

Interactive comment on “A probability of snow approach to removing cloud cover from MODIS Snow Cover Area products” by V. López-Burgos et al.

V. López-Burgos et al.

hoshin.gupta@hwr.arizona.edu

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Response to reviewer comments on “A probabilistic approach to removing cloud cover from MODIS Snow Cover Area products” by V. López-Burgos et al., submitted to HESSD

Dear Dr. Parajka,

Thank you for your comments and suggestions. Your suggestions encouraged us to think more deeply about the seasonal distribution of cloud removal power and its trade-off with mapping accuracy for the algorithms we used. We had stored the information
C6620

for daily and monthly cloud cover removal results and have therefore revised our paper to discuss this manner in more detail and compared it with the papers you suggested. Unfortunately, however, we no longer have access to the daily/monthly accuracy results so we were unable to include this in our revision.

We think that our monthly accuracy results' differences for the Terra/Aqua combination and Time Interpolation would be somewhat similar to those reported by Parajka and Blöschl (2008), Gao et al. (2010) and Xie et al. (2009). For the LWLR we think that the more closely related paper to use for estimating the seasonal mapping accuracy is Parajka et al. (2010) but with some differences. We have addressed this issue on the revised discussion section of our paper.

We have done our best to address your comments and suggestions. Please see our responses in the attachment. Our response to your general comments are included as part of our revised version of sections 5, 6 and 7 and is included below and our responses to your specific comments are enumerated afterwards.

Other changes to the manuscript: 1. The title has been changed to: “Reducing cloud obscuration of MODIS Snow Cover Area products by combining spatio-temporal techniques with a probability of snow approach.”

2. Study Area: Made changes to SI Units in Section 3.1.

3. Section 3.3: We mentioned the COOP data because they are widely used in the US for snow studies and are located at lower elevations in the watershed but we could not use them in our evaluation process because they seemed suspicious. We leave it to the discretion of the editor if this section should be removed or not.

4. Section 4.4 has been revised to include more detail about the Locally Weighted Logistic Regression methodology.

5. Fig 2: We agree we should have used SI units. However, we currently cannot regenerate this graph as the first author no longer has access to the program and

data used. 1 inch = 2.54 cm. Cloud cover accounts for ~ 39 % of the MOD10A1 pixels inside the watershed during the time period. This number is highest during January and February with ~50% and ~ 69% cloud cover respectively. Fig. 2 shows how during the months with the highest amount of snow, MOD10A1 shows almost now snow cover on the ground or significantly less than expected for several days.

6. Fig. 3, 4, 7: As mentioned above, we are unable to regenerate the figures. The subject matter is Snow Cover Area and therefore we think the equal area Sinusoidal projection is appropriate to show the results.

Again, thank you for your comments. They have helped us analyze in more depth the results we obtained. Sincerely Viviana López-Burgos

Please also note the supplement to this comment:

<http://www.hydrol-earth-syst-sci-discuss.net/9/C6620/2013/hessd-9-C6620-2013-supplement.zip>

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 9, 13693, 2012.