

Modeling groundwater responses to climate change in the Prairie Pothole Region

Reviewed by Katie Markovich

Zhang et al. use a land surface model coupled to a two-way groundwater dynamics model to explore the response of groundwater to climate change in the Prairie Pothole Region (PPR) of North America. The study is worthwhile due to the need to explore the hydrologic response to climate change at the regional scale in the PPR.

The authors sufficiently addressed my technical concerns from the first round of revisions. However, some minor issues remain in the presentation of their study.

Minor comments:

Line 51: what is “above soils” ?

Line 59: It would be better to actually review these studies included in the citation, as they support the idea that regional-scale simulation is necessary, and they have contributed important results to that end.

Lines 71-75: ParFlow-CLM simulates three-dimensional flow in the unsaturated and saturated zone, two-dimension flow on the surface, and a two-way exchange between the surface and subsurface. Thus, I am not sure where the conclusion from Line 75 is coming from.

Line 85: induce

Line 137: Here you say 32 wells but Figure 1 says 33.

Line 141: formations

Line 288: predicts a deep bias. (How deep is this bias?)

Line 291: the water table

Line 308: These hydrogeological

Line 352: the current and future climate

Line 356: rainfall events

Figures 9&10: The authors claim in their response to have fixed the figure captions, but these still have captions that read “same as [previous figure].” These need to be rewritten to be descriptive and standalone.

Figures 6&10: A color legend needs to be included on the figure for black, blue, and red lines. In addition a label containing units for the central map color bar needs to be added.