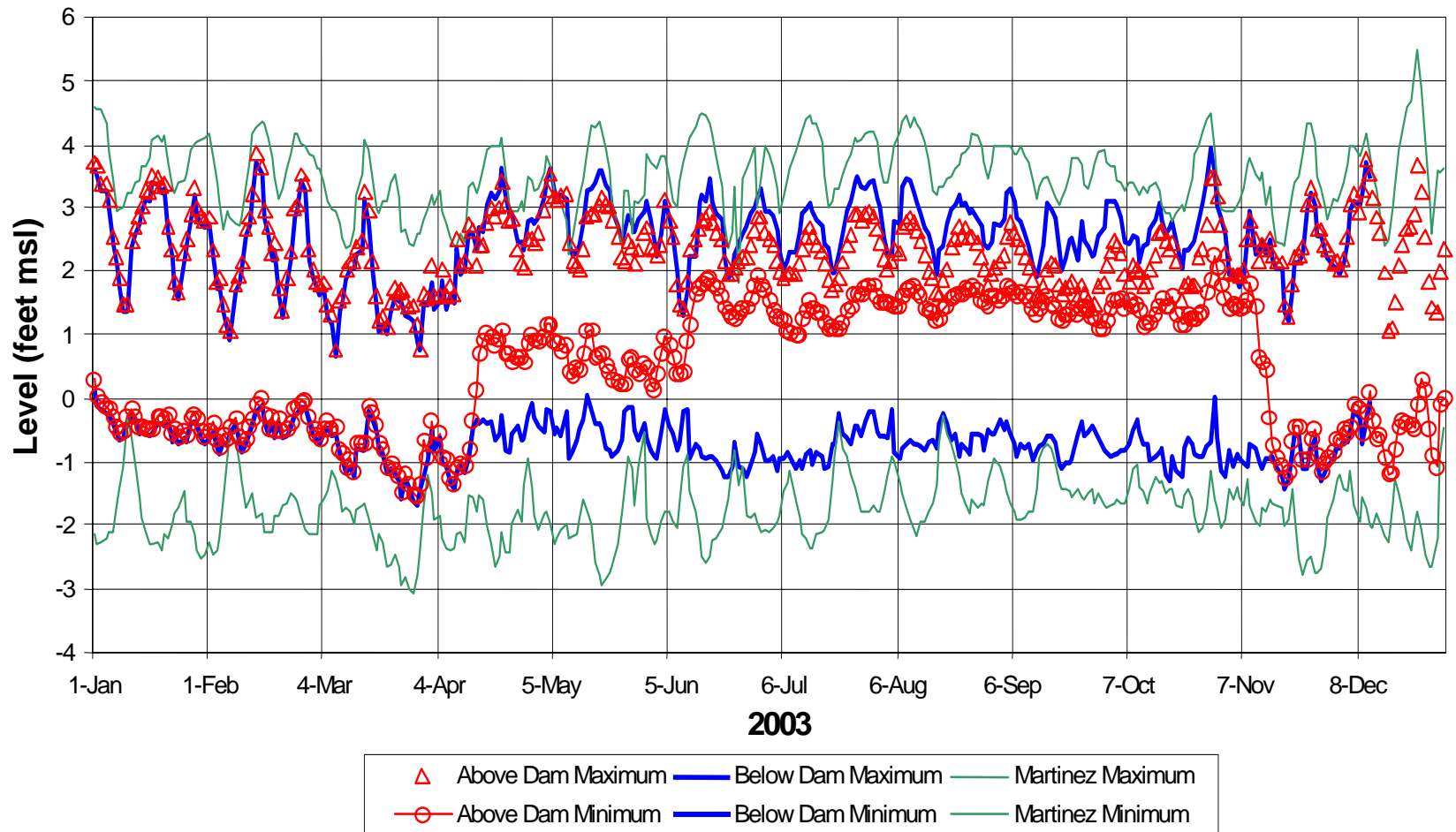


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Figure 5.2-45

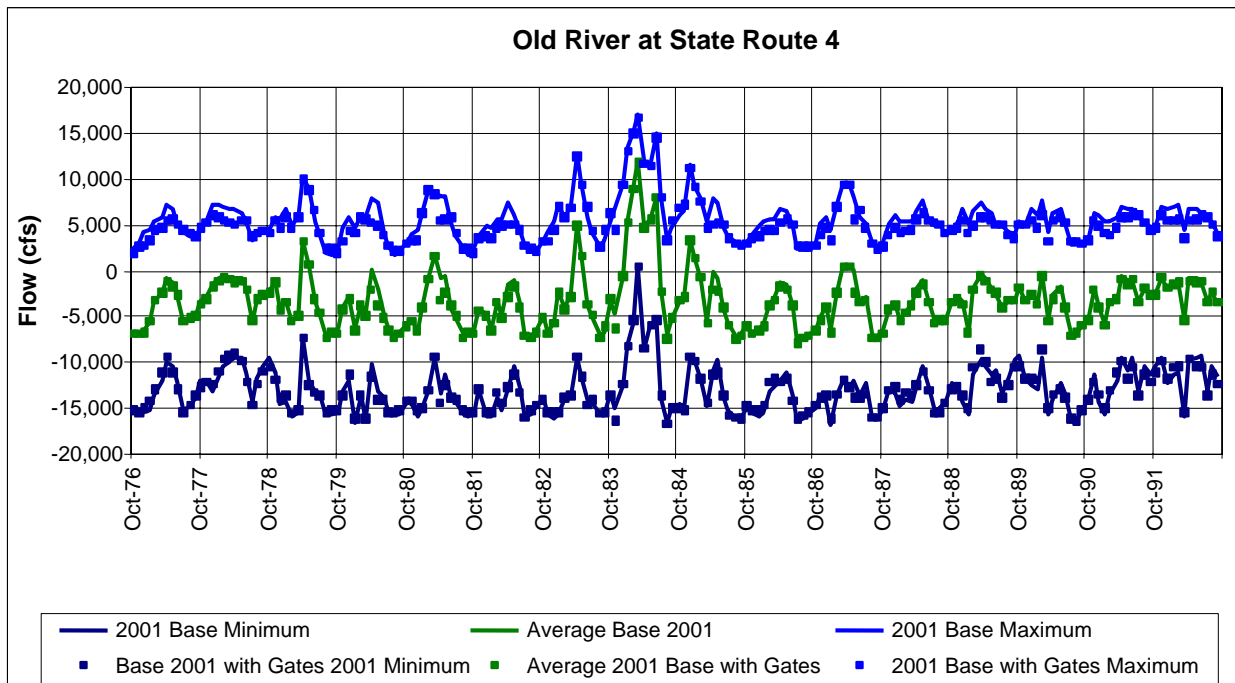
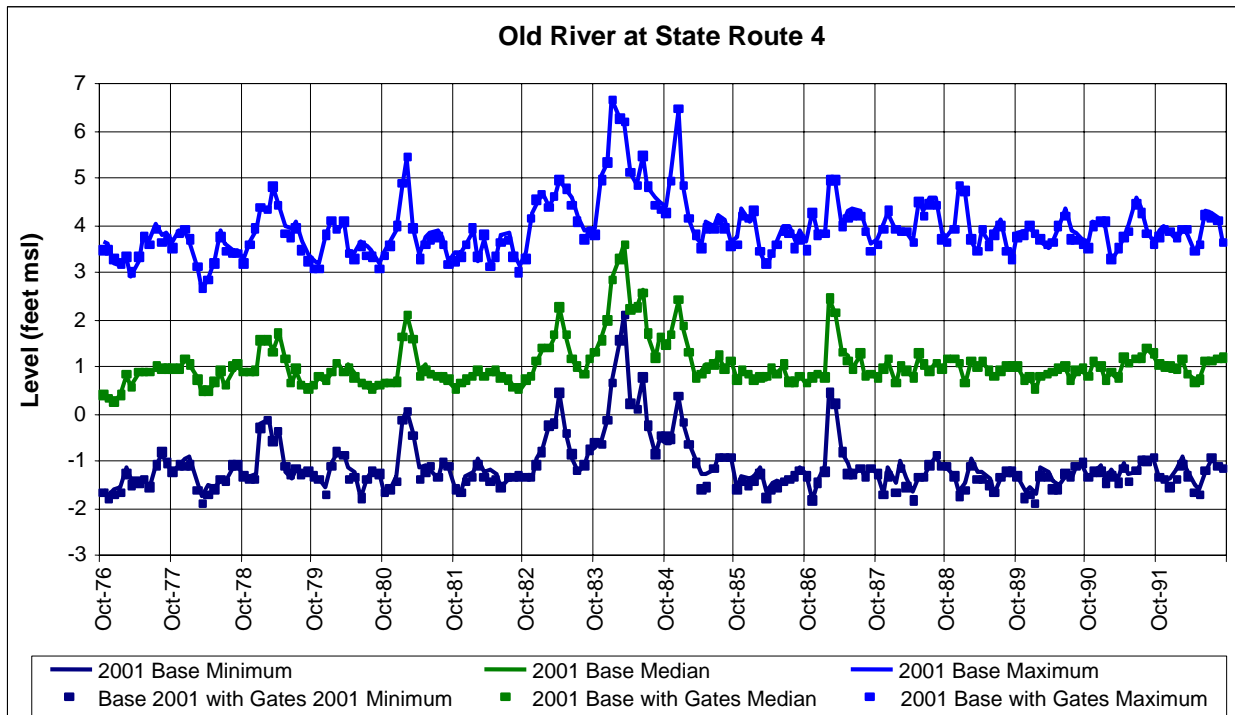
DSM2-Simulated Tidal Level and Tidal Flow Volume at Middle River Tidal Gates Using Circulation Gate Operations with 4,600 cubic feet per second (cfs) CVP Tracy Pumping and 8,500 cfs SWP Banks Pumping

