

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 #2

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Apologies to authors for this late review!

MODIS snow cover products are very important for many research and operational applications and this paper generates and describes a new product for High Mountain Asia, this is certainly a useful contribution to the community and I recommend publication subject to several mainly minor comments.

GENERAL COMMENTS

1. fSCA or NDSI in V6 is a useful measure of subpixel snow cover, especially if the data

C1

is to be assimilated in a modelling scheme to, for example simulate SWE. However this is not available in this study as you use the 8-day product. Can you explain this choice in more detail in the introduction please.

2. Related to point 1, as you implement filtering routines in this study, why did you choose to base the study on the 8day product (a strategy to minimise cloud cover) and not work with daily data? You may have had better temporal coverage in resulting dataset if you had done that? Please justify this decision in the text.

3. While in general, the paper is well written there are reasonably frequent slips in style and grammar, which would likely be caught by thorough reread.

4. Will this dataset be updated in time (annually or so?). Perhaps mention this in the conclusion if so.

5. While as a data paper methods are not expected to be novel, it would be good to emphasis more strongly in the introduction what the contribution of the paper is in terms of both a product that does not yet exist (spatial coverage) and any methodological developments.

6. Please include a README.txt in the data folder on Pangea that contains all meta-data required to use the data eg. codes etc.

SPECIFIC COMMENTS

p1l26 in →during

p2l16 → what is meant by 'improve the snow cover extent?'

p2l21 what is meant by 'somehow improved the quality of snowcover'

p2l23 suggest enormous → large

p3l18 what is a year? calender? or hydrological?

p3l18 consider rephrasing "total seasonal snow cover extent was....." for clarity

C2

p3l33 "then we go for the spatial filter " -poor language

p3l6 "Eq.(1) <by> only"

p3l35 when is melting expected to be negligible? Is this a fair assumption? Please expand.

p4l33 "differentiate <them>,"

p7l28 "we conclude that clouds are not the main obstacle.." - can you expand on what is the main obstacle?

Fig2 'if no clouds' should be where division occurs at the 'Temporal filter' box.

Fig 4+5 could perhaps be a single 2-panel plot to save space as they are closely related.

Fig 6 looks like the plot starts in 2003, not 2002 as stated in the caption.

Table 1 inconsistent capitalisation

Table 2 inconsistent capitalisation

Fig 7. non-intuitive order. Should probably be three column plot 'terra', 'aqua', 'combined'. Is there no 'raw combined'?

Fig 9 caption says 'the blue and red is our final snow' - what does this mean? the legend says that red is snow converted to no snow. These statements seem inconsistent.

Fig 10, It seems that the large systematic shift in summer is at least partly due to 'snow' in the original dataset being reclassified as glacier ice. Does this play a role? If so please discuss that a bit more. The main explanation given is that falsely classified clouds are removed.

Can you make the coverage field on Pangea a polygon and not just a point - this would be more useful.

C3

Interactive comment on Earth Syst. Sci. Data Discuss., <https://doi.org/10.5194/essd-2019-78>, 2019.

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