

# RECLAMATION

*Managing Water in the West*

## Hood River Basin Study

Surface Water Modeling (DHSVM)

Water Resource Modeling (MODSIM)

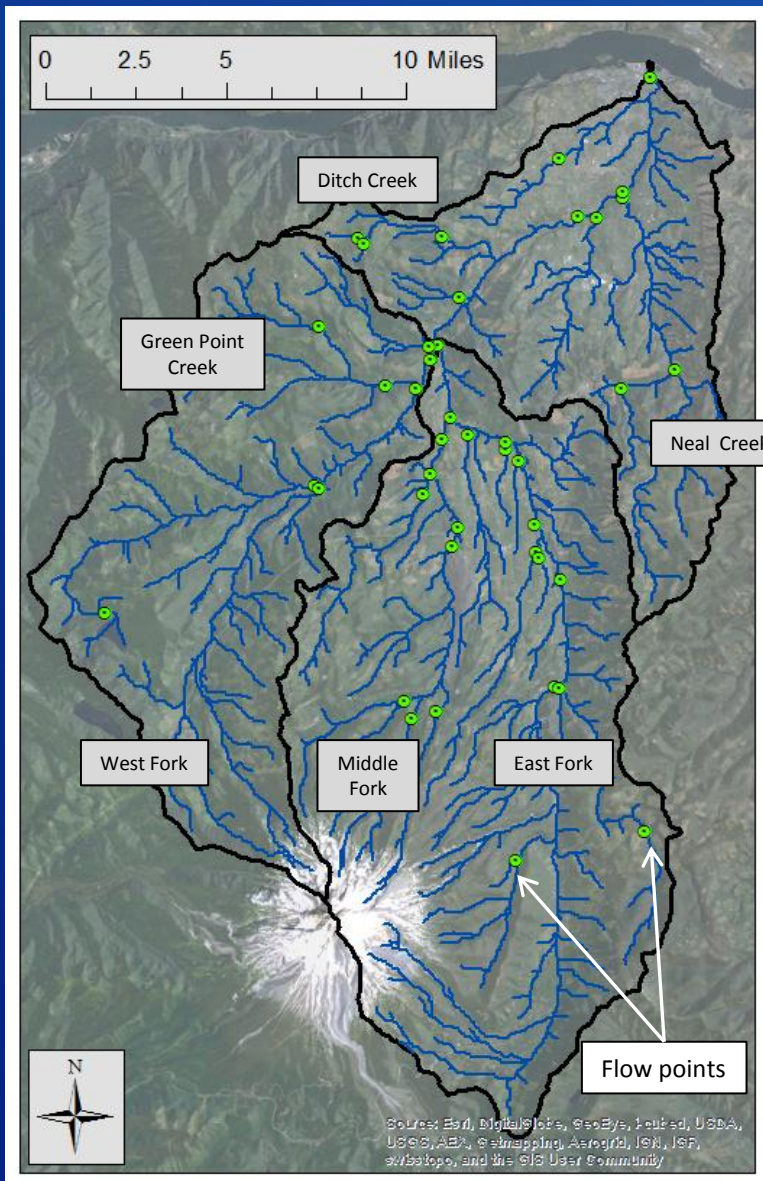
Taylor Dixon, Hydrologist

November 20, 2013

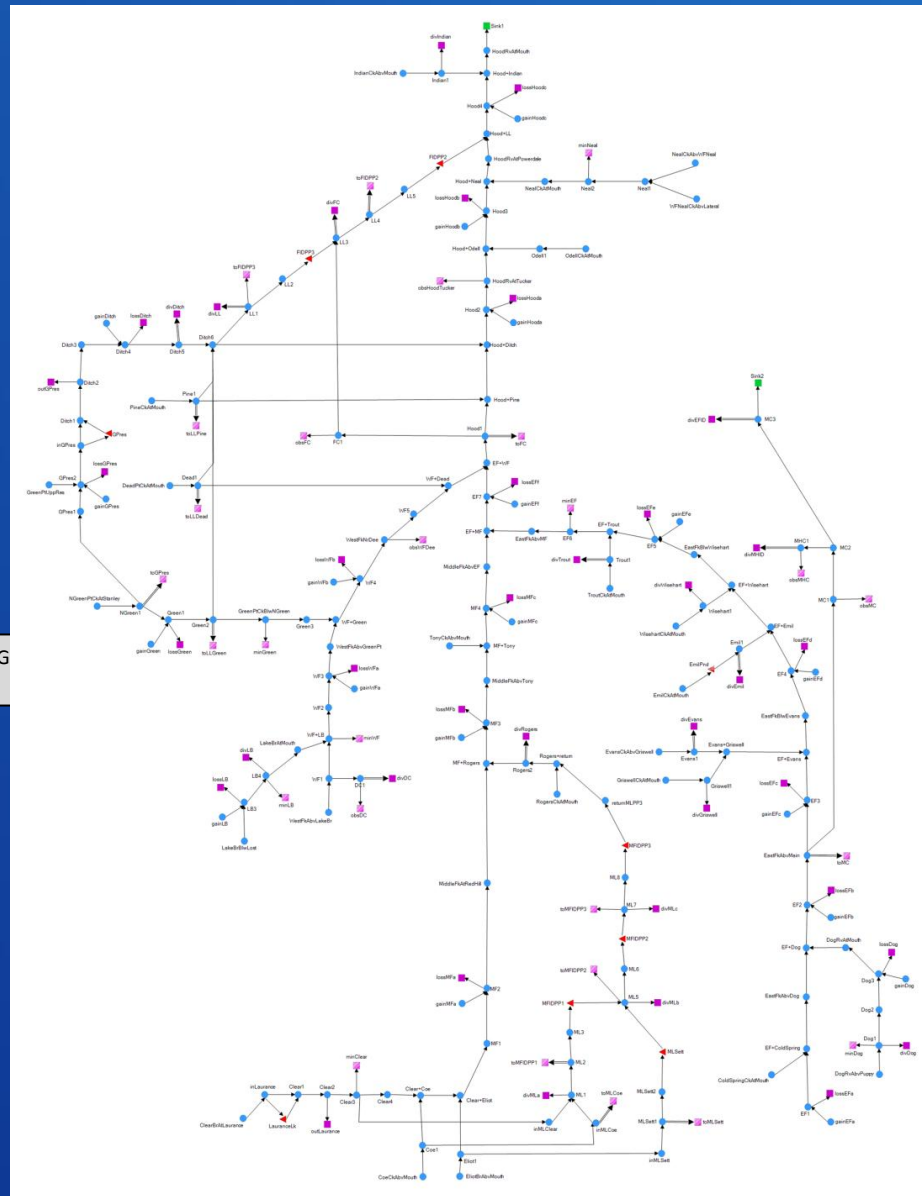


U.S. Department of the Interior  
Bureau of Reclamation

