

# BDCP Physical Modeling Update

## Summary of Delta Hydrodynamic & Water Quality Results

BDCP Steering Committee

June 17, 2010

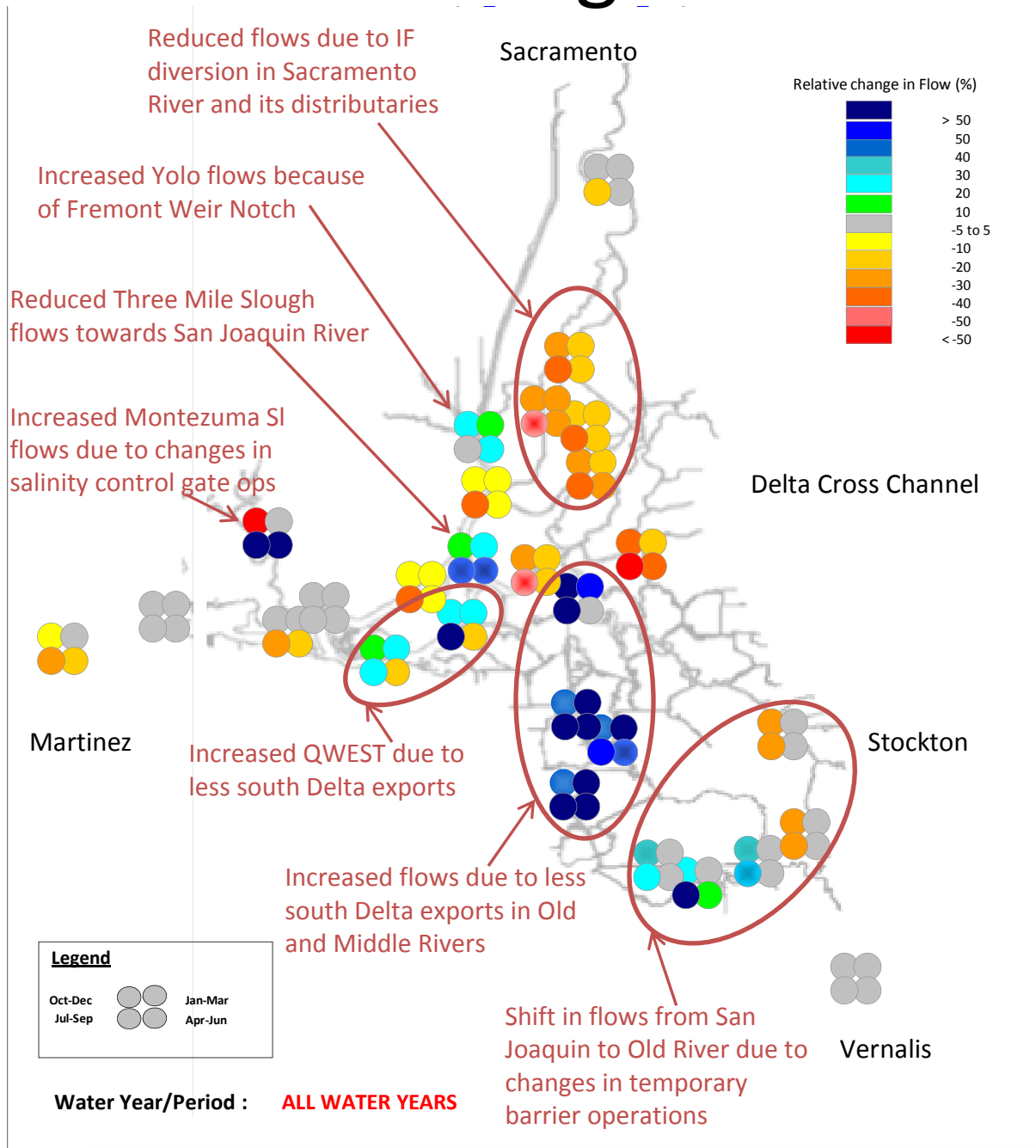
# Outline

- Update on physical modeling
- Summary of Delta flow and stage results
- Summary of Delta water quality results
- On-going work and next steps

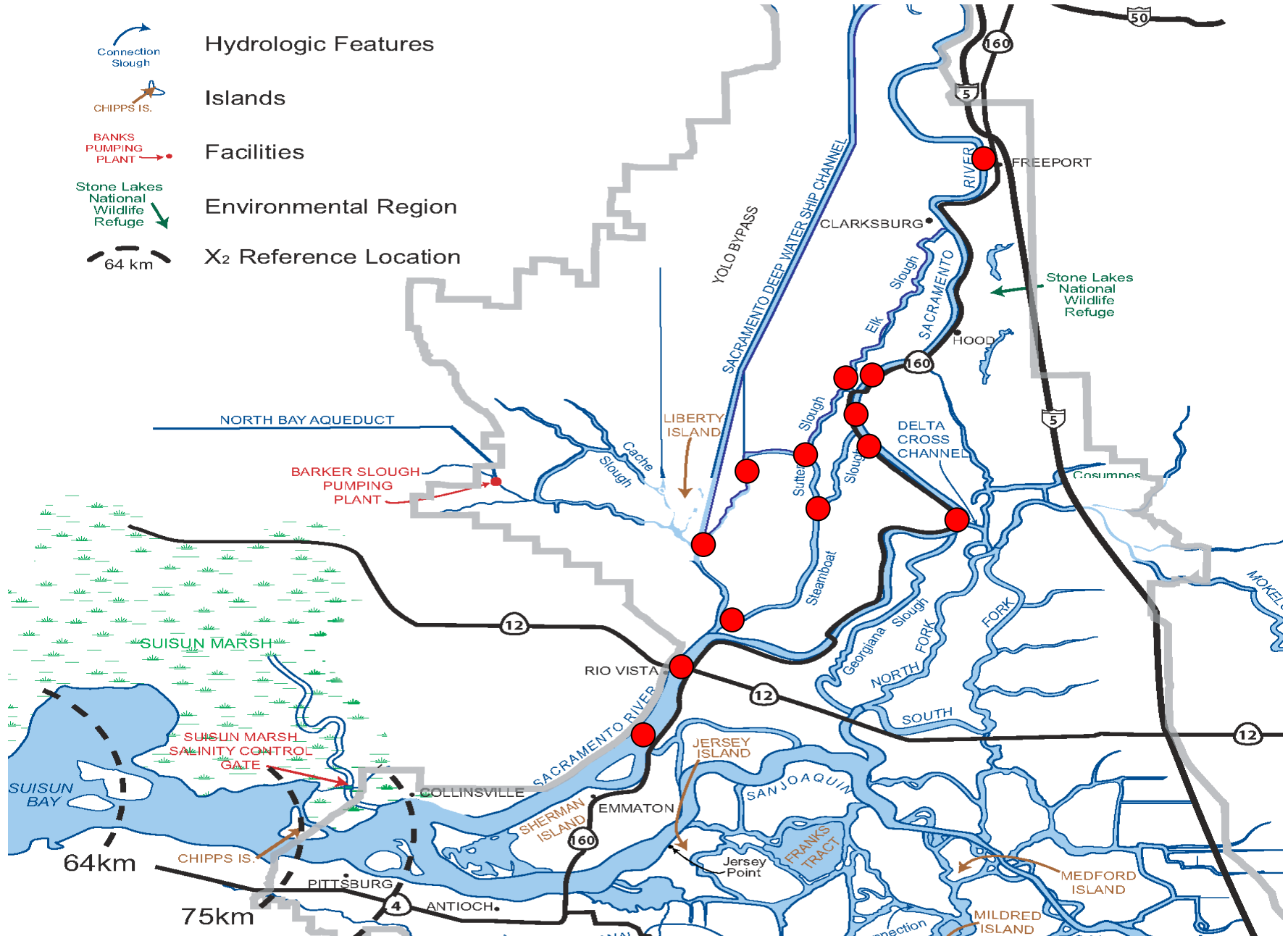
# Update on Physical Modeling

- Physical modeling complete to date
  - **VIC:** Climate-driven hydrologic model
  - **UnTRIM:** Sea level rise effects
  - **RMA:** Tidal marsh effects
  - **ANN:** Flow-salinity responses
  - **CALSIM II:** Hydrology & system operations
  - **SRWQM:** Sac R Water Quality Model
  - **DSM2:** Delta hydrodynamics & water quality
  - **DSM2-PTM:** Particle tracking models
- 6 scenarios for CALSIM II, SRWQM, DSM2, and DSM2-PTM models
  1. **NAA:** No Action Alternative with current climate and sea level
  2. **NAA\_ELT:** No Action Alternative with 2025 climate and sea level rise
  3. **NAA\_LL:** No Action Alternative with 2060 climate and sea level rise
  4. **PP:** Proposed Project (long-term ops) with current climate, sea level, and restoration
  5. **PP\_ELT:** Project with Early Long-Term (2025) climate, sea level rise, and restoration
  6. **PP\_LL:** Project with Early Long-Term (2060) climate, sea level rise, and restoration

