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Reply on RC2

Nicolas Gasset et al.

Author comment on "A 10□km North American precipitation and land-surface reanalysis based on the GEM atmospheric model" by Nicolas Gasset et al., Hydrol. Earth Syst. Sci. Discuss., <https://doi.org/10.5194/hess-2021-41-AC2>, 2021

Thank you for your review and the positive comments and suggestions. We will fully integrate them into the final version of the article.

We recognise the complexity of the system and multiple interconnected components involved. While some streamlining is possible and will be worked on in the future, the use of existing operational system configurations was privileged for this first version of the surface and precipitation reanalysis for the North America using Global Multiscale Model (GEM), produced in Canadian Center for Meteorological and Environmental Prediction (CCMEP).

Specific comments:

~L230:

The radar data would certainly be beneficial for improving the quality and skill of precipitation analysis. They could be easily added to the offline 24 h analysis, albeit only for recent years thus affecting the time consistency of the precipitation analysis. Adding this supplementary input to the online analysis would however be much more time consuming (mostly due to technical reasons). Another possibility, even more attractive and easier to implement is to include IMERG satellite data into the final offline 24 h analysis. We are currently exploring this and it will probably be the next improvement in terms of precipitation observations assimilated.

While cloud and radiation related fields are definitely important for surface-atmosphere interactions, they were not evaluated and analysed here, due to clarity and brevity concerns and because the focus of the paper is to introduce the surface and precipitation reanalysis and evaluate its main aspects. Those fields should be analysed in detail in a subsequent study.[Au2]

The investigation and analysis of the soil moisture are underway and will be included in another publication.

All technical corrections and acronyms synchronization will be incorporated into the revised version of the manuscript.