

Interactive comment on “An improved Terra–Aqua MODIS daily cloud-free snow and Randolph Glacier Inventory 6.0 combined product (M*D10A1GL06) for high-mountain Asia between 2002 and 2019” by Sher Muhammad and Amrit Thapa

Anonymous Referee #2

Received and published: 20 October 2020

Apologies for the delayed review.

This paper represents an update of the previously published (and reviewed by myself) 8-day SCA dataset to daily SCA. The current method uses the 8-day product as a training dataset which additionally reduces overestimation in the daily data due to large SZA. The dataset generated is distinct and a useful contribution to the community and therefore I feel deserves publication in a data journal such as ESSD, subject to the

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following comments.

Page and line numbers are given when appropriate eg. p3 l21 (page 3 line 21).

MAIN COMMENTS

1. The fractional snow cover daily product is very useful for data assimilation and other modelling applications. Can the authors explain why they chose to degrade this to a binary product?
2. In general the paper reads well but there are grammatical and style mistakes throughout the paper and would benefit from a careful proofread. Some examples in MINOR COMMENTS below.
3. I think the dataset on Pangea requires a readme. The manuscript is of course an important reference for the dataset but the dataset published on the repo must include this "use metadata", that is required in order to use the data (basically pixel codes).
4. I would like to be further convinced that you don't just end up with something that looks like the 8-day product with this gap-filling strategy - i.e. is information added? Perhaps you could include a plot of a one month "gappy" interval where you compare the 8-day and gap filled daily so it can be seen how that looks. This is not discernible when the entire timeseries is plotted.
5. p3 l21 How is it possible to have daily extents greater than the 8-day product as the 8-day max is defined by the max snow cover extent in any given daily extent?
6. p5 l14 "and overestimation caused by large sensor zenith angle (SZA) were reduced in this paper" - as this is quite a central contribution of the dataset I would like to see evidence supporting this statement.

MINOR COMMENTS

1. Abstract l.10 poor grammar of the sentence.

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2. p1, l28 remove "The" (unnecessary article, a common mistake throughout).
3. p2, l13 "was somehow reduced" - poor language style.
4. p3, l26 "reduce overestimation due to large SZA" - state this explicitly it is a key contribution!
5. p5, l8 I don't think it was "improved" but "extended" to 2019?
6. p9, l1 why the data link here? You have it in the data availability section.

Interactive comment on Earth Syst. Sci. Data Discuss., <https://doi.org/10.5194/essd-2020-141>, 2020.