Interactive comment on "Using machine learning for real-time estimates of snow water equivalent in the watersheds of Afghanistan" *by* Edward H. Bair et al.

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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.

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.

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.

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

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

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

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.

- 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.

- 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.

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.

Interactive comment

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Discussion paper