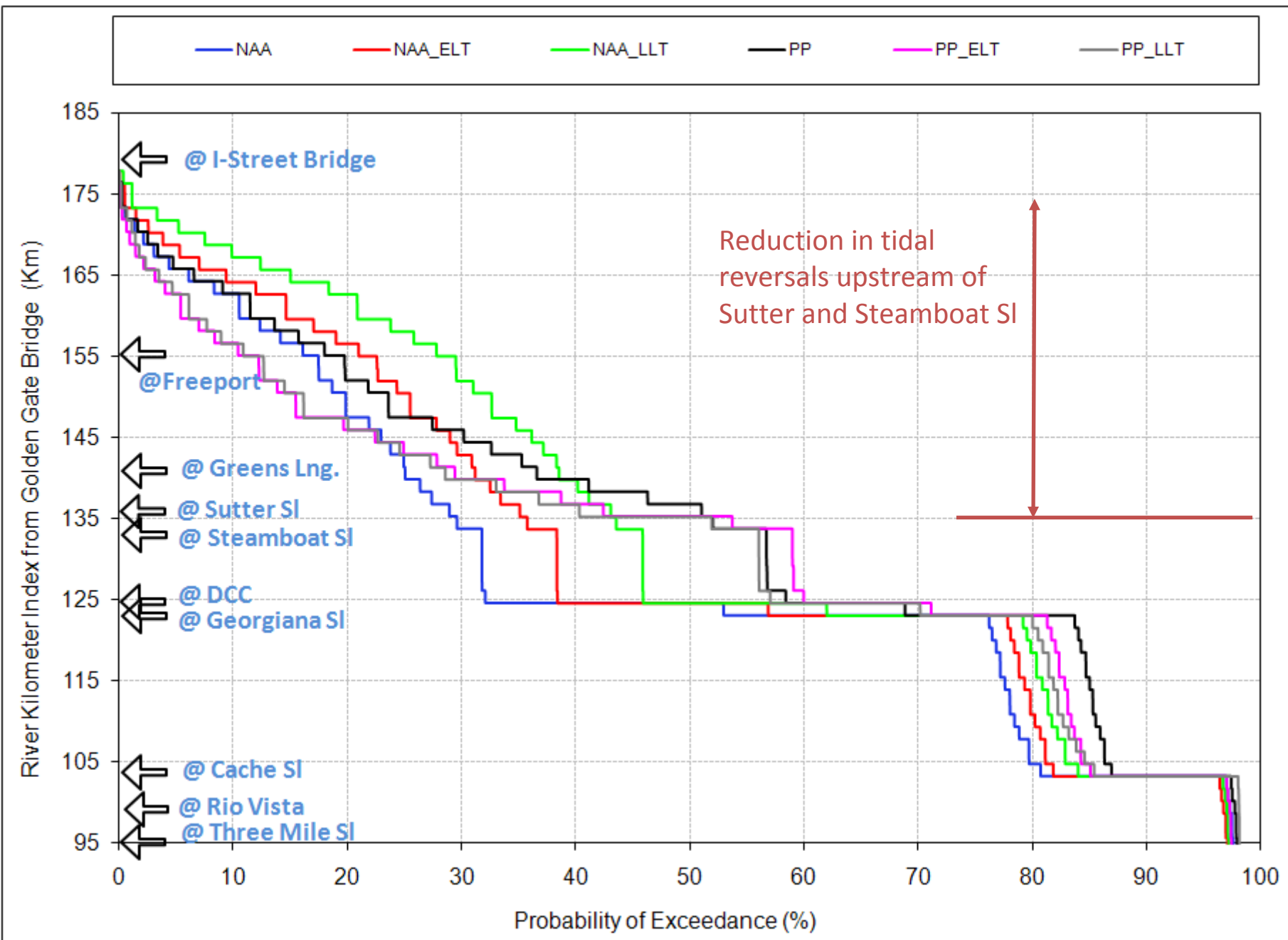
# Seasonal Changes in Flow



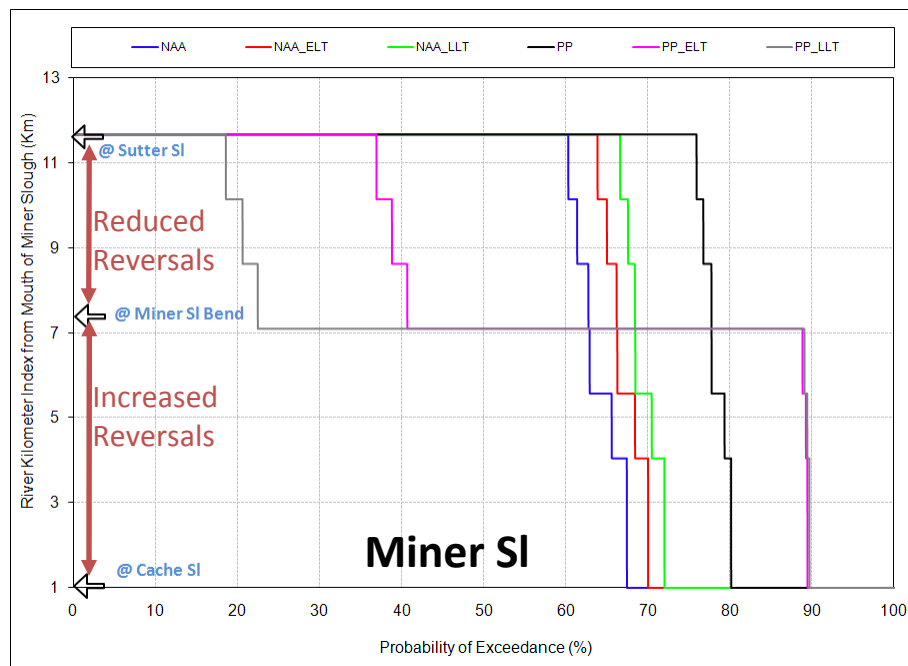
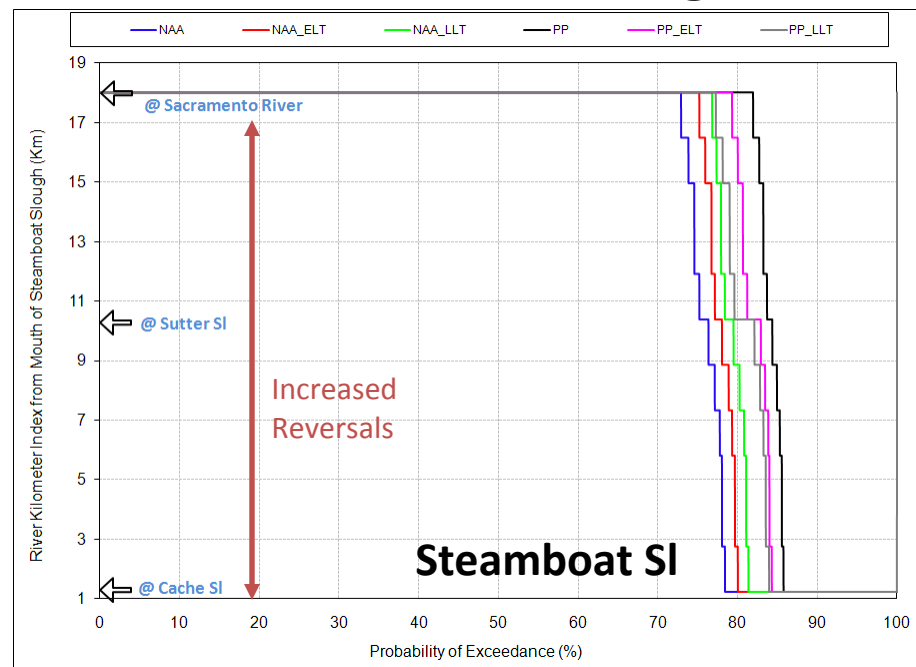
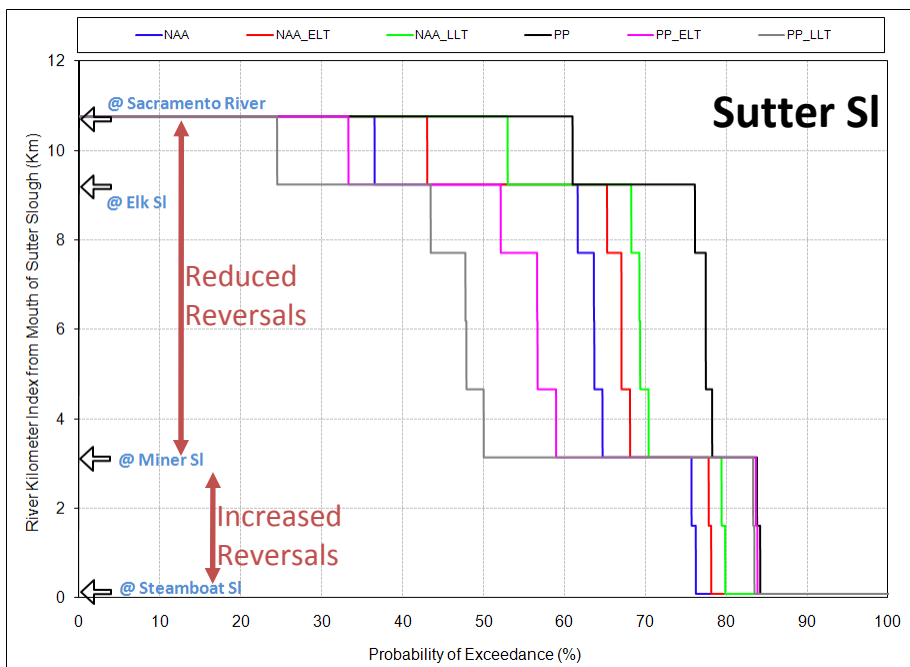
# North Delta Locations for Today's Discussion