Level in Old River near the Delta-Mendota Canal



Note: The Old River and Middle River temporary barriers were installed from mid-April through mid-November. The Grant Line Canal temporary barrier was installed from early June through early November. The daily minimum and maximum tidal levels at Martinez are shown for comparison.

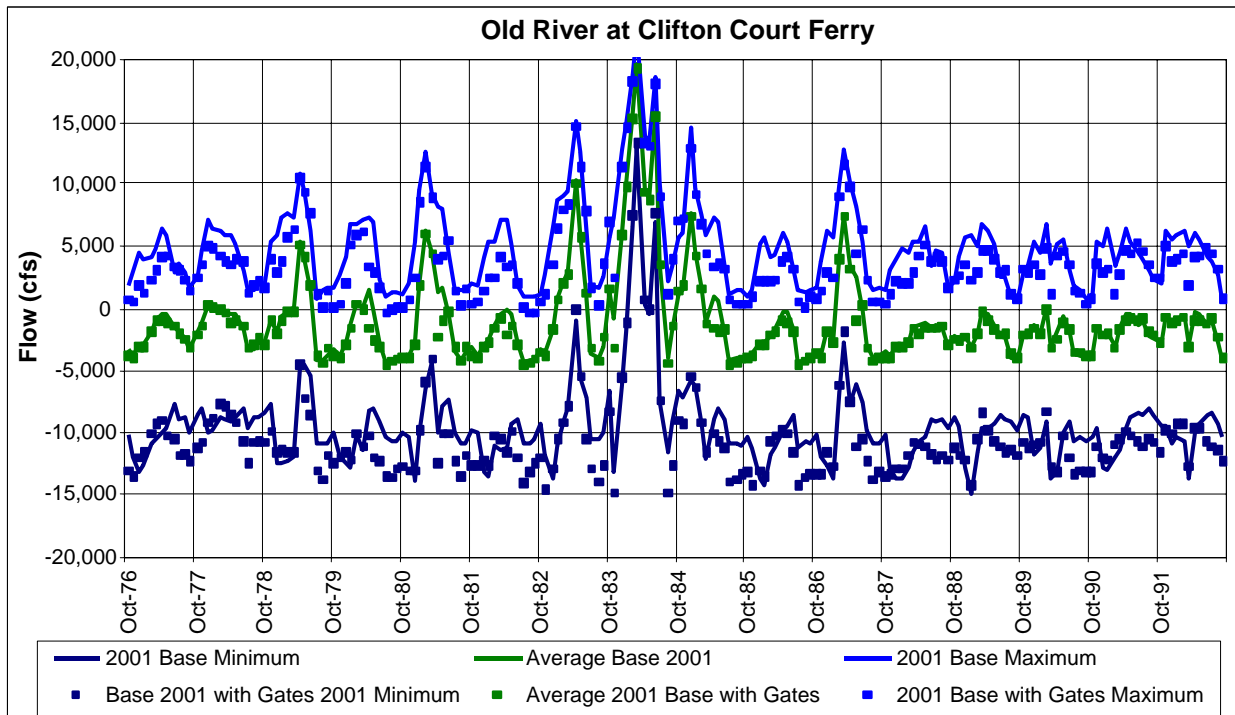
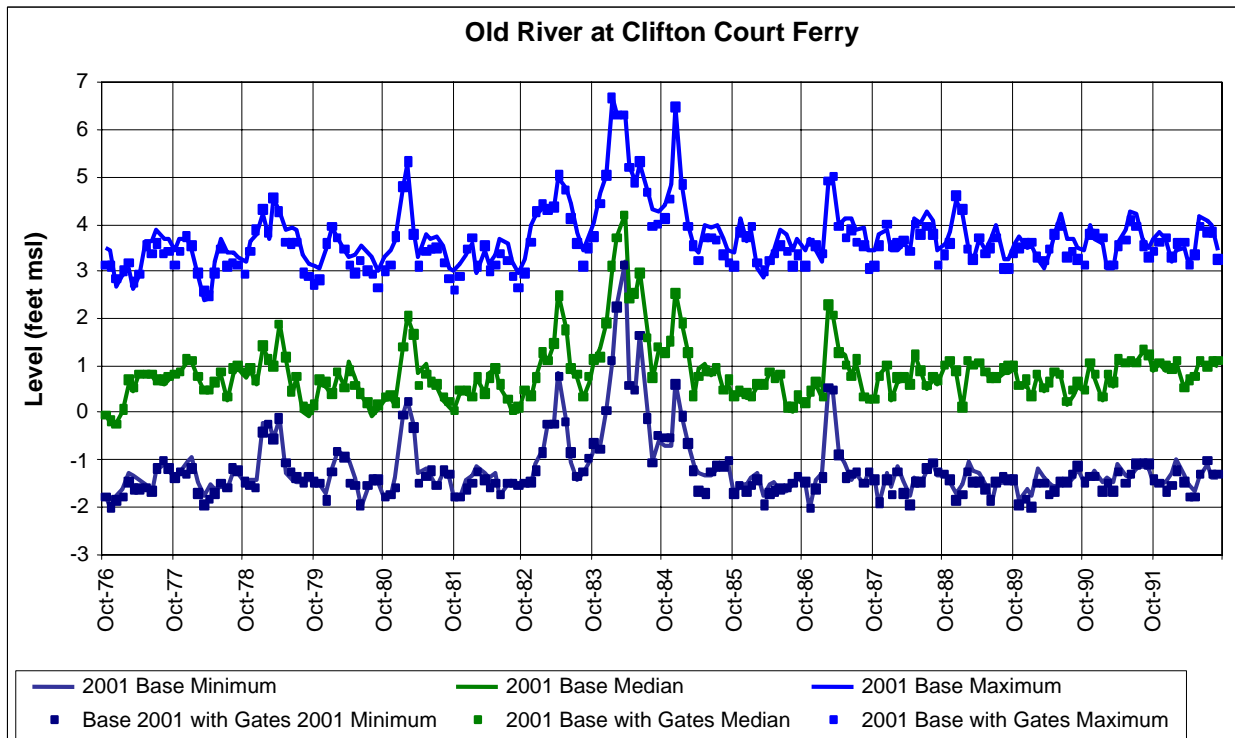
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Figure 5.2-47

