STATE OF COLORADO

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TO: Colorado Water Conservation Board Members

FROM: Eric Hecox
Water Supply Planning

DATE: May 7, 2010

SUBJECT: **Agenda Item 26, May 18-19, 2010 Board Meeting**
Colorado River Water Availability Study (CRWAS) Planning Ranges and Update on Water Supply Planning Activities

Staff Recommendation
Staff will ask for Board feedback on using the CRWAS to help define planning ranges.

Background
At the January 2010 Board meeting staff discussed the development of the Portfolio Tool and presented common elements of the mid-demand/mid-supply portfolio. Since January, staff has worked with Colorado's water stakeholders to refine the Portfolio Tool and further develop portfolios for the status quo and mid-demand/mid-supply scenarios. We have explored different combinations of Identified Projects and Processes (IPP) success rates, Conservation, Reuse, New Supply Development, and Agricultural Transfers.

Also since January, staff has worked with the CRWAS study team, the IBCC, and others to understand how the CRWAS can help inform the planning range for our scenario planning work. The purpose of developing low, middle, and high supply ranges is to ensure that Colorado is planning around a range of plausible futures and then to understand what common portfolio elements exist within each of these potential futures.

During this agenda item staff will:

1. Present the current working portfolios for the status quo and mid-demand/mid-supply scenarios. Staff will use these working portfolios to present updates to the Portfolio Tool.
2. Present several CRWAS options for statewide planning and ask the Board for feedback on using the CRWAS to help define planning ranges. To help facilitate this discussion, staff will summarize the feedback received from the IBCC and use the Portfolio Tool to examine the associated tradeoffs of assuming 0, 100, 200, and 300 KAF for low-supply; 350, 400, and 450 KAF for mid-supply; and 600, 700, and 800 KAF for high-supply

Attached are graphics representing the options that staff will discuss.

Handout
Agenda Item 26
CRWAS Planning Ranges and Update on Water Supply Planning Activities
May 19, 2010

Supply Scenario Ranges

The purpose of developing low, middle and high supply ranges is to ensure that the Colorado Water for the 21st Century process is planning around a range of plausible water supply scenarios, build portfolios for each scenario, and then identify the common elements within each portfolio. In order to fully develop portfolios and to inform Phase II of the Colorado River Water Availability Study, it is important to agree upon representative low, middle, and high supply values. Since each of the various values is equally plausible, the Board can examine several potential supply scenarios.

For illustrative purposes we have developed sample portfolios examining:

- 0, 100, 200, and 300 KAF for low-supply
- 350, 400, and 450 KAF for mid-supply
- 600, 700, and 800 KAF for high-supply

The components of the mid-demand/mid-supply working portfolio are used as a starting point for each of these portfolios. These components include:

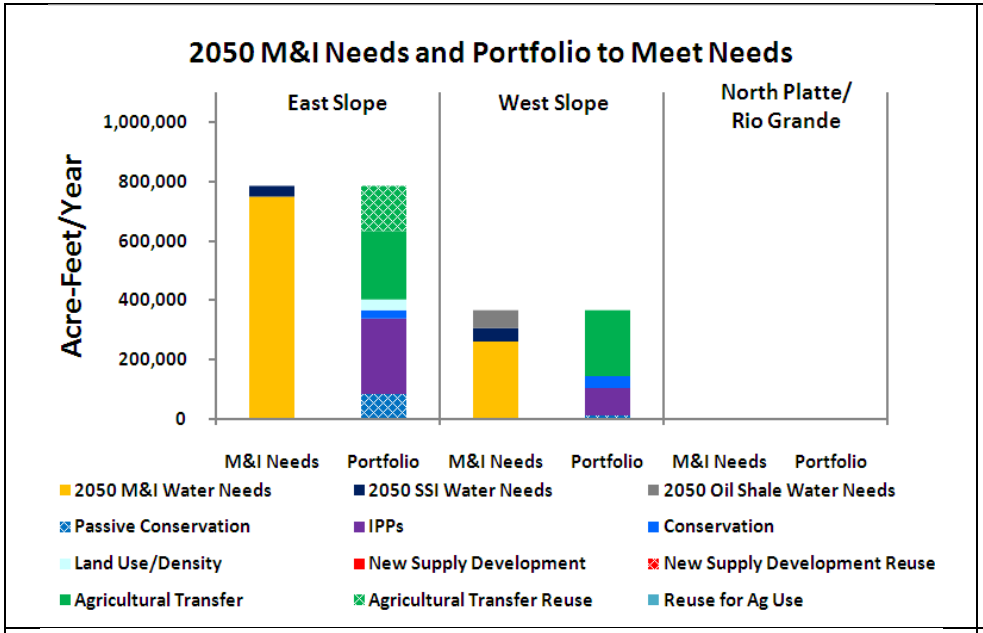
- IPP Success Rates – Varies by basin ranging from 60% - 90%
- Conservation – 15% from 2008 baseline on new demands.[1]
- New Supply Development – 350 KAF developed between west slope and east slope
- Ag Transfer – Remaining East Slope M&I Demands will be met through ag transfers
- Reuse – 70% efficiency

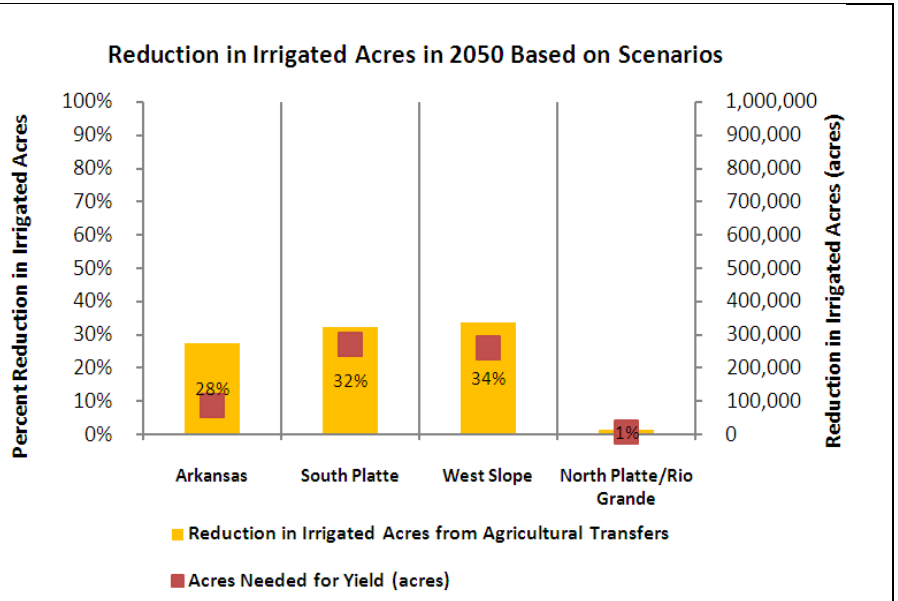
In the following examples, all of the above components are held constant except for New Supply Development. By changing only one variable, the tradeoffs associated with different water supply ranges can be examined. The portfolios and associated tradeoffs are summarized below.

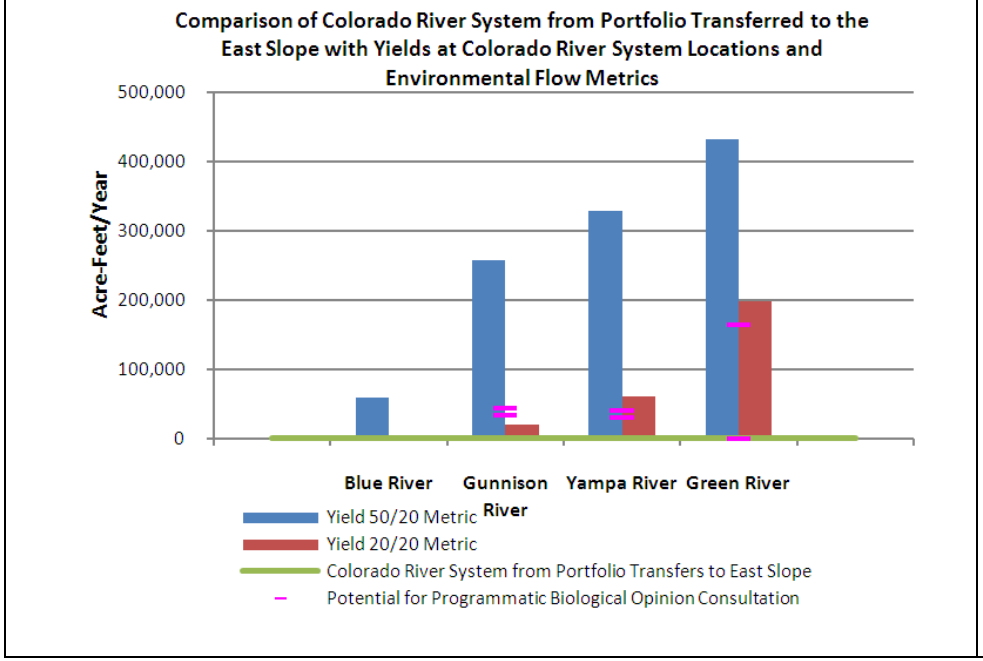
For complete documentation of the portfolio and tradeoff tool, please refer to the document *Portfolio Tool v8 Documentation.docx*, available on the CWCB and IBCC website.

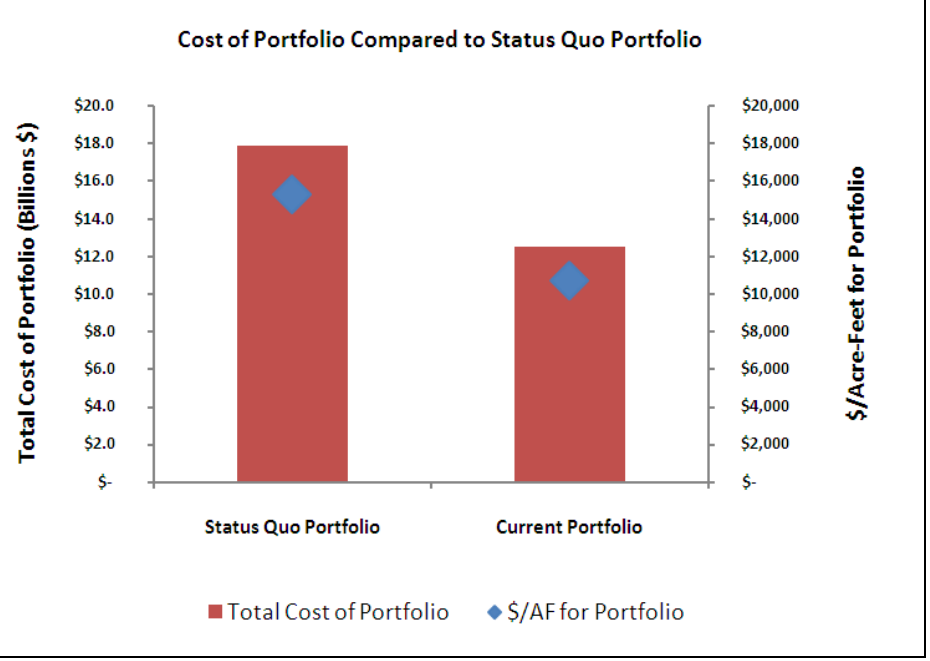
[1] It is important to note that the conservation numbers in this portfolio are included as a placeholder while CWCB develops additional conservation information.