# DHSVM & MODSIM

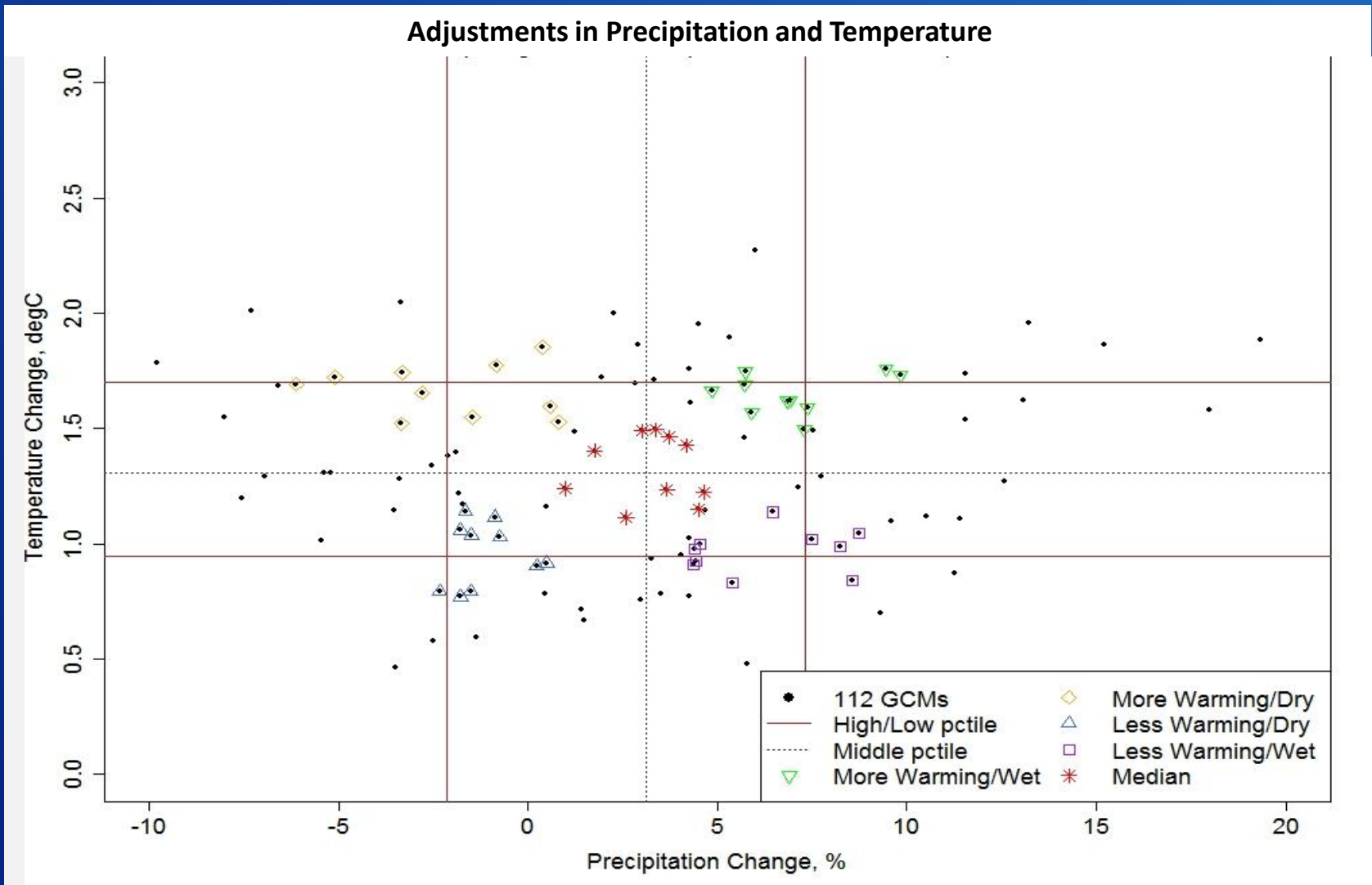


G

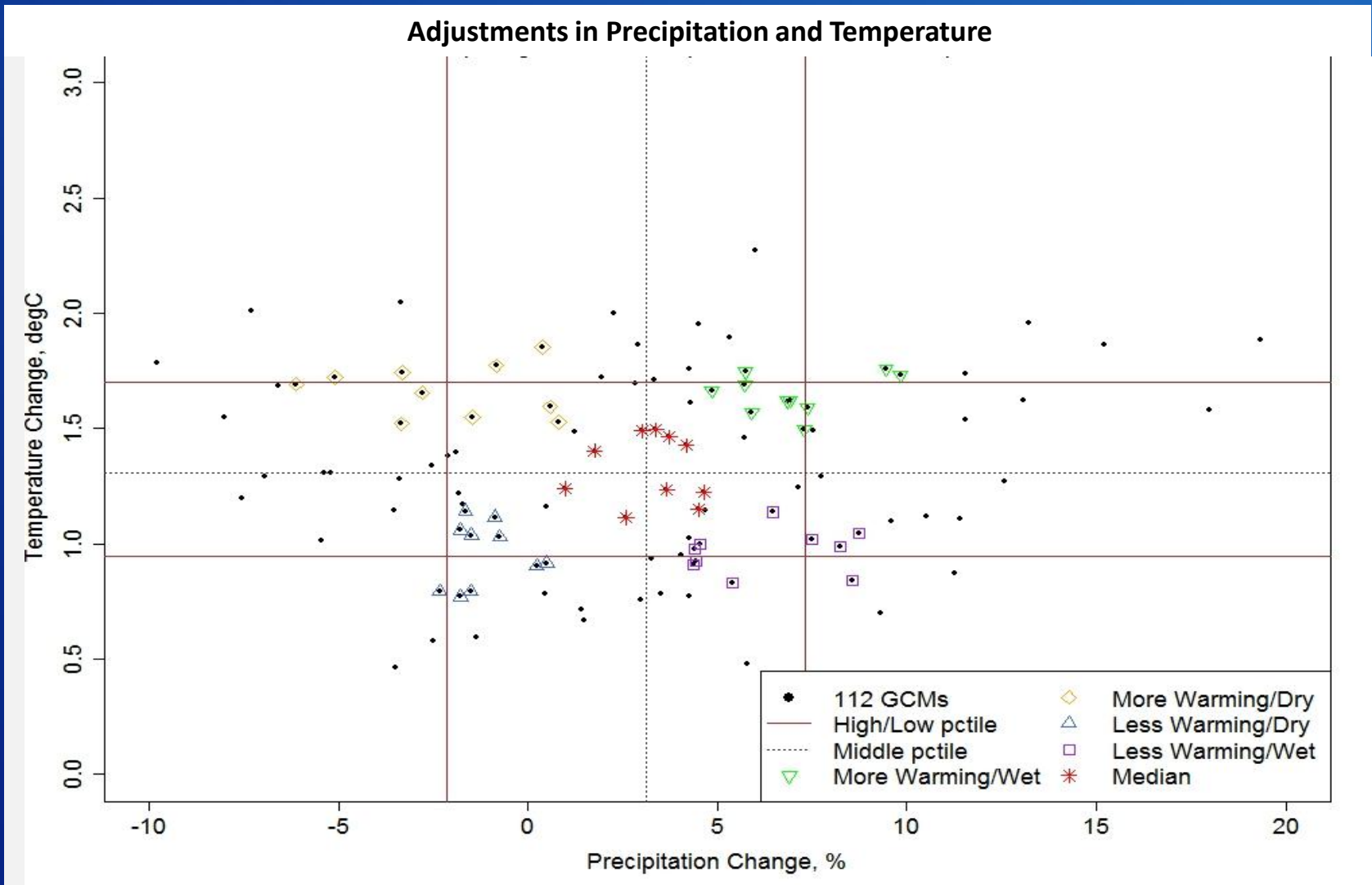


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# Climate Scenario Selection

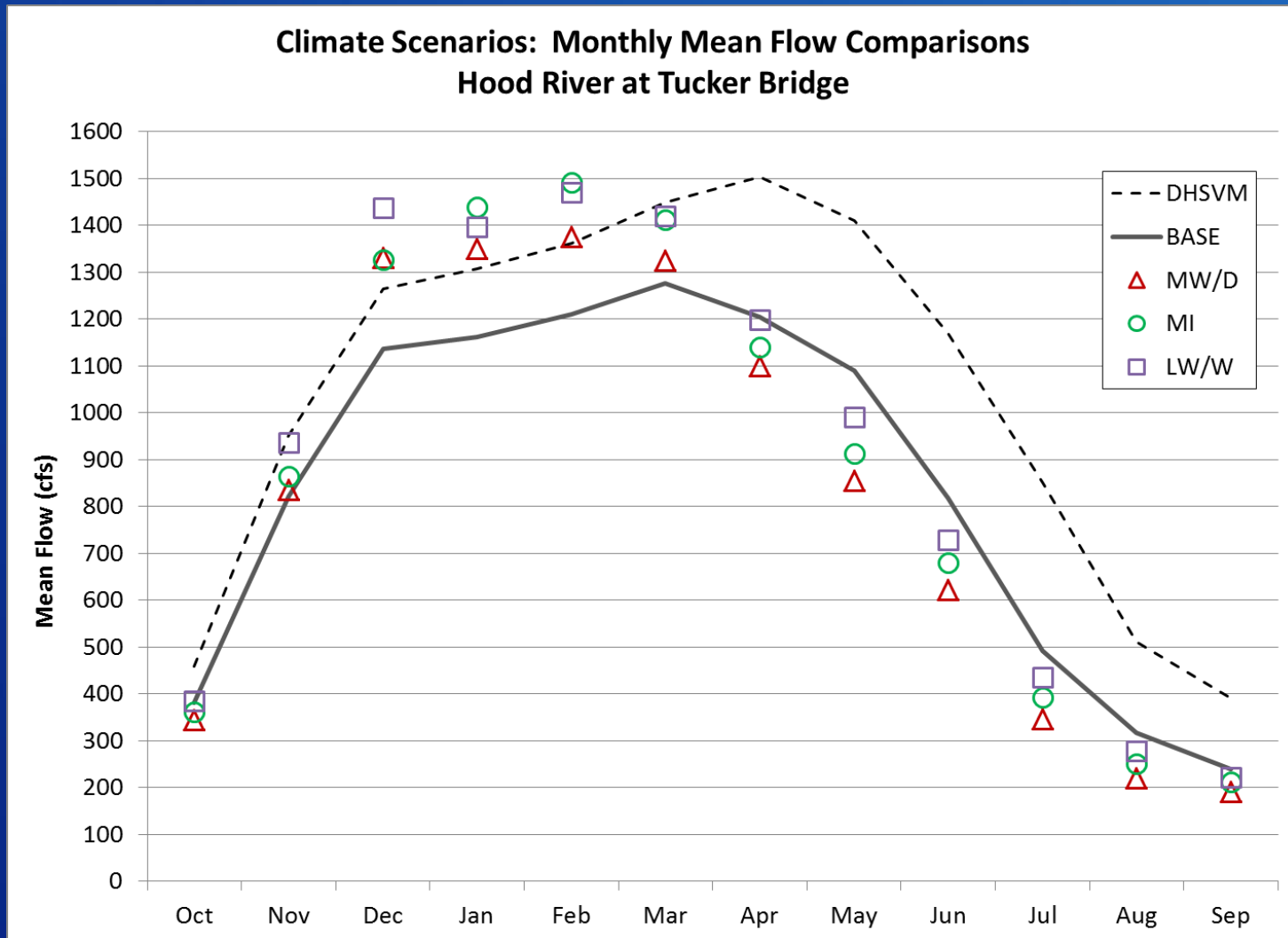


# Climate Scenario Selection





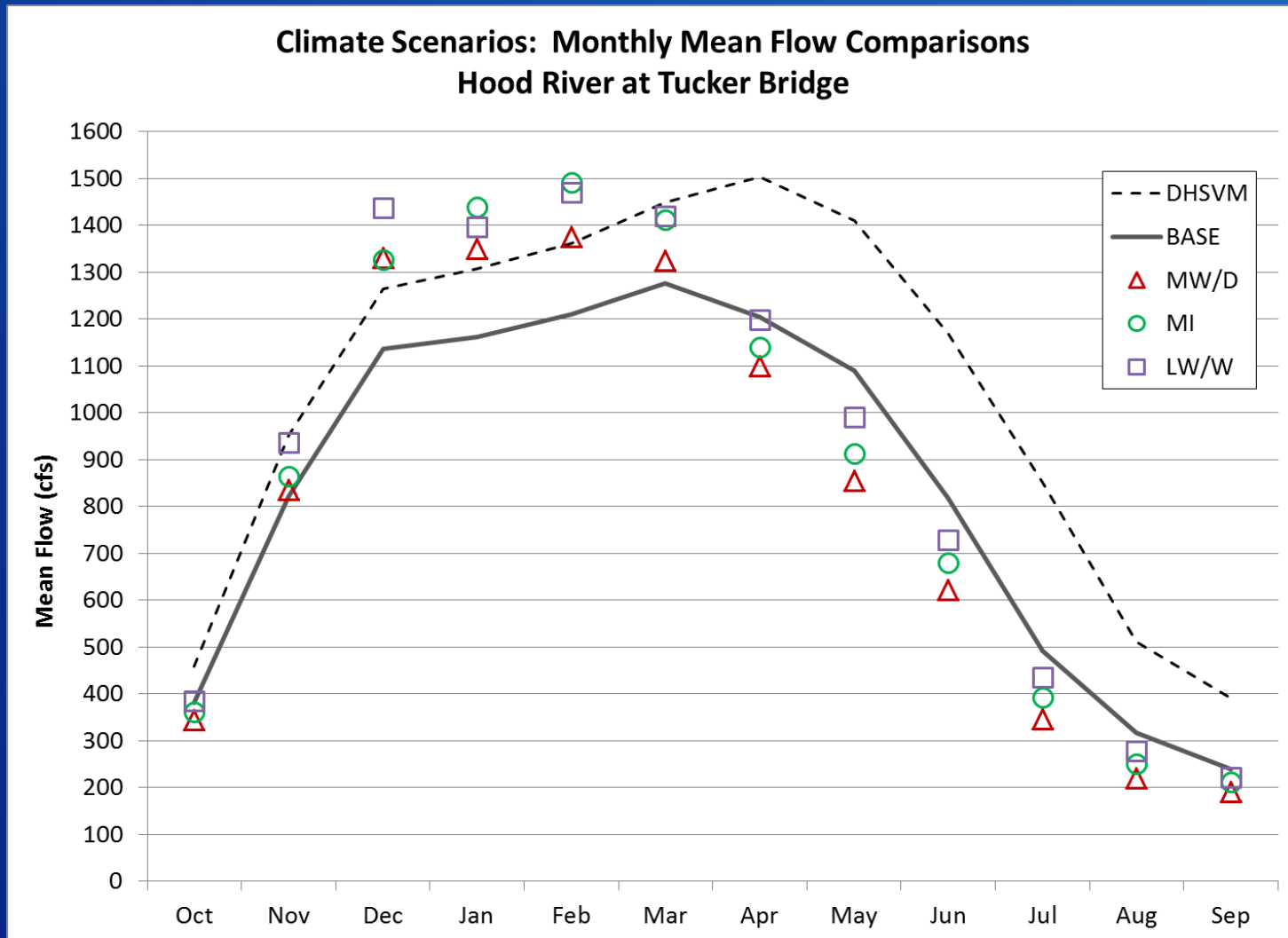
# DHSVM & MODSIM Climate Scenario Results