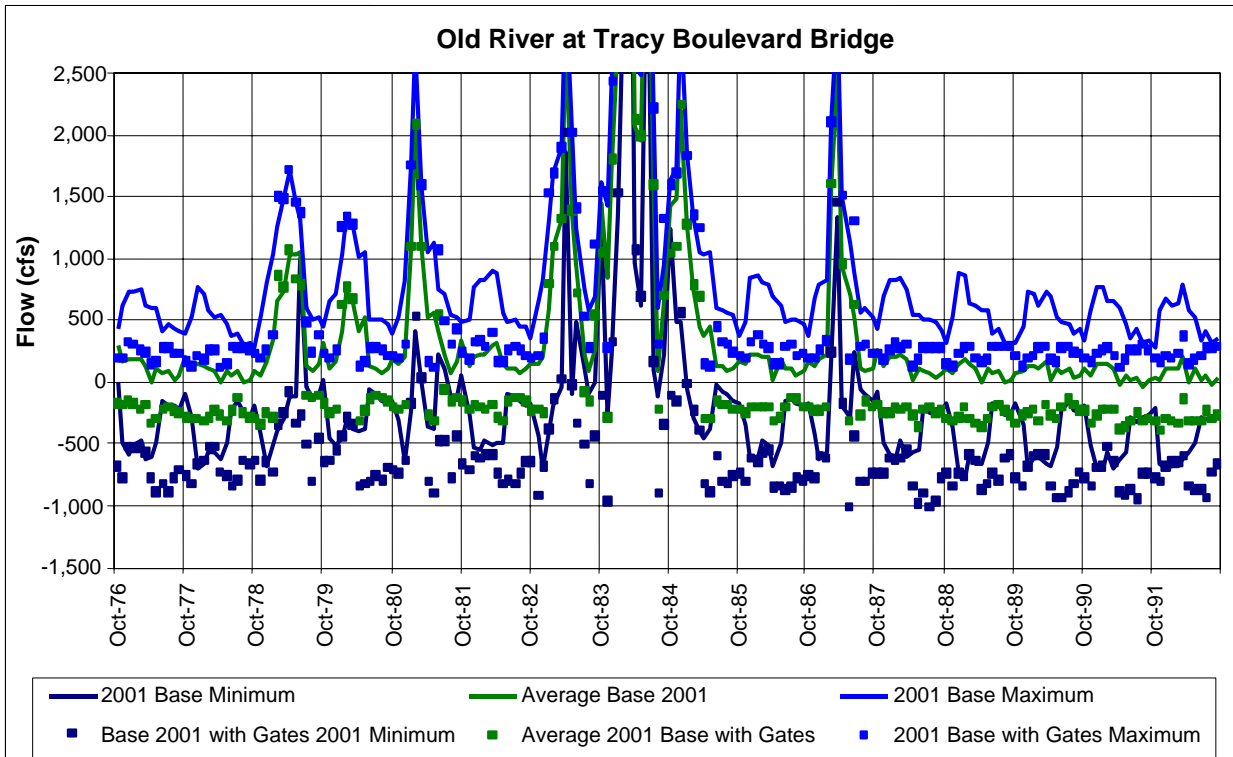
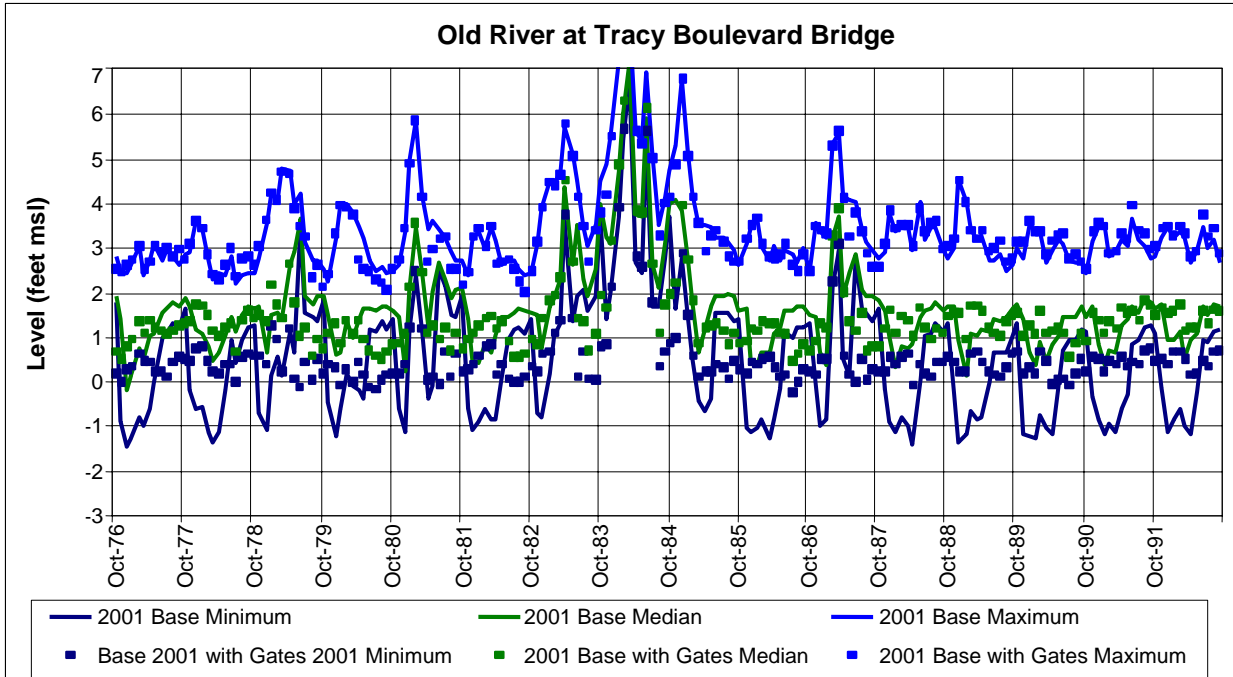
**DSM2-Simulated Tidal Level and Tidal Flows
in Old River at State Route 4 Bridge for Alternative 2A Stage I
Compared with 2001 Baseline Conditions for 1976–1991**



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Figure 5.2-48

**DSM2-Simulated Tidal Level and Tidal Flows
for Old River at Clifton Court Ferry for Alternative 2A Stage I
Compared with 2001 Baseline Conditions for 1976–1991**



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Figure 5.2-49

DSM2-Simulated Tidal Level and Tidal Flows for Old River at Tracy Boulevard Bridge for Alternative 2A Stage I Compared with 2001 Baseline Conditions for 1976–1991