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Comment on hess-2022-160

Anonymous Referee #1

Referee comment on "Climate warming-driven changes in the cryosphere and their impact on groundwater-surface water interactions in the Heihe River Basin" by Amanda Triplett and Laura E. Condon, Hydrol. Earth Syst. Sci. Discuss.,
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This manuscript analyzed the hydrological response for cryosphere change and temperature increase in the middle Heihe River basin. The topic is interesting. I have some major concerns listed below:

- About the PF-CLM model simulation. Because the interaction between the surface and subsurface flow is important, the flow in the river channel in the study region need to be accurately simulated. So, what method is used for the river routing in the study region?
- The pumping of groundwater for irrigation may have significant impact on groundwater simulation in the study region. How is this considered in the model simulation.
- For the glacier scenario, a 15% percent of flow is considered as the contribution of glacier melt. Is this fraction provided by previous observations or other studies?
- The groundwater storage increases in all the scenarios, this may be related to the precipitation changes. So, the results of all the scenarios are also related to the precipitation. Then the conclusions are also need to be revised and analyze the precipitation conditions is need. I suggest to add some scenarios, such as a scenario without the increase in precipitation.
- Figure 3. It seems that the model overestimated the observed flow, why?
- For the permafrost degradation, it may reduce the summer peaks, is this effect considered in the study?