

Interactive comment on “Multi-scale spatialization of snow water equivalent (SWE) according to their spatial structures in eastern Canada” by Noumonvi Yawu Sena et al.

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In Sena et al (in review) the authors introduce a spatially explicit estimate of snow water equivalent across northeastern Québec and Labrador. This reconstruction may be useful but I do have some questions about the data used to construct the model applied in this study. I would also like to call attention to there being significant overlap in some sections with an earlier manuscript (Sena et al [2019]) which includes whole sections of the snow data description being nearly word-for-word replicated from the earlier paper. This issue is quite glaring and surprising to see in a manuscript under consideration.

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Some data related points are mentioned below: [1] In situ data is not summarized or shown on a map so it is difficult to surmise which regions are represented well. Likewise, it is difficult to know whether elevation bands, ecotypes and climate regions (coastal vs continental) are sampled appropriately by the data. The authors in Sena et al (2019) do present a map and it reveals huge swaths of land, particularly in eastern Labrador which have no SWE measurements included. This includes the Torngat Mountains where the authors are extrapolating from sea level to 1600+ m a.s.l. with no SWE observations within hundreds of kilometres of these sites. This is highly problematic to include these regions in the study in the absence of validation.

[2] The authors do not present their prediction errors which undoubtedly will be tremendously large in the areas that lack contemporary snow information. I find it difficult to see how this product is an improvement over reanalysis in many of the areas lacking snow survey information;

[3] Significant inter annual variability in snow cover occurred over the past 20 years so the authors need to test the assumption that this is not introducing extra error into the predictions when they are grouping together data with different periods. There are some stations on the map from Sena et al (2019) that have not been active for decades...;

[4] I am not presently sure I understand how the authors are determining SWE from weather stations that are only currently recording snow depth?

As a final note. The authors seemingly mention a lot of place names in Québec while largely avoiding the same for Labrador. I found the place names were a bit overwhelming overall, especially in the absence of a reference map. As such, consistency would be desired.

Sena, Chokmani, Gloaguen, and Bernier. 2019. Critical Analysis of the Snow Survey Network According to the Spatial Variability of Snow Water Equivalent (SWE) on Eastern Mainland Canada. *Hydrology*, 6: 55. doi:10.3390/hydrology6020055.

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