

Correction to the manuscript MS No.: tc-2019-49 (Journal: TC)

Title: Evaluation of snow depth and snow-cover over the Tibetan Plateau in global reanalyses using in-situ and satellite remote sensing observations

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Following some interaction with scientists in charge of MERRA-2 reanalyses at an international workshop, we were made aware that, confusingly, MERRA-2 snow depth is not the gridded snow depth but rather snow depth over snow covered area. Hence, the snow cover fraction needs to be taken into account. While the MERRA-2 snow depth data has been frequently misused, we wanted to make the paper as correct as possible.

Hence, we corrected the figures in the manuscript related to MERRA-2 snow depth, namely Figures 2,4,5,6 and 8. Only the curves or maps related to MERRA-2 were changed in those figures. The correlation values related to MERRA-2 were changed in Table 2.

After that adjustment, MERRA-2 performed better than JRA-55 in terms of snow depth, and we have made minor corrections in the text to take that into account.

P6, L33: It is clearly apparent that, with the exception of MERRA-2, the re-analyses show a regular seasonal cycle, with a snowpack that grows nearly steadily during the cold season and culminates in February or March.

P7, L2: In comparison with in-situ observations, MERRA-2 has the best performance among re-analyses for both the RMSE and the temporal correlation, closely followed by JRA-55. The ERA5 re-analysis over-estimates the seasonal maximum SD by a factor of 10.

P7, L6: We removed the sentence on the summer snow excess in MERRA-2.

P7, L11 : It is not surprising that JRA-55 performs well

P7, L30: JRA-55 is much worse than MERRA-2 for SCF, while their performance for SD was similar.

P8, L14: In the southeastern part, SDs in MERRA-2, ERA-I and JRA-55 are smaller than the MW data, consistent with Fig. 2

P9,L30: Hence, while JRA-55 has excellent performance among re-analyses for SD

P10,L12: Incidentally, this may explain the excellent performance of MERRA-2 in terms of mean snow depth over the stations (see Fig. 4, left).

P11, L16: MERRA-2 and JRA-55 have the best performance among re-analyses for snow depth.

In addition

P11, L9: we added “and further studies on this issue are warranted.”, as suggested by one reviewer.

We added Drs. Reichle and Kumar in Acknowledgements.

We corrected several typos, and moved the section header 4.3 Excessive precipitation issue, up one paragraph, since it was more suited there.