

Preliminary Physical Modeling of BDCP Proposed Project – Early Long-Term

BDCP Steering Committee

September 10, 2009

Overview

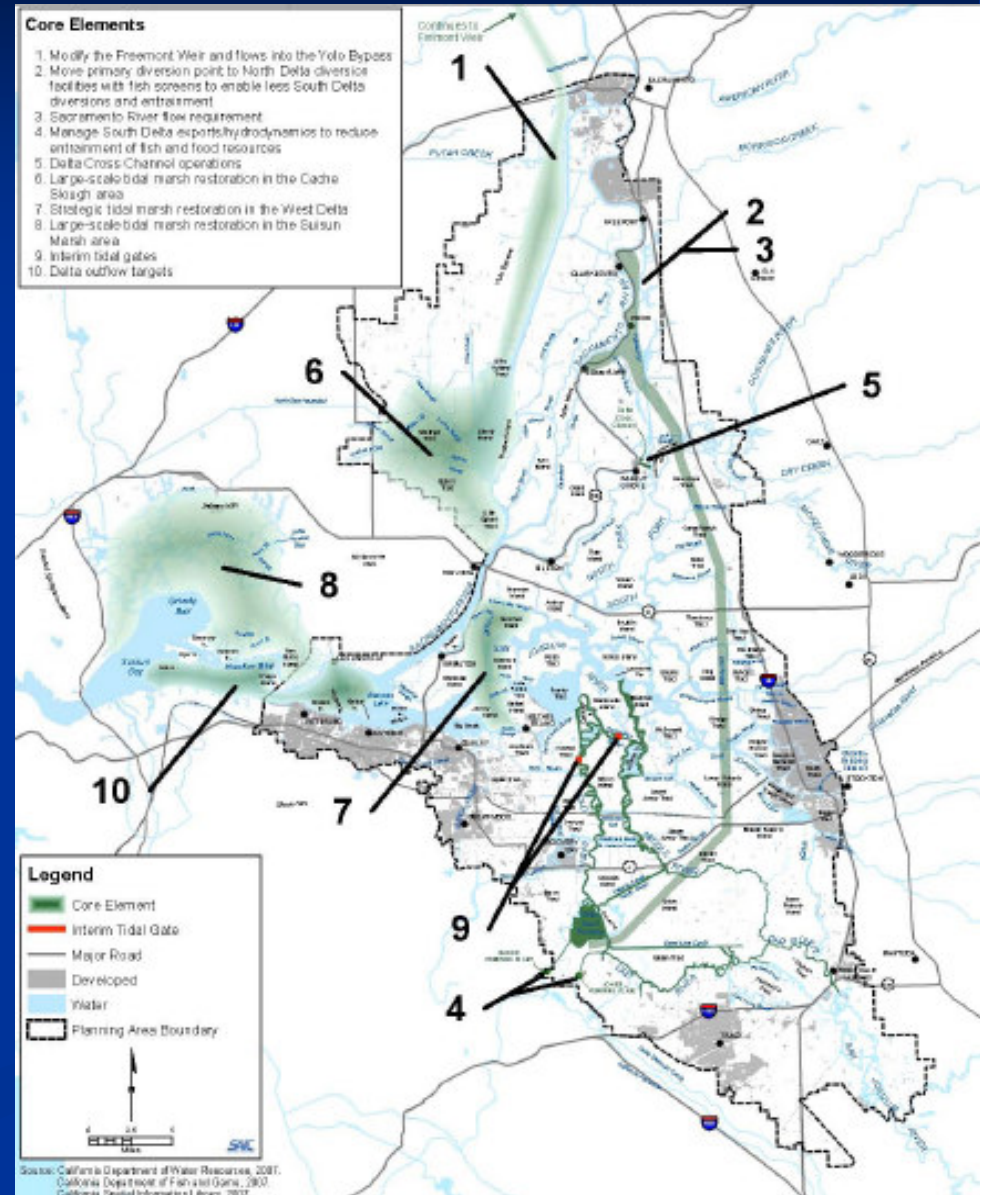
- BDCP Proposed Project conservation measures developed in late July (Chapter 3)
- Proposed Project includes
 - Physical habitat (tidal marsh, floodplain, riparian)
 - Water operations (dual convey, south delta restrictions, Fremont Weir, etc)
 - Other stressors
- Preliminary modeling performed to guide definition of Proposed Project and to evaluate effects

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BDCP Core Elements of Draft Conservation

Strategy

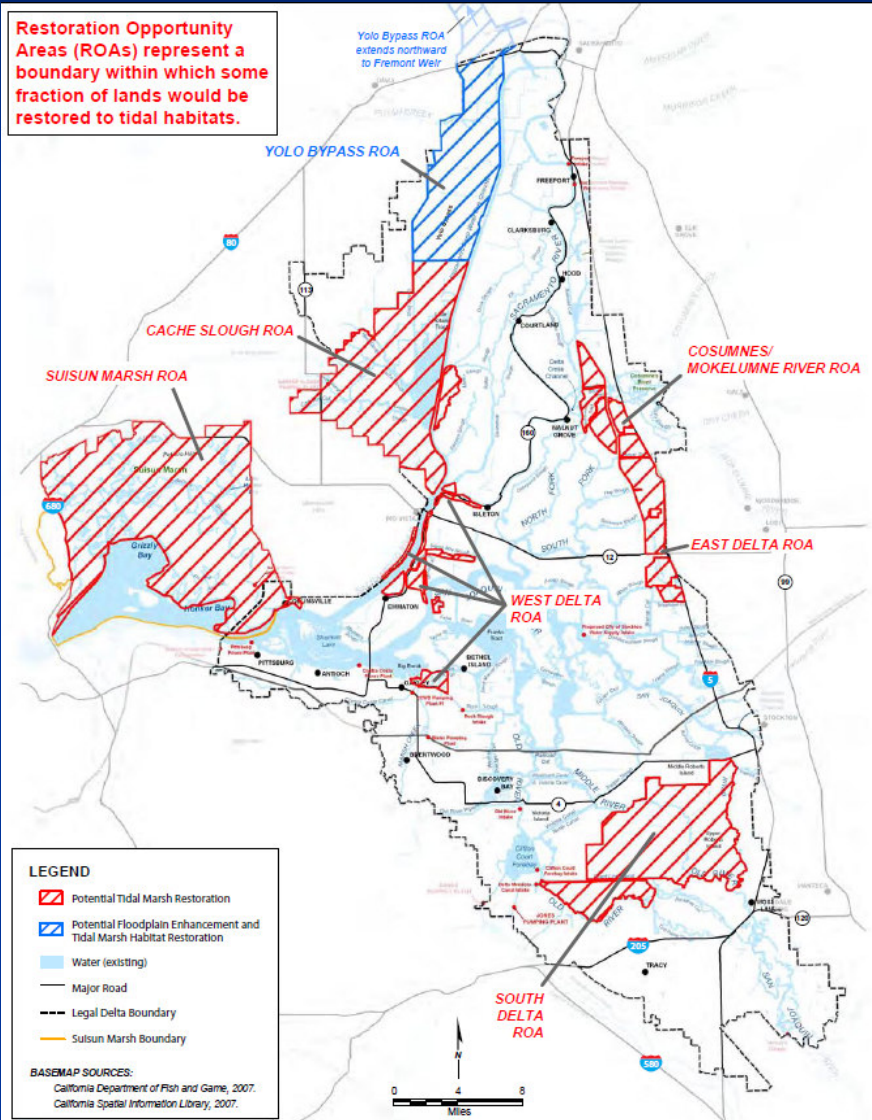
- Fremont Weir modifications for more frequent inundation
- North Delta diversion and associated bypass flows (two scenarios)
- Delta Cross Channel operations
- Old and Middle River flow restrictions
- Large-scale tidal marsh restoration in Cache Slough, Suisun Marsh, West Delta, East Delta, and South Delta



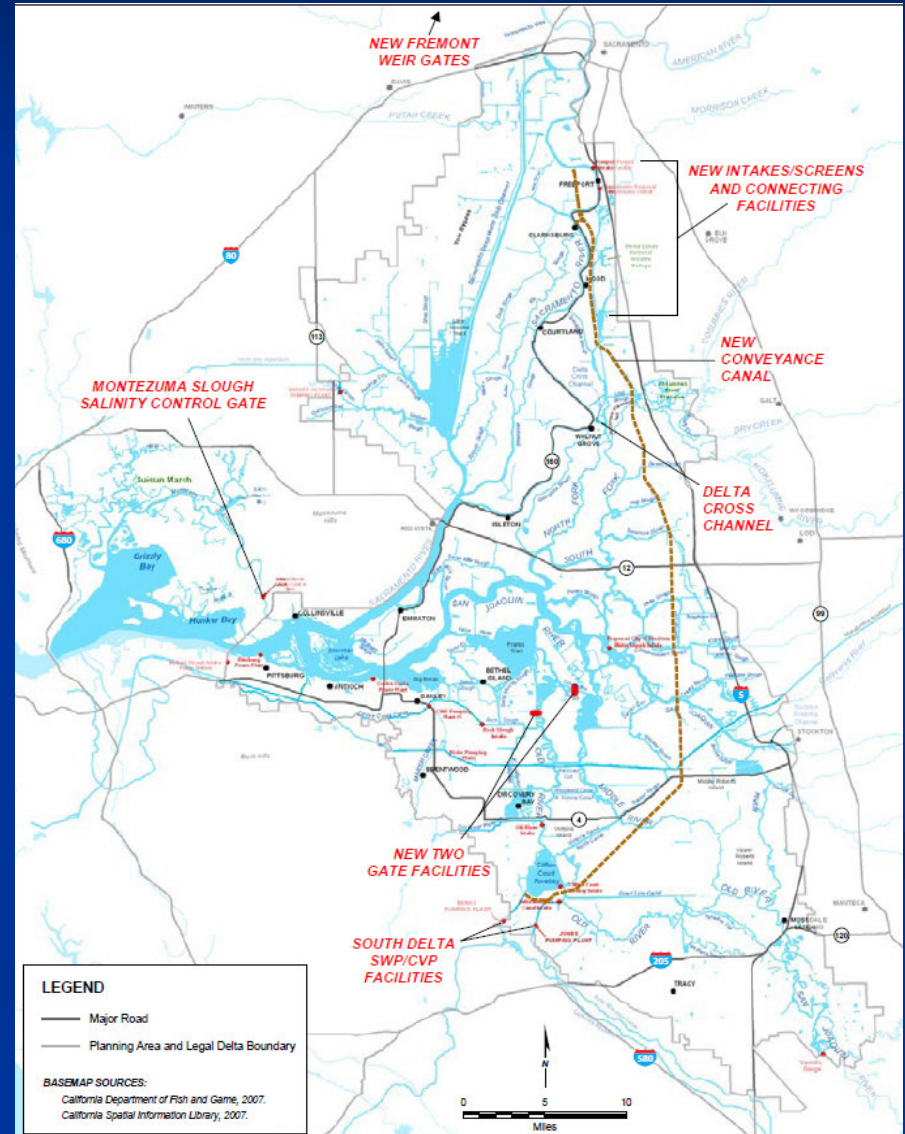
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BDCP Restoration Opportunity Areas