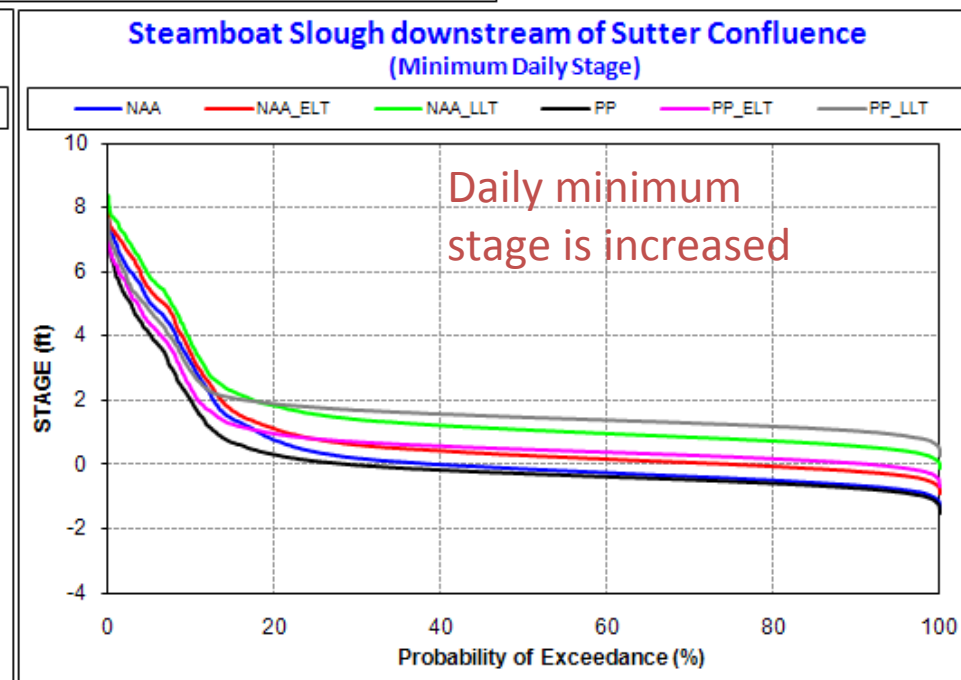
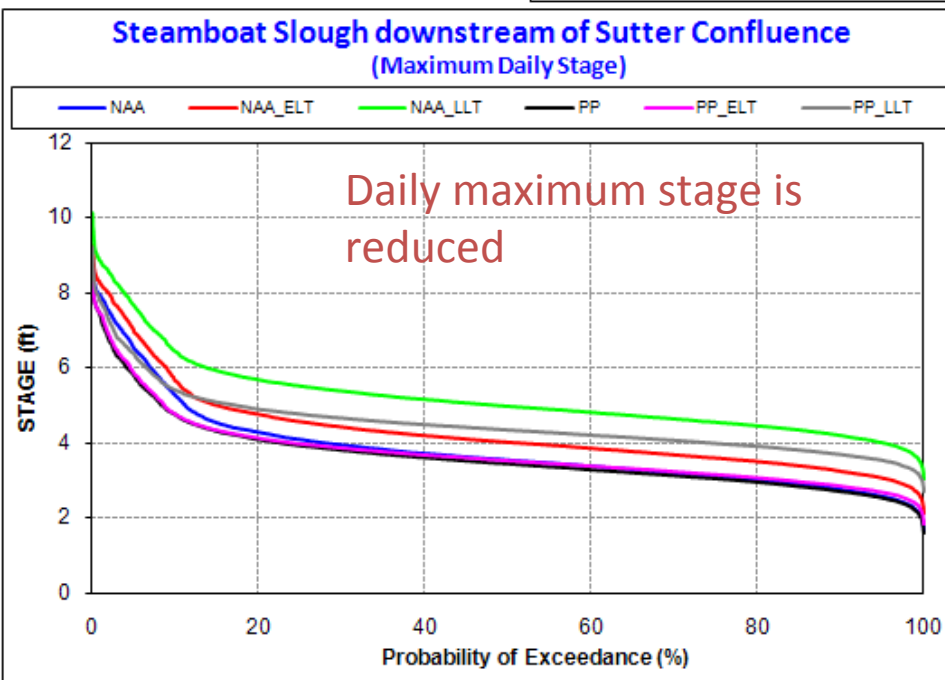
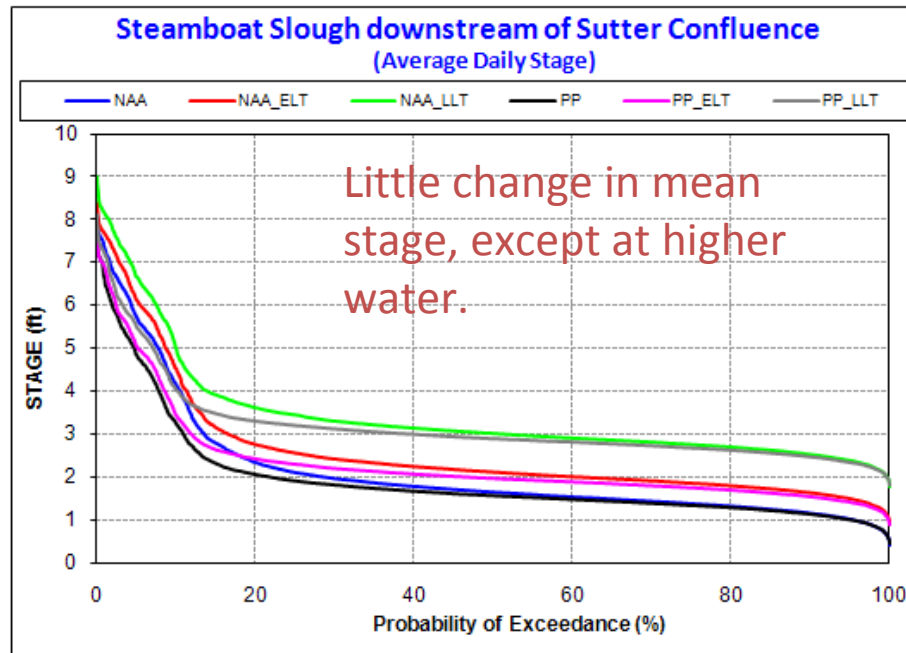
# Flow Reversals in Sacramento River



