Review of **The value of ASCAT soil moisture and MODIS snow cover data for calibrating a conceptual hydrologic model** by Tong et al.

The study of Tong et al. focuses on using ASCAT soil moisture and MODIS snow cover, together with runoff for the calibration of the TUWmodel for 213 catchments in Austria. To do so, the study defines three calibration strategies for soil moisture and runoff, snow cover and runoff, and soil moisture, snow cover and runoff together. In addition, runoff is included with different weights for each calibration strategy. The authors conclude that the soil moisture data helps the soil moisture simulations, and the snow data the snow simulations.

Generally, the authors present a thorough analysis, and their conclusions are well supported by their data. Nevertheless, I need to raise some concerns, and I hope the authors can improve on these issues.

I think the manuscript could be made more concise and to-the-point. For example, twelve figures and 8 tables seems a bit much to me. Most figures and tables are also double, for the calibration and the validation, and the text becomes for that reason sometimes a bit repetitive. As these findings are rather similar, I would suggest that the authors focus more on one of the cases, for example the validation data, and move half of the figures to the Supplement. Some of the tables could be moved to the Supplement as well, as the figures already show the same data. I suggest as well to make Table 7 or 8 a similar figure as Figures 5 and 6, and remove the examples in Figures 11 and 12, that, in my view, do not add much compared to the full picture in the Tables 7 and 8. In addition, there are still relatively many unclear sentences and small issues with the figures., such as missing units.

More methodologically, the calibration on soil moisture is carried out for a much shorter period compared to the snow cover. At the same time, the authors conclude that the snow data are more efficient in improving snow simulations than the soil moisture data are in improving soil moisture simulations. Is it still a fair comparison? There is much more information in the snow data in this case.

To conclude, I generally like the approach and methodology, but some major improvements are needed. I hope the authors find my comments useful and I am looking forward to an improved version of the manuscript.

Minor comments

P1.L29. I think many more references could fit here, such as Kavetski et al. (2006), Wagener and Montanari (2011)

P5.L126. from digital elevation model → from a digital elevation model?

P5.L131. Except of → except for

P9.L233. Than the WQ variants. → What do you mean? To what are you comparing the red boxes in Fig.3? These are the WQ-variants already, correct?

P9.241. Particularly for WQ between 0.3 and 0.4. → How can I see this exactly? Please help the reader a bit.

P12.L294. signals .Accordingly → signals. Accordingly

P12.L291-295. Generally, it may also have to do with the depth that the remote sensing products "sees". The active rooting zones are much shallower in agricultural lands, whereas trees root much deeper.

P13.L303-304. The largest...only (wQ=1) →Do you mean for AP or in general?

P13.L304. Is larger than ...(SDGR). → I do not see this. You still discuss OSM in the second panel, correct?

P16.L228. The medians of the model parameters → of all the catchments, correct?

P16.L335-336. and adding snow and soil moisture is complementary → regarding the findings for the snow parameters you mean, correct? Please be specific.
P18.L375-376.has a median relative improvement about 4% to 25% lower → So you mean the difference between the red and blue line here? Seems more than 4 and 25% to me, if I look at it correctly.
P19.L386. WQ>0.6 → Not the other way around? WQ<0.6?
P24.L441. Previous studies → please add the references
P24.L441-445. If it is the same model, this is not very surprising and it doesn't seem to relate to the previous analyses as shown.

Sec.4.3. The title of this section relates also to what is discussed in the previous paragraph on Figure 8.

Fig3. Please add in the caption that the boxes represent the values from the different catchments. In addition, as WQ is a full calibration on Q only, I would here just show one boxplot. The three should be identical here, correct?
Fig.5. Is it correct that these come from the calibration SSM+SCM+runoff?
Fig.7. Please add the units of the parameters.
Fig.8. You could group the parameters here also for snow, soil moisture and runoff, maybe by just putting a thick line between them.

Table7,8. I would suggest to turn these Tables into similar figures as Figures 5 and 6.

References

Kavetski, D., Kuczera, G., Franks, S.W., 2006. Bayesian analysis of input uncertainty in hydrological modeling: 1. Theory. Water Resources Research 42. https://doi.org/10.1029/2005WR004368

Wagener, T., Montanari, A., 2011. Convergence of approaches toward reducing uncertainty in predictions in ungauged basins. Water Resources Research 47. https://doi.org/10.1029/2010WR009469