HESS-2011-103: "Climate change impacts on snow water availability in the Euphrates-Tigris basin"

Response to Anonymous Referee #3 Comments
(please see my responses in blue text below)

Page 3641 line 12: The comparison of snow covered area was made in January, when the snow accumulation is far more than important processes during at the time. This reader suggests the author to provide a comparison of SCA in late March or April, through which the efficiency of the modeling in evaluate snowmelt can be evaluated.

The validation of the hydrological model to a watershed in the watershed with relatively low data availability is a hard part for modeling evaluation. This reader suggests the author to provide more comparisons of flow at the gages within the watershed if any other gage is available.

The purpose of the SCA comparison is to show that the model is able to accumulate snow during the cold season, which would then become melt and runoff. While agree with the reviewer that the most important aspect of this work is the snowmelt, availability of snow is the main driver of snowmelt – there would not be any SWE available if there was no snow accumulation. Therefore I would feel comfortable leaving the SCA comparison as it is in the cold season. Moreover, with the addition of a comparison plot (Figure 7) between gauge observed and modeled river discharge as suggested by this and the previous reviewer, all aspects of the snow–related processes are covered: i) the cold season (January) SCA; ii) multi-year SWE; and iii) melt dominated runoff.

Fig 1. A scale in the figure will provide the readers who are not familiar to learn the size of the watershed. Add some weather stations and river flow gages would also help readers to better understanding the work.

This is a great suggestion. I added a scale bar to make this better interpreted. I also added the locations of several gauge and meteorological observation stations.

Fig 5. The modeled and observed SCA maps during late March till May will help readers to learn the efficiency of VIC modeling in modeling both the snow accumulation and snowmelt processes.

Please see the response above.

Fig 6. This figure only shows 12 out of the 13 models. The author should explain why one model was left out.

There was a similar comment from the previous reviewer. One figure (MRI_CDCM2.3.2) was left out because of space constraints and not because it was an outlier. In fact, the figure (model) that was left out was very similar to the predictions made by another model.