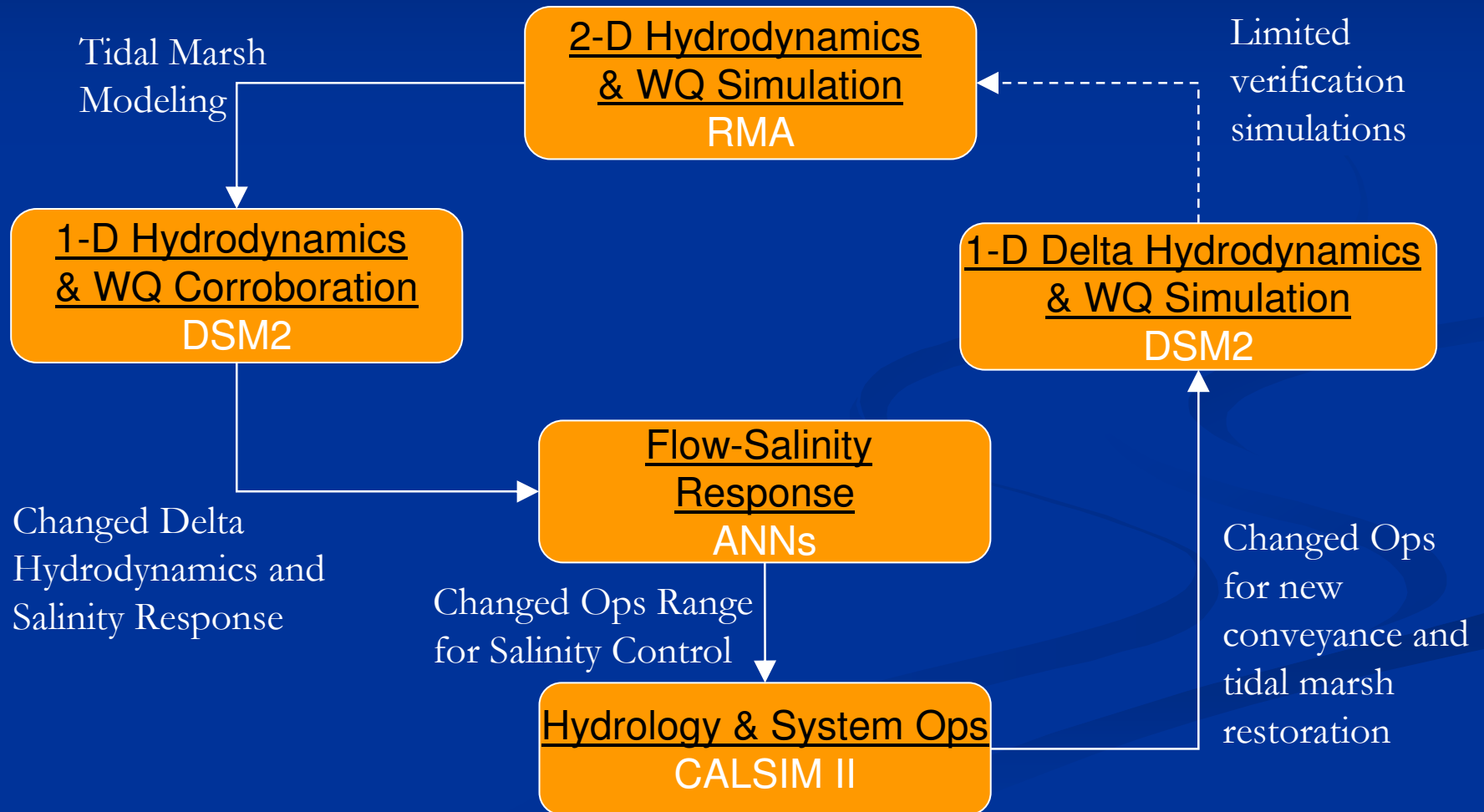
Restoration Opportunity Areas (ROAs) represent a boundary within which some fraction of lands would be restored to tidal habitats.