*Portfolio Results for **zero** remaining Colorado River system for development*

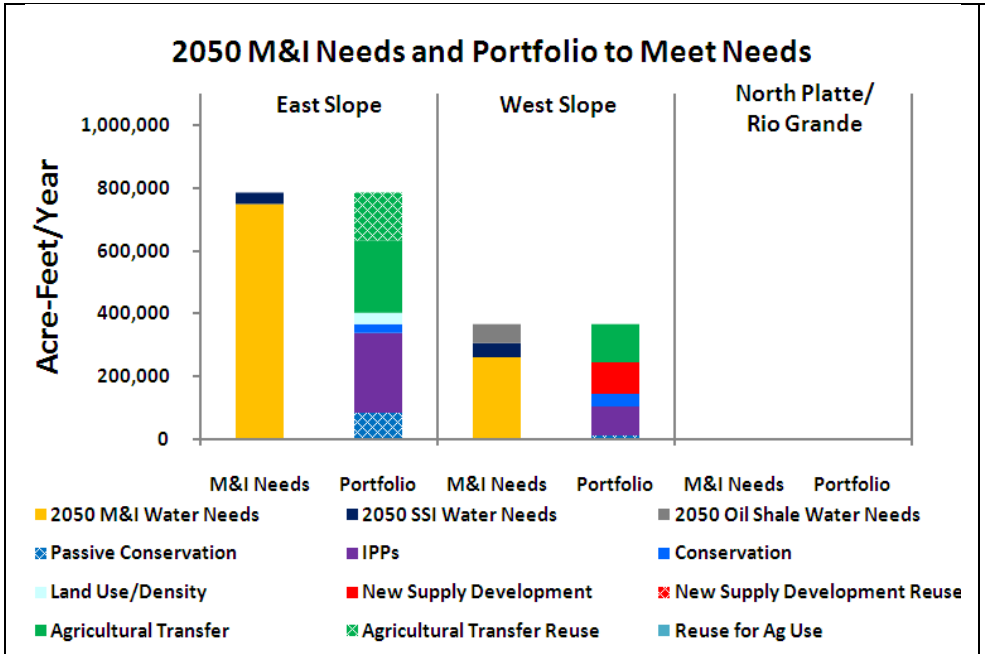


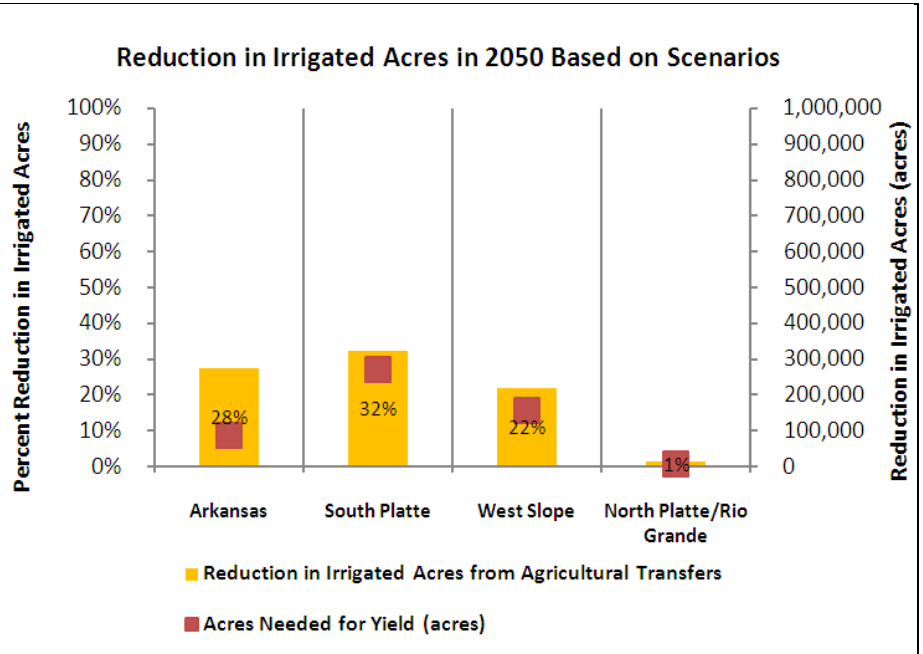


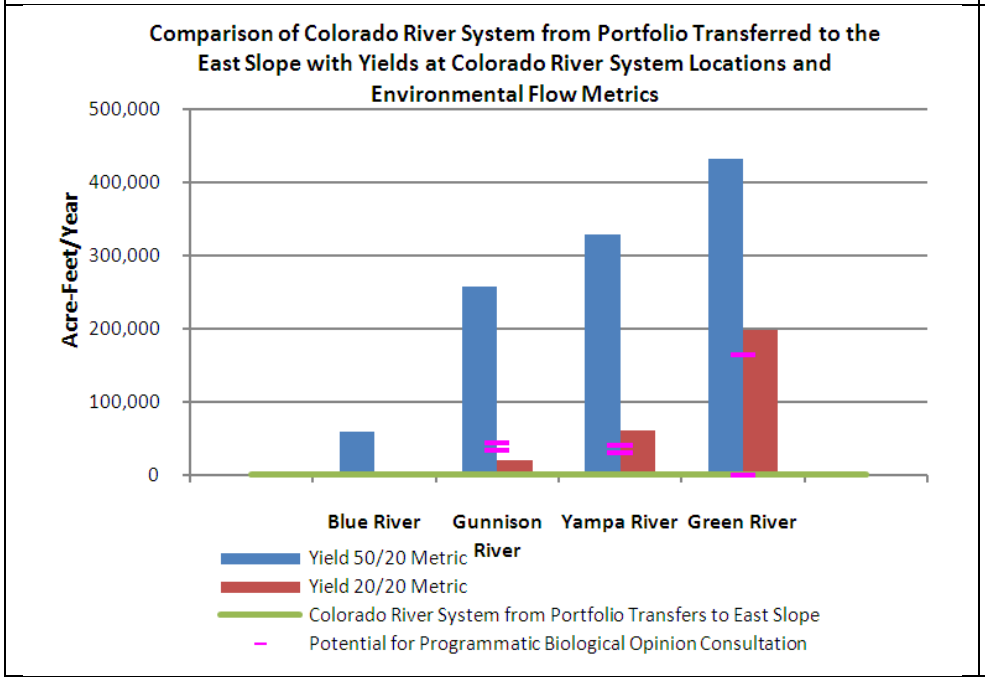


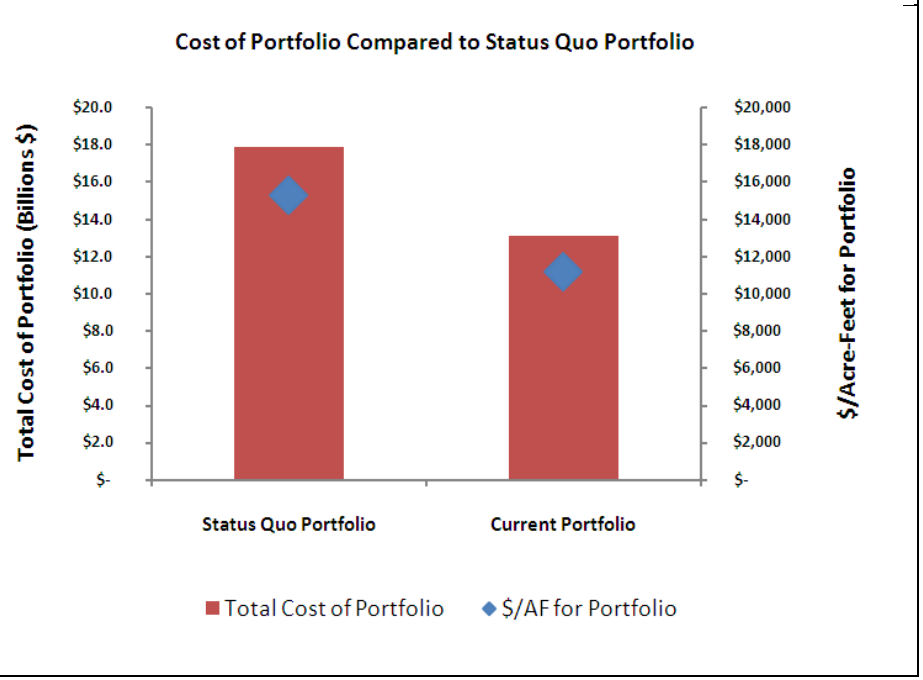


*Portfolio Results for **100,000 AF** remaining Colorado River system for development*

