I reviewed the previous version of this paper and my main issues were that the methods were not well described, and that the Results and Discussion section was very brief. The authors have addressed some of my comments, and the Methods section is much improved. However, the authors did not address some of the specifics comments that I had on the methods (see below). The Results and Discussion section is improved, but the authors need to further put the results into context. It is unclear what the error statistics (bias and RMSE) are based on - what is the “truth” that these statistics are being compared to.

We thank Referee #2 for the critiques and for reviewing the paper a second time. We understand how much time these reviews take and are grateful for the feedback.

As for explaining what the error statistics are based on and what the “truth” is, we state on p 9 l 11-12 that 20% of the observations were held out for validation. Also, please see added Section 3.4 on in situ validation with snow depth from FOCUS weather monitoring posts in Afghanistan and our responses to Referee #1 concerning validation of our reconstructed SWE estimates.

Overall, we find that our reconstructed SWE estimates have proven to be unbiased and accurate across a variety of snow climates. The addition of the FOCUS snow depth observations as validation source further strengthens this statement. Therefore, we suggest our reconstructed SWE estimates represent the most accurate “truth” available for Afghanistan.

While there is not much snow data available for Afghanistan, there is a USGS-USAID tool that may be relevant to this work: <https://earlywarning.usgs.gov/fews/software- tools/10>. There are specific results on SWE in Afghanistan presented by Daly et al. (2012); the authors should present more specific SWE results and reduce the emphasis on evaluation statistics (see specific comments below). They should consider more specifics than just the summary in Table 3.

We are very familiar with the FEWS NET product as it is based on passive microwave estimates of the snowpack in Afghanistan. These assessments are done by CRREL on a weekly basis for operational use. The approach used is summarized in two previous studies, both of which are cited in the manuscript (Daly et al., 2012; Vuyovich and Jacobs, 2011). In fact, the original funding for this project was to use our reconstructed SWE estimates to improve these weekly snow assessments. In Table 3, we specifically compare our reconstructed SWE estimates to those from Daly et al. (2012). The basin wide SWE estimates appear close but that is somewhat misleading as large areas of Afghanistan’s watersheds never have snow cover. We suggest that it is more important to concentrate on the heavier snow areas in each basin, all of which have pixels with reconstructed SWE values an order of magnitude greater than the passive microwave saturation limit of 150 mm (p5 l34-35;6 l1-2).

We have found that the passive microwave estimates are not only inaccurate in terms of predicting snow depth or SWE, but they fail to even capture the rank order statistics (e.g. Fig S3), which are arguably more important to a water manager than “million cubic meters” of SWE. This is one reason why it is not an important predictor, even at the enhanced 3.125 km resolution.

Specific Comments

- Methods and Table 1: southness uses an aspect starting in the south. Previous papers have used northness, so at least a reference explaining the difference would be good.

Ok, Dozier and Frew (1990) citation added to Table (now) 2. The convention referencing directions to 0 degrees at south dates back to Sellers' *Physical Climatology* and Geiger's *Climate Near the Ground*. Moreover, such usage is consistent with a right-hand coordinate system (which measuring directions clockwise is not).

- section 3.1: not sure how common these variables are. They are used for the Colorado River by Fassnacht et al. (2012).

Ok reference added, p3 l 7.

- page 7, line 24 and Table 1: Barrier difference is also called shield height (e.g., Fassnacht et al., 2012).

We are unclear about this comment. The entry in Table 2 says "also called shield height".

- page 11, lines 10-11: Fassnacht et al. (2012) describes some of the physiographic predictor variables.

Ok, reference added

Overall the figures have been improved, but there is repetition in some of the Figure and Tables.

- Figure 2b is a repeat of Figure 2a.

Referee #1 specifically requested that we show and discuss inter-annual variability with respect to the mean so we've kept Figure 2b.

- Figure 4 is a repeat of the top of Table 4. Either remove Figure 4 or add the bottom of Table 4 to Figure 4 and remove Table 4. The same is true for Figure 5a and Table 5 - remove one of these.

Ok, tables (now) 5&6 have been deleted.

- Table 3 and 5 could be combined. At minimum they should state the watersheds in the same order. It would also be helpful to state the area off each watershed so the SWE estimates i Table 3 can be taken in context.

See last response and we've added the basin area as a row in (now) Table 3.

Reference

Fassnacht, S.R., Dressler, K.A., Hultstrand, D.M., Bales, R.C., and Patterson, G.G.: Temporal Inconsistencies in Coarse-scale Snow Water Equivalent Patterns: Colorado River Basin Snow Telemetry-Topography Regressions, Pirineos, 167, 167-186, doi: 10.3989/Pirineos .2011.166008, 2012.

Daly, S. F., Vuyovich, C. M., Deeb, E. J., Newman, S. D., Baldwin, T. B., and Gagnon, J. J.: Assessment of the snow conditions in the major watersheds of Afghanistan using multispectral and passive microwave remote sensing, Hydrological Processes, 26, 2631-2642, doi 10.1002/hyp.9367, 2012.

Dozier, J., and Frew, J.: Rapid calculation of terrain parameters for radiation modeling from digital elevation data, IEEE Transactions on Geoscience and Remote Sensing, 28, 963-969, doi 10.1109/36.58986, 1990.

Vuyovich, C., and Jacobs, J. M.: Snowpack and runoff generation using AMSR-E passive microwave observations in the Upper Helmand Watershed, Afghanistan, Remote Sensing of Environment, 115, 3313-3321, doi 10.1016/j.rse.2011.07.014, 2011.