BDCP Water Operation Control Facilities



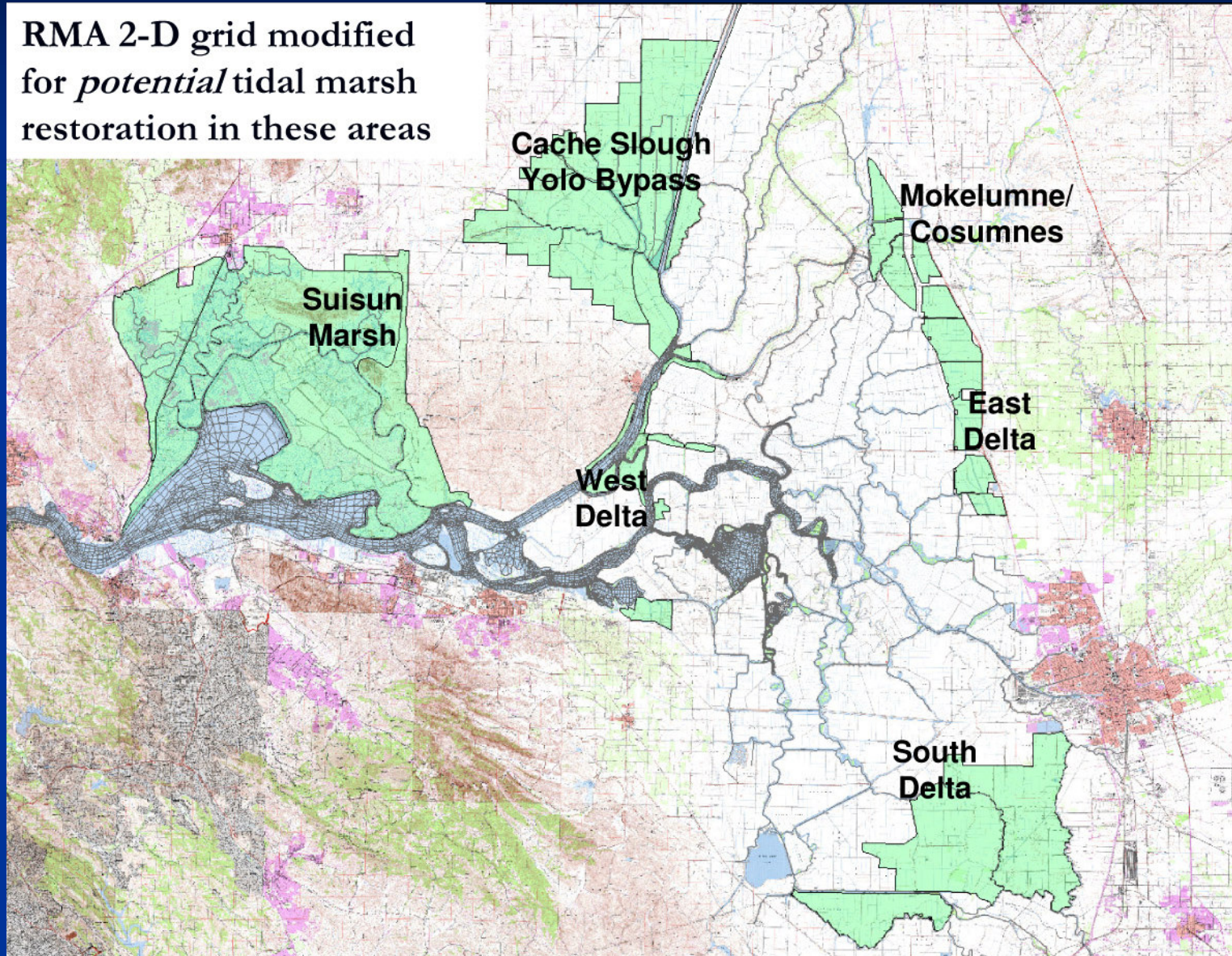
A Scaling Approach to Physical Modeling



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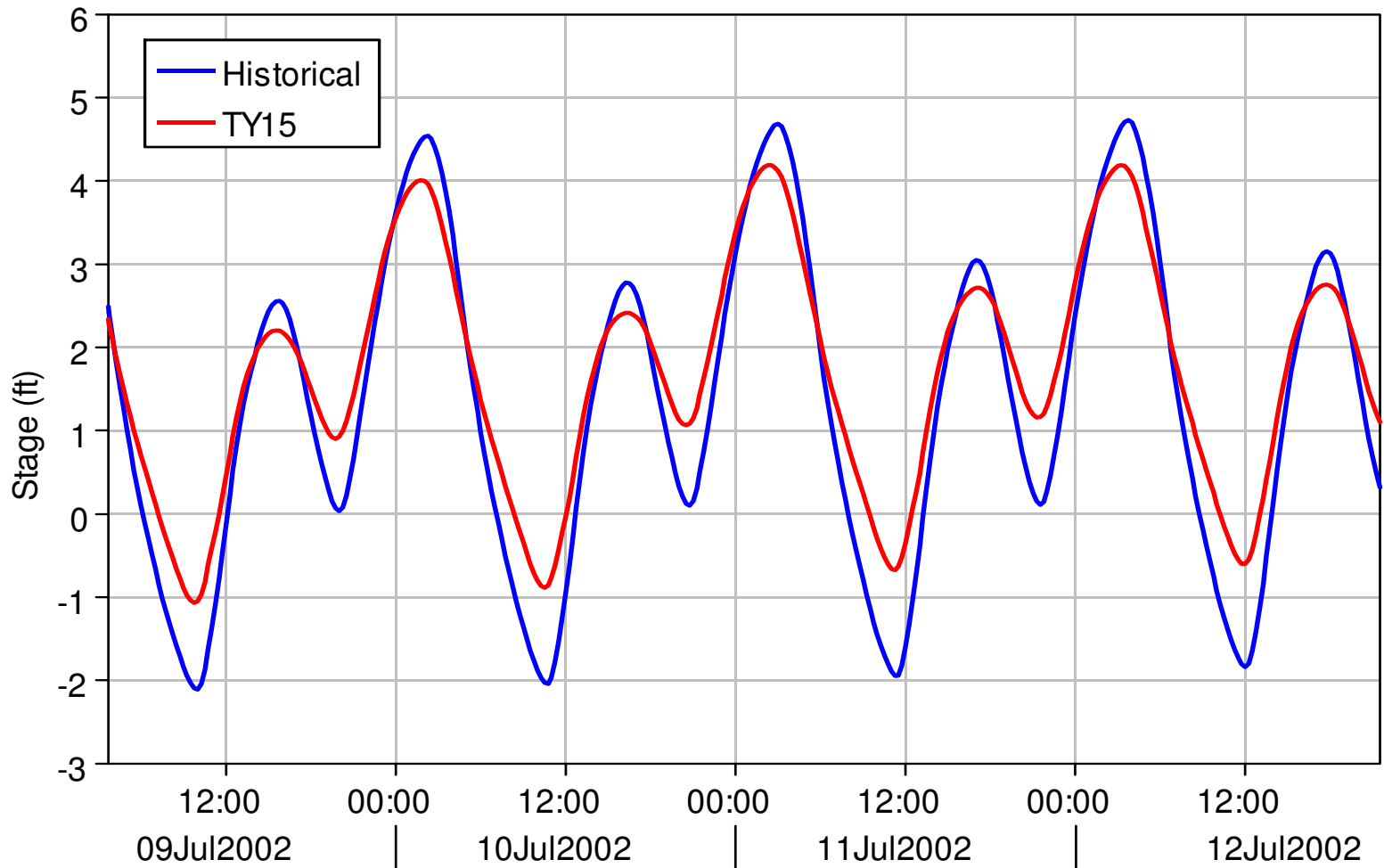
Restoration Opportunity Areas

RMA 2-D grid modified
for *potential* tidal marsh
restoration in these areas

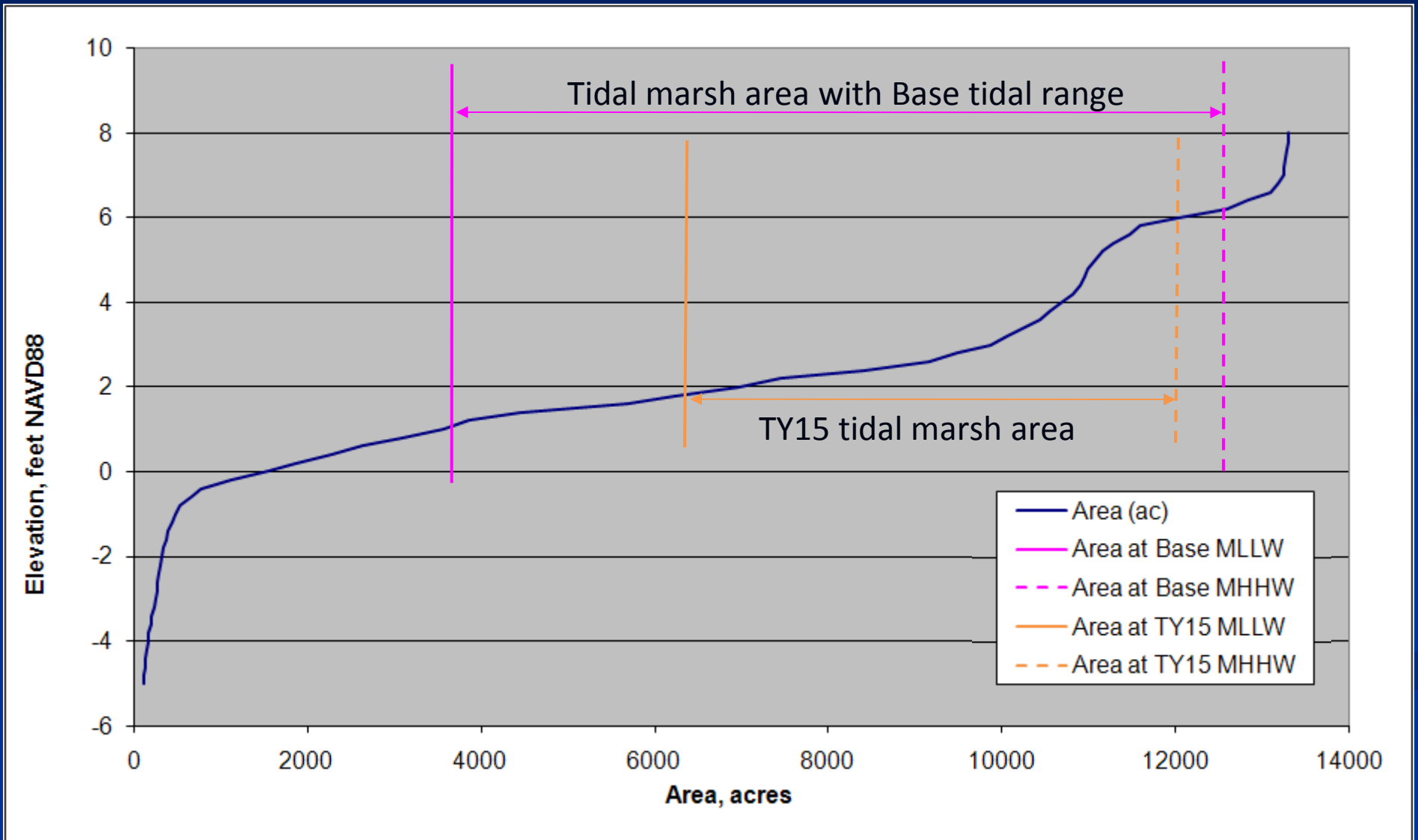


Stage at Beldon's Landing

Tidal range compresses with added restoration area



Suisun Marsh TY15 grid Area Vs. Elevation



Channel Restrictions

- Most Suisun Marsh channels are restrictive and have been widened in the TY 15 grid, including
 - Montezuma Slough
 - Suisun Slough
 - Nurse Slough
 - Cutoff Slough
 - Boynton Slough

However, channel capacity is still limiting

- Cache Slough is restrictive
- Middle River restricts flow into Union Island

RMA2 - DSM2 Tidal Marsh Corroboration for the Early Long-Term BDCP Scenario

■ Corroboration Process

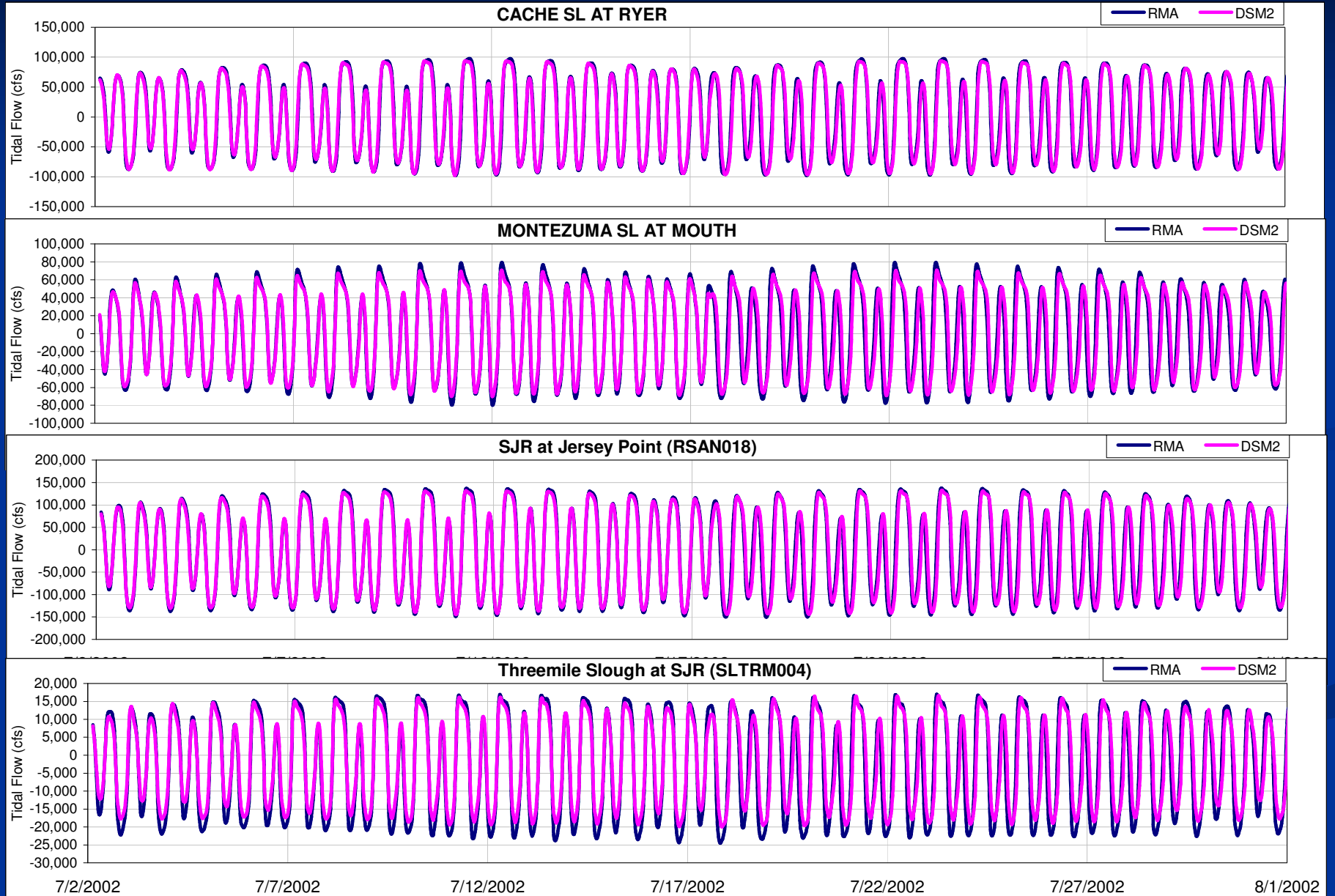
- ROAs implemented in DSM2
- Martinez stage and EC boundary conditions in DSM2 are corrected based on the linear correlations from RMA
- Adjusted reservoir entrance & exit coefficients and weir coefficients in DSM2
- Modified channel roughness and dispersion factors