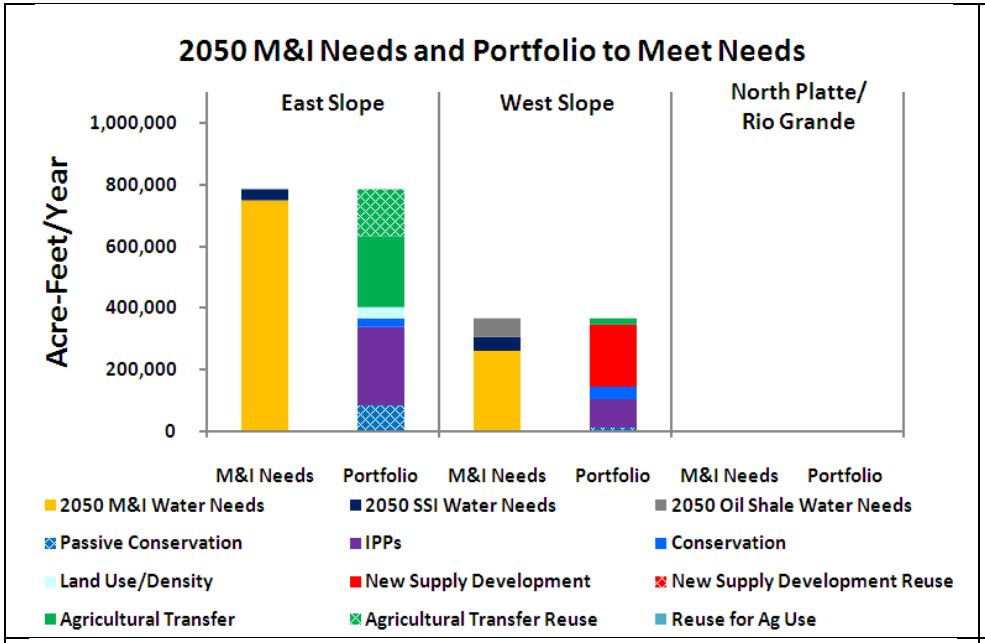


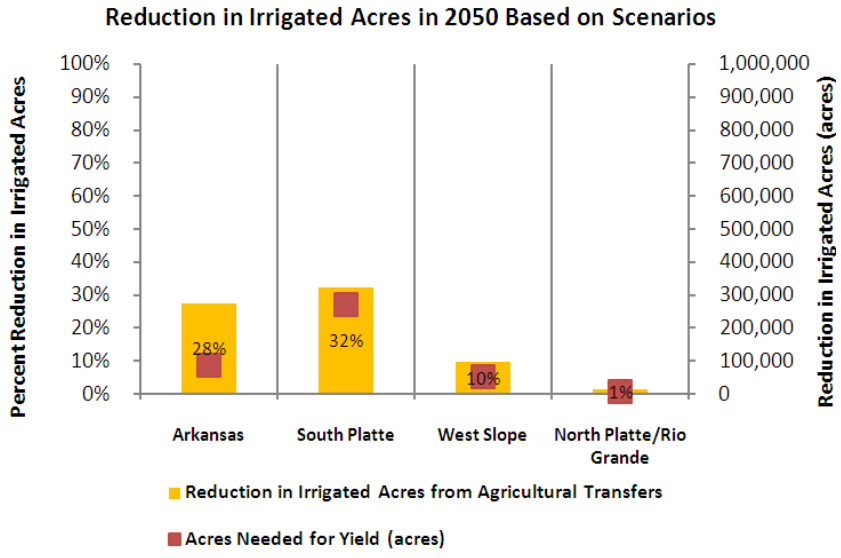


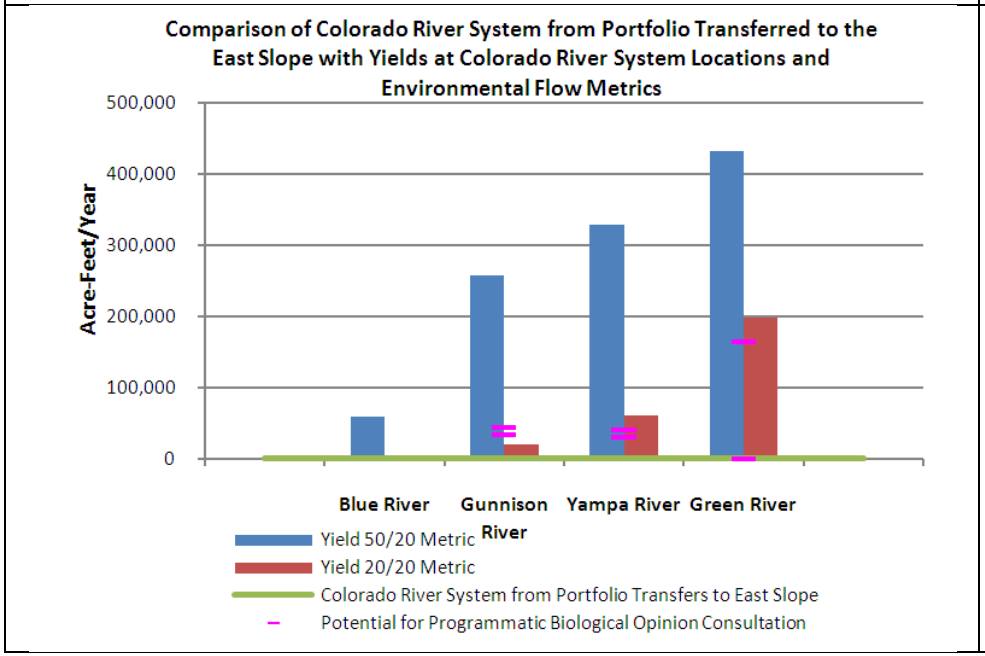


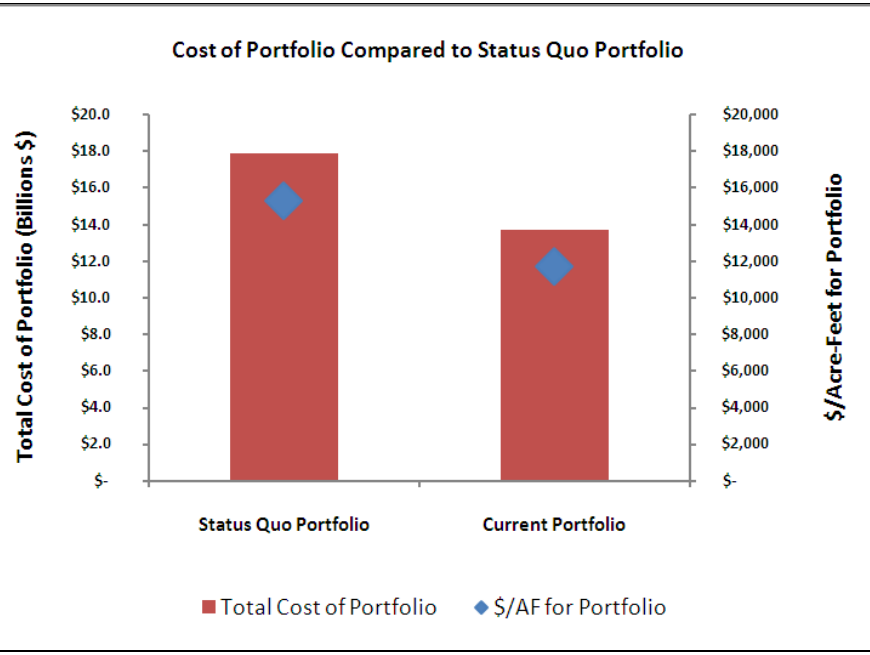


*Portfolio Results for **200,000 AF** remaining Colorado River system for development*

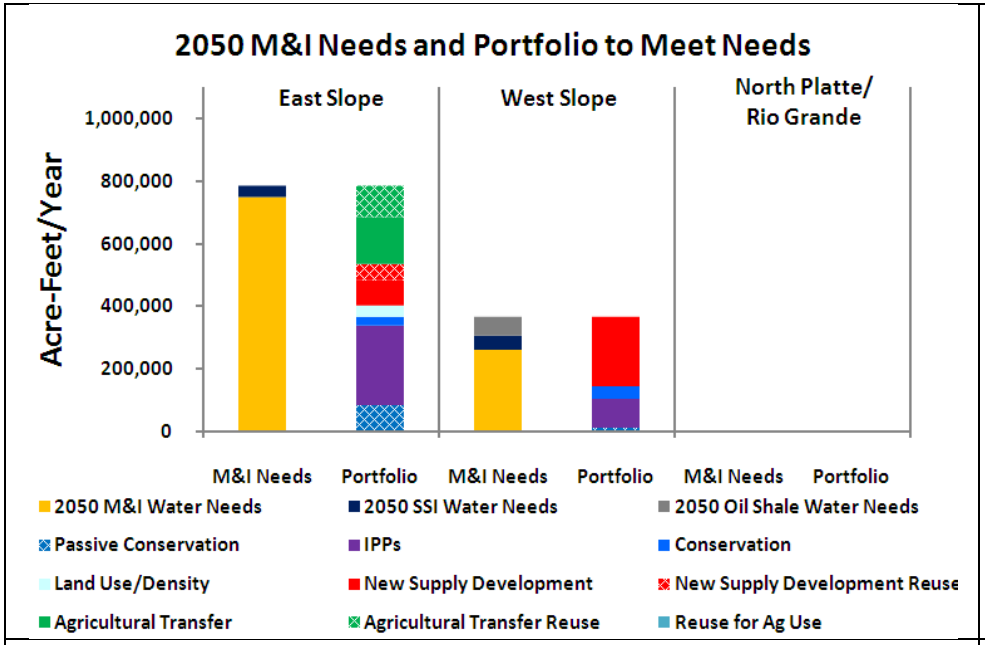


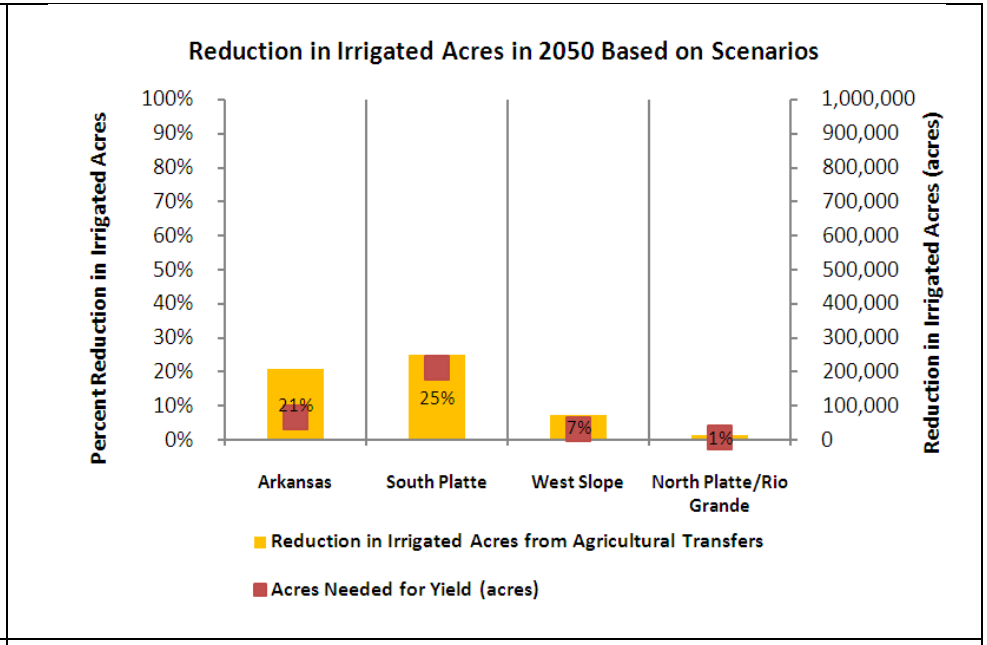


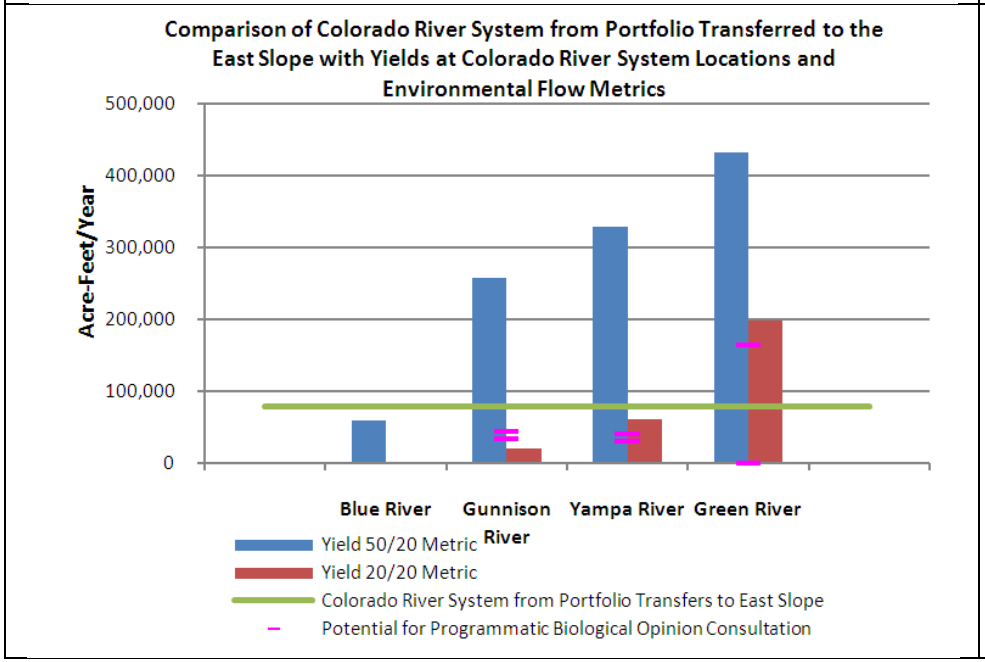


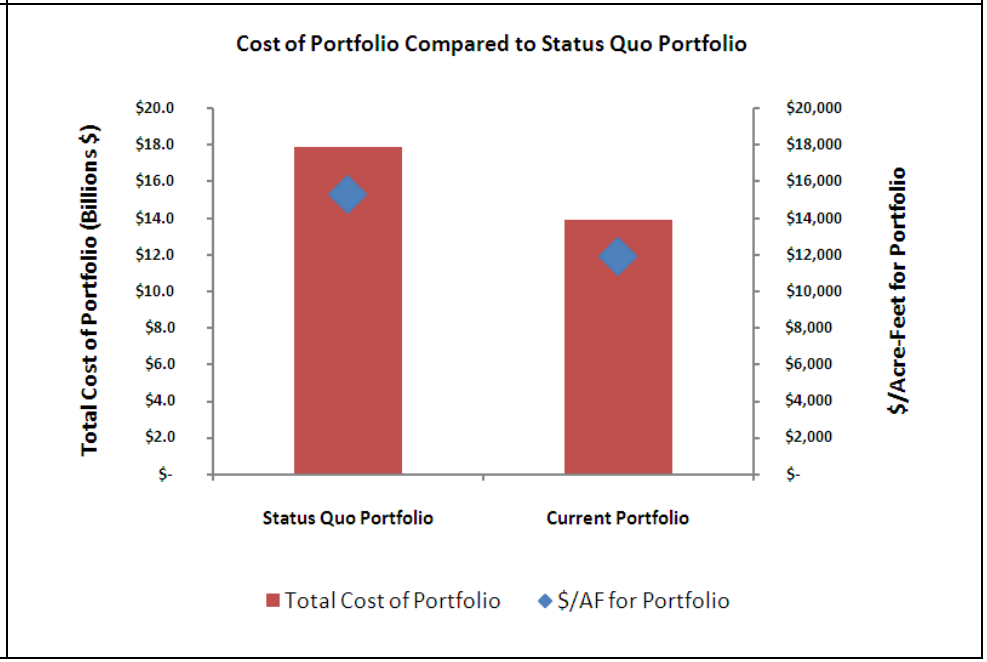


*Portfolio Results for **300,000 AF** remaining Colorado River system for development*

