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Projecting Water Scarcity Across Scales: Case Study of the Colorado River Basin

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Southern Plains DEWS Partners Meeting

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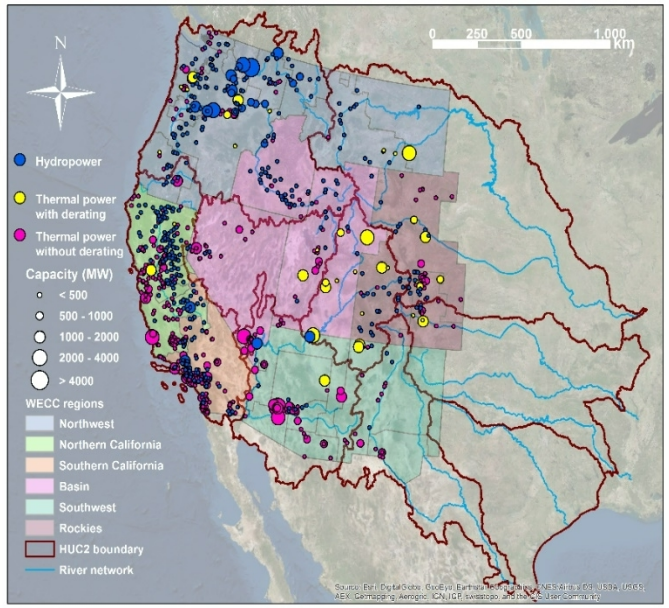
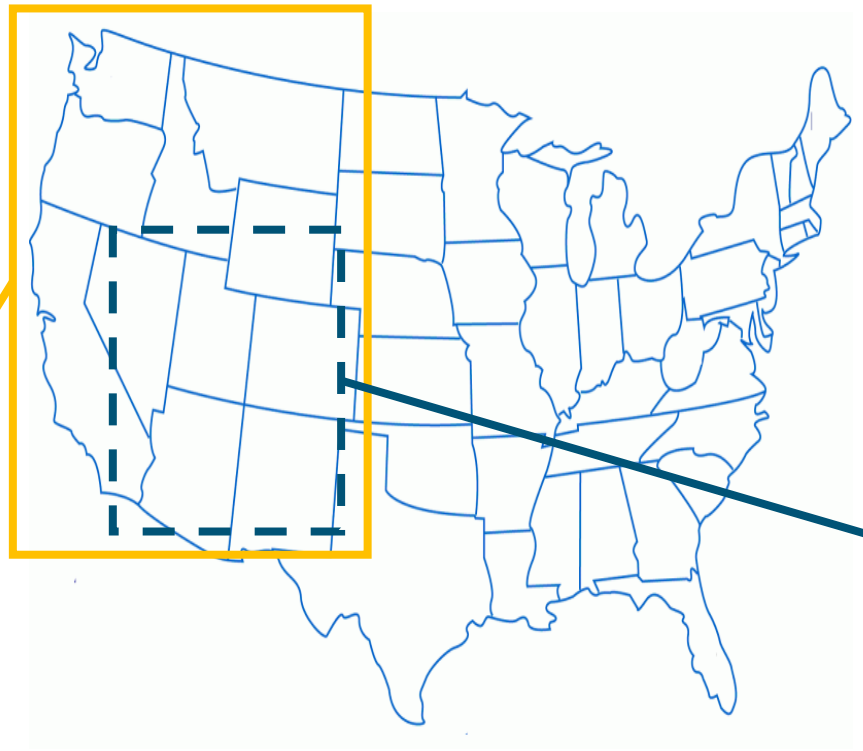
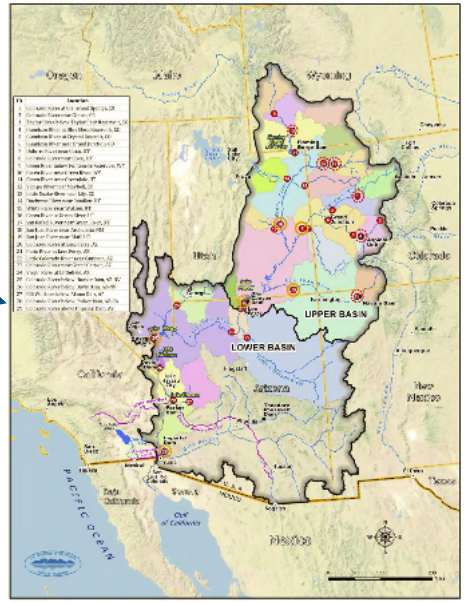
Western United States and the Colorado River basin are exemplars for Integrated Multi-Sector, Multi-Scale Modeling (IM3)