■ Corroboration Metrics

- Instantaneous flows at breaches
- Incremental change in the instantaneous flows at key locations
- Incremental change in the tidally-filtered daily averaged flows at key locations
- Incremental change in the tidally-filtered daily averaged EC at key locations

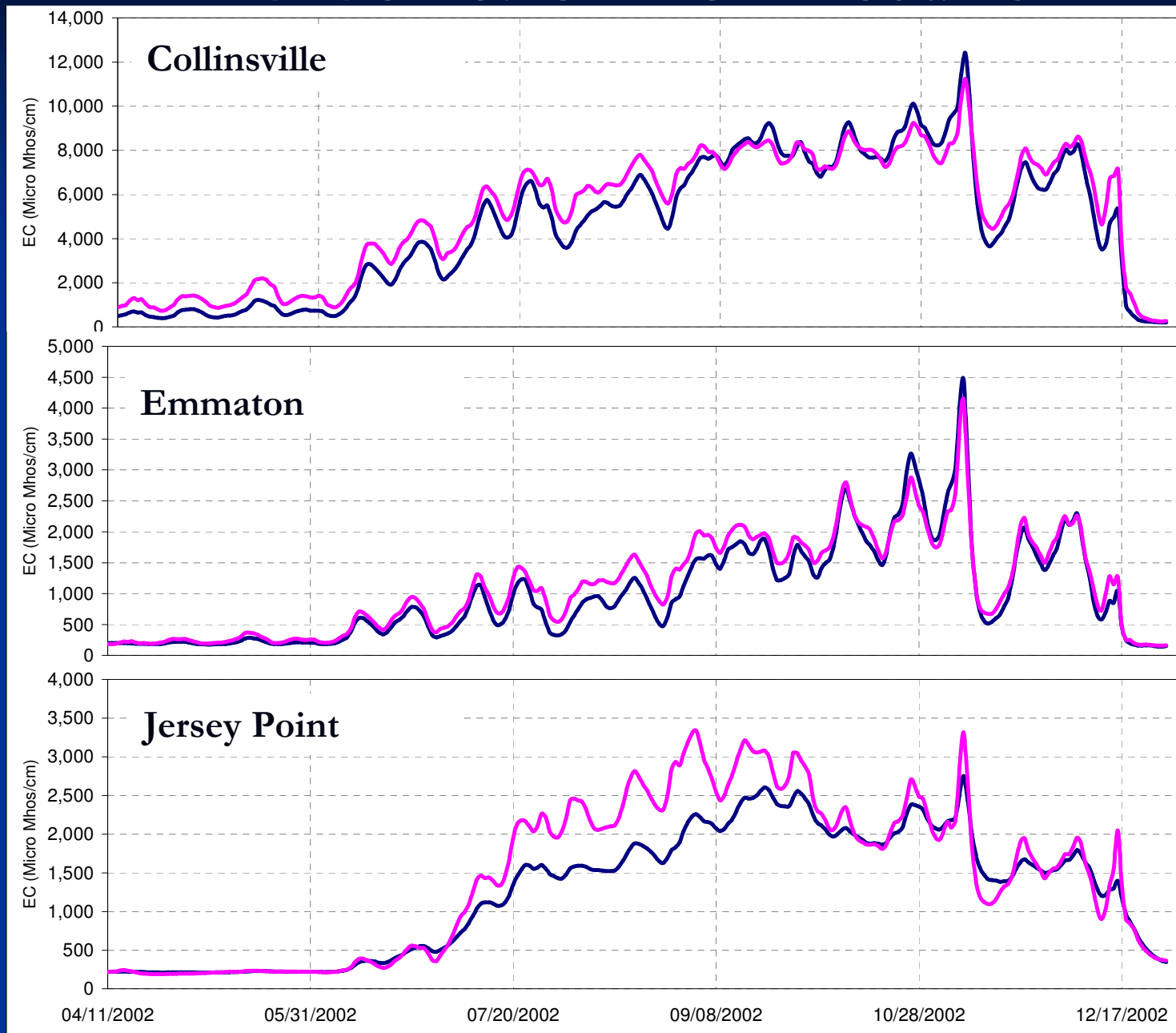
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Flow Corroboration Results



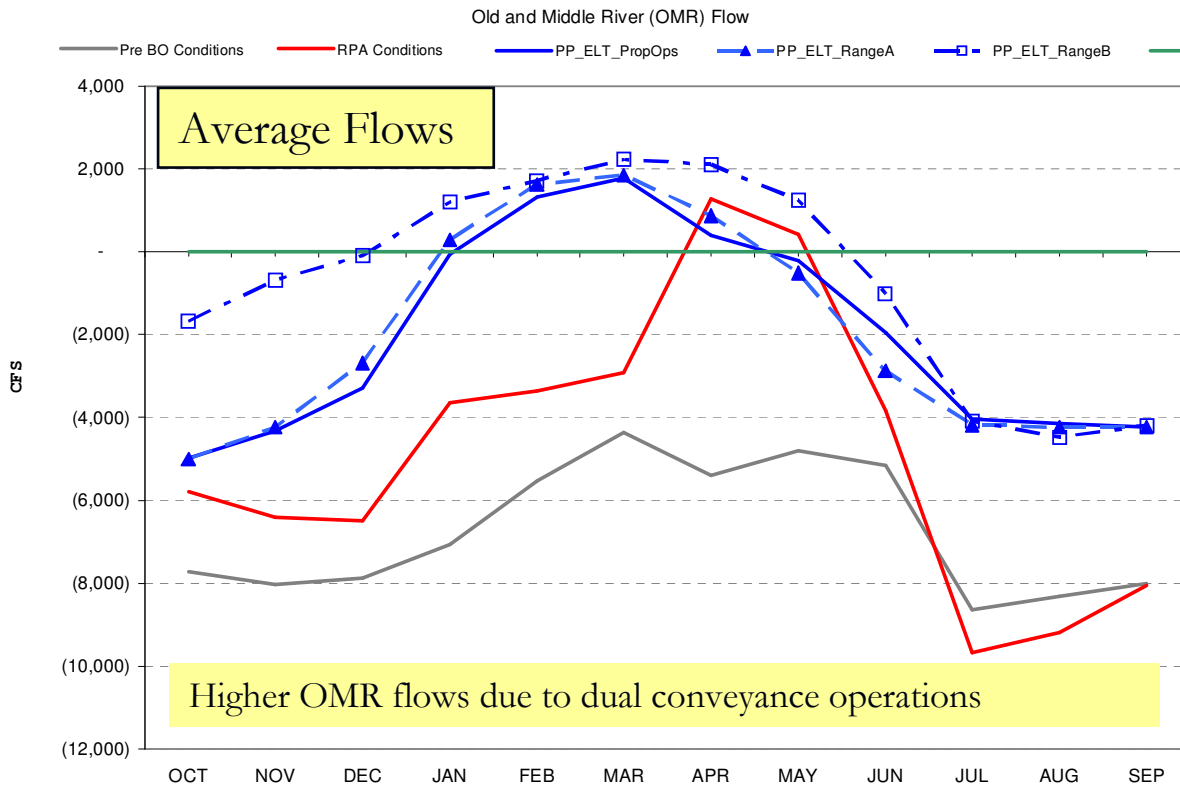
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EC Corroboration Results



