Earth System
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Data Discussions

ESSDD

Interactive
comment

Interactive comment on "A combined Terra/Aqua MODIS snow-cover and RGI6.0 glacier product (MOYDGL06*) for the High Mountain Asia between 2002 and 2018" *by* Sher Muhammad and Amrit Thapa

Anonymous Referee #1

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Abstract: In your abstract you had mentioned and put a link to access the data that you produced (MOYDGL06*) with a reference. You should remove it from here and you better put it in the data analysis section or in any other appropriate sections. Introduction: In your introduction please try to include the objective of the study and how your study will contribute in filling the existing gaps. The paper miss this point. I think you can also merge Section 3.6 and Section 5 together and you can remove section 5. General Comments and Questions: 1. Please define variables and symbols in your equations. 2. To what extent were your original MODIS Terra and Aqua data were disturbed by

cloud cover? 3. Can you show us the comparison map of pixels affected by cloud and the improved map after you are applying the three filtering techniques on mapping the snow cover? Your manuscript miss this important aspect. 4. How do you separate the debris-covered and debris-free glacier ice? 5. Do you have any reason why you choose Landsat 8 data for validation only in 2018? Why not in any other years of the study period? 6. Why the minimum and maximum snow periods are selected in 2018 only? 7. Have you tried to improve the existing snow detection algorithms to avoid overestimation of the MODIS snow cover data or you simply used the one developed by others from the literatures? Please try to discuss everything clearly. 8. Which snow detection threshold method have used in this study? Please mention it clearly. 9. "The seasonal filter removed approximately 44.66 % and 31.29 %, temporal filter removed 54.08 % and 65.48 %, spatial filter removed 99.91 % and 99.84 % of the total cloud cover existing mainly outside the snow cover extent in Terra and Aqua products." Line 32- 38. So, why temporal filter is the most effective step in cloud removal than the others? It is not clear for me. 10. Why the overall snow extent is showing significantly decreasing trend since 2013 as compared to the whole observation period between 2002 and 2018? Please elaborate this. 11. On Figure 6 caption please change the word "now" to "snow". 12. On Figure7, the unit for SCA is not mentioned. 13. From Figure 9, generally we can say that the number of pixels changed from snow to no snow are much more higher than the pixels changed from no snow to snow which shows that the uncertainty in snow cover underestimation due to cloud cover is less than that of the MODIS large swath width and poor spatial resolution. It also shows to use better spatial resolution snow cover product than the one you proposed. Please try to elaborate and discuss this point in your discussion part.