Western Interconnect





Colorado River Basin

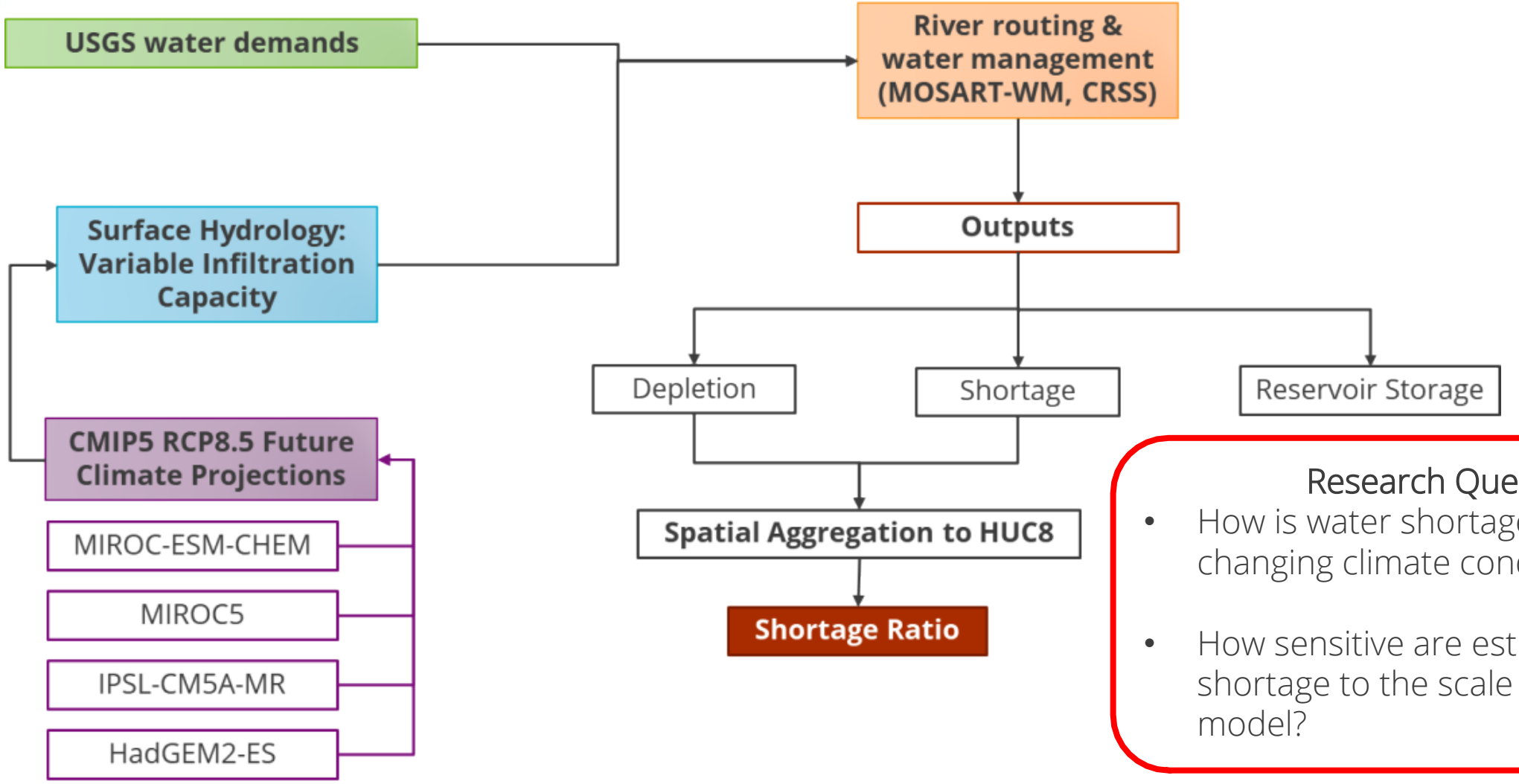


Research Model: MOSART-WM

Planning Model: CRSS (RiverWare)