Summary of Preliminary CALSIM II Results

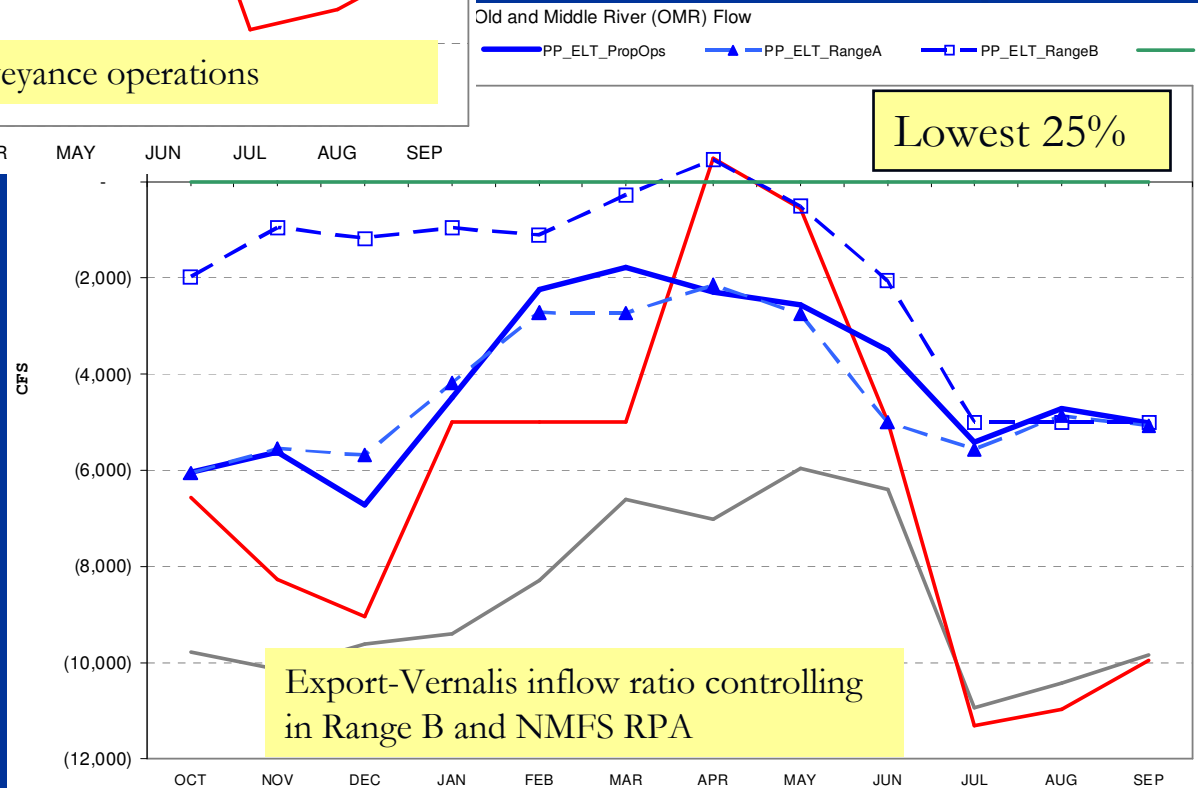
- Studies are preliminary ...
 - New ANNs have not yet been incorporated
 - Operational refinements will be necessary
 - Range B X2 storage off-ramps refinement is still in progress
 - BO RPA models are still under review

