

## ***Interactive comment on “Improving gridded snow water equivalent products in British Columbia, Canada: multi-source data fusion by neural network models” by Andrew Snauffer et al.***

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The study assesses the use of an artificial neural network (ANN) to extract more accurate snow water equivalent (SWE) information from multiple sources of gridded SWE data in the province of British-Columbia, Canada. When comparing with manual surveys, results show a much improved performance compared with other approaches, such as using a multiple linear regression or the mean of gridded products, or simply the products themselves. The results are interesting and fit the scope of The Cryosphere.

My main comment relates to the lack discussion on the assumptions and limitations of

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the study. These would include the dependency on ANN-specific parameters, such as the number of layers, and the number and quality of predictor variables. I think some discussion on potential scaling issues is indispensable. The study uses elevation difference between manual surveys and cells of gridded products as a predictor variable and I am assuming this is to get around part of this issue (I would suggest adding clarifications to justify the use of predictor variables). While this is possibly the most important variable, other relevant factors are affected by gridcell size, such as slope and orientation, vegetation and surface water/ice. How does the spatial resolution of each gridded product affect the results?

My other comments are included in the attached pdf.

Please also note the supplement to this comment:

<https://www.the-cryosphere-discuss.net/tc-2017-56/tc-2017-56-RC1-supplement.pdf>

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