Study Objective: Compare water shortage projections from different water management models

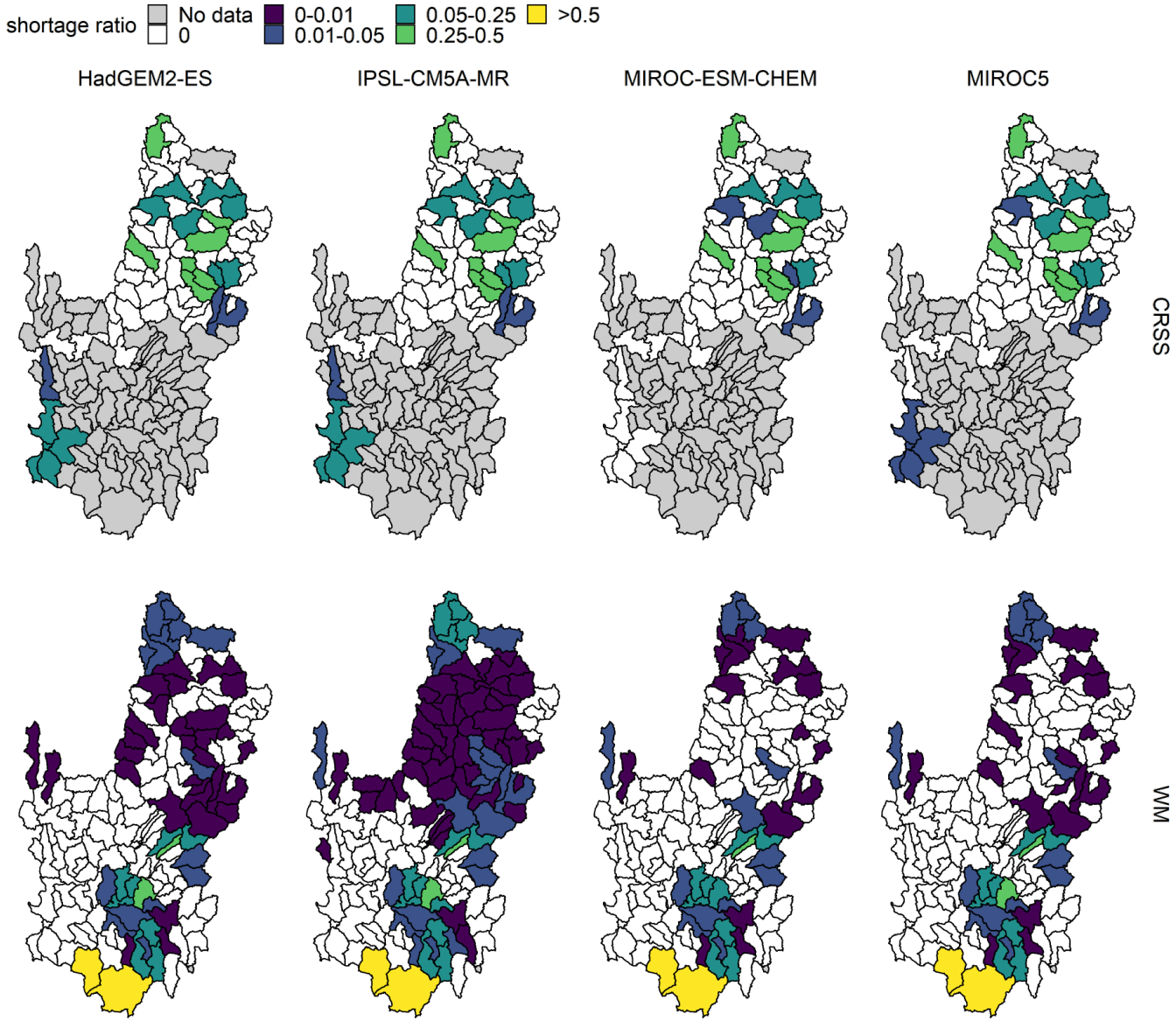
Common water demands, surface hydrology, and climate projections used across water management models



