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The Cryosphere Discussions

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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I would like to thank you for the good reviews and comments you made to improve the article. I have provided each of your pertinent questions with essential answers for the understanding of the article. These questions have generated modifications and additions of ideas that you have suggested. Thank you for your contribution.

Question 1 SWE survey stations are usually scarcely distributed and the SWE data doesn't necessary represent well larger region when spatially interpolated. This manuscript attempts to do spatial SWE interpolation with taking into account geograph-

ical and physical factors. In my opinion this goal is important and it could result with a better method to retrieve SWE maps. However, there are some major issues with the manuscript. The spelling and grammar should be checked with a professional since there are obvious issues. For example, the second sentence in the abstract is repeated.

Answer 1 The paper entitled Multi-scale spatialization of snow water equivalent (SWE) according to their spatial structures in eastern Canada is reviewed by the experts of Catalytic Translation (http://www.traductioncatalytik.com/) in scientific paper revision. Corrections have been made in the abstract. On page 5 (line 23-31), the paragraph is corrected with more precision.

Question 2 In addition, the structure of the manuscript is not coherent. Especially the Results-chapter (chapter 3) is hard to follow. In my opinion the chapter should be rethought maybe by summarizing the results in a table rather than as text. The figures 4-8 contain lots of similar looking scatterplots. Is this really necessary? The key parameters could be in a single table without the plots.

Answer 2 Figures 4 to 8 represent results from the different models in the delineated areas. Summary tables (3 in total) have been added to simplify the presentation of the results. These scatterplots allow to visualize the organization of the points according to the 1:1 diagonal.

Question 3

Better maps (remaking Fig. 1 and 10) would improve the manuscript significantly. Since the manuscript deals with the spatial distribution of the snow surveys it would make sense to have a map of their locations. Even a geographic map of the target area would make following the discussion a lot easier since the text relies much on toponyms.

Answer 3 The map of the distribution of measurement stations is added to Figure 1. The names of the largest mountains and some snow measuring stations have been

added to locate the reader.

Question 4 -Figure 1 should explain A-G in a) and colors in b) in the caption

Answer 4 Explanations of the different zones delineated at the regional scale are provided (Page5, line 1-16). Explanations of Figure 1b are added. (Page5, line 17-21)

Question 5 -Chapter 2.2 Snow data, where are the stations located? Since the spatial distribution of stations is important there should be a map.

Answer 5 The location of the stations is added to Figure 1

Question 6 -Chapter 2.3.1 the metavariables U1-U4 are not explained. Are they same as latitude, longitude, altitude and distance to ocean? Or latitude and longitude, relief, and distance from the ocean?

Answer 6 Metavariables U1 to U4 are explained (Page 3, line 1-21)

Question 7 -Chapter 2.4 the metavariables U1LZ,U2LZ,U3LZ,U4LZ,U5LZ,U6LZ are not explained. Are they same as slope, aspect, distance to rivers, solar radiation, curvature,and vegetation height?

Answer 7 Metavariables U1LZ to U6LZ are explained (Page 3, line 1-21)

Question 8 -In chapter 3.1.1 and 3.1.2 the presentation of the results is hard to follow. Two tables would summarize the results better.

Answer 8 Tables (3 in total) have been added to make a summary of the results.

Question 9

-Figures 4-8: is it really necessary to present multiple scatterplots for all zones? I think these results could be better summarized as a table.

Answer 9 The point scatterplots of the different models are different from one area to another. The presentation allows to visualize the distribution of the points with respect to the 1;1 diagonal. The results of the indices are presented in tables

Question 10 -Figure 10: A-G should be explained in the caption

Answer 10 Figure 10 shows the delineated areas presented (Page 4, Figure 1a) with the map of the SWE estimated.

Question 11

-The discussion in chapter 3.2 relies heavily on toponyms that the reader can't associate with the target region at all because the figures 1 and 10 are inadequate in this respect.

Answer 11 Toponyms are added to the maps.

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