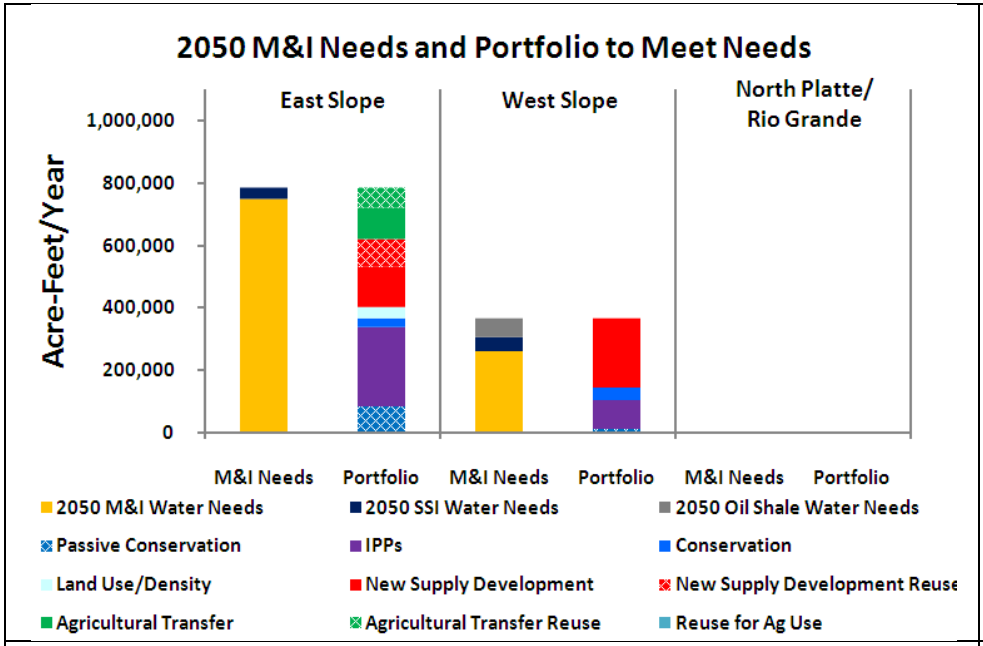


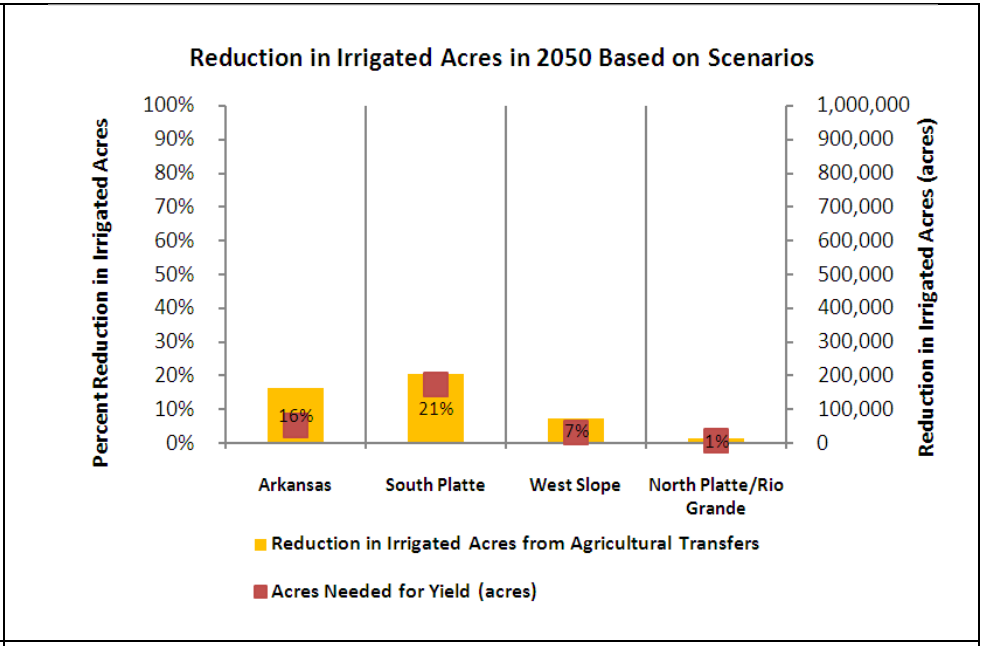


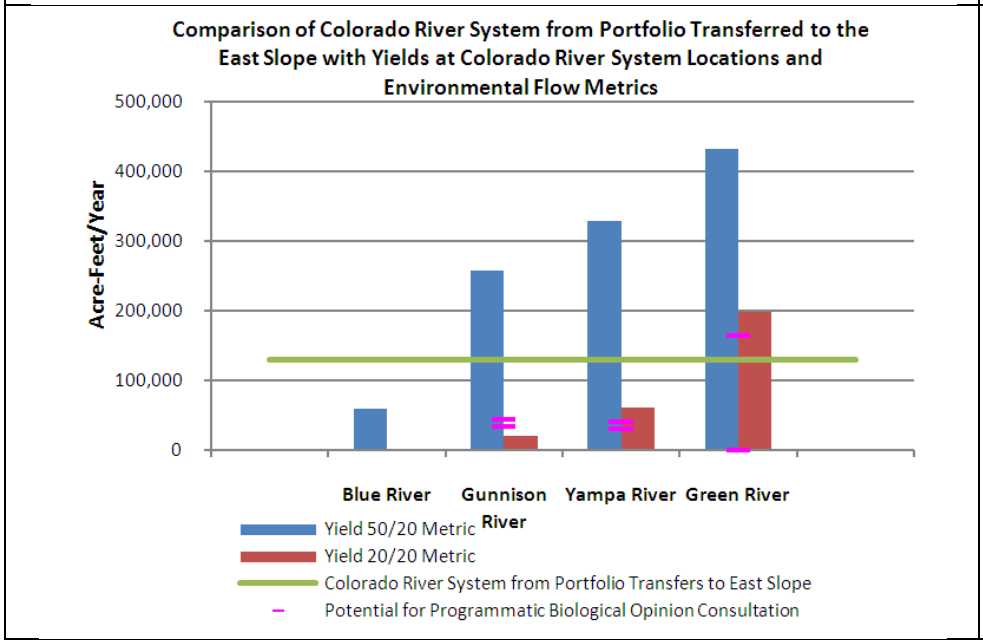


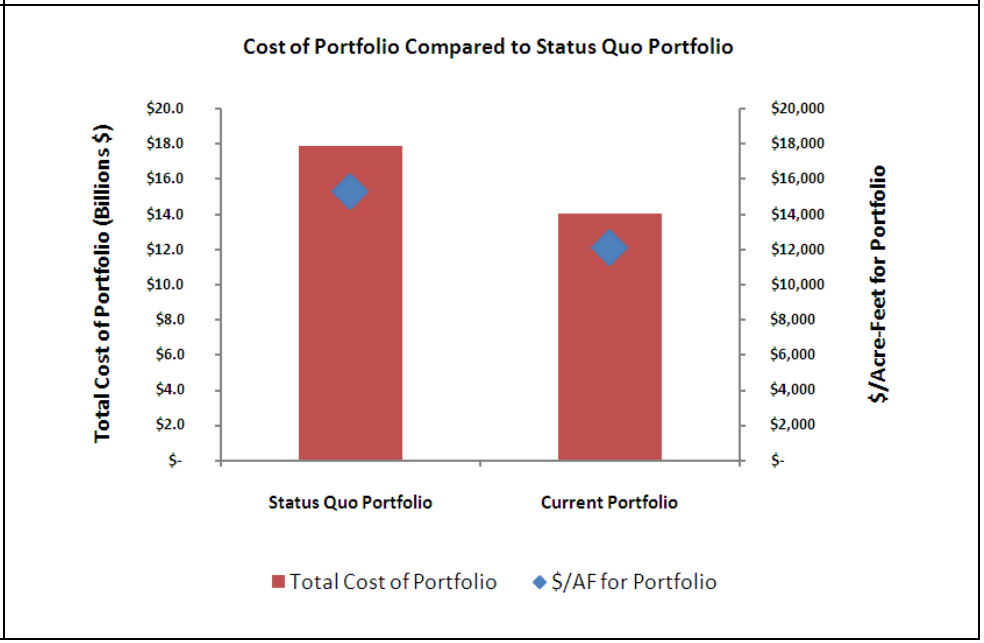


*Portfolio Results for **350,000 AF** remaining Colorado River system for development*