On an annual basis, *natural* flow volumes relatively unchanged, but runoff timing impacted

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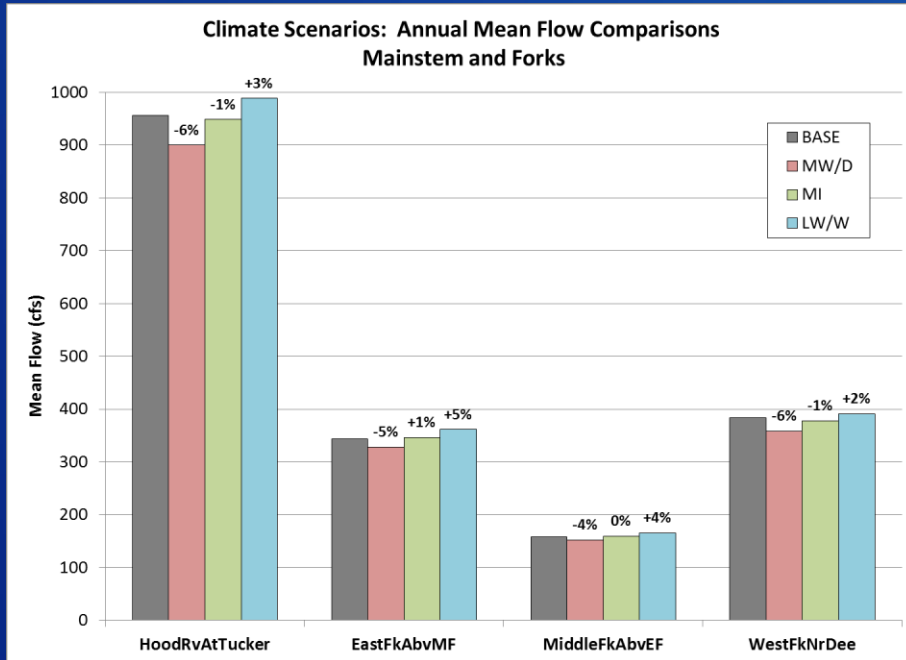
# DHSVM & MODSIM Climate Scenario Results



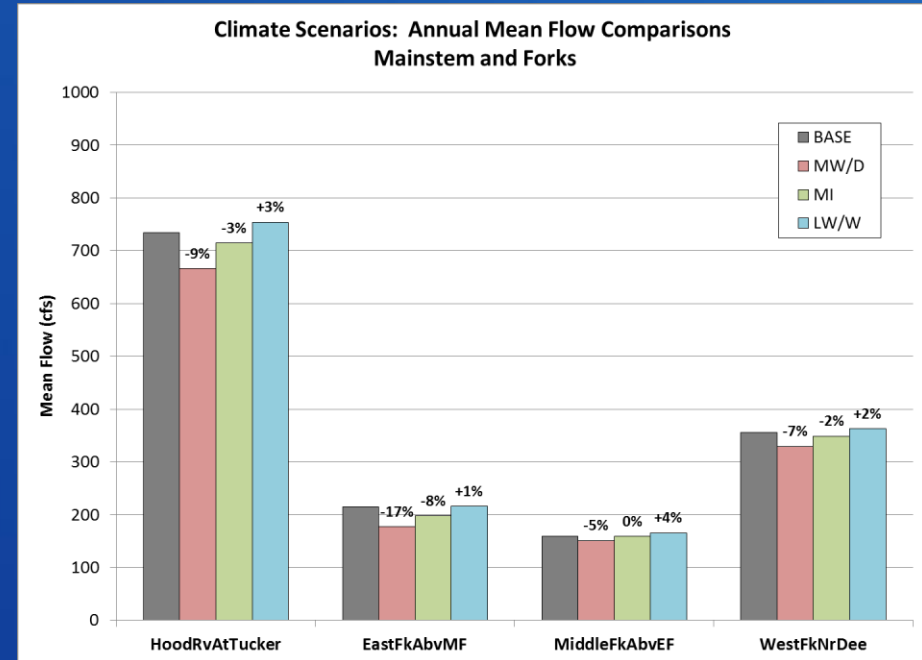
Moreover, seasonal changes more apparent in *regulated* flows

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# DHSVM & MODSIM Climate Scenario Results



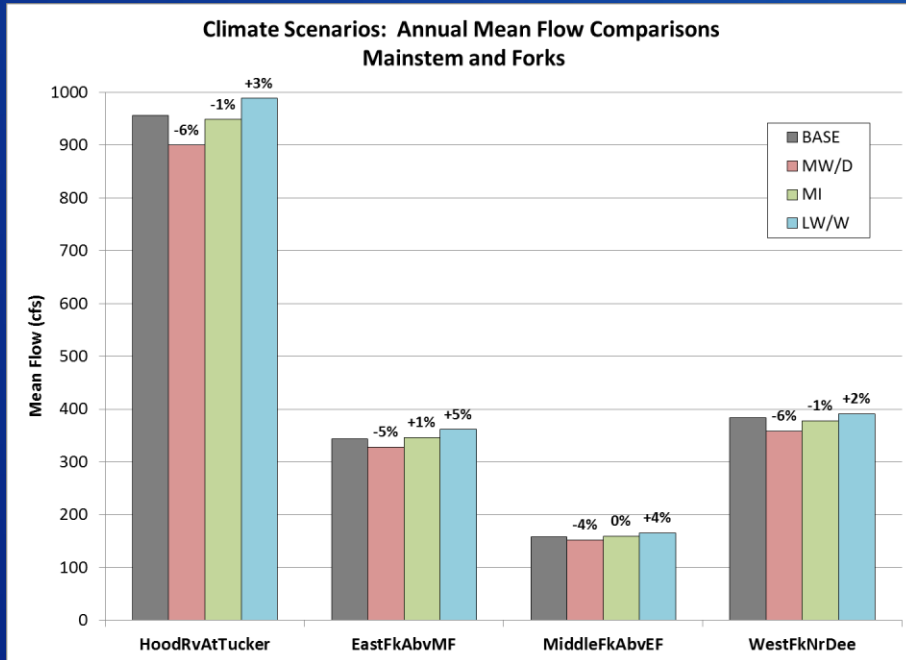
DHSVM



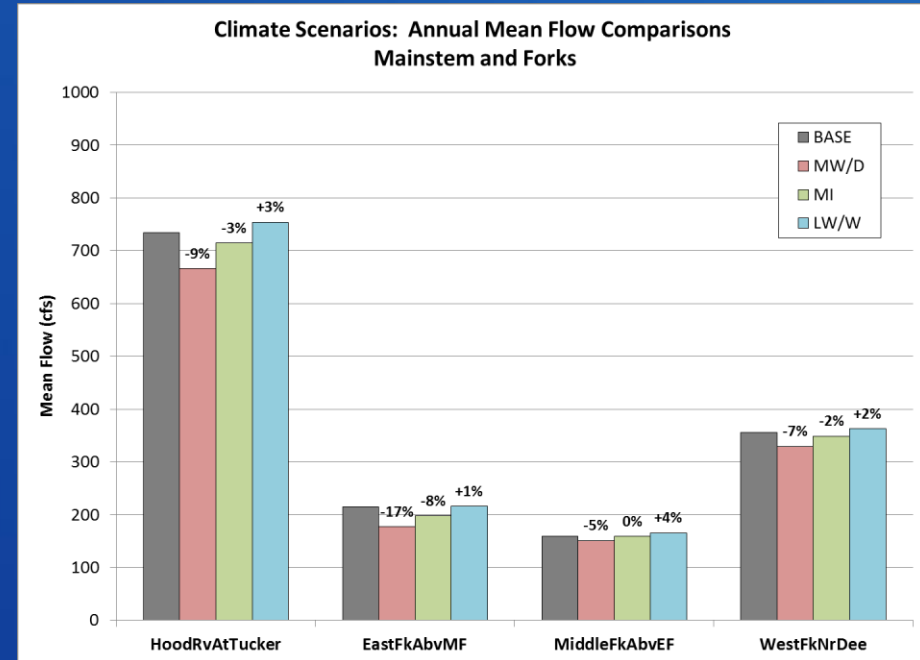
MODSIM

*Relative changes in annual mean flows more apparent after considering water usages*