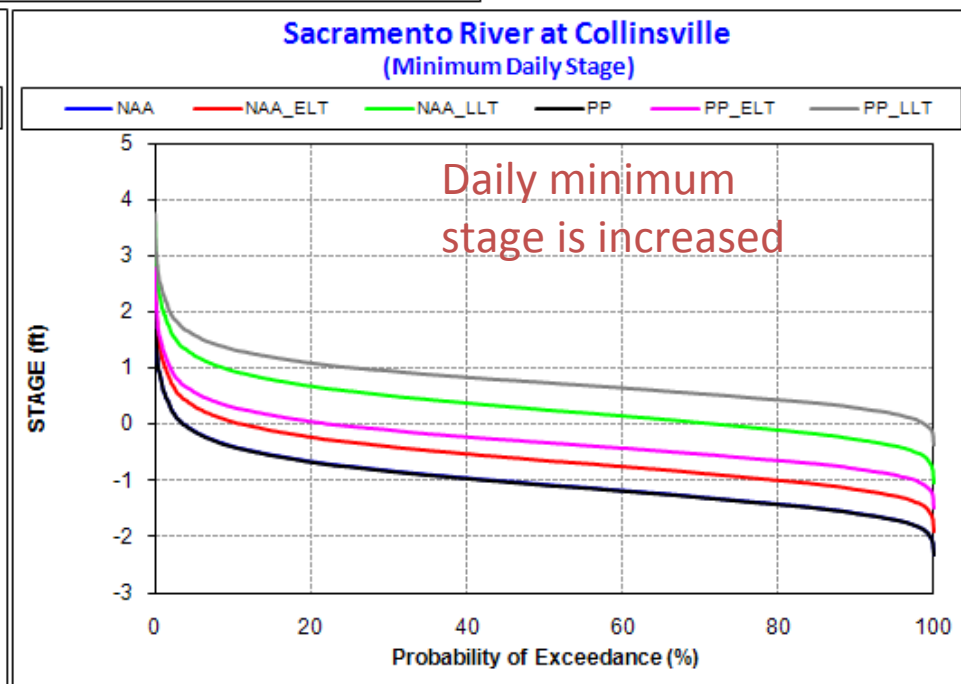
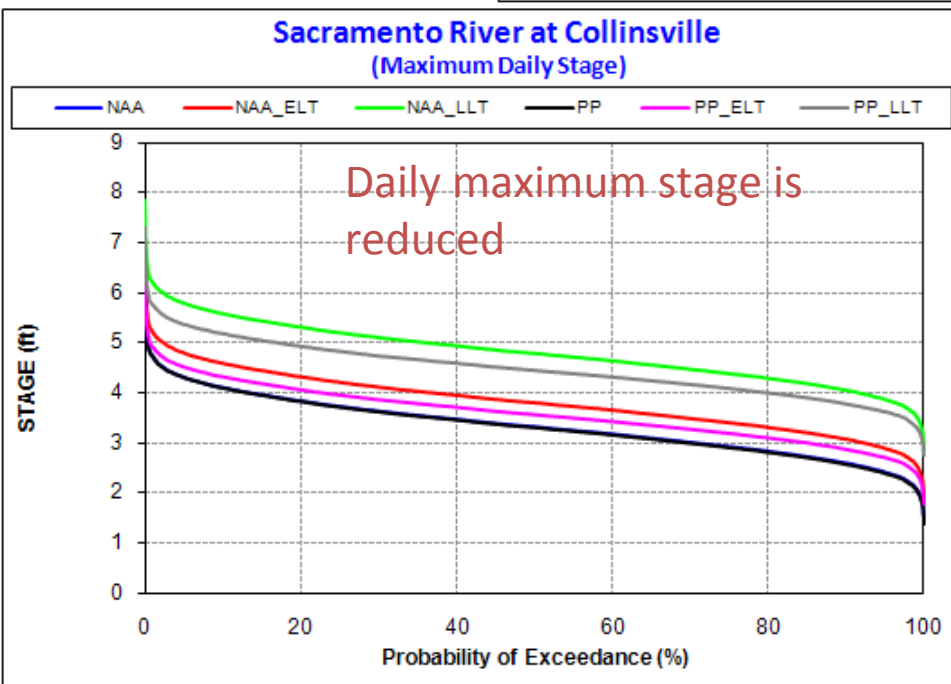
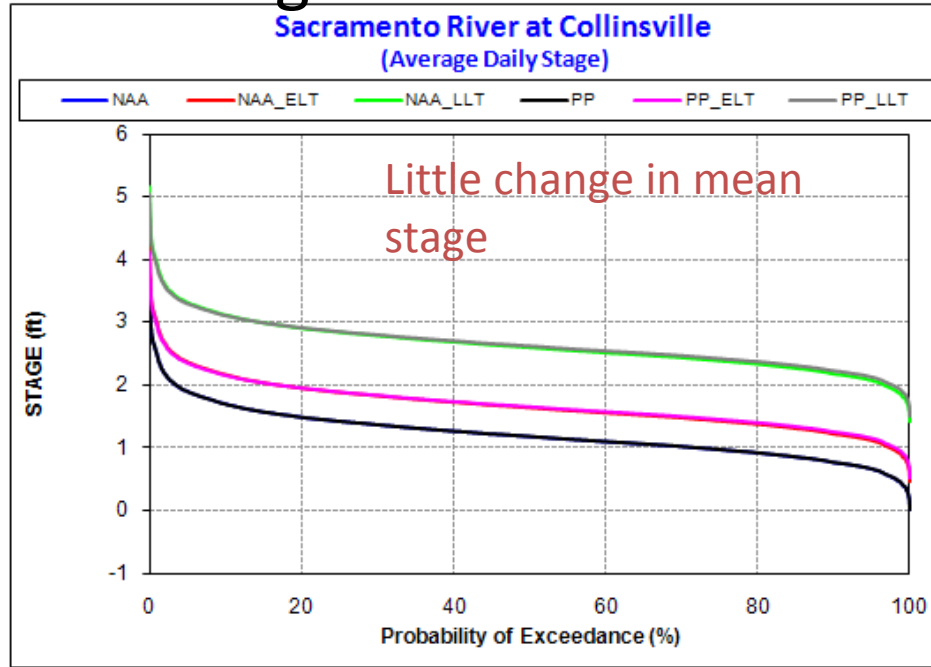
# Flow Reversals in Sutter, Steamboat and Miner Sloughs