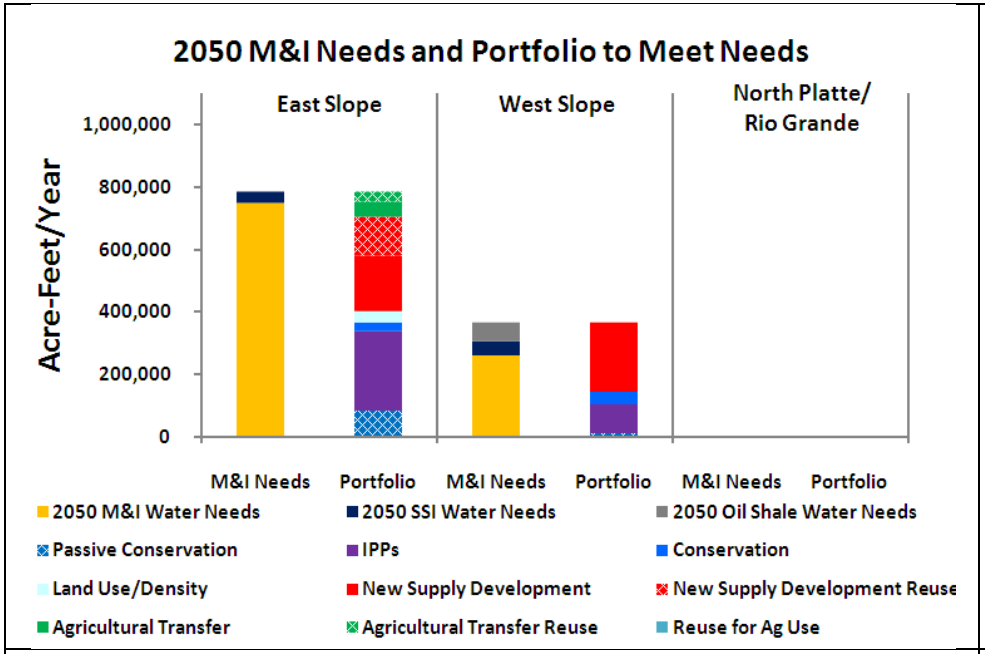


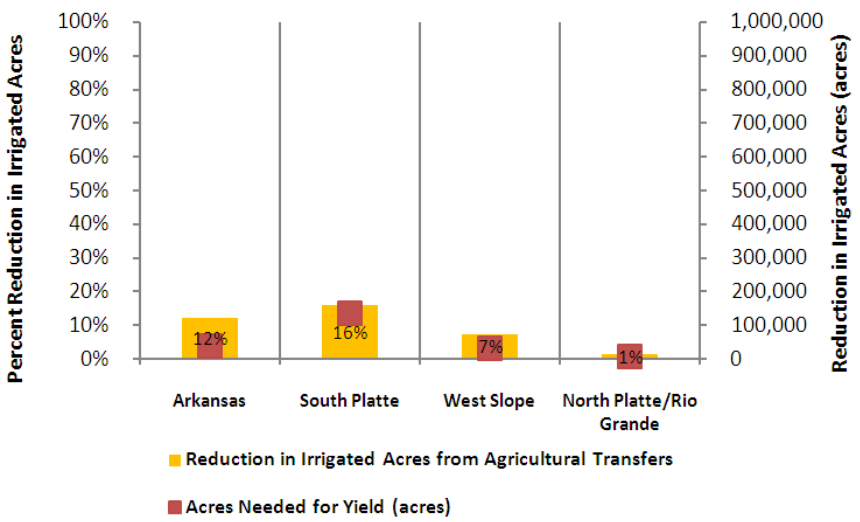


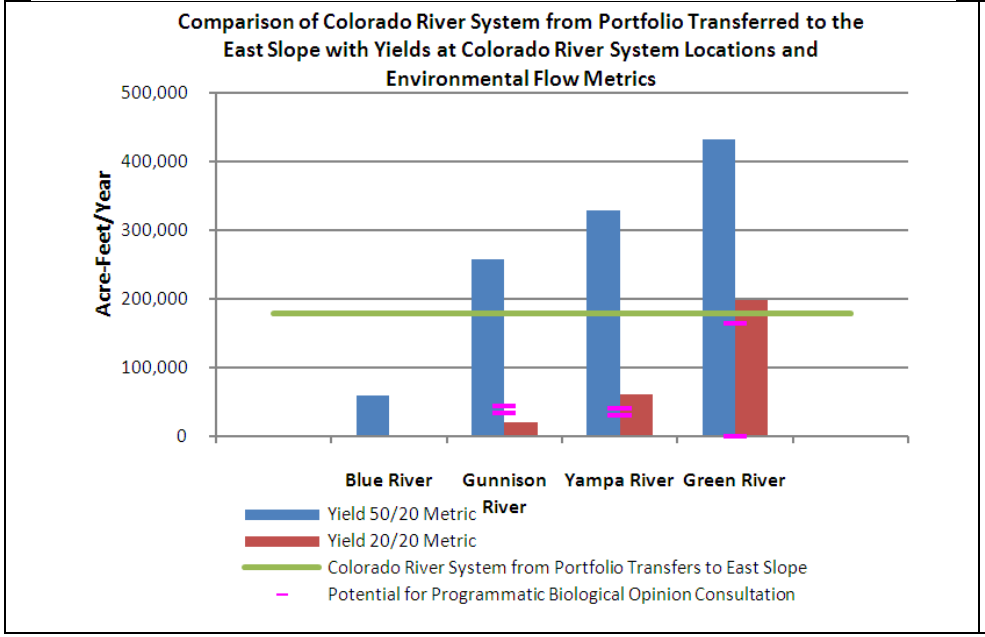


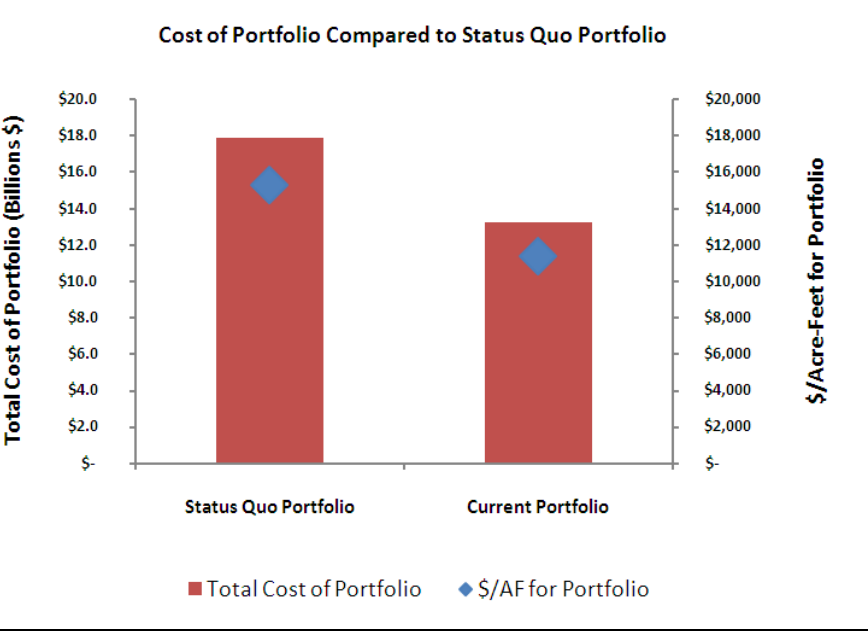


*Portfolio Results for **400,000 AF** remaining Colorado River system for development*

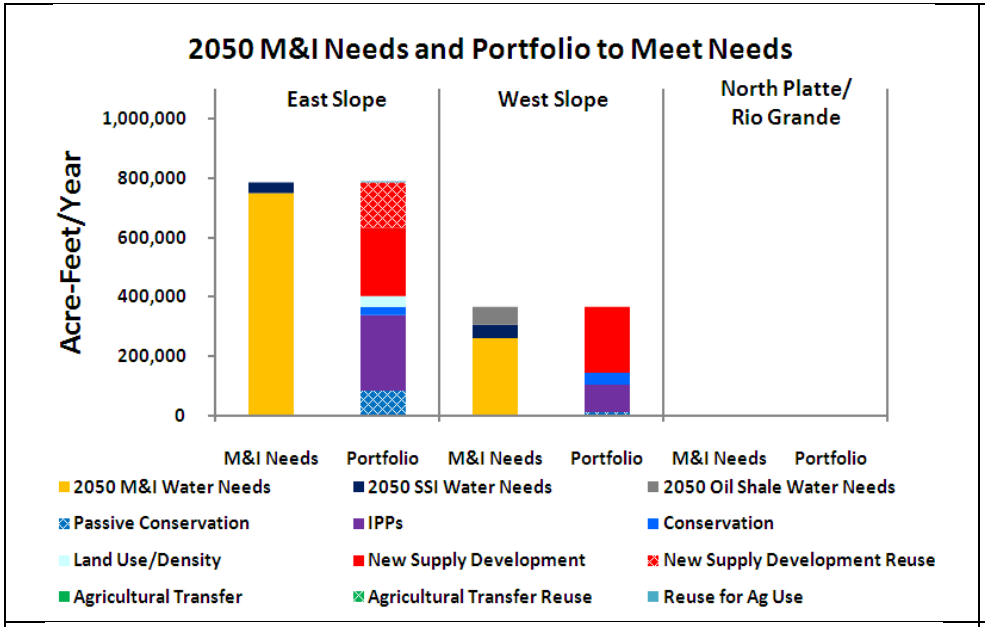


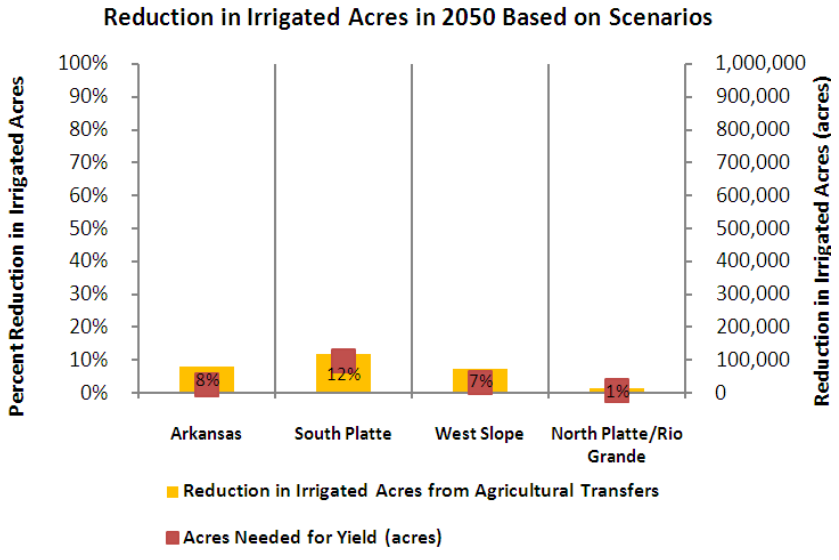


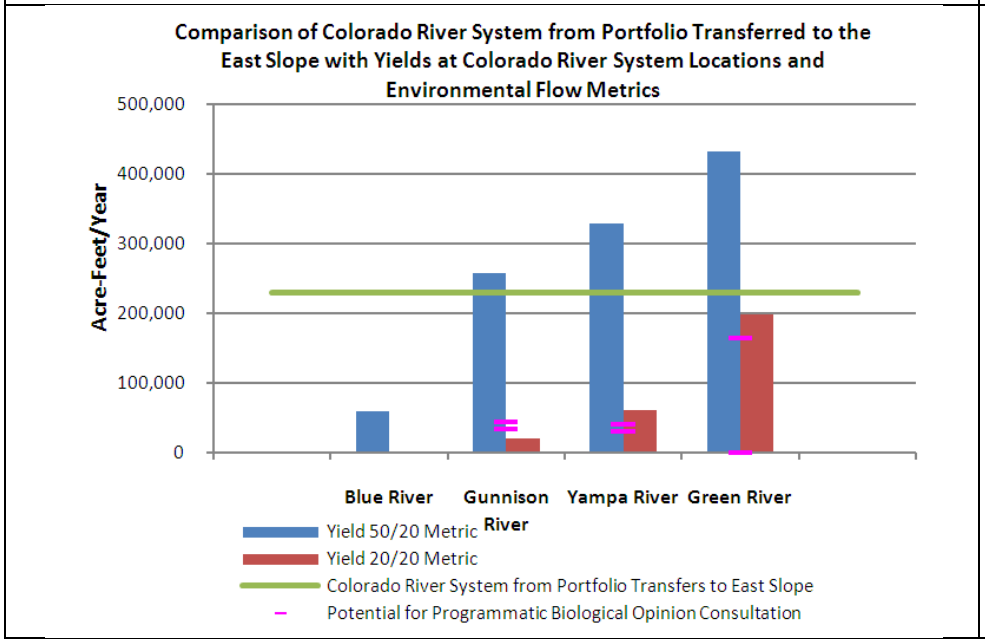


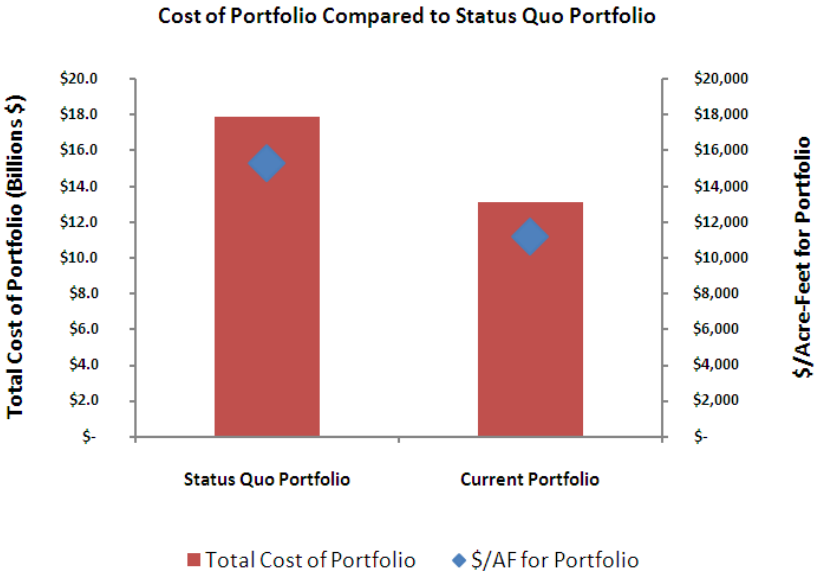


*Portfolio Results for **450,000 AF** remaining Colorado River system for development*