# DHSVM & MODSIM Climate Scenario Results



DHSVM

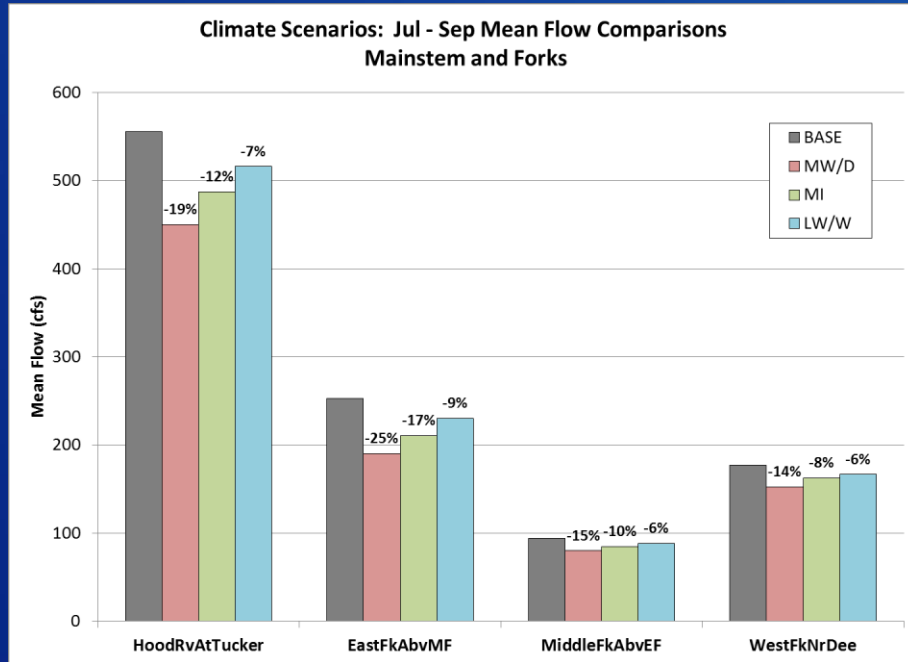


MODSIM

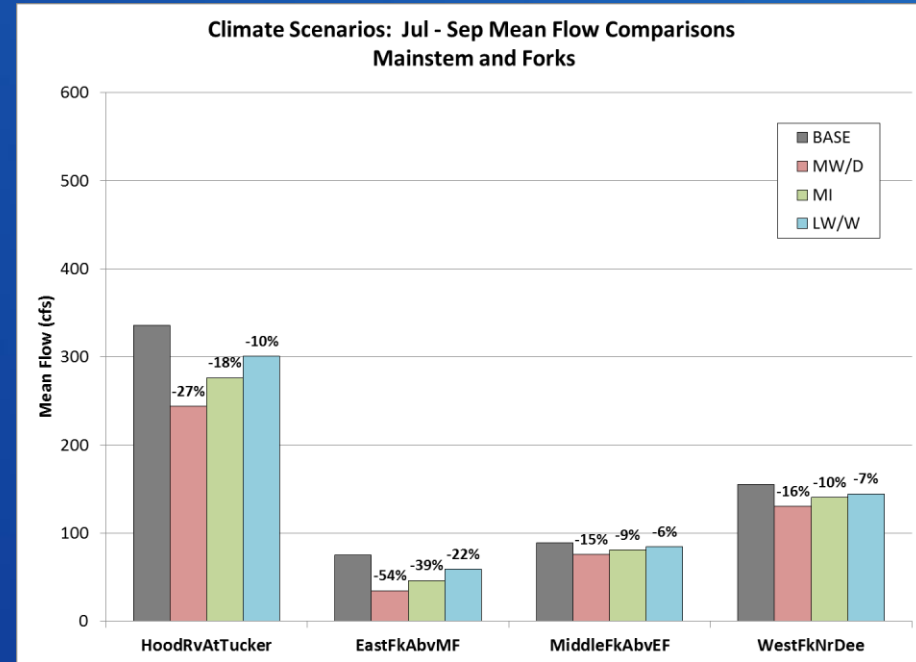
*Relative changes in annual mean flows more apparent after considering water usages*



# DHSVM & MODSIM Climate Scenario Results



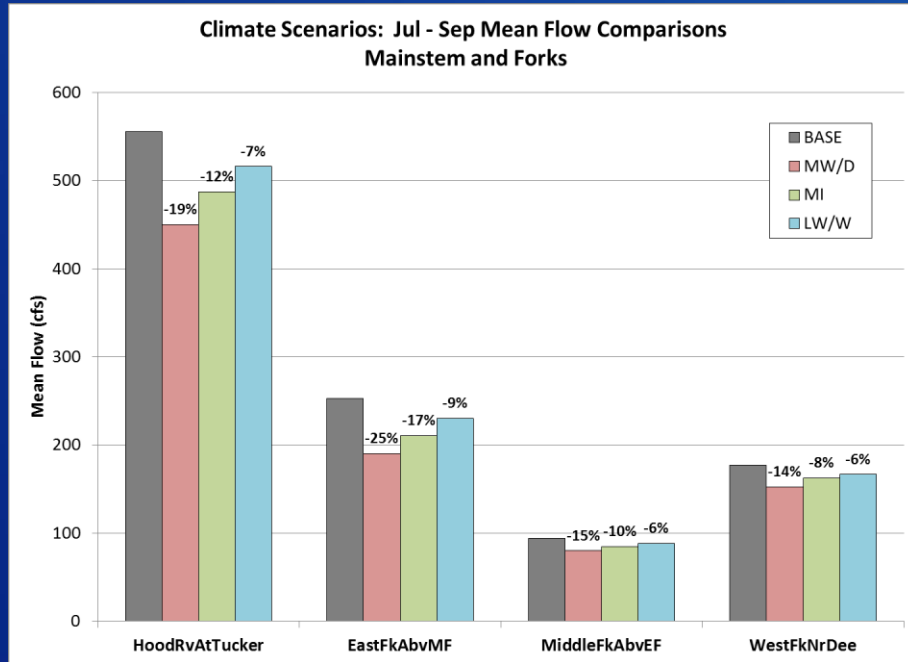
DHSVM



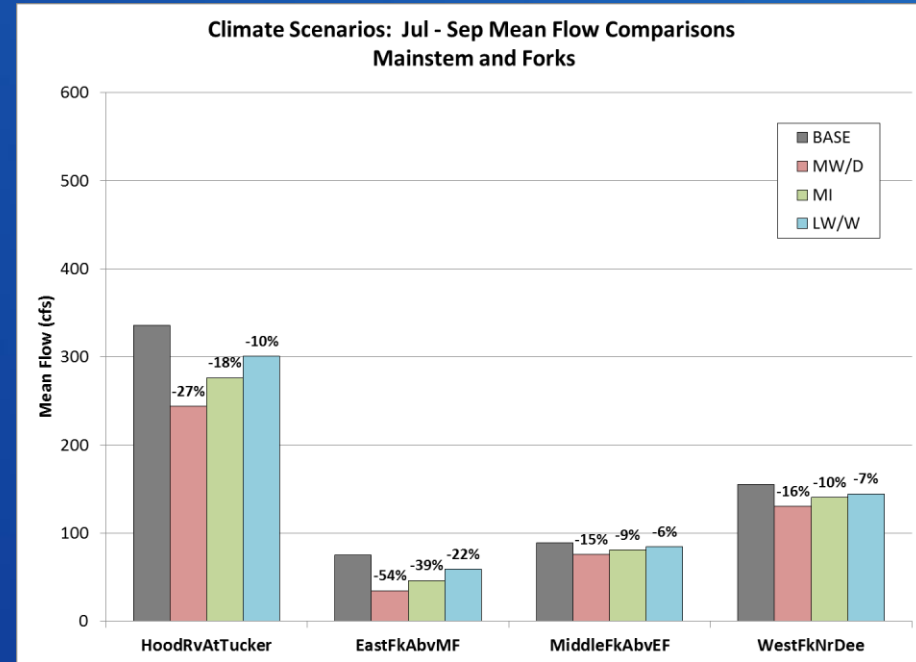
MODSIM

Relative changes in late summer mean flows amplified after considering water usages

