Author Response to Reviewer 1 (T. Wagener)

We thank the editor and reviewers for their comments, which helped improve this manuscript. Please note: responses to reviewer comments are italicized and bolded text below each reviewer's comments.

The manuscript by Hamman et al. introduces a new version of the widely used and highly cited VIC model. It is, to my knowledge, the first time the model is properly published in a journal of the nature of GMD. This is a relatively short and well written manuscript, focusing on the latest version of VIC (5) and its implementation for distribution within the scientific community. The extensive use of VIC in the community already suggests that this will be a very welcome activity. As such I have few comments:

Thank you for taking the time to review this paper. We have appreciated your comments.

[1] Is the African flood and drought monitor different from the global drought monitor? If yes, then maybe one could add this in the introduction section.

The Global drought monitor (Nijssen et al 2014) and the African drought monitor (Sheffield et al 2014) are, indeed, different systems. We have added a citation to the African drought monitor in table 1.

[2] The authors might have excluded it on purpose, but I would find it helpful to see the schematic figure of VIC that is widely used. This would be mainly helpful for people not familiar with VIC. My suggestion would be to include a version of it.

We appreciate the suggestion. Versions of the classic "VIC schematic" have been published many times before and we did not feel it was necessary to include in this paper. The VIC documentation website, which is linked to from this paper, does include the figure for interested readers.

[3] Maybe the conclusions section could include a brief outlook paragraph in which the authors discuss what they see as the future evolution of VIC? It would be interesting to hear what the authors think is the future of this code as a scientific and/or operational tool for hydrology and water management.

We have expanded our conclusions section to provide additional discussion on the future evolution of VIC. We have intentionally emphasized the role of the open-source community in future maintenance and development activities.

[4] One issue that in the past has been problematic for LSMs is the detailed assessment of uncertainty (see Wood et al. vs Beven and Cloke discussion in WRR). I wonder what impact the re-structuring of the code in VIC-5 for the ability of modellers to undertake a detailed uncertainty analysis (especially of space-time fields)? Both in terms of memory requirements as well as in terms of model run times (on clusters).

Our intent in this paper was to emphasize the new developments in and possible applications of VIC.5. Uncertainty analysis is one application that would be easier in VIC.5 when leveraging new features such as 1) configurable model parameters, 2) parallel computing enhancements that greatly speed up run and post-process times, and 3) improved I/O formats for both model parameters and model output. When combined, these new features allow a scientific user to more readily perform sensitivity analysis. We have highlighted this point in the manuscript.

[5] And finally, given the tremendous number of papers in which VIC is advanced and used, could the authors make some suggestions about what papers a new user should start with? Maybe a basic reading list. Where should a new user start after downloading VIC-5?

While the original Liang et al (1994) papers provide good context for the origins of the VIC model, significant model development has occurred since then and the early papers do not necessarily provide new users with a complete, or even accurate, description of the model. Even more so, overview papers describing VIC model development (such as this one) have been few and far between. We therefore suggest starting with the VIC documentation website. Users can easily read an overview of current model features and follow citations to specific papers describing the development of individual components of the mode according to their specific interest. This point has been emphasized more clearly in the manuscript.