Research Questions:

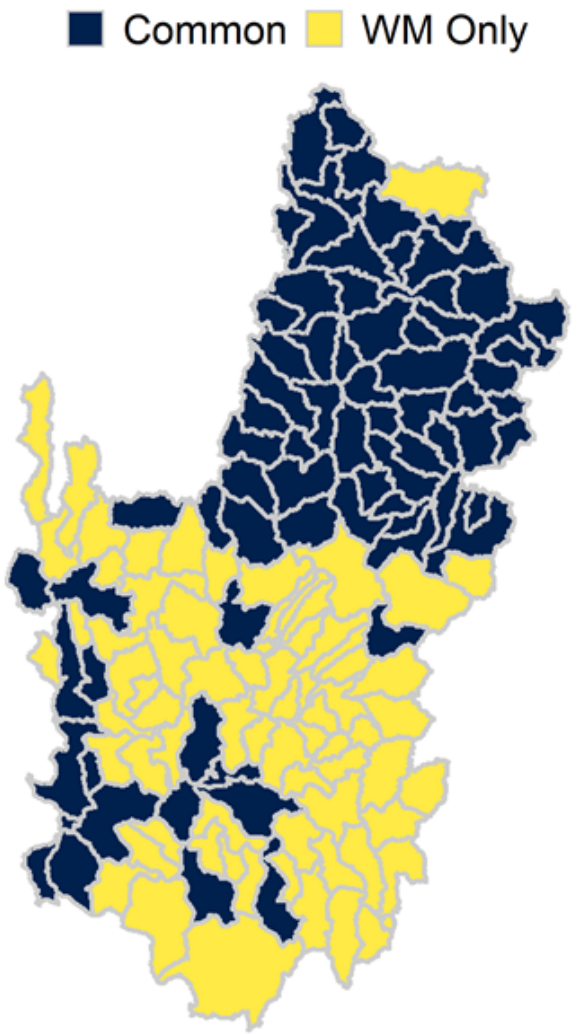
- How is water shortage impacted by changing climate conditions?
- How sensitive are estimates of water shortage to the scale and purpose of model?

Observed spatial heterogeneity of projected mean water scarcity across climate and water management models