# DHSVM & MODSIM Climate Scenario Results



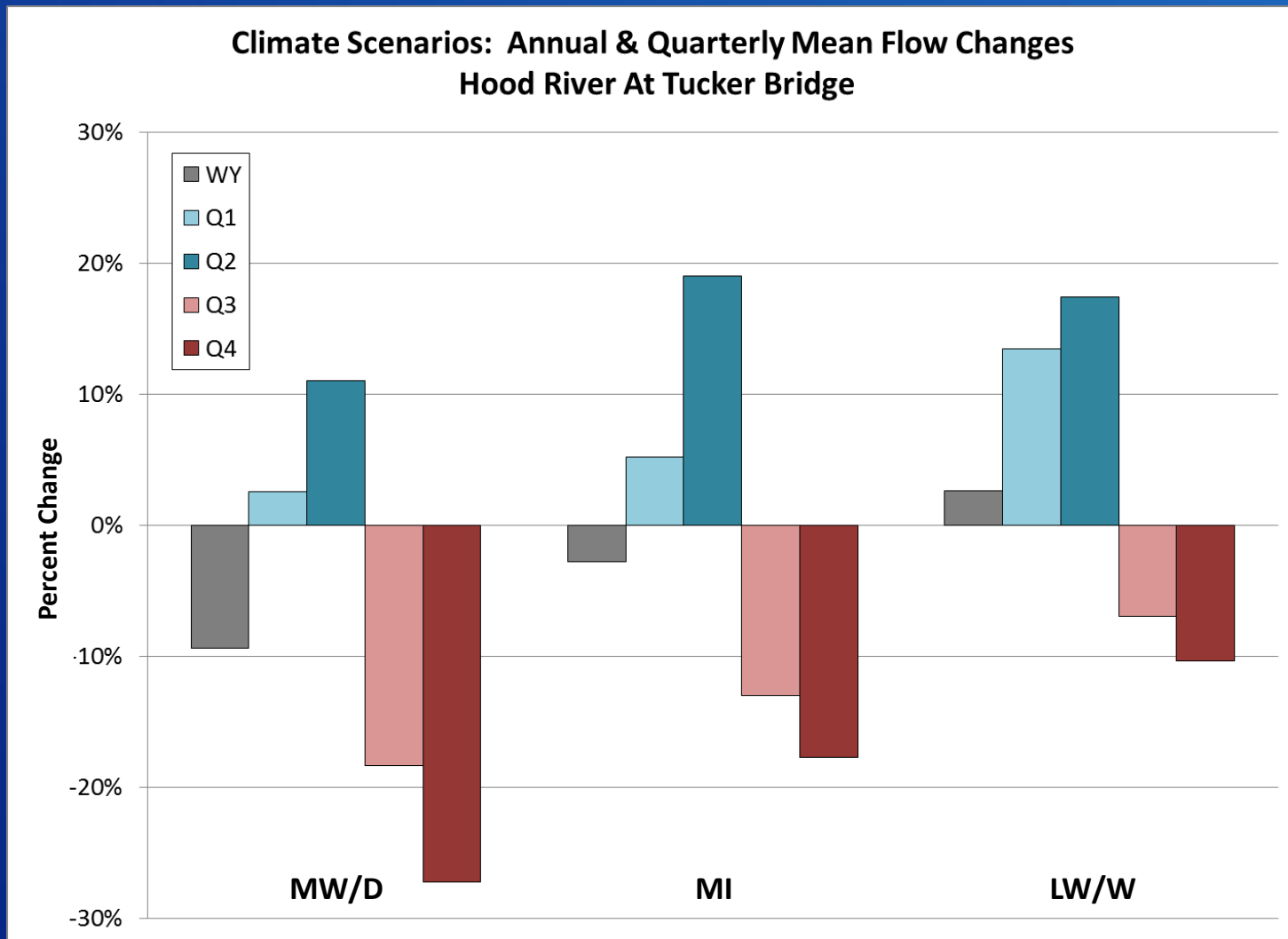
DHSVM



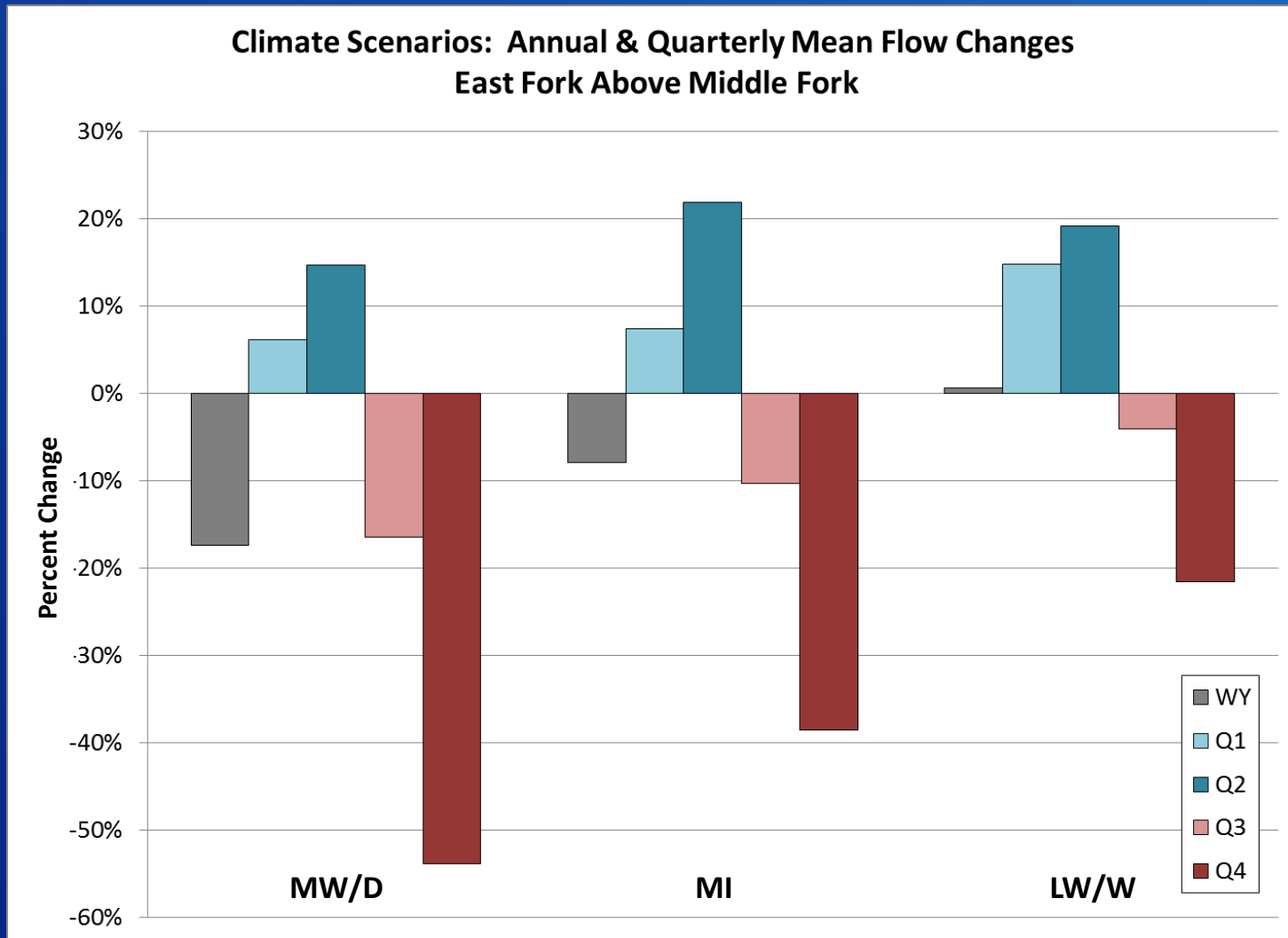
MODSIM

Relative changes in late summer mean flows amplified after considering water usages

# MODSIM Climate Scenario Results

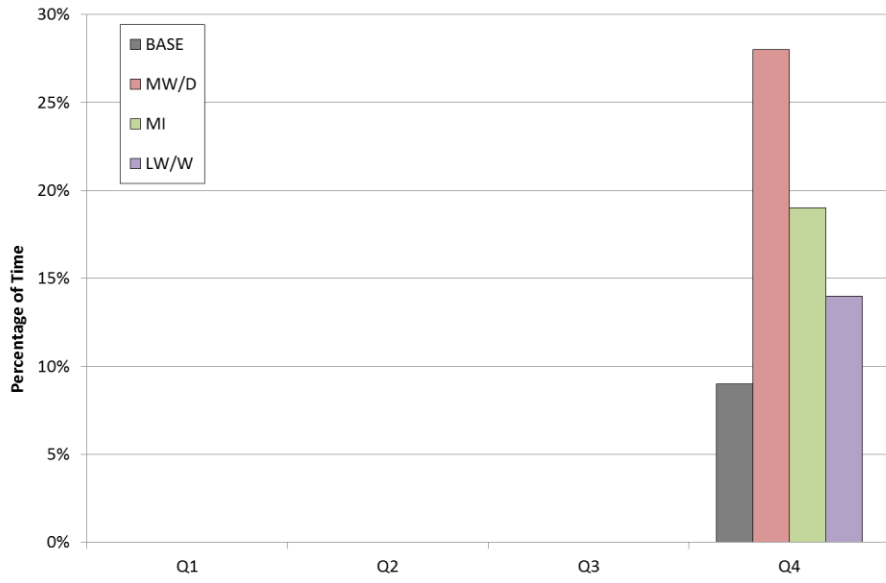


# MODSIM Climate Scenario Results

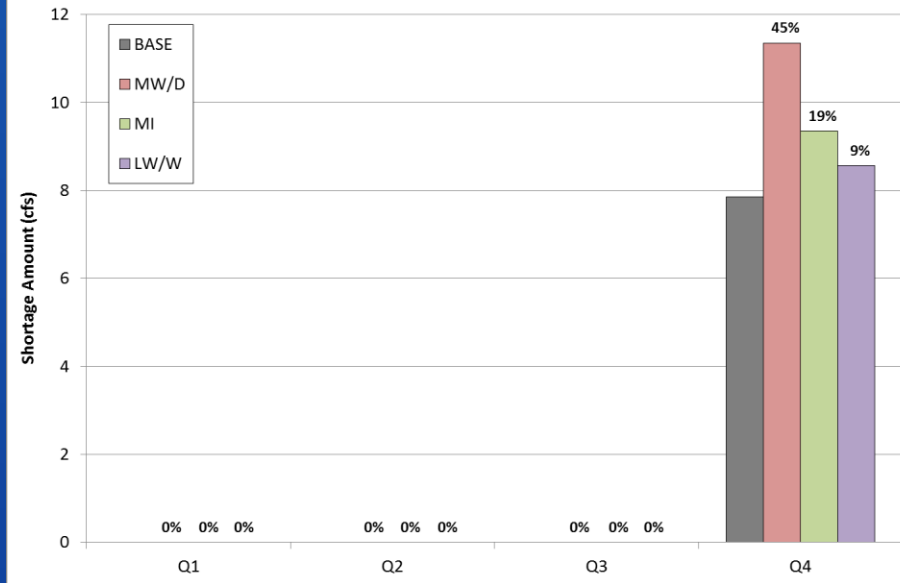


# MODSIM Climate Scenario Results

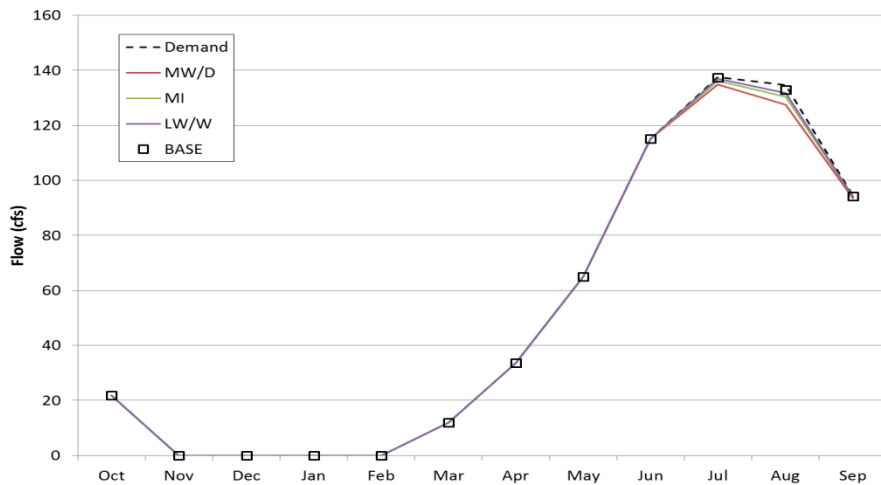
Climate Scenarios: Quarterly Shortage Occurrence Comparisons  
East Fork Main Canal



