

Geosci. Model Dev. Discuss., referee comment RC2
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Comment on gmd-2021-197

Anonymous Referee #2

Referee comment on "GCAM-USA v5.3_water_dispatch: integrated modeling of subnational US energy, water, and land systems within a global framework" by Matthew Binsted et al., Geosci. Model Dev. Discuss., <https://doi.org/10.5194/gmd-2021-197-RC2>, 2021

The manuscript 'GCAM-USA v5.3_water_dispatch: Integrated modelling of subnational U.S. energy, water, and land systems within a global framework' presents an open-source Integrated Assessment Model version for GCAM with focus on Energy, Water Land representation of the United States. The manuscript is an important contribution to the community considering recent US climate commitments.

The manuscript is structured in a very good manner but I felt that more of the information that should have been in the manuscript is referred to other papers which may not help the readers to fully understand the modelling framework.

The authors mentioned that the water sector is a 'key new development of GCAM-USA' while it's hard to fully grasp the water structure which is being used in the model. Line 190 explains the water supply system but it lacks an explanation of how the water supply data was obtained, processed. Additional Information on the water supply system and also data sources and spatial aggregation methods for the data could benefit the readers to know more. I highly recommend that the authors insert a figure explaining the water supply system and how it's linked to the demands within the framework.

Line 470 explains the water availability is constrained to default levels of renewable and non-renewable groundwater. Please add more explanation on the constraints here instead of referring to existing papers. A figure or table on Supplementary information explanation on the water prices for USA could help the readers more.

I think energy system is explained in a well structured way whereas additional information on the water structure, prices and linkages in the framework can improve the manuscript overall.