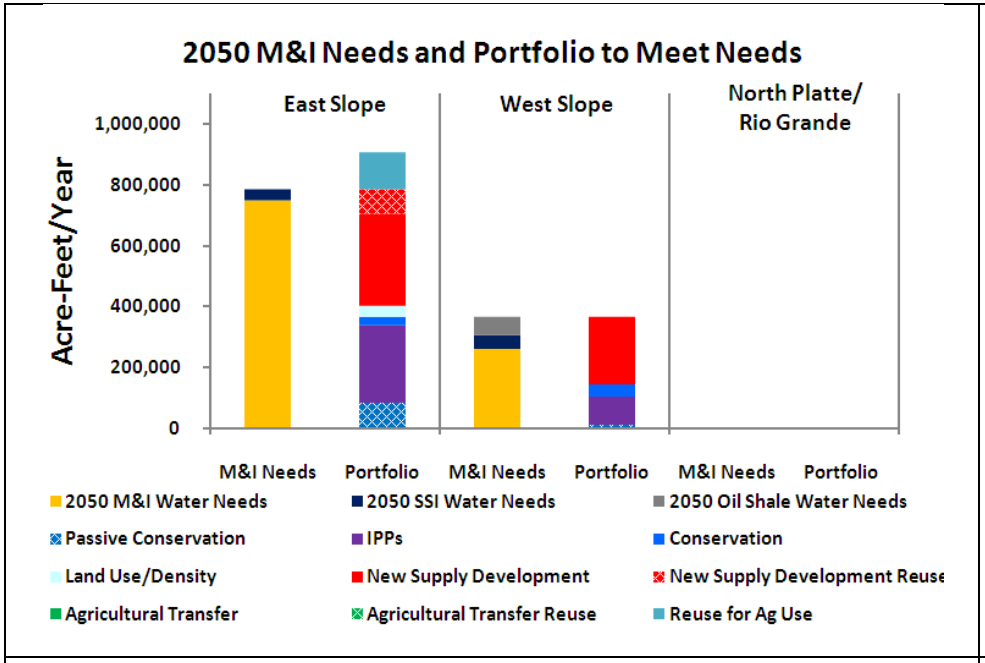


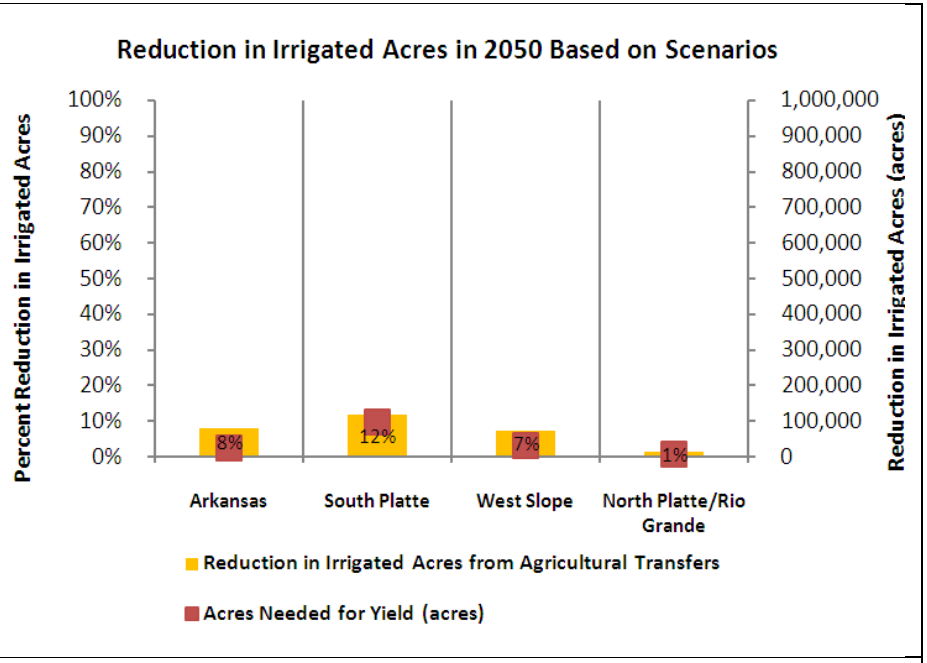


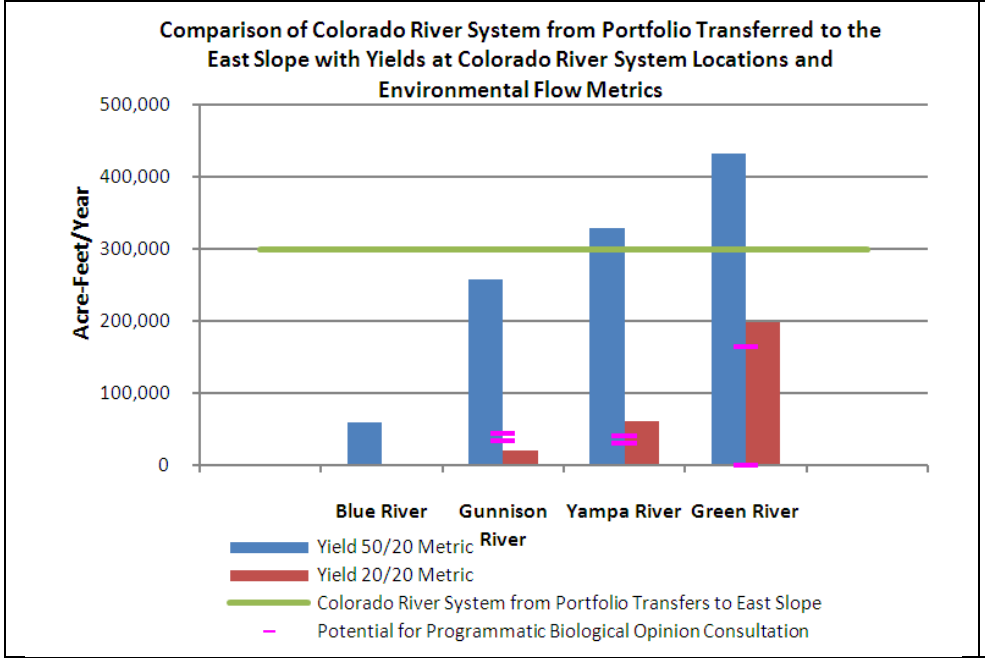


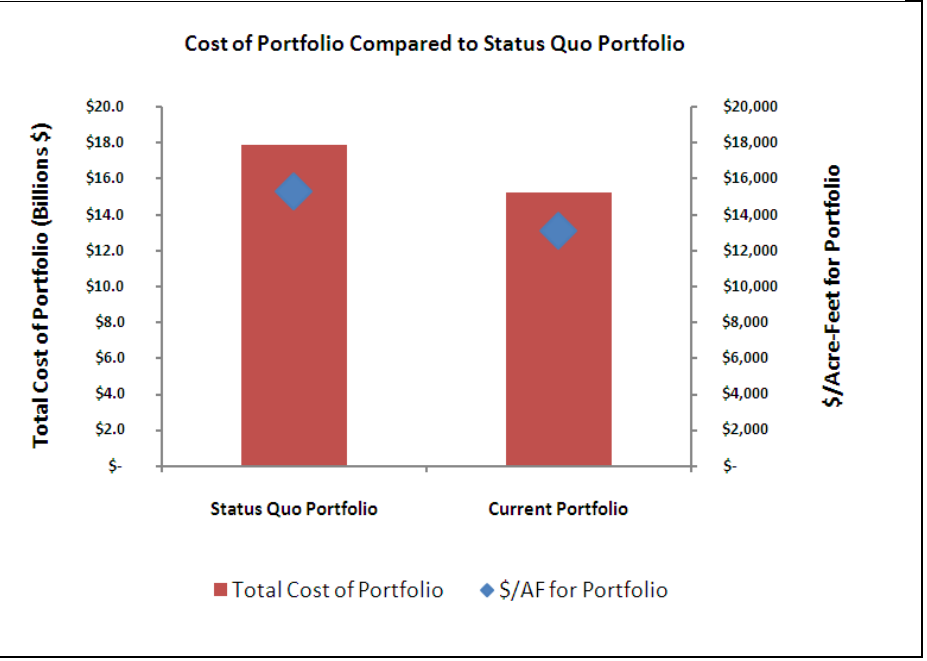


*Portfolio Results for **600,000 AF** remaining Colorado River system for development*