Climate Scenarios: Quarterly Mean Shortage Comparisons  
East Fork Main Canal



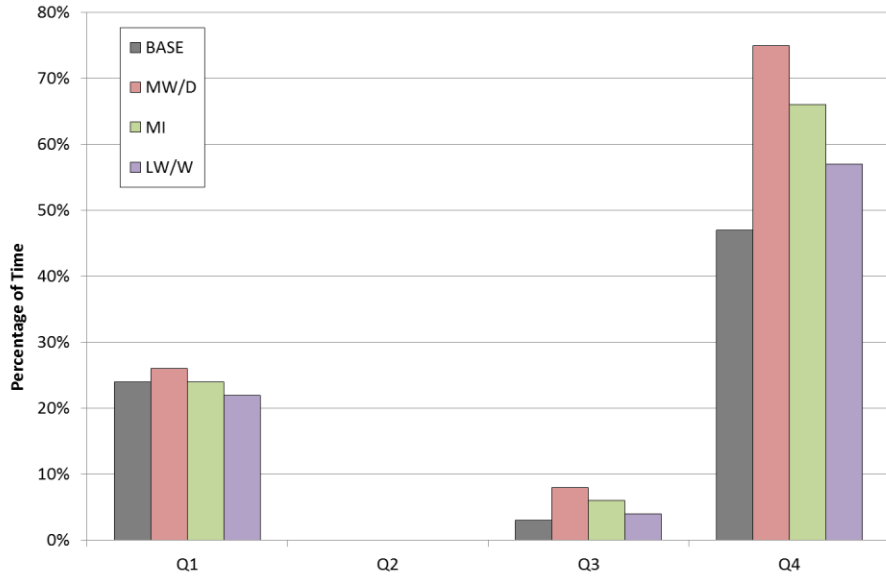
Climate Scenarios: Mean Monthly Demand Flows  
East Fork Main Canal



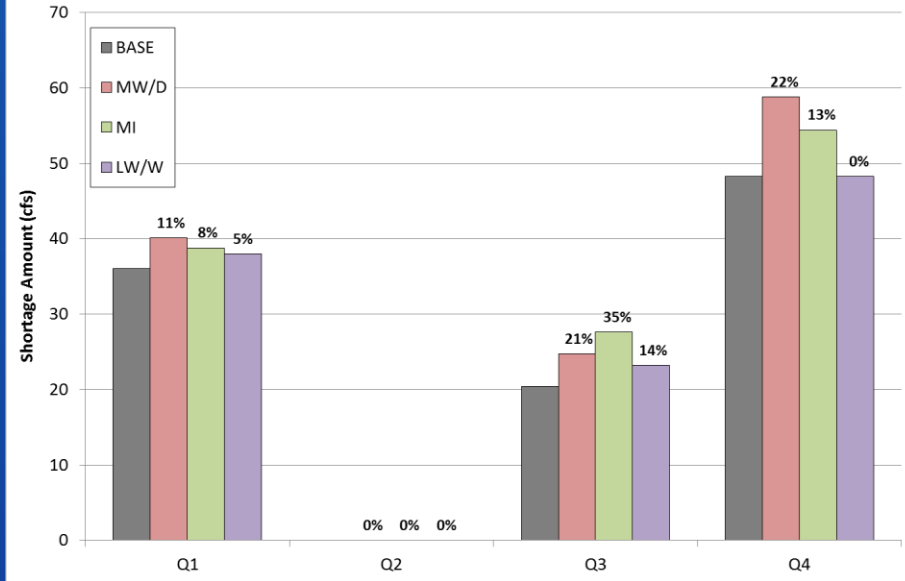
Both the magnitudes and occurrences of shortages increase

# MODSIM Climate Scenario Results

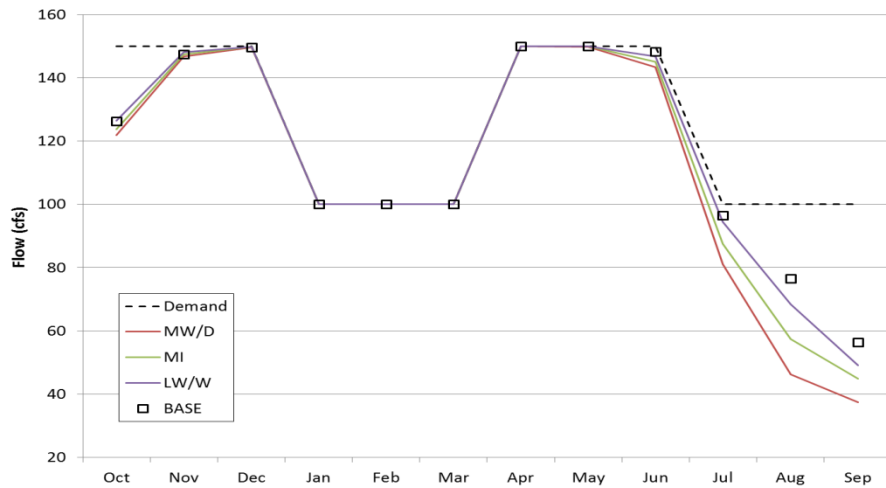
Climate Scenarios: Quarterly Shortage Occurrence Comparisons  
East Fork Minimum Flow Requirement



Climate Scenarios: Quarterly Mean Shortage Comparisons  
East Fork Minimum Flow Requirement



Climate Scenarios: Mean Monthly Demand Flows  
East Fork Minimum Flow Requirement



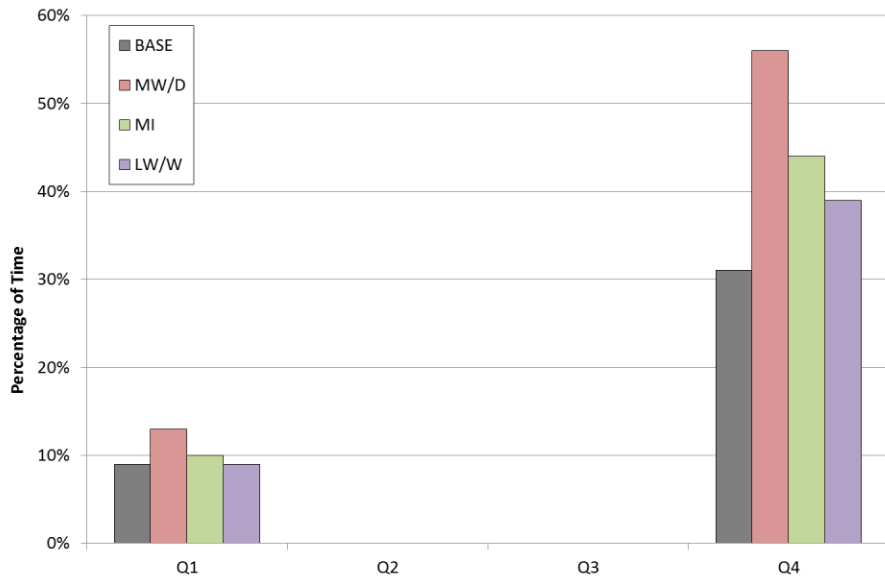
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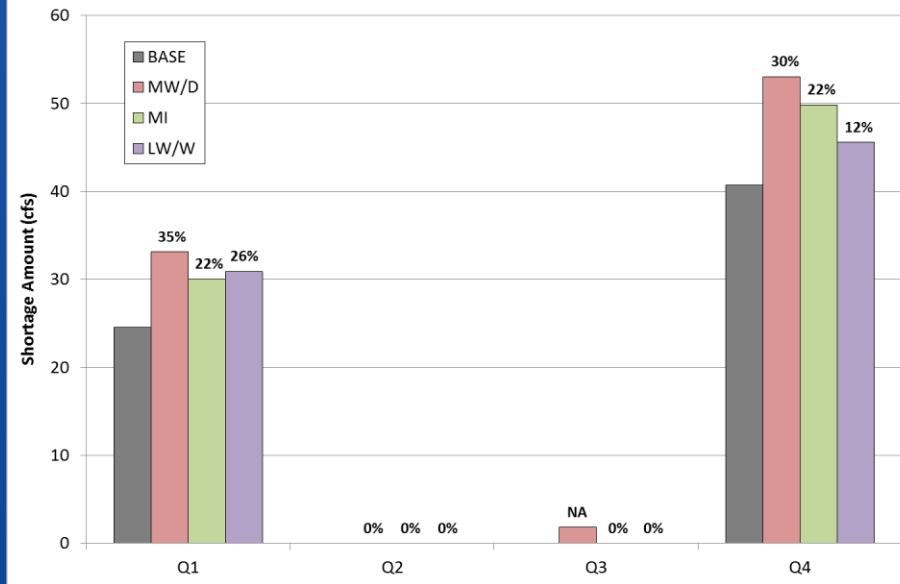


# MODSIM Climate Scenario Results

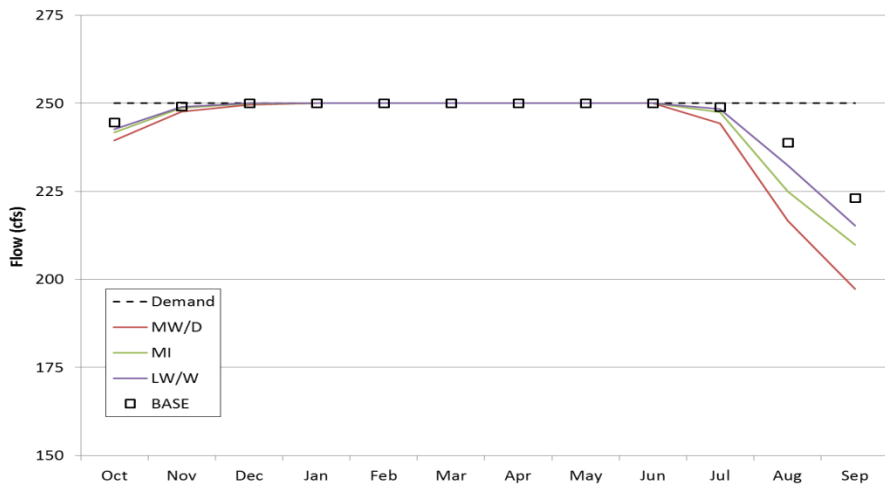
Climate Scenarios: Quarterly Shortage Occurrence Comparisons  
Hood River Minimum Flow Requirement