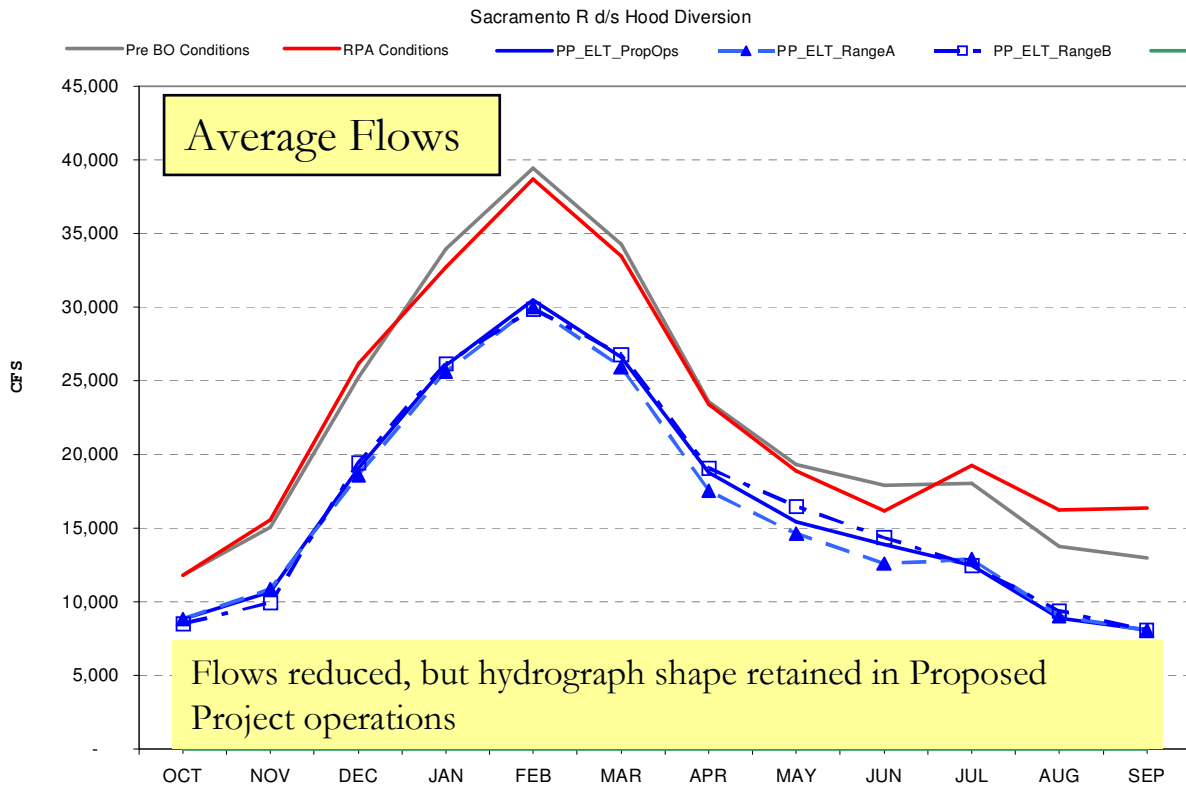


Combined Old and Middle River (OMR) Flows

Preliminary Results

RPA conditions represents current estimate of "mid-range" of BOs

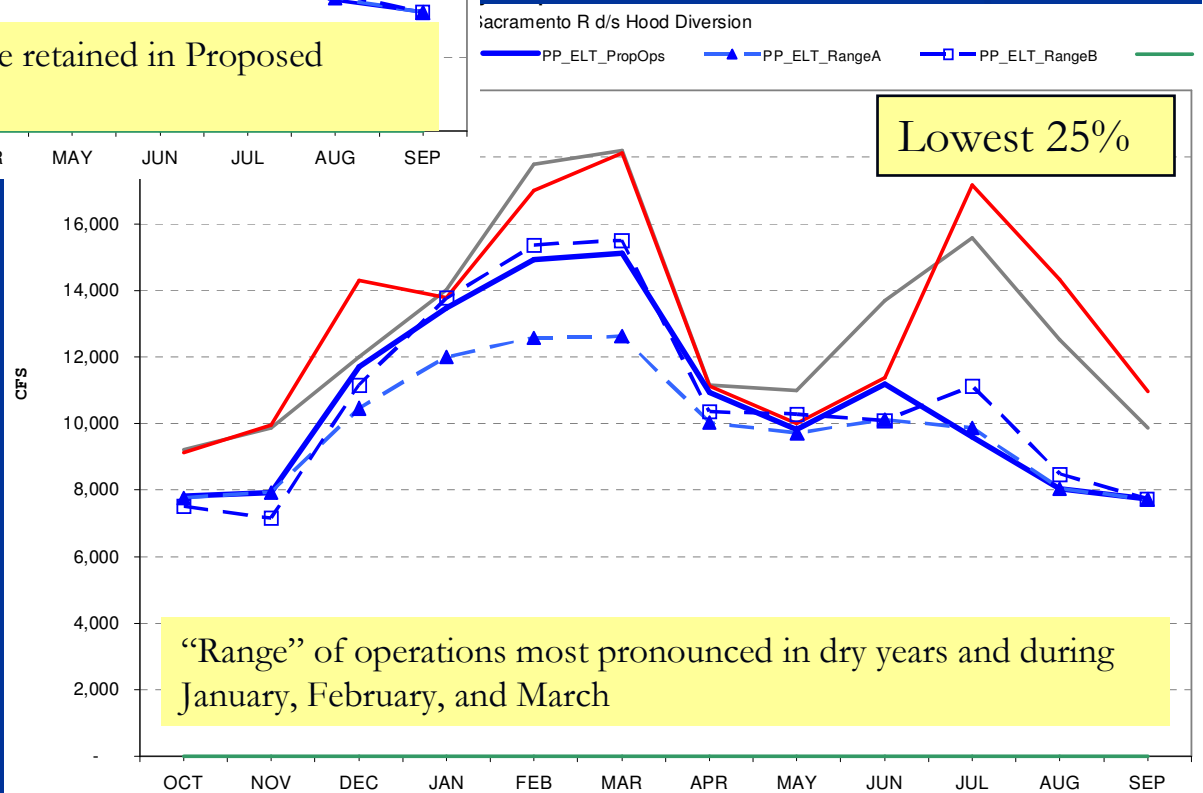


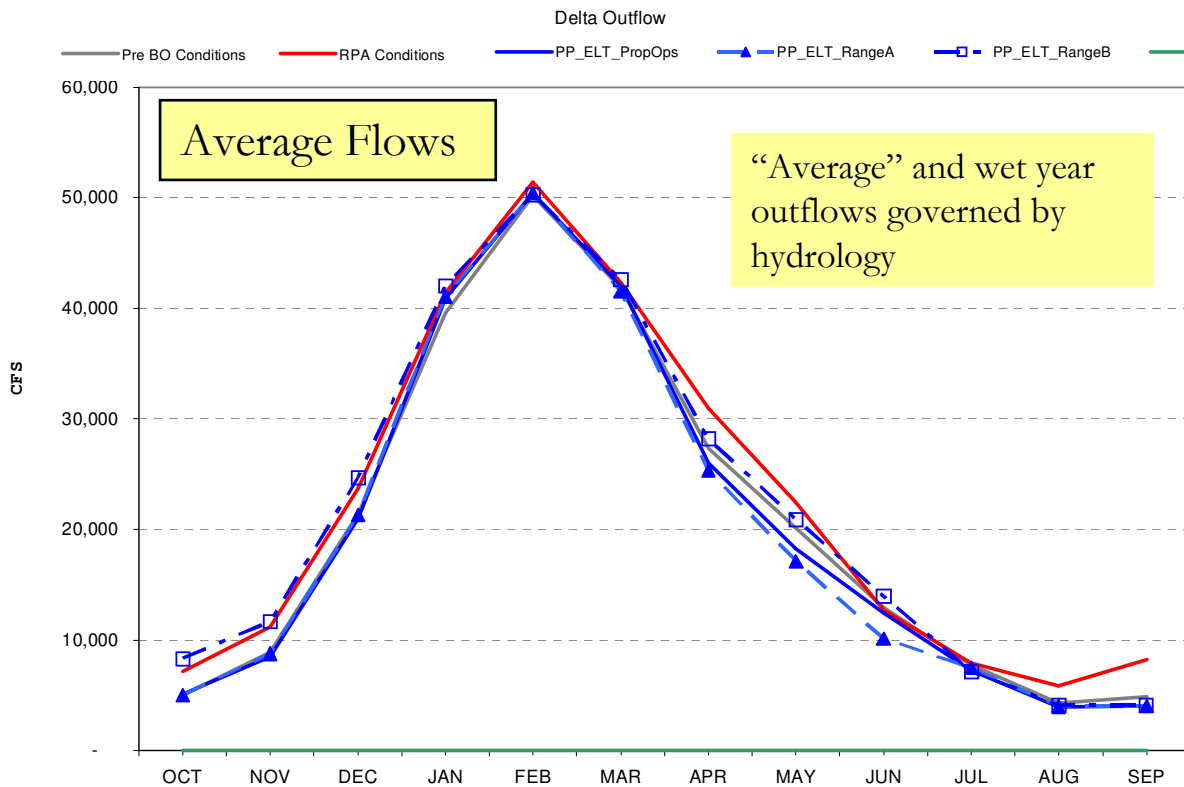


Sacramento River Flows (downstream of diversion)