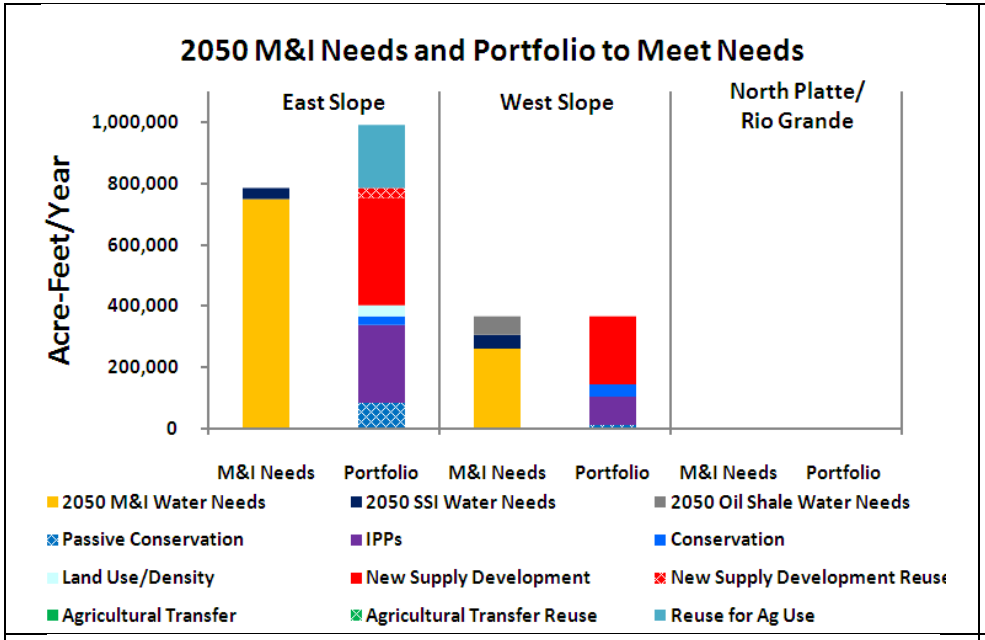


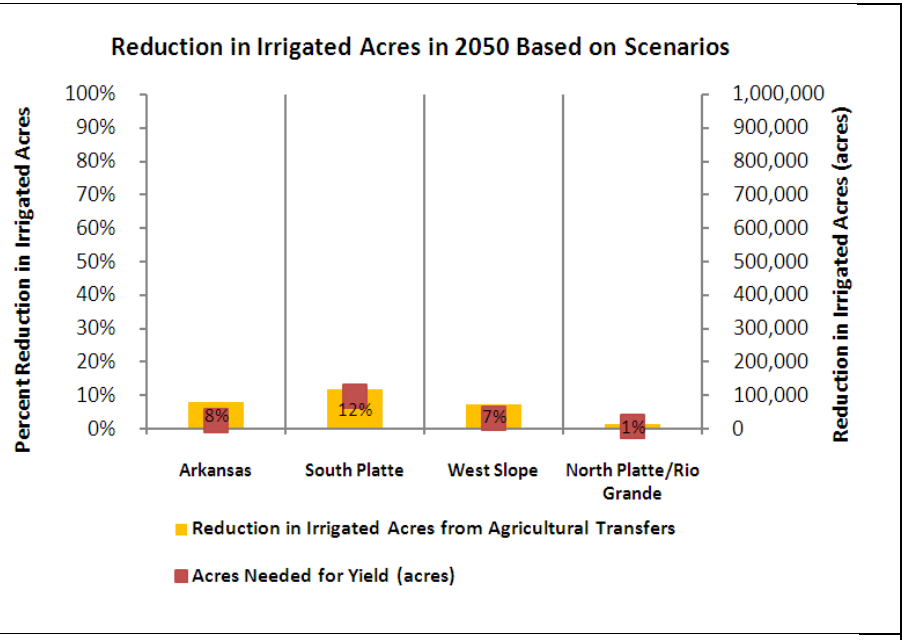


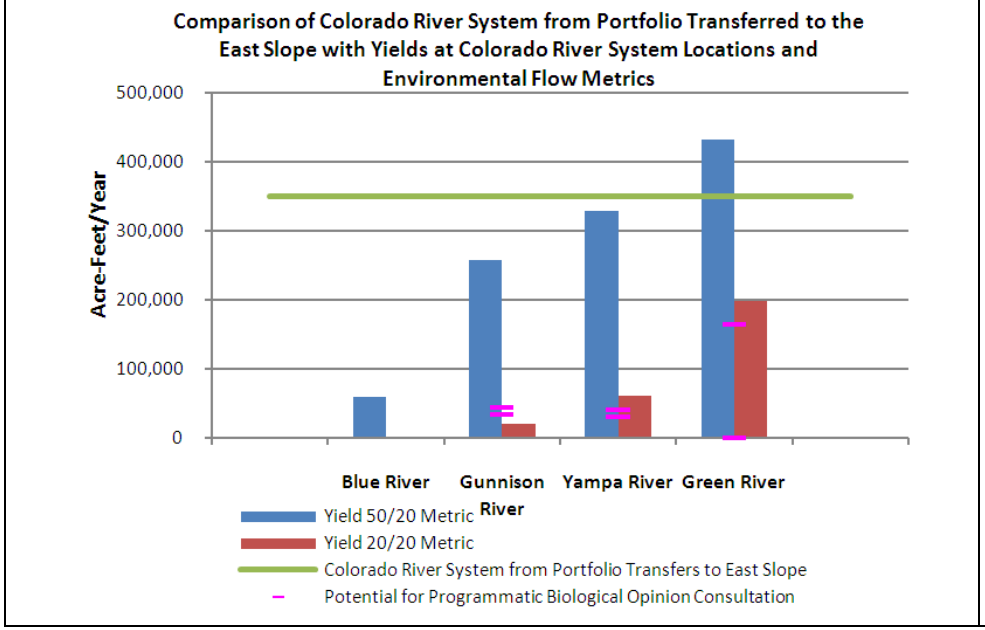


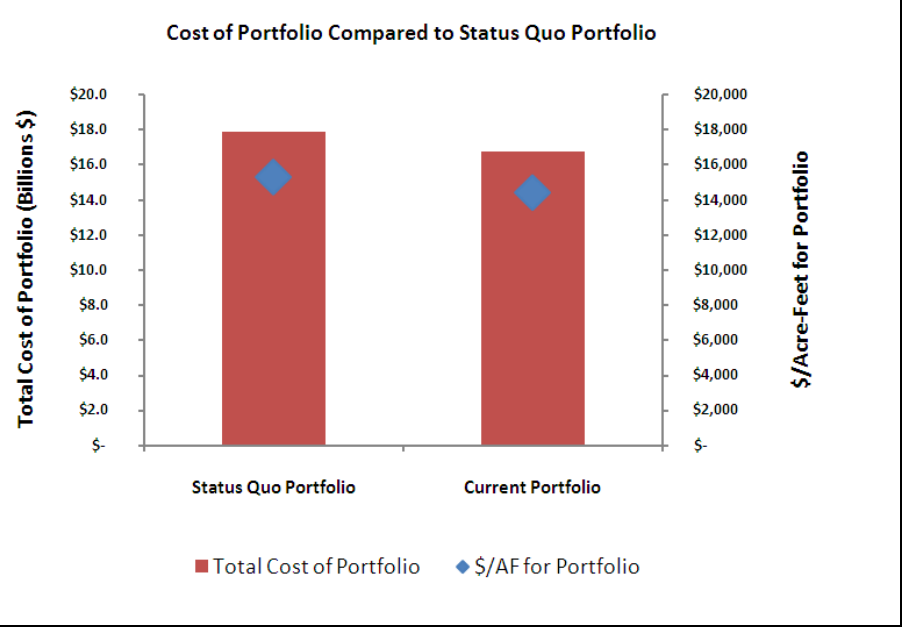


*Portfolio Results for **700,000 AF** remaining Colorado River system for development*

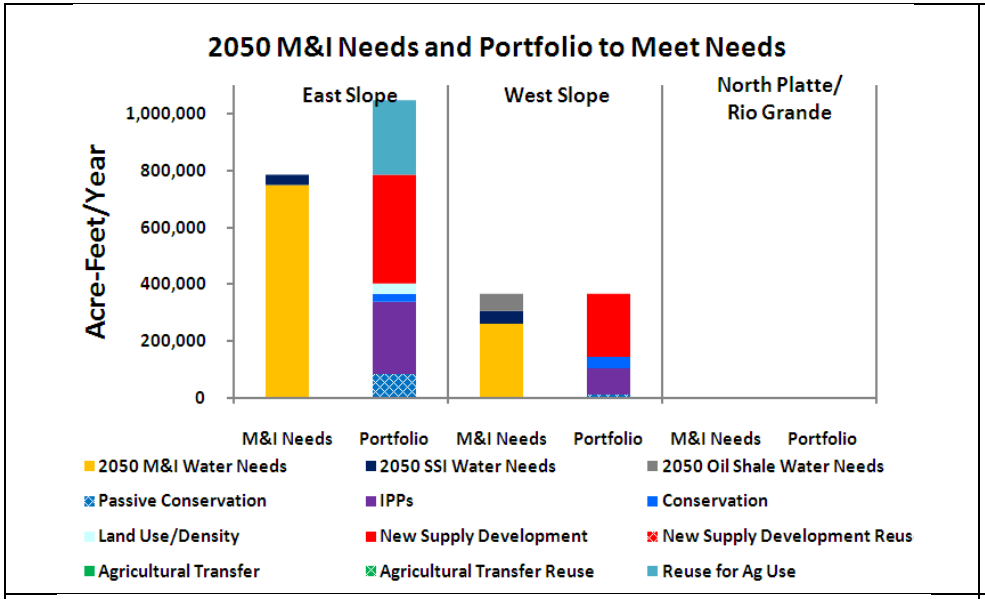


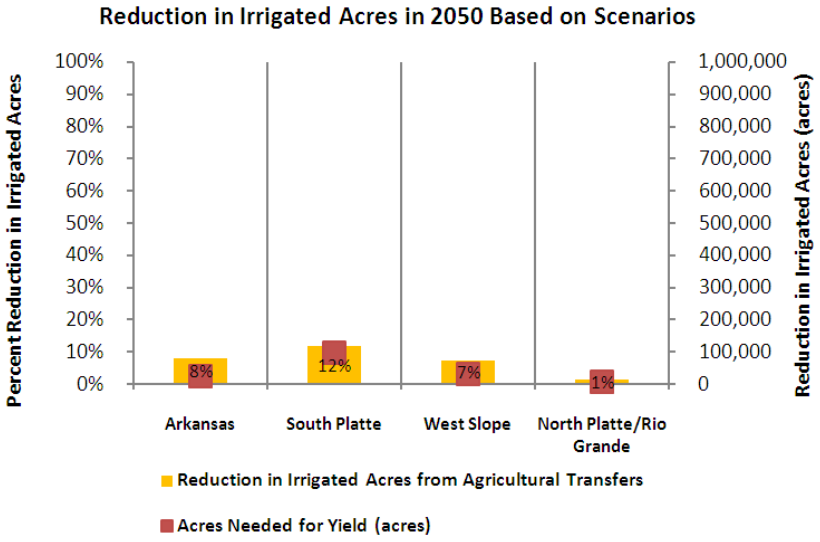


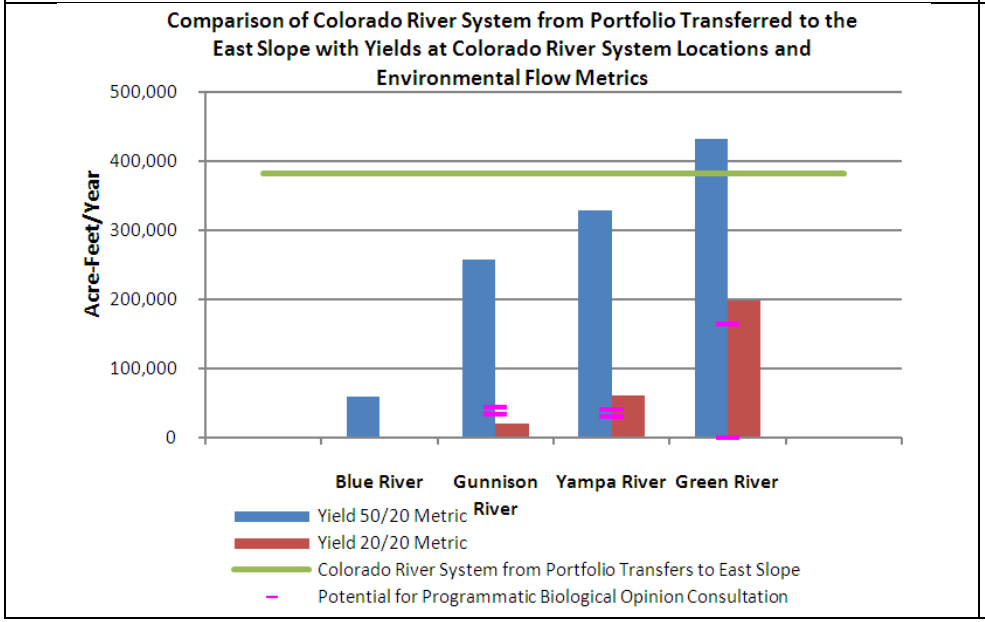


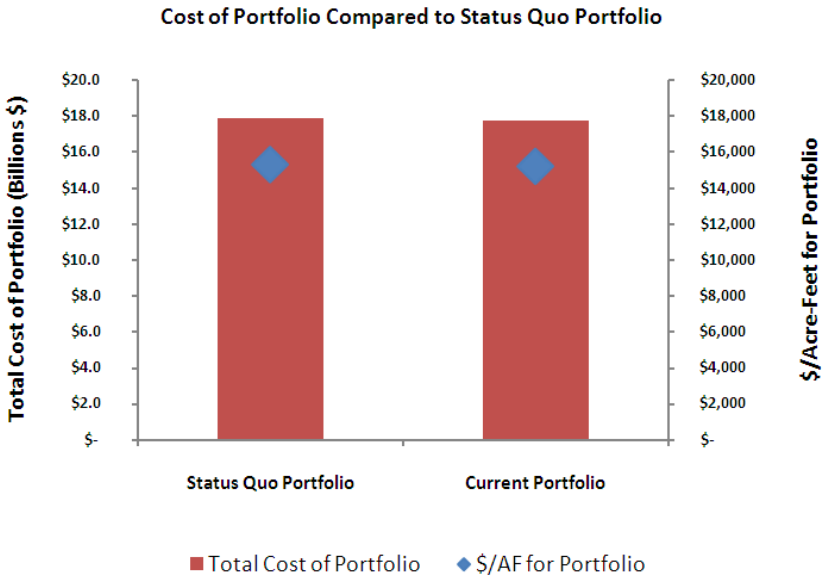


*Portfolio Results for **800,000 AF** remaining Colorado River system for development*