Climate Scenarios: Quarterly Mean Shortage Comparisons  
Hood River Minimum Flow Requirement



Climate Scenarios: Mean Monthly Demand Flows  
Hood River Minimum Flow Requirement



Both the magnitudes and occurrences of shortages increase

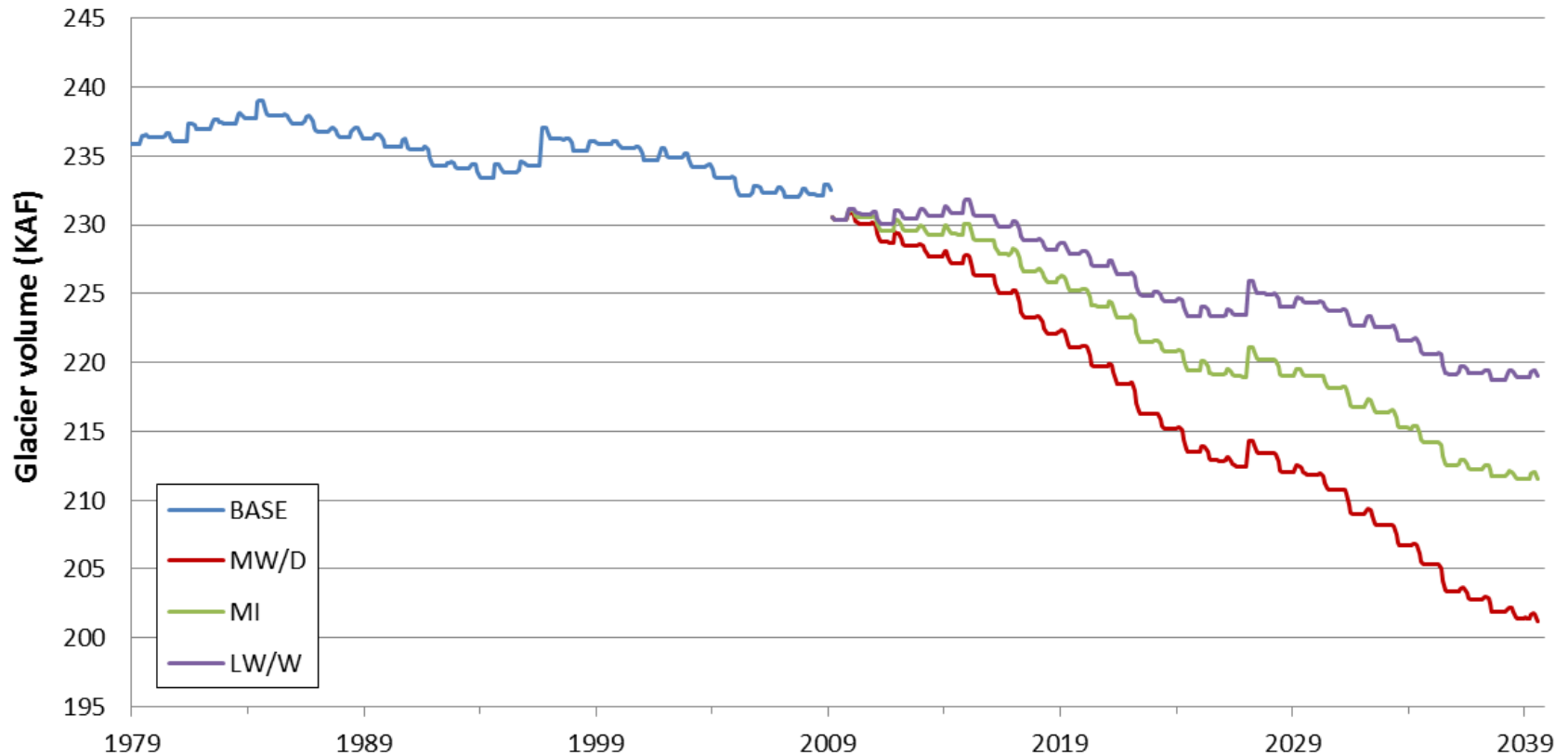
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Questions?

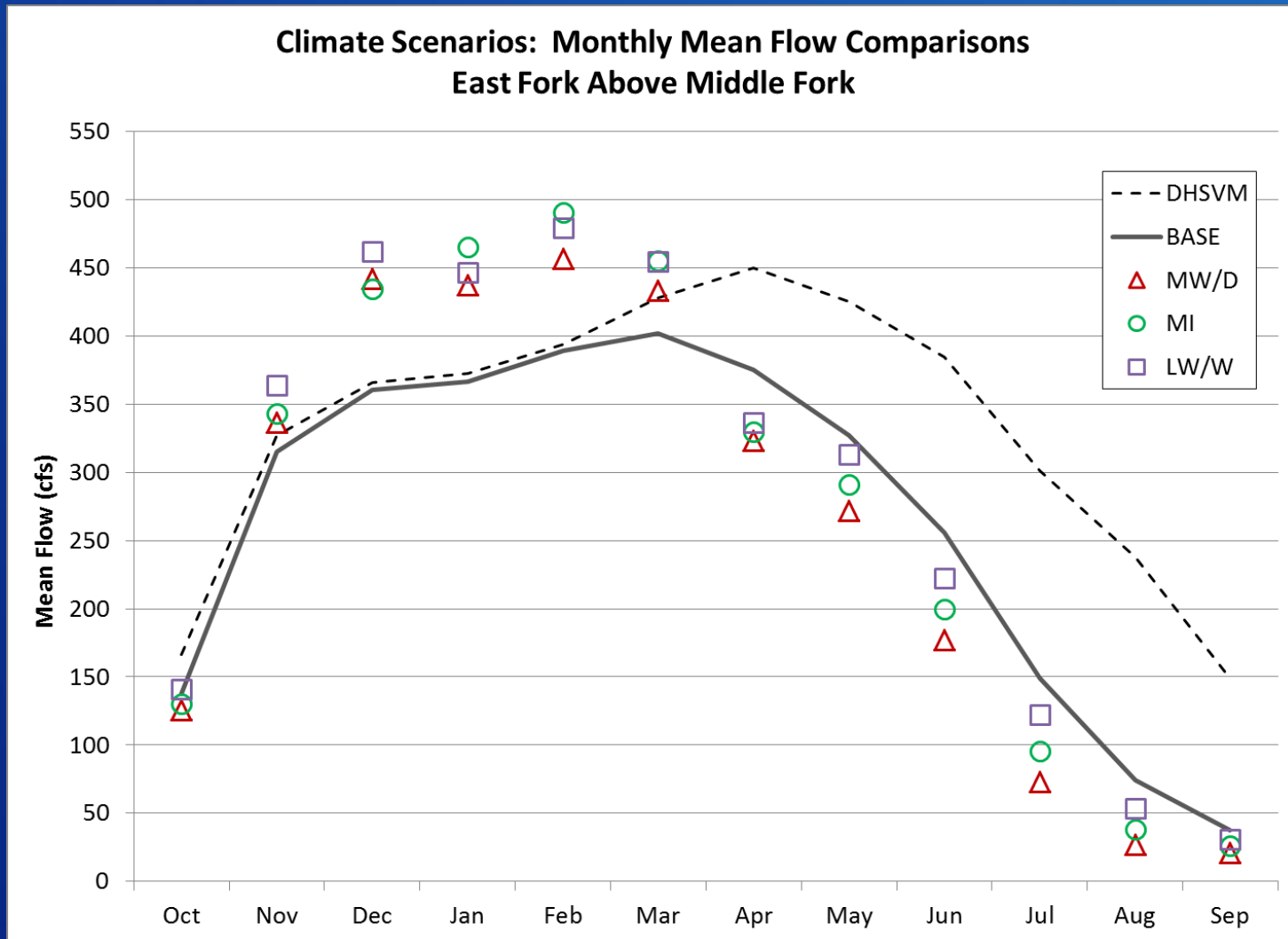
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# DHSVM Climate Scenario Results

