Response to Reviewer 1 are structured as follow: (1) 1.X: comments from Reviewer 1, (2) Response to 1.X: author's response and author's changes in manuscript when any. For sake of clarity, line and page from the first submission is used.

**Reviewer#1 : Wolfgang Wagner**

**General comments**
**This is an excellent paper, so I keep my review short.**
**This study is one of the first evaluations of ECMWF's latest reanalysis ERA-5. ERA-5 brings a number of important improvements over the widely used ERA-Interim reanalysis, including more detailed process descriptions and finer spatial- and temporal resolution. The authors evaluate ERA-5 by forcing a land surface model with ERA-Interim and ERA-5 data. To single out the effects of the enhanced precipitation estimates in ERA-5, the authors add a third forcing data set composed of ERA-5 data with only precipitation coming from ERA-Interim. The authors comprehensively evaluate the model simulations over North America with an impressive number of reference data, from in situ networks (runoff, soil moisture, evaporation, snow depth..) and remote sensing (soil moisture, LAI, ...). The results are realistic, pointing to consistent improvements of ERA-5 over ERA-Intermin in particular for the hydrologic components.**

Dear Wolfgang Wagner, many thanks for reviewing the manuscript and for highlighting its relevance and interest. Your comments and suggestion led to an improved version of the manuscript, in particular with respect to section 4.

**Specific comments**
**1.1 [Lines 254: Please explain, why discarding stations with drainage areas differing by more than 20 % from the simulated one makes sense.]**

Author's response to 1.1:
The following explanation has been added to the revised version of the manuscript:

P.8, L.254, "This criterion aims to ensure a meaningful comparison between observed and simulated values. It is necessary for coping with the significant distortions in the model representation of the river network that are caused by the coarse spatial resolution of the CTRIP global river network (0.5°x0.5°)."

**1.2 [Section 4: This section is a bit weak. Consider e.g. to summarize key findings with respect to each of the analysed processes and data sets. I also think that too much of the present discussion deals with other on-going work of the authors. Please try to discuss relevant links with similar undertakings currently on-going in the US, Japan,China, etc..]**

Author's response to 1.2
In agreement with comment 1.2, the revised version of the manuscript have the following modifications:

P.16, L.350-352: "Albergel et al., 2017, 2018 (in prep.) recently presented a Land Data Assimilation System (LDAS-Monde) able to sequentially assimilate satellite derived estimates of surface soil moisture and LAI."
**is now:**
"ERA-5 has a great potential to further improve the representation of land surface variables if used to force offline LDAS. In the past recent years, several LDAS have emerged at different spatial scales, (i) regional like the Coupled Land Vegetation LDAS (CLVLDAS, Sawada and Koike, 2014,

Sawada et al., 2015), the Famine Early Warning Systems Network (FEWSNET) LDAS (FLDAS, McNally et al., 2017), (ii) continental like the North American LDAS (NLDAS, Mitchell et al., 2004; Xia etal., 2012), the National Climate Assessment LDAS (NCA-LDAS Kumar et al., 2018) as well as at (iii) global scale like the Global Land Data assimilation (GLDAS, Rodell et al., 2004) and more recently LDAS-Monde (Albergel et al., 2017, 2018 in prep). LDAS-Monde is a global capacity system able to sequentially assimilate satellite derived estimates of surface soil moisture and LAI."

New references:

-Albergel, C., S. Munier, A. Bocher, C. Draper, D. J. Leroux, A. L. Barbu, J.-C. Calvet: LDAS-Monde global capacity integration of satellite derived observations applied over North America: assessment, limitations and perspectives. to be sumitted to Remote Sensing, Special Issue "Assimilation of Remote Sensing Data into Earth System Models", 2018

-Kumar, S.V., M. Jasinski, D. Mocko, M. Rodell, J. Borak, B. Li, H. Kato Beaudoing, and C.D. Peters-Lidard: NCA-LDAS land analysis: Development and performance of a multisensor, multivariate land data assimilation system for the National Climate Assessment. J. Hydrometeor., 0, https://doi.org/10.1175/JHM-D-17-0125.1

-McNally, A., Arsenault, K., Kumar, S., Shukla, S., Peterson, P., Wang, S., Funk, C., Peters-Lidard, C. D. and Verdin, J. P.: A land data assimilation system for sub-Saharan Africa food and water security applications. Scientific Data, 4, 170012, :10.1038/sdata.2017.12, 2017.

-Mitchell, K. E., et al. The multi-institution North American Land Data Assimilation System (NLDAS): Utilizing multiple GCIP products and partners in a continental distributed hydrological modeling system, J. Geophys. Res.,109, D07S90, 2004. doi:10.1029/2003JD003823

-Muñoz-Sabater, Joaquín, Emanuel Dutra, Gianpaolo Balsamo, Souhail Boussetta, Ervin Zsoter, Clement Albergel, Anna Agusti-Panareda: ERA5-Land: an improved version of the ERA5 reanalysis land component. Joint ISWG and LSA-SAF Workshop, 26-28 June 2018, Lisbon, Portugal.

-Rodell, M., P. R. Houser, U. Jambor, J. Gottschalck, K. Mitchell, C.-J. Meng, K. Arsenault, B. Cosgrove, J. Radakovich, M. Bosilovich, J. K. Entin, J. P. Walker, D. Lohmann, and D. Toll, The Global Land Data Assimilation System, Bull. Amer. Meteor. Soc., 85(3), 381–394, 2004.

-Sawada, Y., T. Koike, and J. P. Walker, A land data assimilation system for simultaneous simulation of soil moisture and vegetation dynamics, J. Geophys. Res.Atmos., 120, doi: 10.1002/2014JD022895, 2015.

-Sawada, Y., and T. Koike, Simultaneous estimation of both hydrological and ecological parameters in an ecohydrological model by assimilating microwave signal, J. Geophys. Res. Atmos., 119, doi:10.1002/2014JD021536, 2014.

Xia, Y., et al. 2012, Continental-scale water and energy flux analysis and validation for the North American Land Data Assimilation System project phase 2 (NLDAS-2): 1. Intercomparison and application of model products, J. Geophys. Res., 117, D03109, doi:*10.1029/2011JD016048*, 2012.

**1.3 [Albergel et al. (2018) not in the references]**

Author's response to 1.3: it is now corrected in the revised version of the manuscript.

**1.4 [Figure 4: "For sake of clarity"]**

Author's response to 1.4: it is now corrected in the revised version of the manuscript.