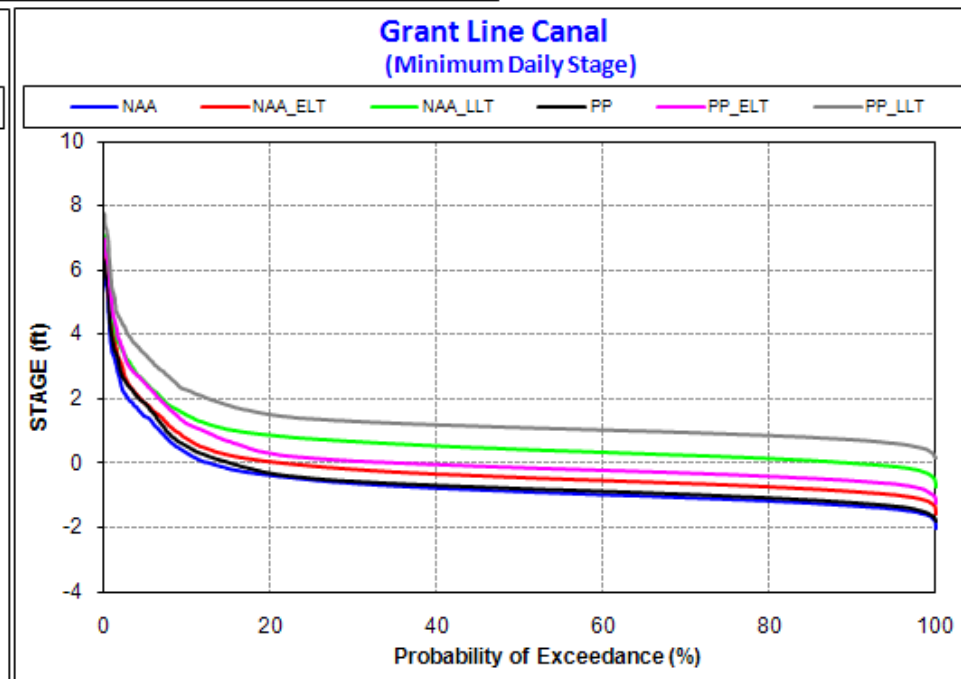
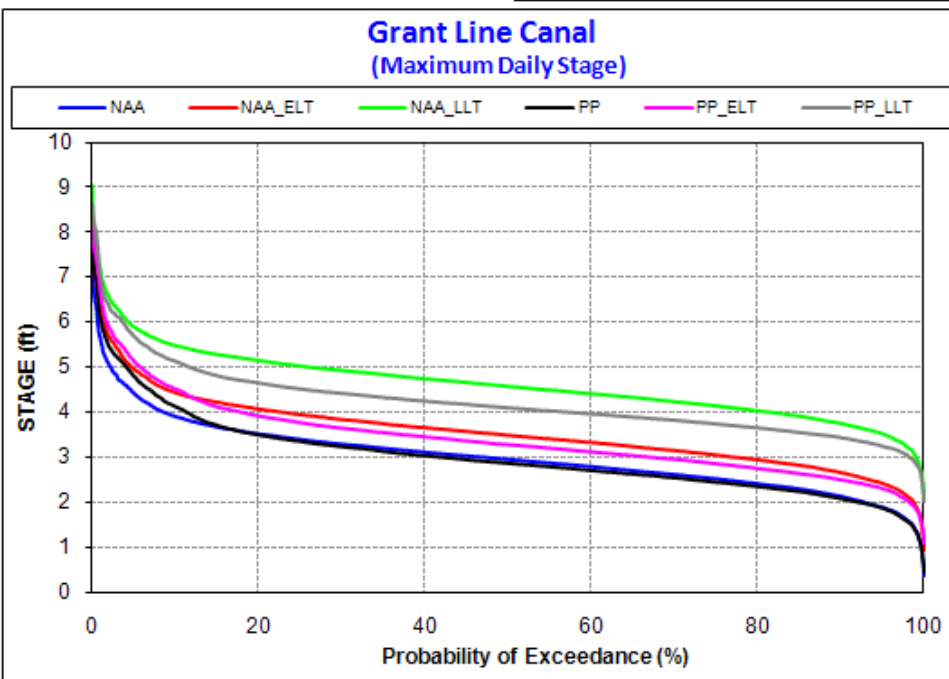
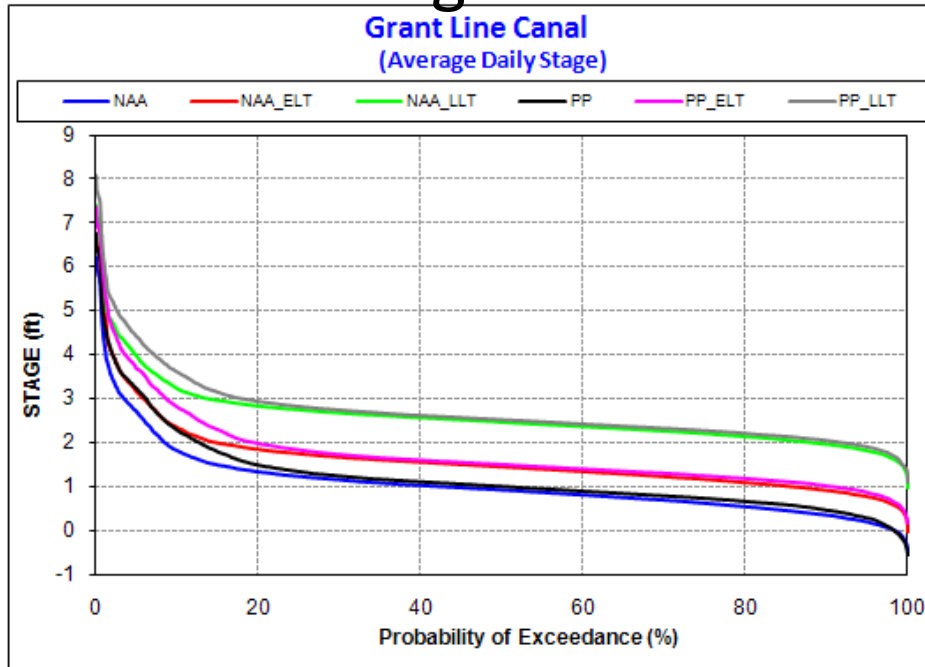
# Water Level Changes in North Delta



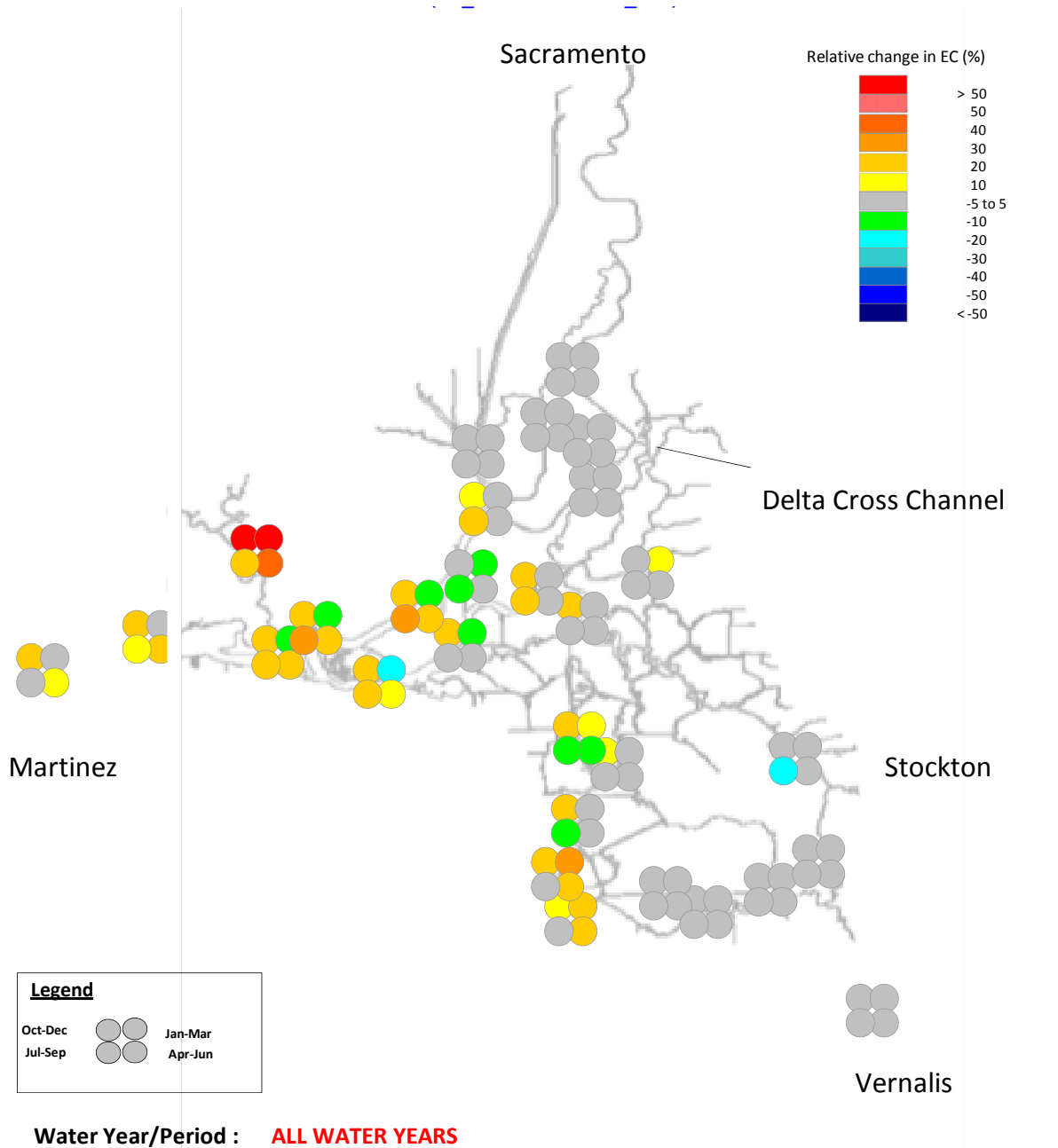
# Water Level Changes in West and Central Delta

