

Interactive comment on “MODIS snow cover mapping accuracy in small mountain catchment – comparison between open and forest sites” by J. Parajka et al.

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Review of “MODIS snow cover mapping accuracy in small mountain catchment – comparison between open and forest sites”

By J. Parajka, L. Holko, Z. Kostka, and G. Blöschl

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Summary: In this article, the authors examine the accuracy of MODIS snow cover products for a small mountain catchment in northern Slovakia over the period 2000-

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2011. Using in situ snow measurements, MODIS data are assessed for their accuracy at a range of elevations in open and forested sections as well as areas of mixed land use of the Jalovecky Creek catchment, Slovakia. The results show an overall accuracy of 91.5% for the MODIS data, with lower values in the forested and mixed land use areas compared to open areas. A 2-day temporal filter reduces cloud coverage issues and improves overall MODIS snow mapping accuracy to 94%.

This paper is generally well-written and provides interesting results. It should therefore be published in Hydrology and Earth System Sciences following some minor revisions. My detailed report on the paper follows:

General Comments:

- 1) Have the authors considered using the MODIS fractional snowcover product in place of the binary one (e.g., Salomonson and Appel 2004)?
- 2) Additional climatic information of the study site would provide better context for the study. For example, information on mean annual air temperature, total precipitation, snow depth, etc. could be reported under “study area”.
- 3) How does the accuracy of the MODIS snowcover mapping vary over time? Are there greater uncertainties in the MODIS data during the ablation period rather than the accumulation period?

Specific Comments:

- 1) P. 4073: The title of the article should be changed to read “. . . in a small mountain catchment. . .”
- 2) P. 4074, line 3: Instead of “grassy sites” perhaps use the term “open sites”?
- 3) P. 4076, lines 19 and 20: These two sentences should begin with “The”.
- 4) P. 4076, line 23: Rewrite as “a national park”.

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- 5) P. 4077, lines 25-28: The wording here could be improved.
- 6) P. 4079, lines 21-22: The precision of snow cover mapping accuracy index should be consistent, either no decimal figure or one decimal figure.
- 7) P. 4083, lines 11-15: Has a 7-day filter also been tested in assessing the accuracy of the MODIS data?
- 8) P. 4084, line 23: The journal should end with "Sensing".
- 9) P. 4085, line 18: Note the spelling mistake in "moisture".
- 10) P. 4087, Table 1: Are the sites for the snow measurements exactly at 100 m intervals of elevation? It might be useful to provide a graph of the timing of the snow measurement campaigns rather than just the total numbers.
- 11) Pp. 4089-4091, Tables 3-5: Instead of the column header "Snow OK", please use "Snow True".
- 12) P. 4093, Figure 2: Can you please add a scale to this figure and the cardinal directions for the maps?
- 13) P. 4094, Figure 4: This figure can be deleted since it does not provide more information than the maps in Figure 3.

New references:

Salomonson, V. V. and I. Appel, 2004: Estimating fractional snow coverage from MODIS using the Normalized Difference Snow Index (NDSI), *Remote Sensing of Environment*, 89:351-360.

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