Preliminary Results

RPA conditions represents current estimate of "mid-range" of BOs

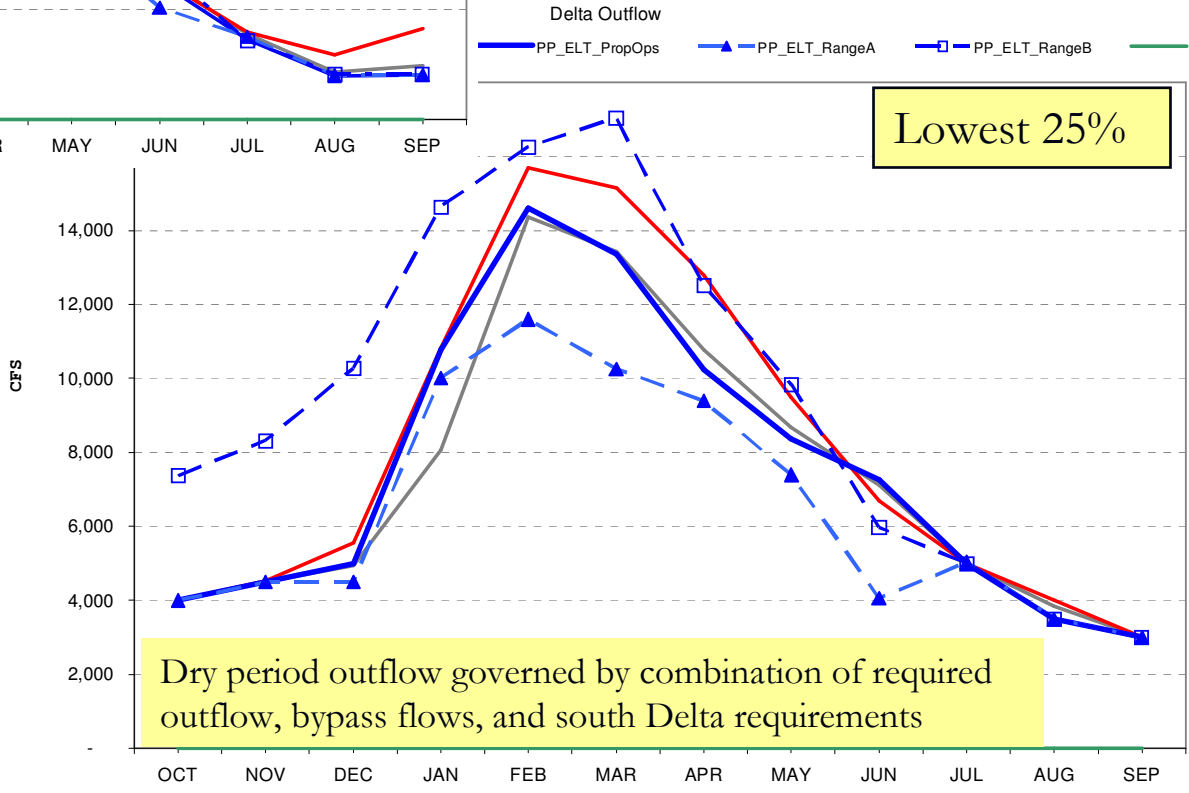




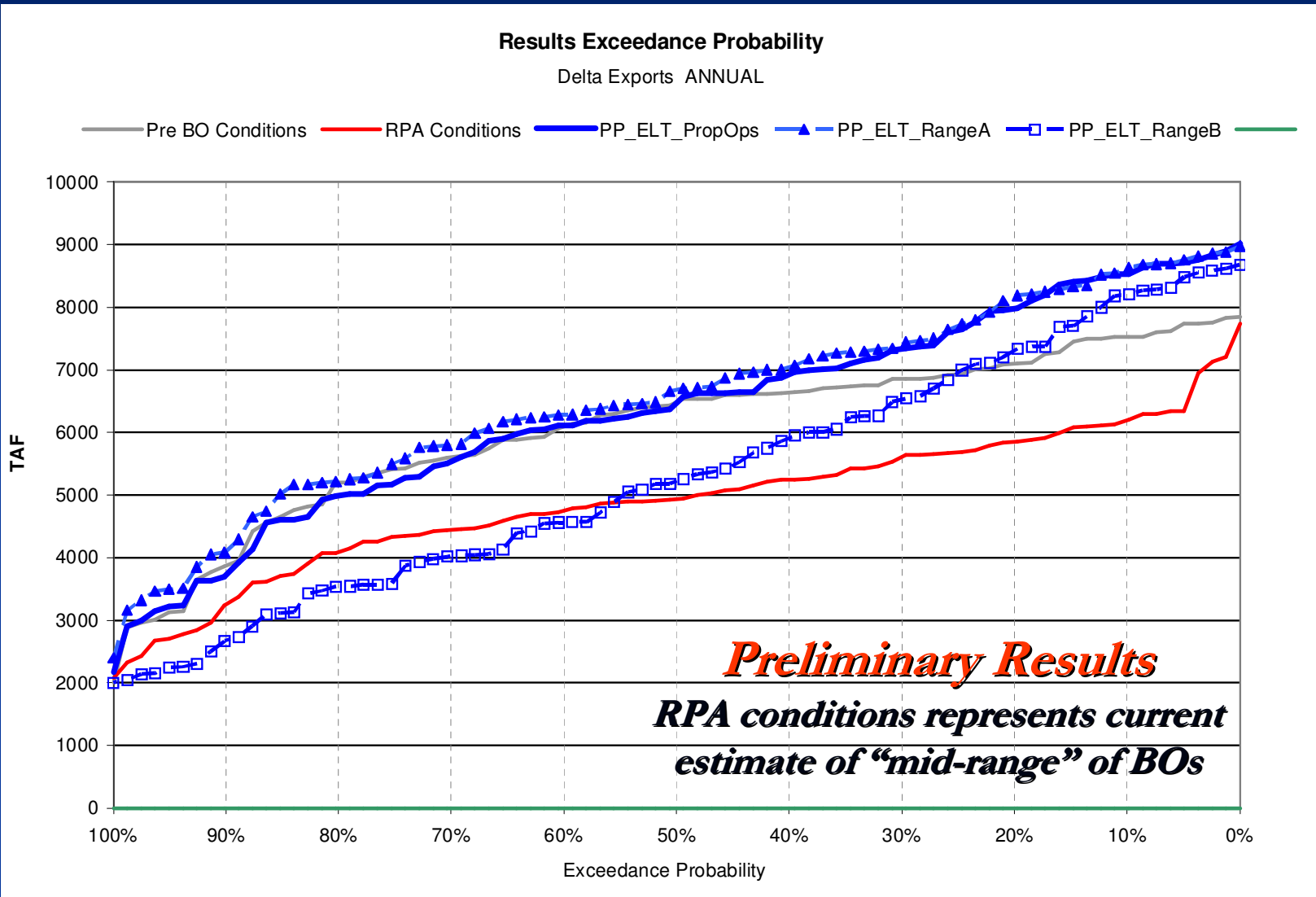
Delta Outflow

Preliminary Results

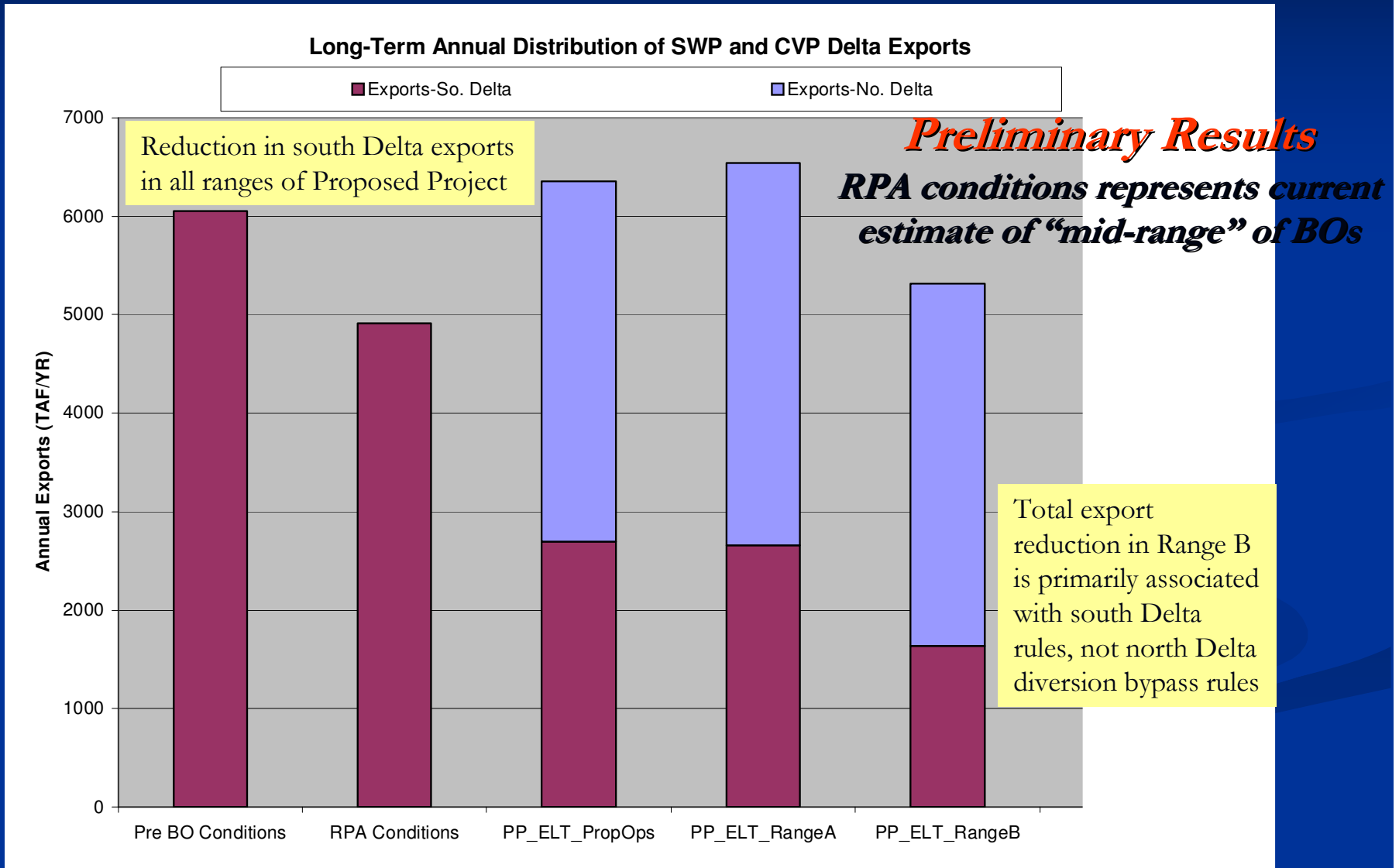
RPA conditions represents current estimate of “mid-range” of BOs