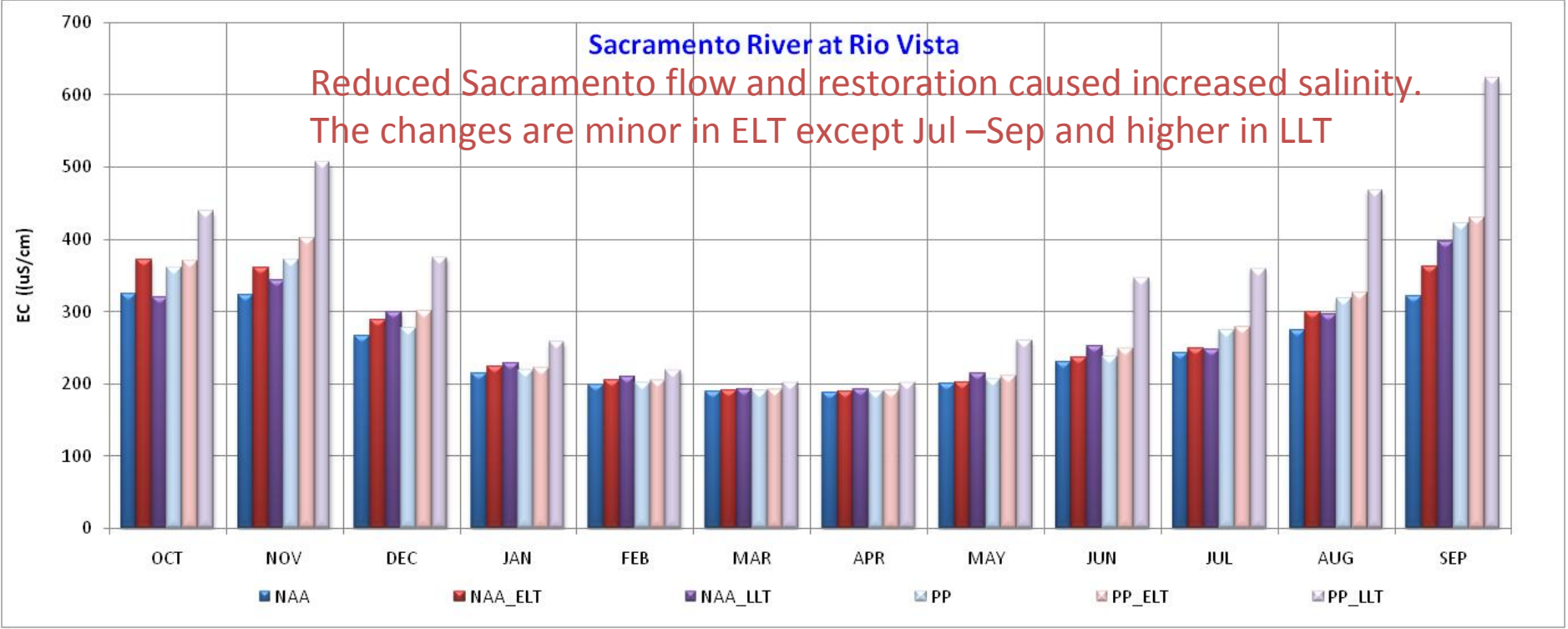
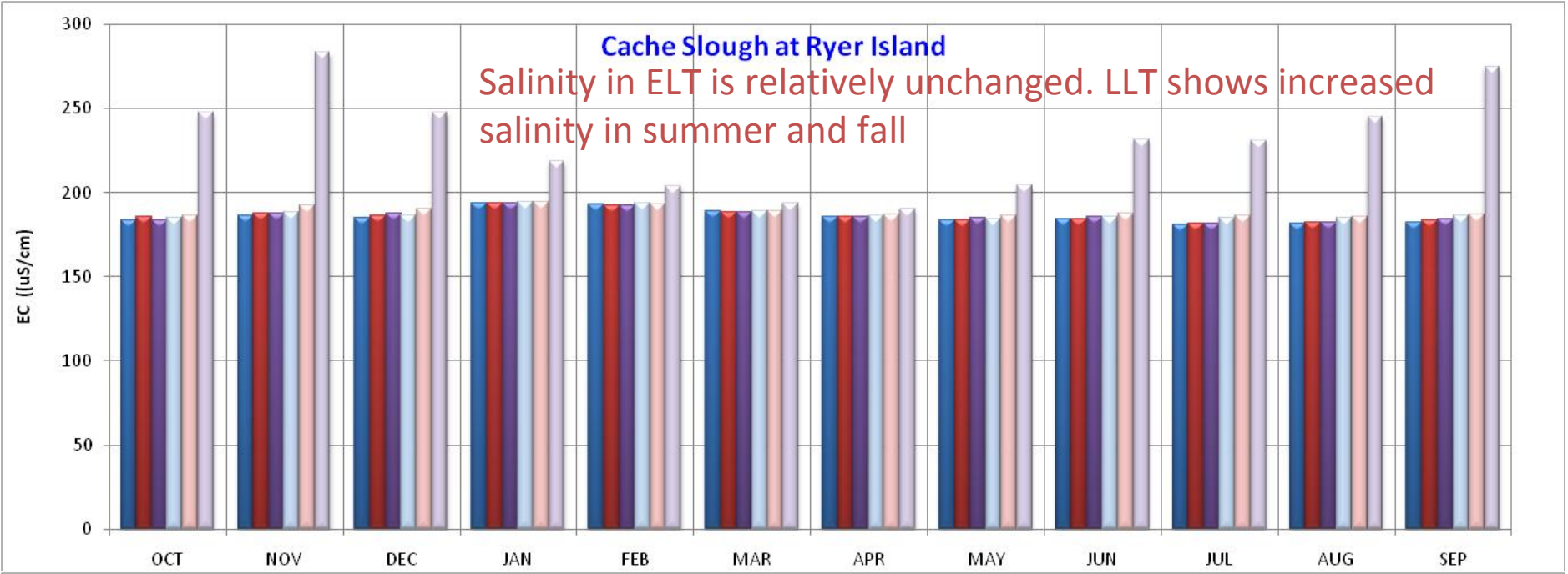