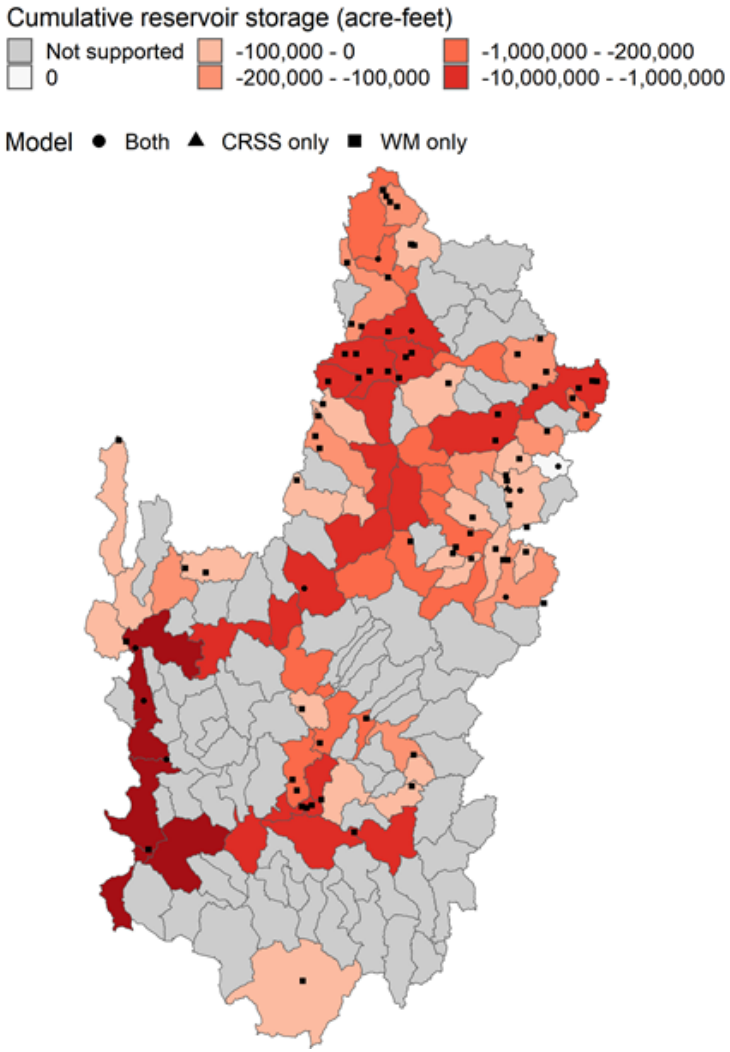


MOSART-WM and CRSS are fundamentally different—and thus yield different results

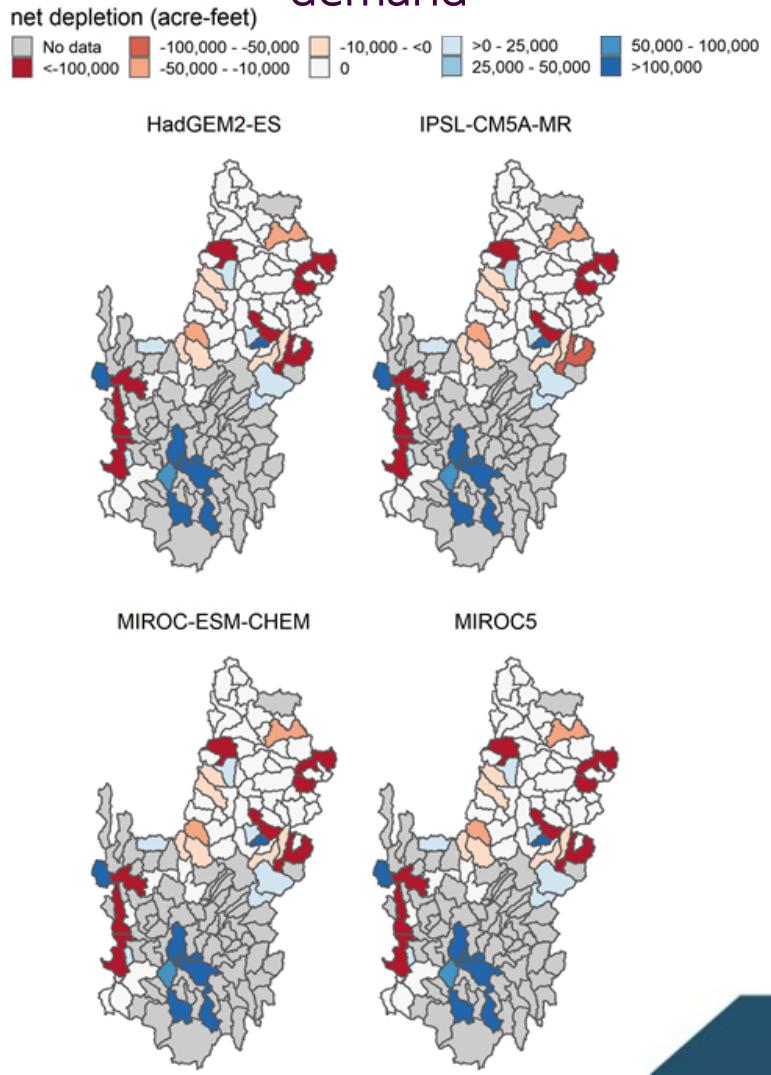
Difference in basin representation



Difference in operated reservoirs



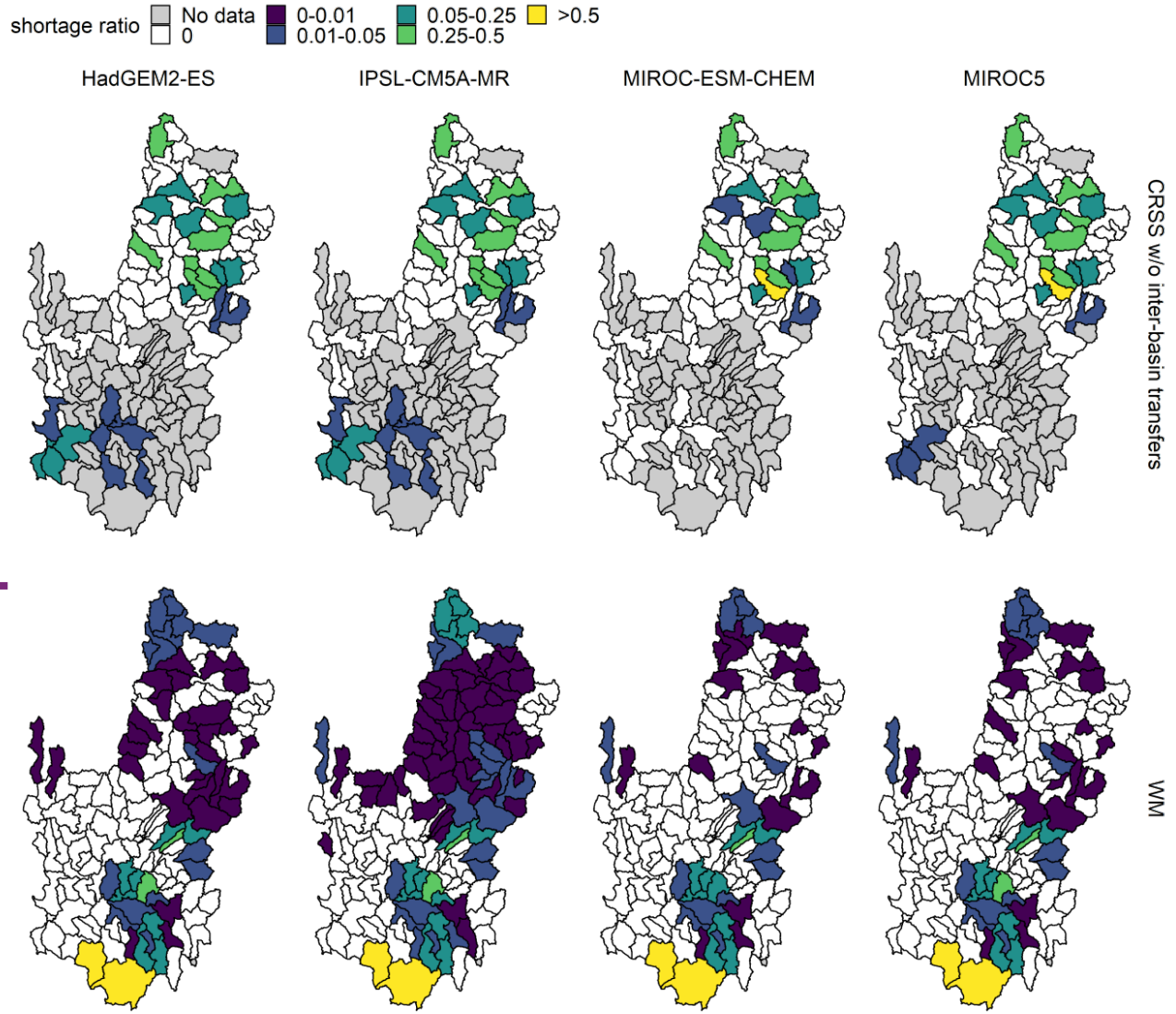
Difference in treatment of inter- and intra-basin transfers that account for roughly 30% of demand



In conclusion, MOSART-WM and CRSS are fundamentally different water management models that yield different results

- Sources of differences
  - Basin representation
  - Operated reservoirs
  - Treatment of inter- and intra-basin transfers
- Be mindful of your study's goals

- On-going and future work directions
  - Couple surface-groundwater dynamics
  - Extend comparison to additional climate projections



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