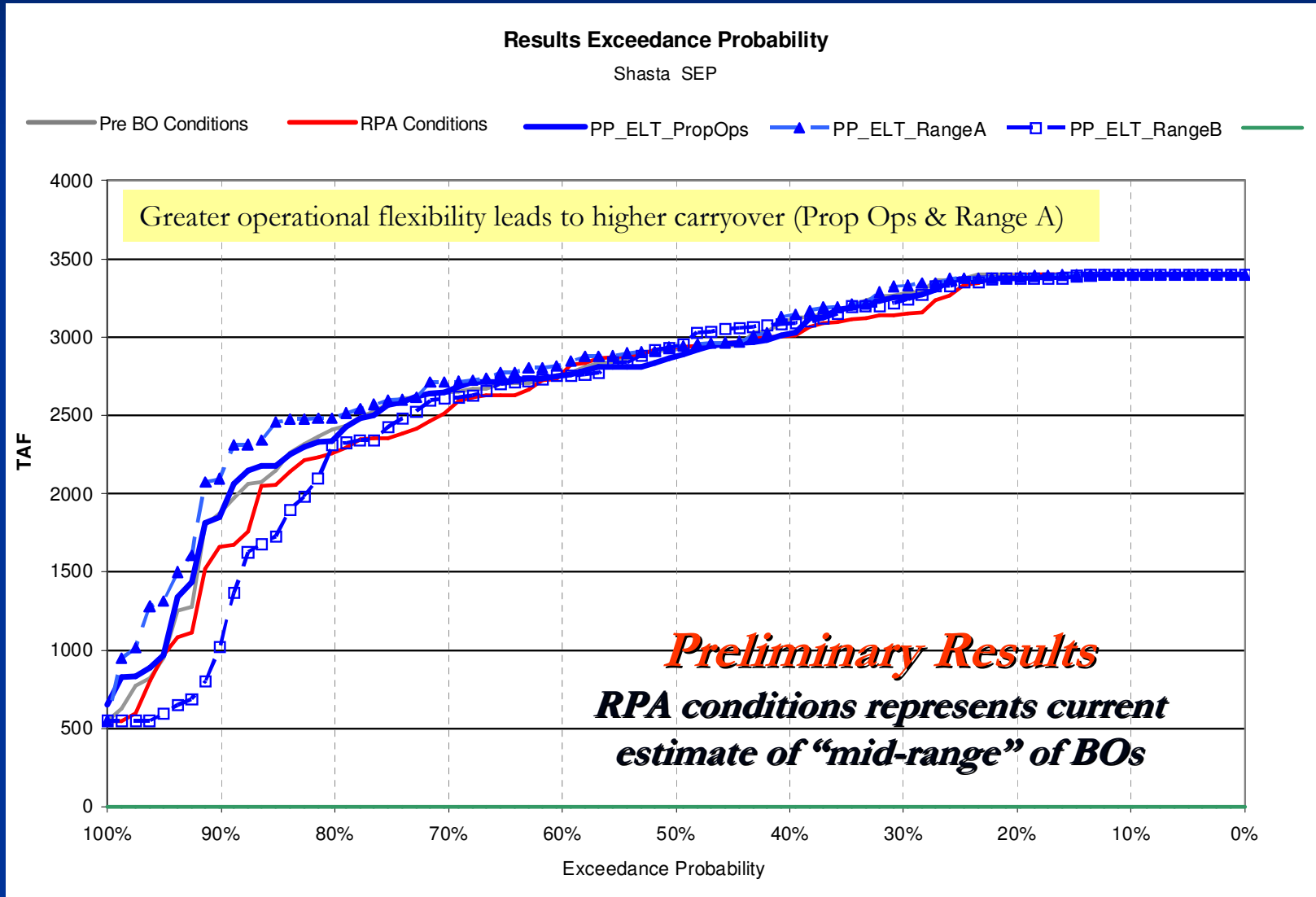
SWP and CVP Delta Exports



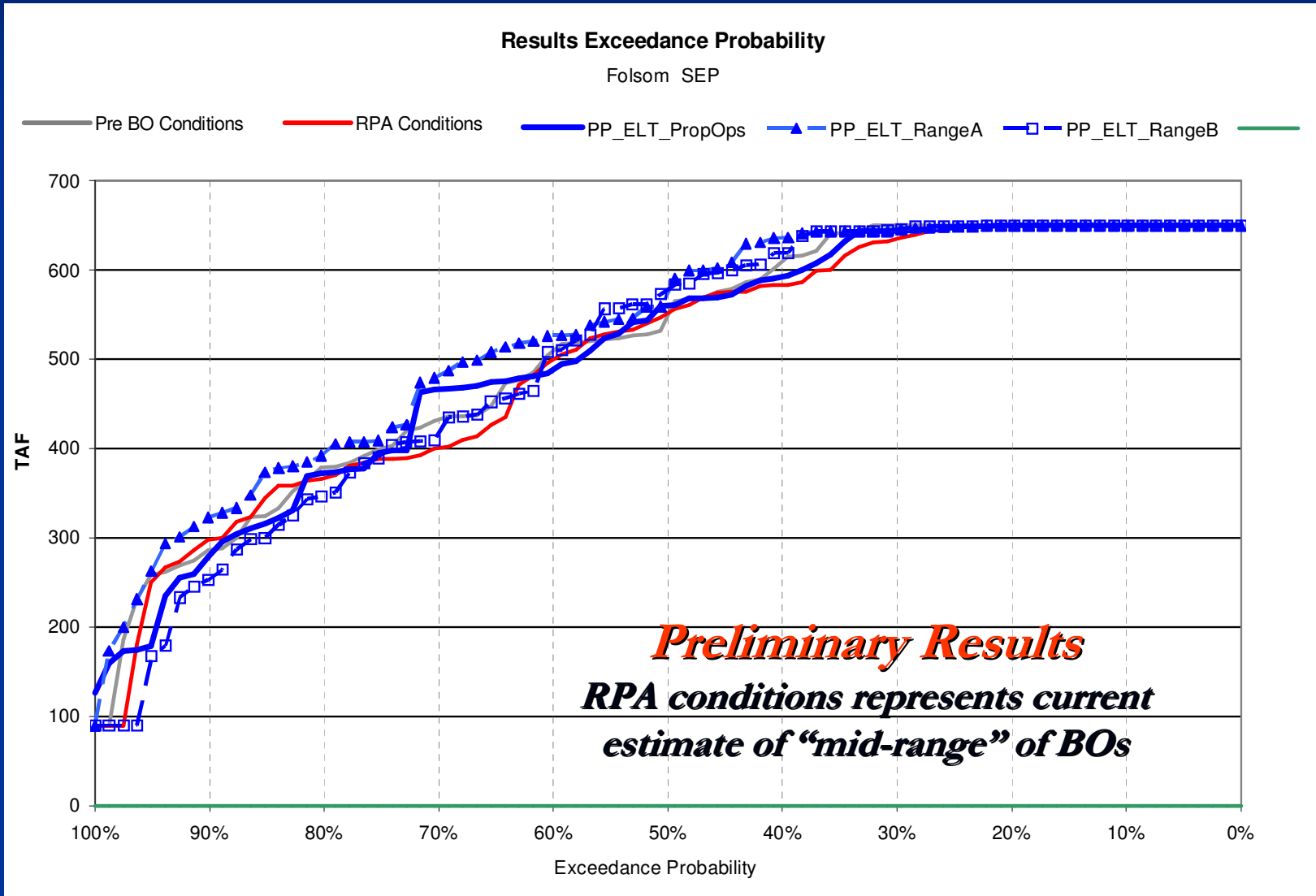
Distribution of SWP and CVP Exports



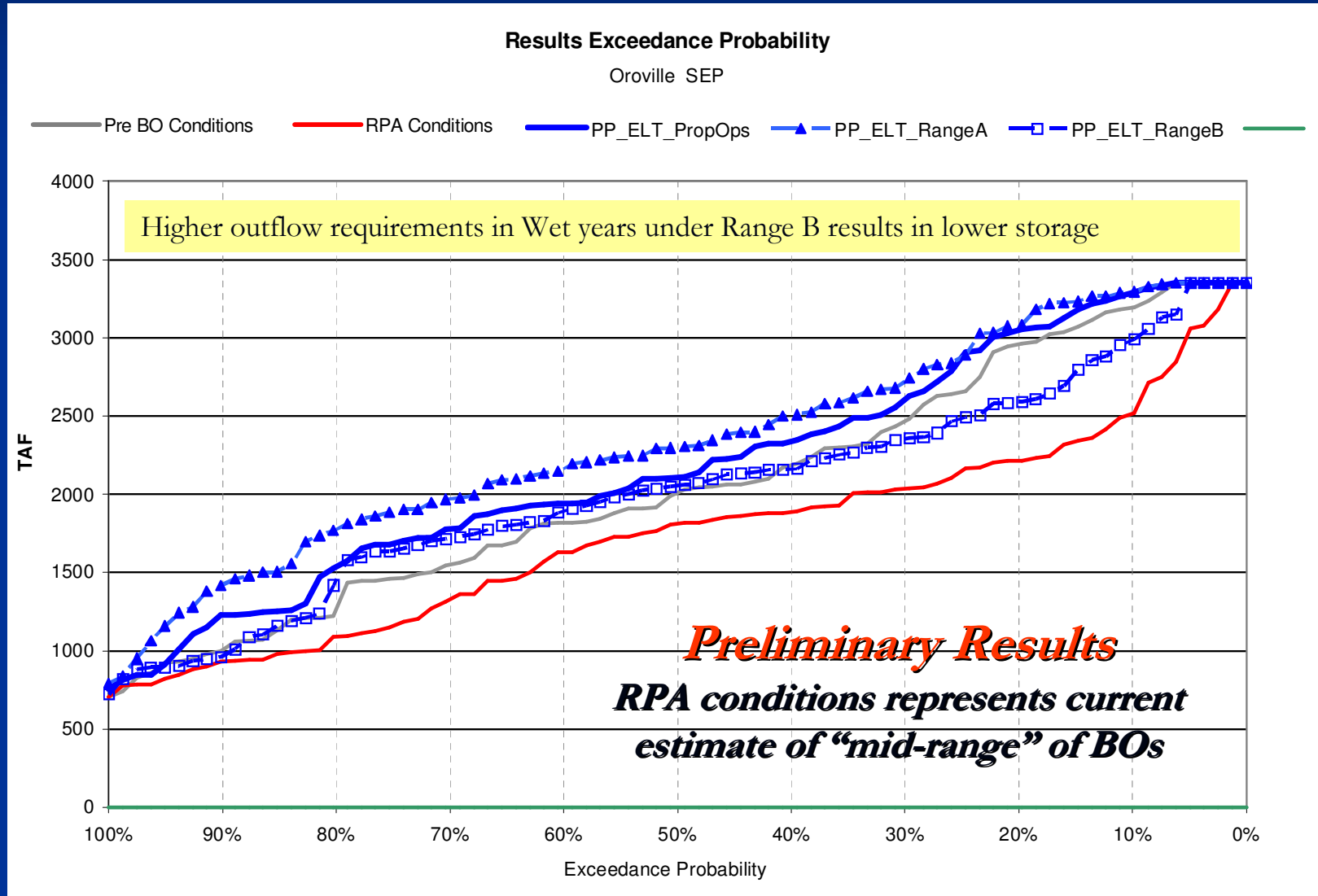
Shasta Storage – End of September



Folsom Storage – End of September

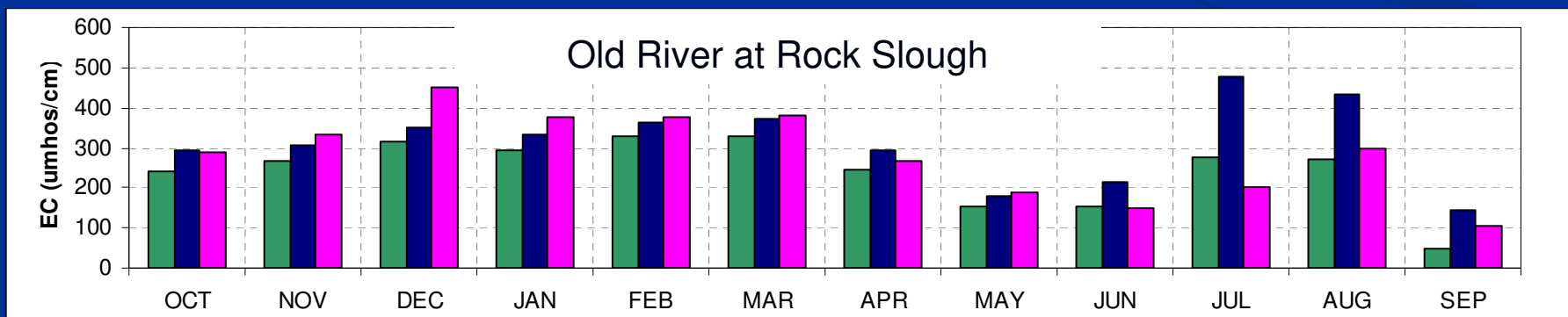
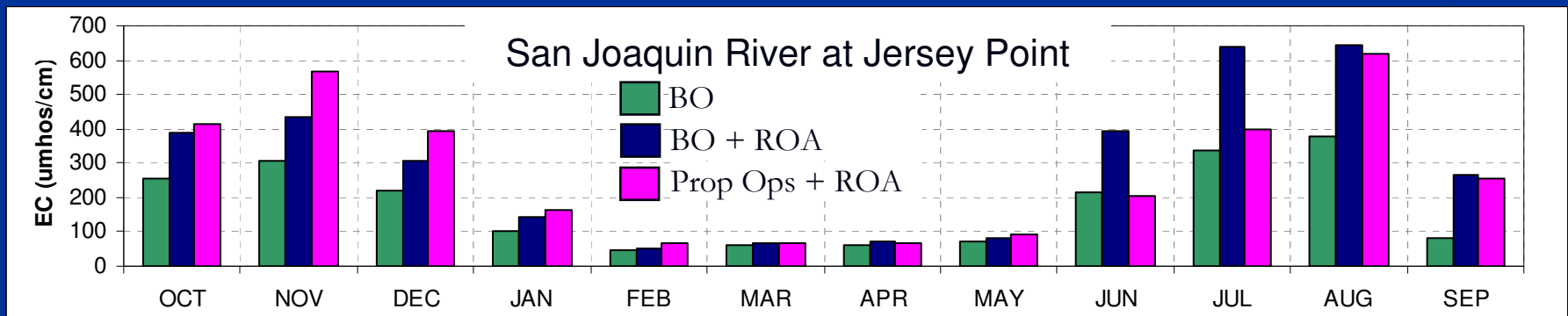
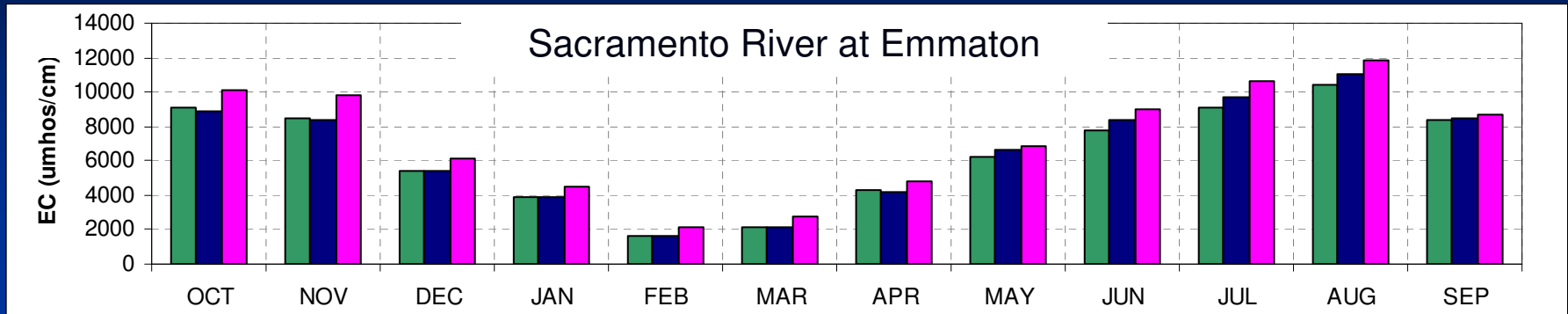


Oroville Storage – End of September



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Dry Period Average EC Monthly Trend (1986 – 1991)



Next Steps

- Incorporate revised flow-salinity ANNs
- Evaluate salinity change sensitivity to various restoration area implementation
- Refine operational range simulations
- Provide detailed modeling information for impact and conservation analysis