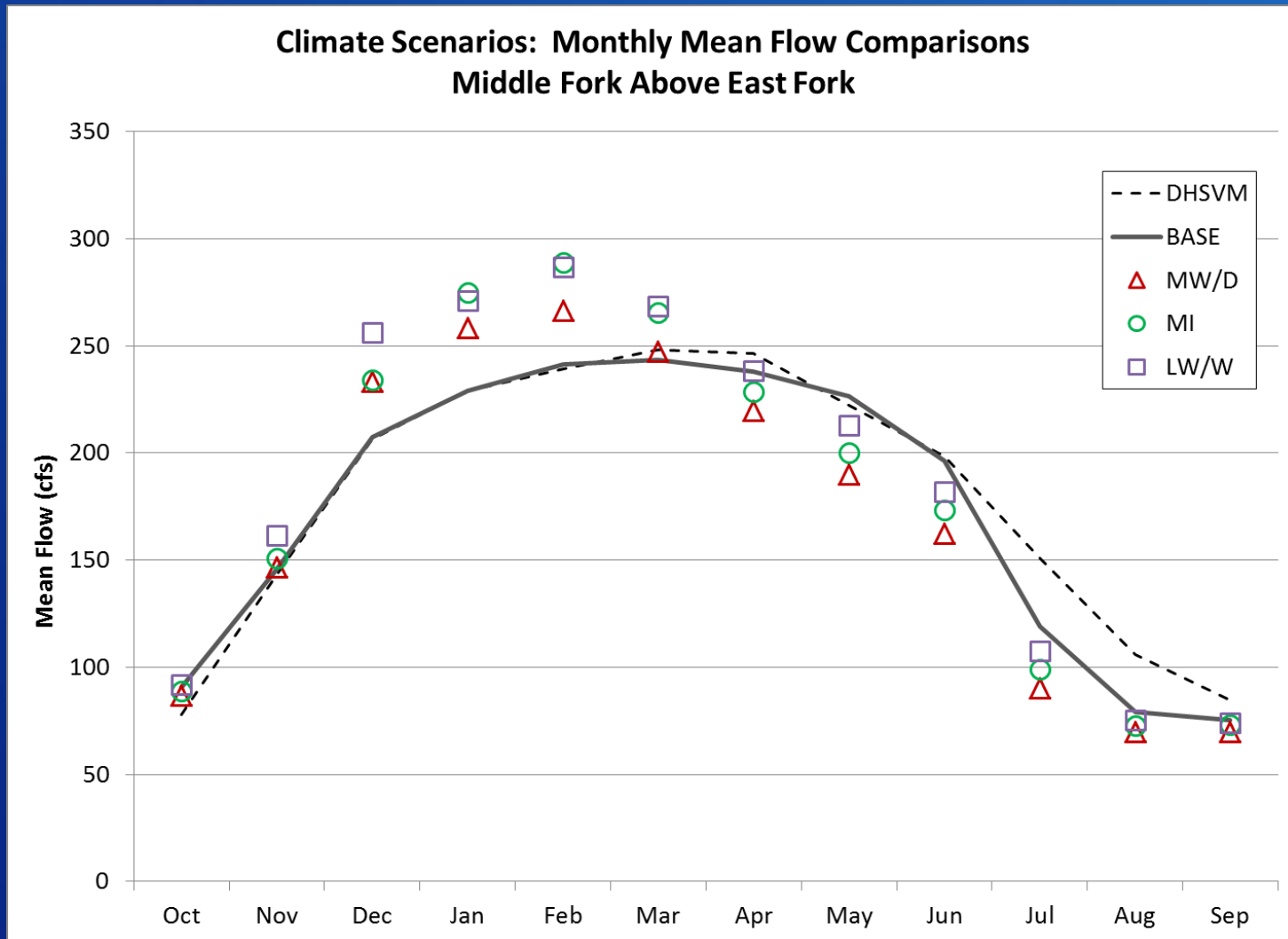
## Climate Scenarios: Simulated Glacier Volume Comparisons



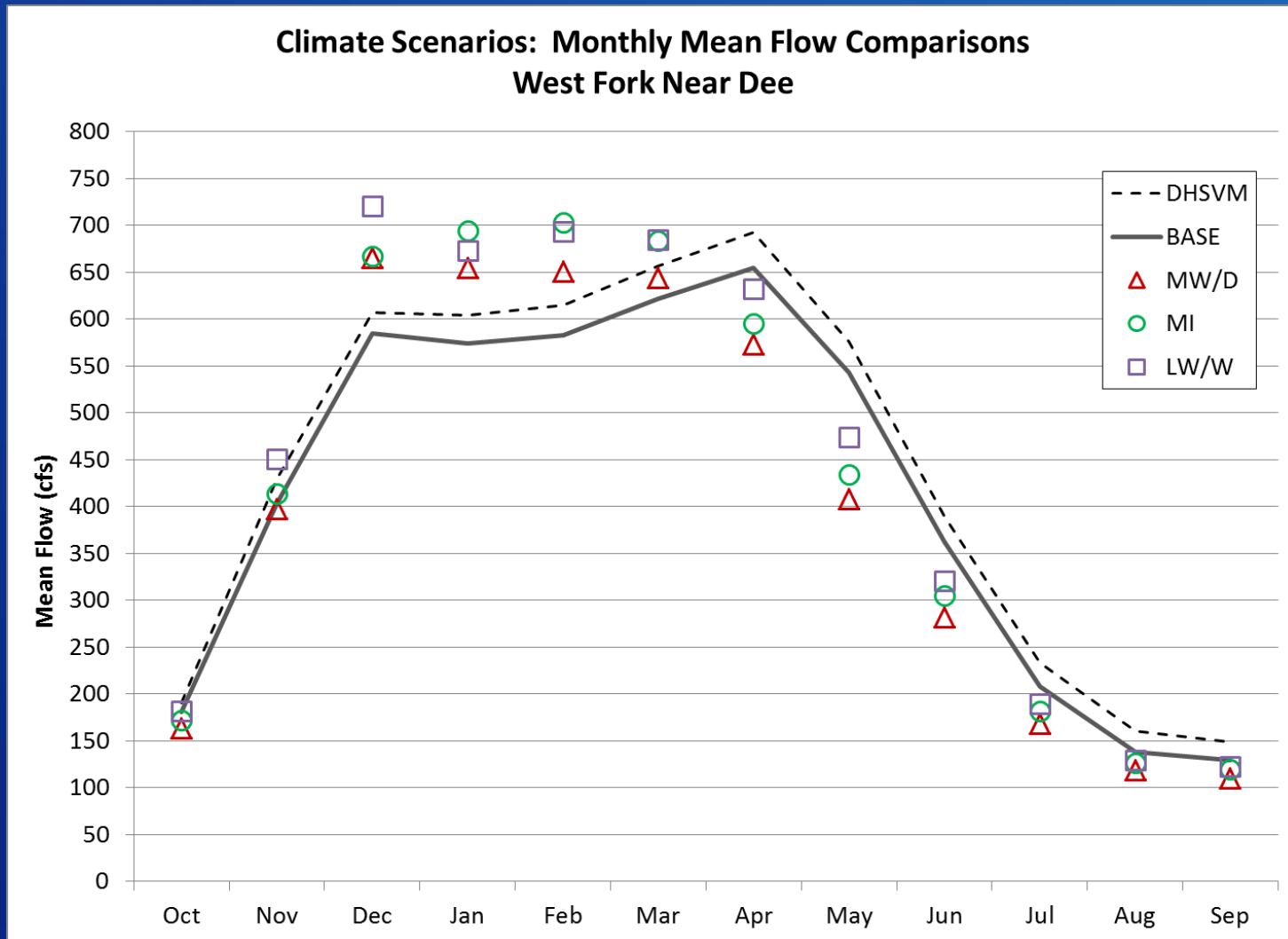
# DHSVM & MODSIM Climate Scenario Results



# DHSVM & MODSIM Climate Scenario Results

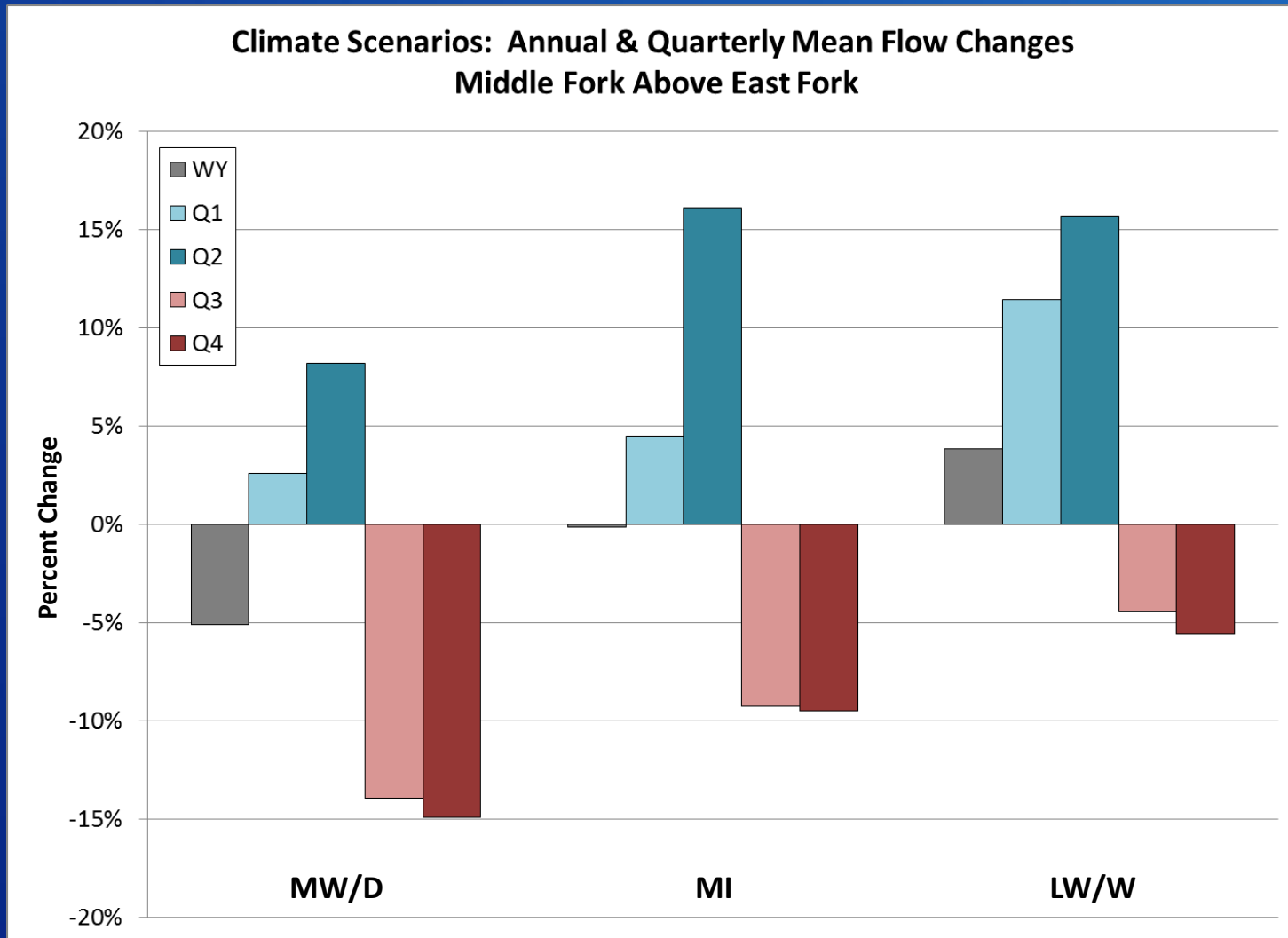


# DHSVM & MODSIM Climate Scenario Results





# MODSIM Climate Scenario Results



# MODSIM Climate Scenario Results

