

An Integrated Water Availability (WA) Project



Western U.S. WA at intra-seasonal timescales: accounting for direct sfc/gw withdrawal and global warming indirect effects

1. To what accuracy is the current WA and regional water use known?
2. How have/may changes in LULC, including snow cover and phenology, feedback on local and remote WA?
3. What are the key processes and are their sensitivities well modeled?
4. Can we verify process sensitivities through existing observations or a new (i.e. summit to plains) campaign?

Processes:

Global circulation modes
Atmospheric blocking (Arctic warming or tropical source?)
Great Plains low-level jet (LLJ)
Convection and mesoscale convective systems (MCSs)
Mountain meteorology and hydrology
Dynamic vegetation
Land-atmosphere interactions
Water management for agriculture, energy, and tap water

Applications:

Enhanced short-range weather forecasts
Improved flood, drought and heatwave prediction
Informed water, forest, and agricultural management

Tools:

Numerical Weather Prediction models (NWP)
Short range and seasonal forecast system
Satellite retrievals in complex terrain
Integrated water+energy measurements; diurnal PBL T, q, and winds
Data assimilation
Multi-agency OSSE in a cloud?
CMIP-6 DECK and MIPs, incl. Hi-Res



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An Integrated Water Availability (WA) Project



Central Valley WA at intra-seasonal timescales: accounting for direct sfc/gw withdrawal and global warming indirect effects

1. To what accuracy is the current WA and regional water use known?
2. How have/may changes in LULC, including snow cover and phenology, feedback on local and remote WA?
3. What are the key processes and are their sensitivities well modeled?
4. Can we verify process sensitivities through existing observations or a new (i.e. summit to plains) campaign?

Processes:

Global circulation modes

Atmospheric rivers

Mountain meteorology and hydrology

Dynamic vegetation

Land-atmosphere interactions

Intensive water management for agriculture, energy, and tap water

Decision making and governance

Applications:

Enhanced short-range weather forecasts

Improved flood, drought and heatwave prediction

Informed water, forest, and agricultural management

Cost/benefit of large-scale desalinization

Social “game theory” case study

Tools:

Numerical Weather Prediction models (NWP)

Short range and seasonal forecast system

Satellite retrievals in complex terrain

Integrated water+energy measurements; diurnal PBL T, q, and winds

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