Portfolios for Mid-Demand/Low-Supply and Mid-Demand/High-Supply

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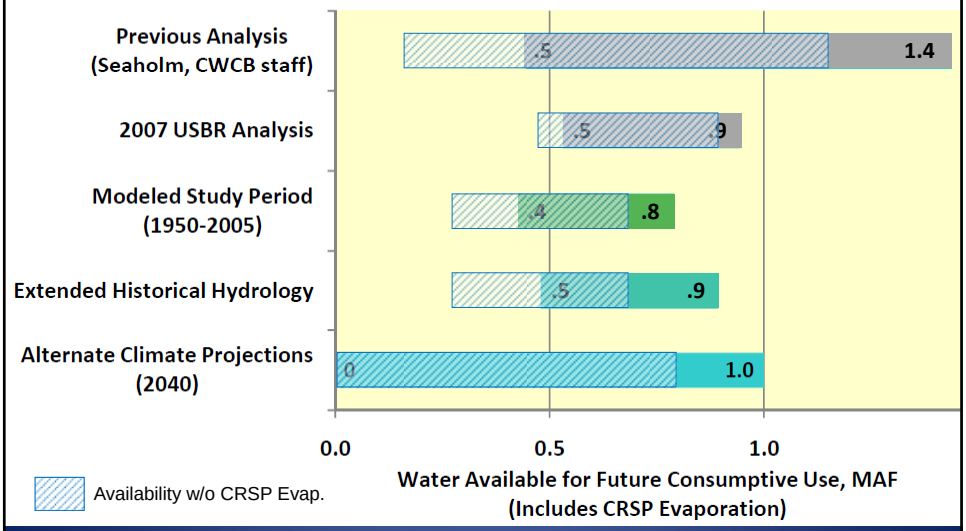
CRWAS Options for Statewide Planning

for discussion purposes

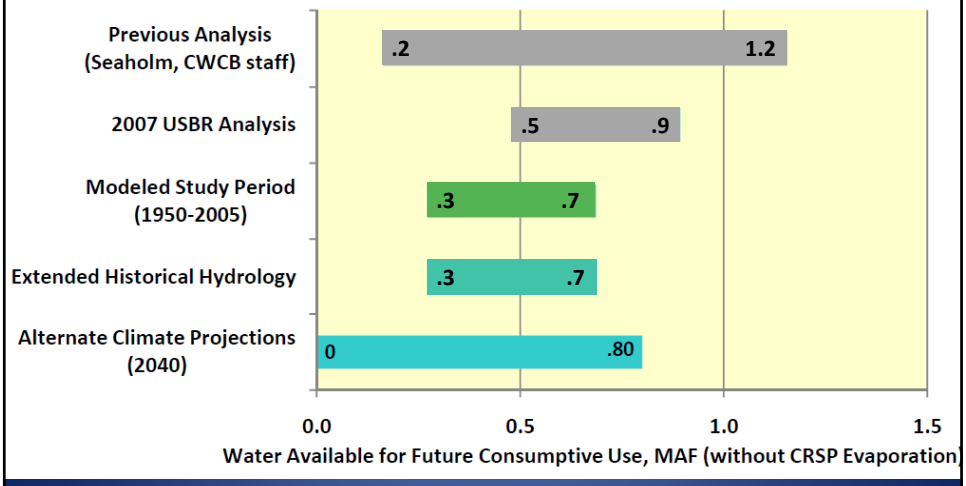
Colorado Water Availability for Future Consumptive Use
(with CRSP evaporation)



Why CRSP Evaporation is Not Included for Planning Ranges

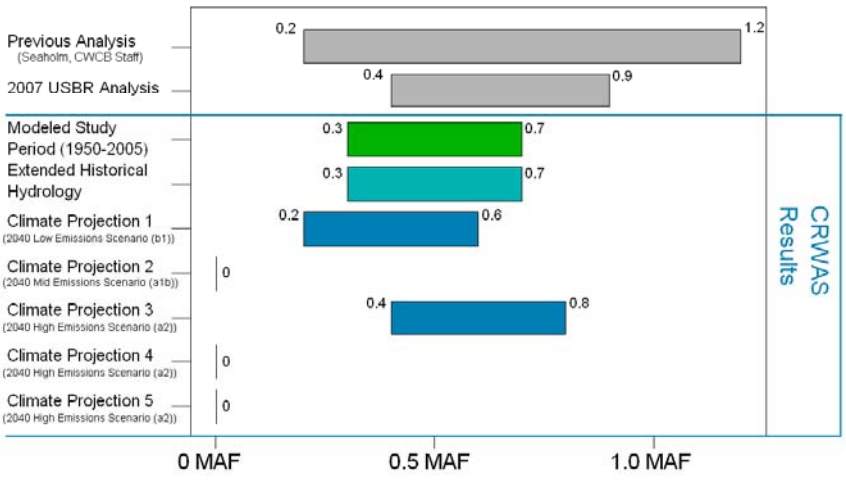
- Originally tried to be consistent with the previous analysis
- For statewide water supply planning purposes, however, the evaporation cannot be utilized

Colorado Water Availability for Future Consumptive Use
(without CRSP evaporation)



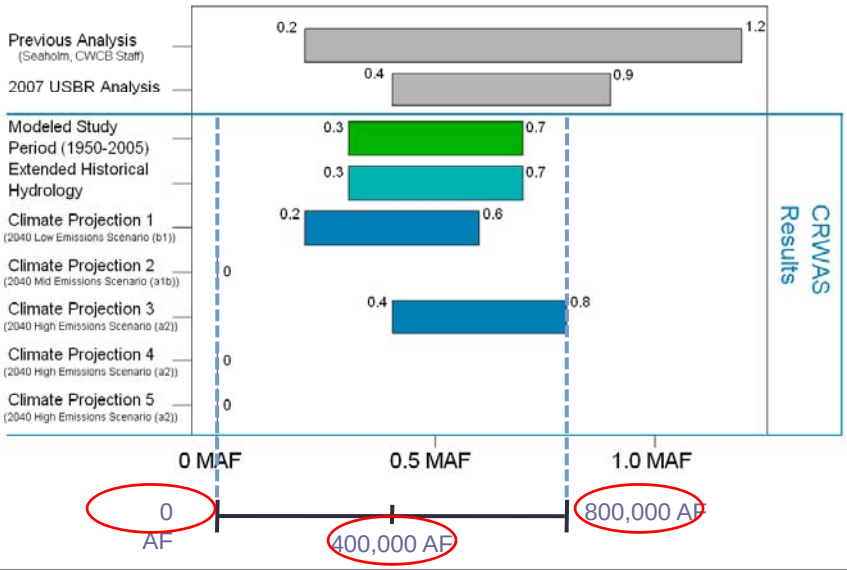
Results Summary

Colorado's Water Availability for Future Consumptive Use
(Without CRSP Evaporation)



Option 1: Full Range Approach

Colorado's Water Availability for Future Consumptive Use
(Without CRSP Evaporation)



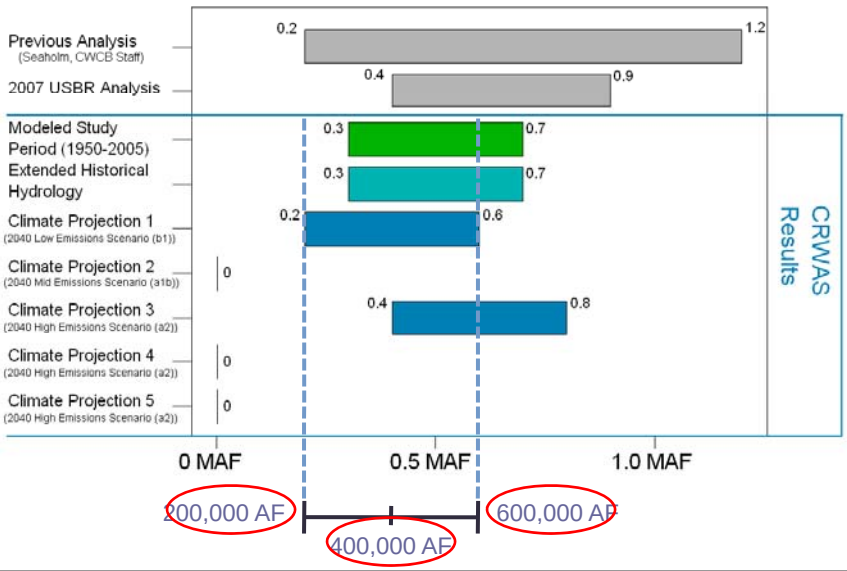
0 AF

800,000 AF

400,000 AF

Option 2: Midpoint / Average Approach

Colorado's Water Availability for Future Consumptive Use
(Without CRSP Evaporation)



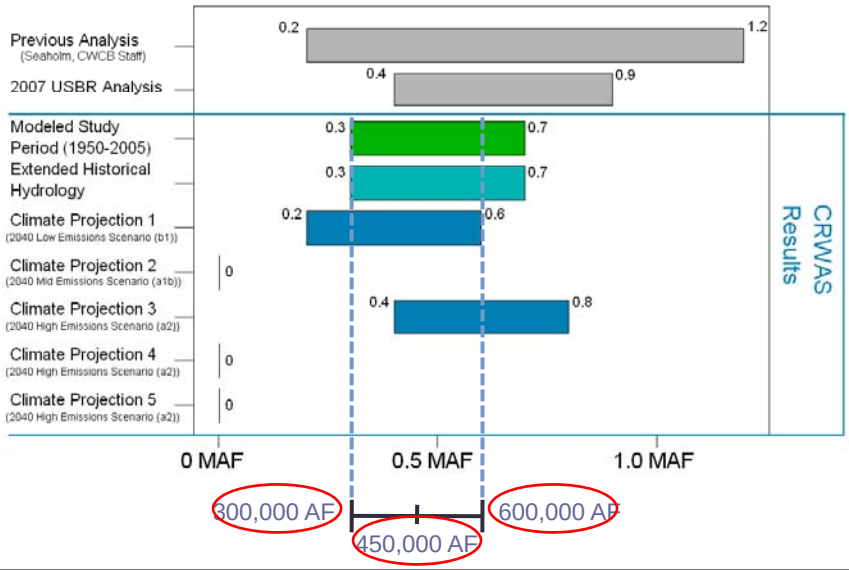
200,000 AF

600,000 AF

400,000 AF

Option 3: Overlap Approach

Colorado's Water Availability for Future Consumptive Use
(Without CRSP Evaporation)



Combined Approach

- Define the mid-range as the overlap area.
- Define the low-range as anything below the mid-range and the high range as anything above the mid-range.
- Take the midpoints of each range as a starting point.
- Conduct a sensitivity analysis to determine how representative the midpoint is and the effect of the extremes of each range on the trade-offs.