# Water Level Changes in South Delta

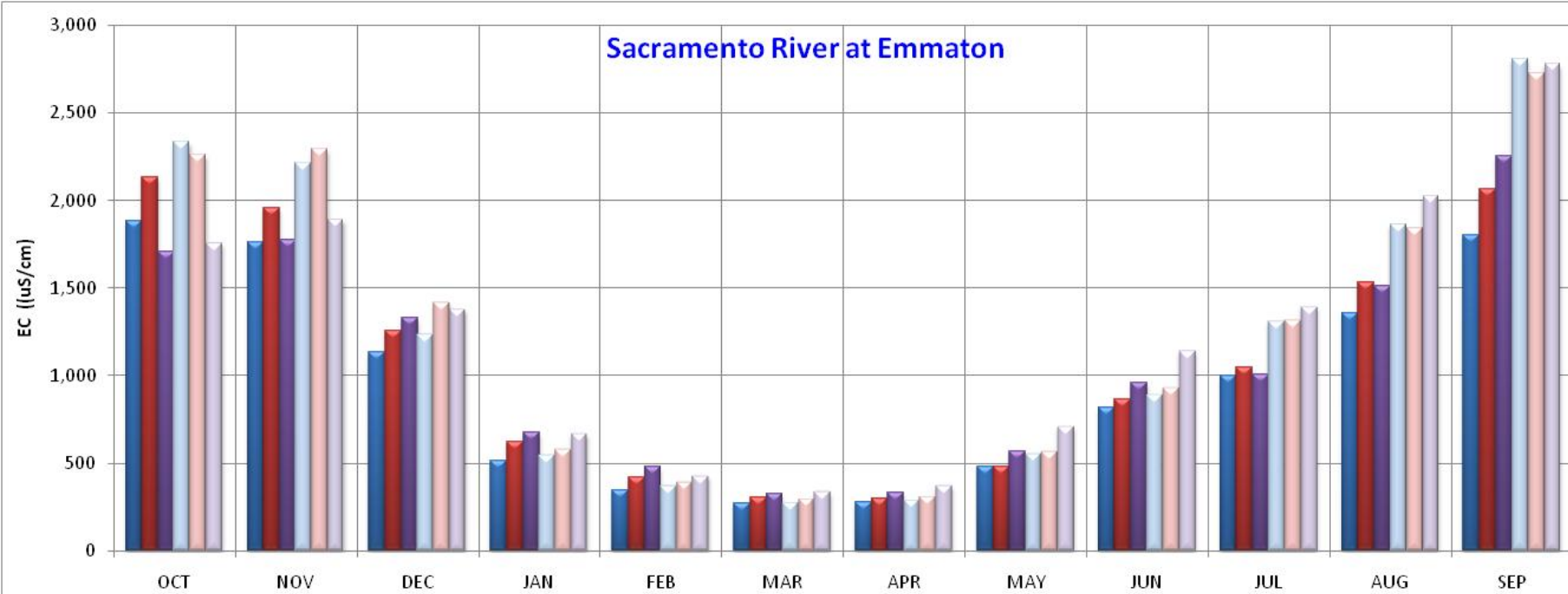


# Seasonal Changes in EC

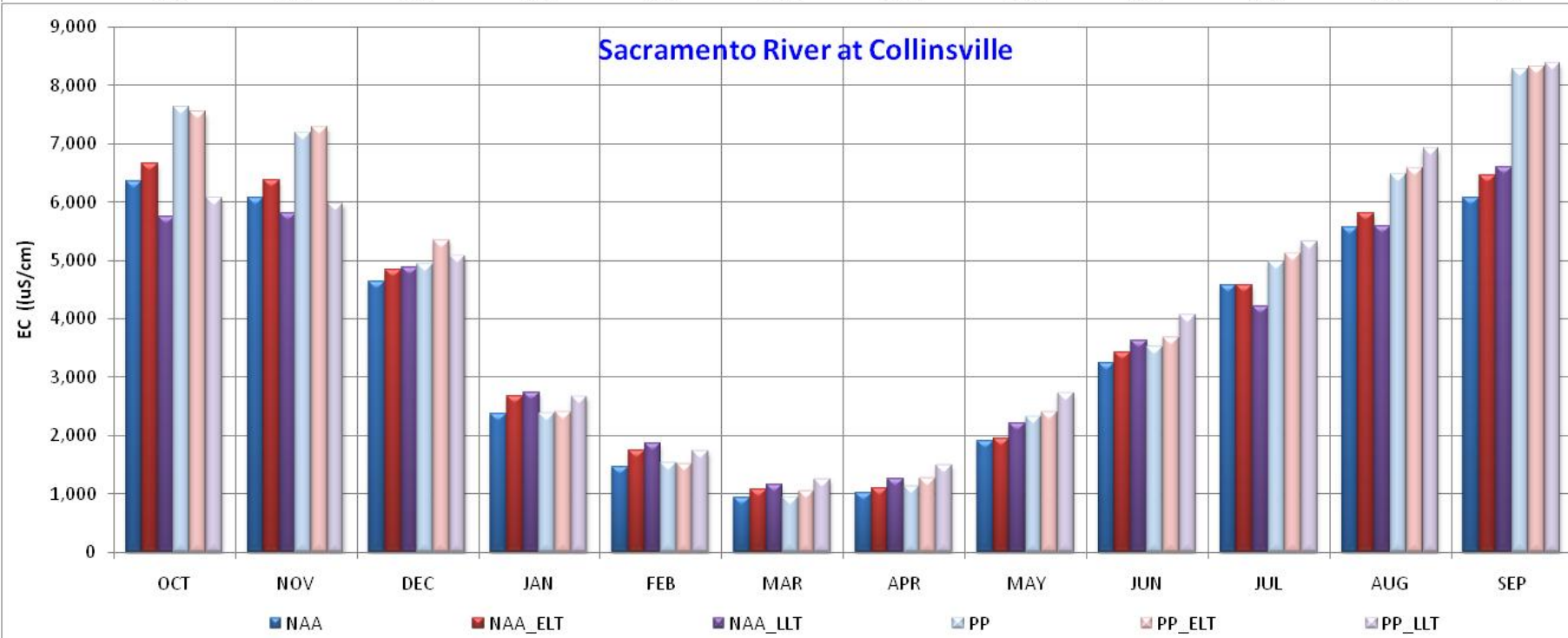




### Sacramento River at Emmaton



### Sacramento River at Collinsville



NAA

NAA\_ELT

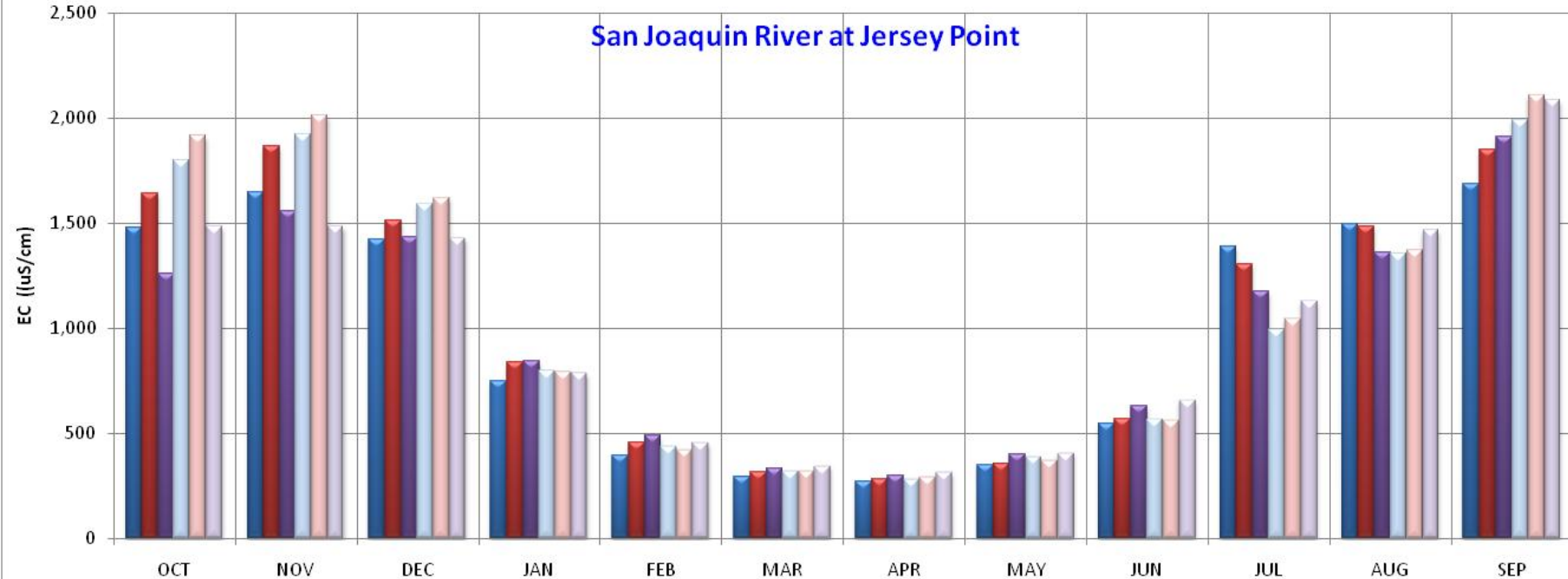
NAA\_LL

PP

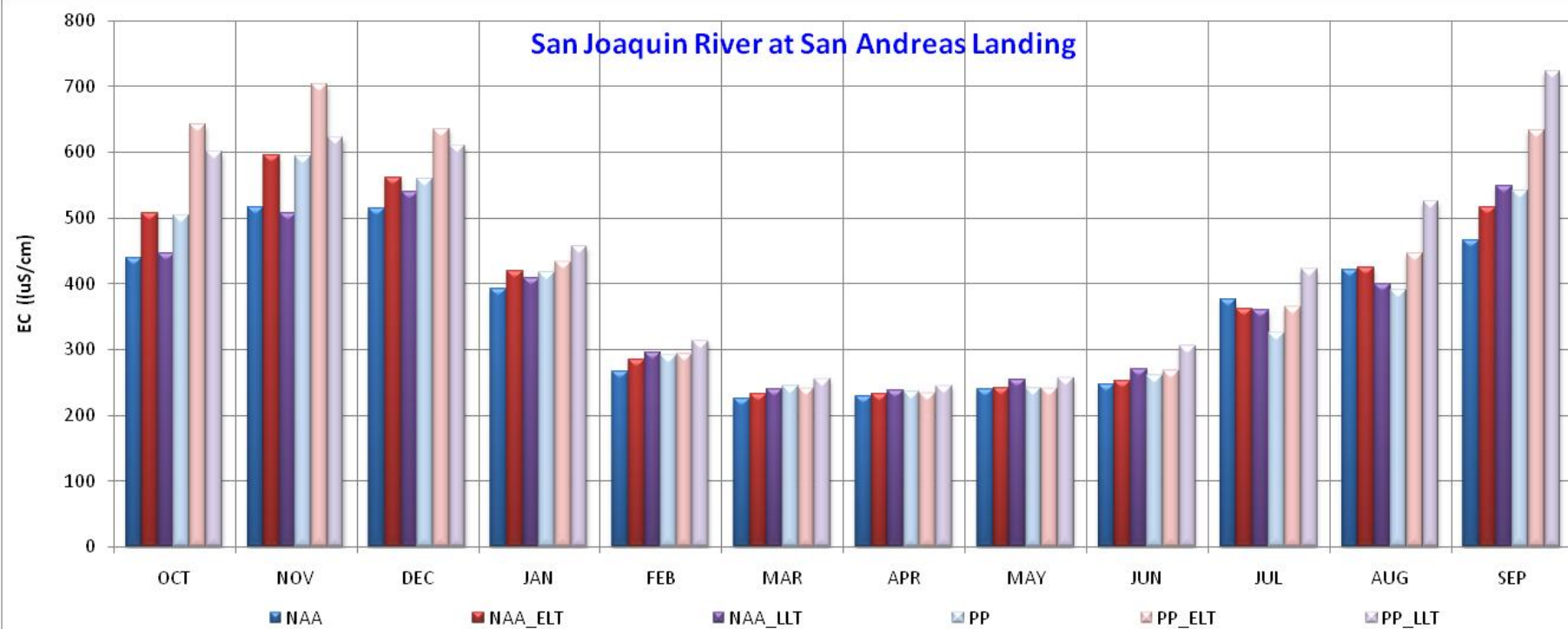
PP\_ELT

PP\_LL

### San Joaquin River at Jersey Point



### San Joaquin River at San Andreas Landing



■ NAA

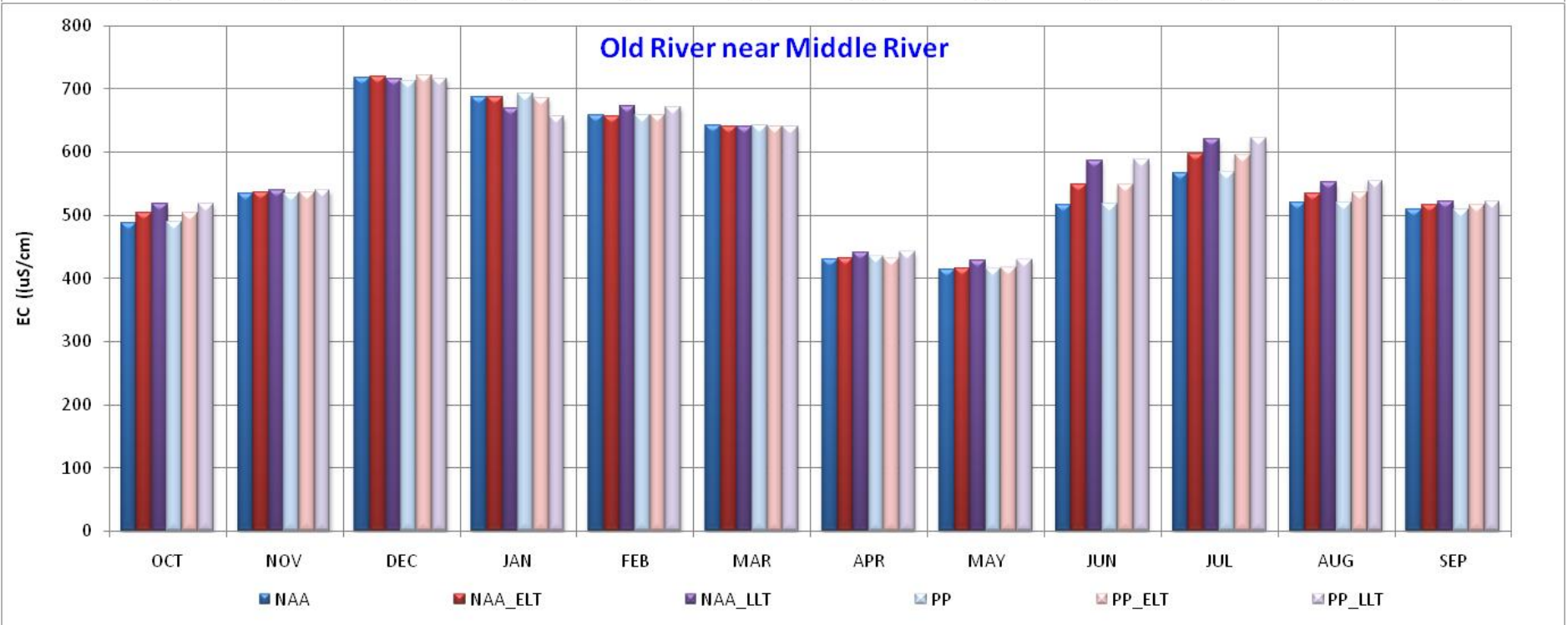
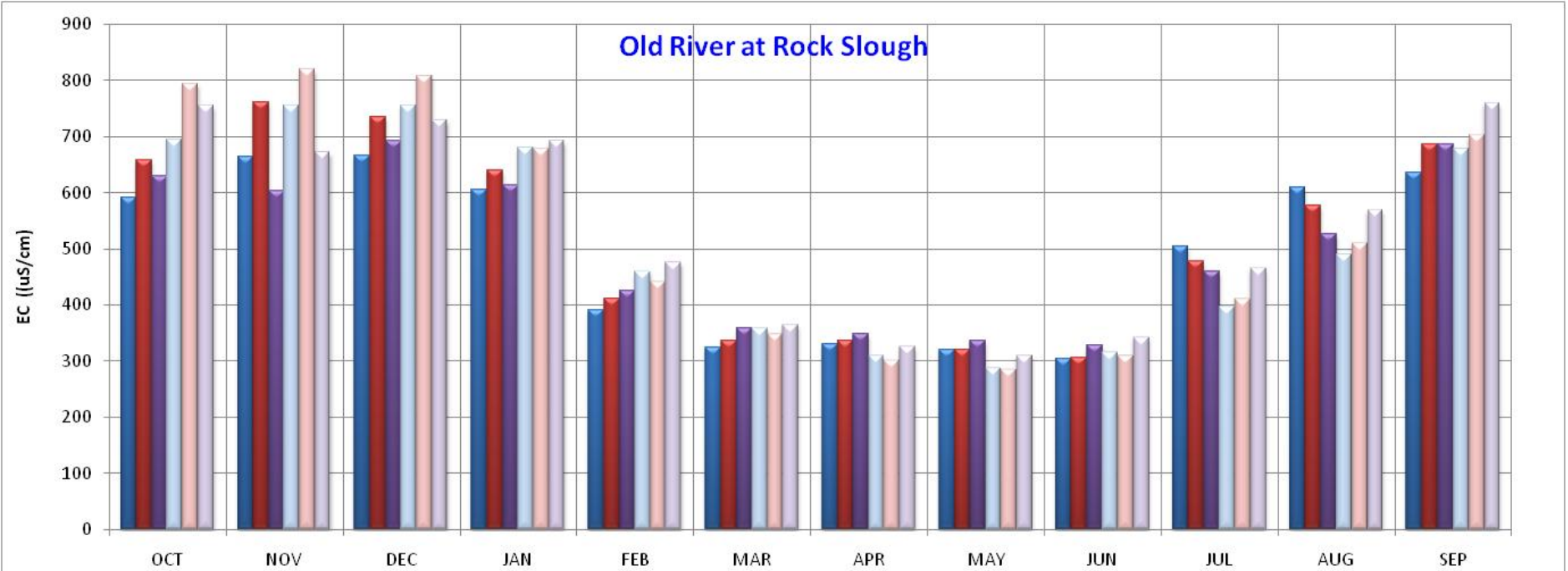
■ NAA\_ELT

■ NAA\_LLT

■ PP

■ PP\_ELT

■ PP\_LLT



# Key Findings Comparing Proposed Project to No Action at Early- and Long-Term

- Channel Flows
  - Net flows reduced in north and central Delta due to north delta diversion
  - OMR and QWEST increased due to reduced south Delta exports
  - Restoration allows more periods with unidirectional flows or reduced occurrence of reversals in the north Delta
- Stage
  - Mean water levels reduced in the north Delta near proposed diversion and remain fairly unchanged rest of the Delta
  - Tidal range decreased by 1 to 2 ft in portions of the Delta – mainly caused by the restoration

# Key Findings Comparing PP to NAA at ELT and LLT

- Salinity
  - No significant change upstream of Rio Vista and in southern Delta
  - Slight increases in Old and Middle River and central Delta due to changes in contribution of the Sacramento (less) and San Joaquin
  - Salinity increases in the west Delta due to the increased tidal excursion and reduction in Sacramento River flow

# On-going Work and Next Steps for Physical Modeling Team

- Supporting teams conducting effects analysis
- Completed analytical range sensitivity studies
- Completing climate sensitivity studies
- Conducting special studies
  - North delta intake and conveyance sizing sensitivity
  - North delta intake location sensitivity
  - North delta bypasses evaluation summary
  - Delta levee failure and sea level rise
  - San Joaquin inflow sensitivity
  - Old River corridor integration