

Major comments:

1. This manuscript is using UAV-lidar data to understand the snow-depth heterogeneity in agro-forested environments and boreal forests. Since the author also used the slope and aspect as topographical variables for studying the snow-depth distribution. However, at site Saint-Marthe and Saint-Maurice, the elevation difference is actually very small comparing to the spatial scale of the study area, it would be kind of surprising to observe any meaning effects from topographical variables in these 2 study areas. And although Montmorency has a elevation difference of 20 meters in the study area, it seems the main area is facing towards south east direction. It would also be helpful to visualize the distribution of the slope and aspect of the 3 study areas to make sure there is significant variability in these predictors of snow-depth before feeding them into a model like random forest.
2. It is not very clear on how the forest edge descriptors are derived, it would be helpful to have a visualized illustration to demonstrate how variables are derived based on canopy cover data from lidar.
3. The 2nd objective raised in the Introduction part for this manuscript seems to be extremely open ended. Is there a particular hypothesis the authors would like to test with the used dataset and validate the hypothesis throughout the manuscript? The current objective of “exploring the relationship between snow depth, topography, and forest structure” seems too vague and not specific enough.

Minor comments;

Figure 1 – it looks like the first 2 study areas are very flat with low elevation and the 3rd one has elevation difference and the elevation is much higher. Is the precipitation in this area affected by orographic effect as well?

Line 154-155: given it is 1 m diagonal cross shape, why it is 1.4x1.4 m grid cell? Isn't it going to be 0.7m x 0.7m grid cell instead?

Line 162-165: it is not clear why UAV-lidar is more robust and the technology represents an improvement to previous studies.

Line 184-186: The closest weather station is 19 km away from Saint-Maurice. Is the wind data going to be trustable for this site given it is very far and the wind speed and direction can be quite different comparing to the actual on the site, right?

Line 193: how is LAI, CC, and GF calculated? By using Lidar360 software?

Line 202: why the grid size for vegetation is so much larger than the resolution of the snow-depth (1.4x1.4 m). It seems the vegetation grid resolution is so much coarser and are we able to capture all the forest variable based on such a low resolution?

Section 2.2.4, please see major comment #2, it is not very clear how d and d_{max} are derived based on the forest-covered lidar data.

Line 250-253, are hyperparameters in Random Forest tuned or selected before training each model?

Line 257: It is not very clear how forested vs. fields are defined. It would be helpful to have a map of these site showing this binary variable. And why don't we use this binary variable directly in the RF model directly? Is it to show at different area how other variables affecting snow-depth differently?

Figure 3: it is a bit surprised to me at Montmorency there is not many data points for under canopy. Then we might not be able to observe a lot of under canopy snow-depth signals.

Figure 4: how is the scale break selected? Please describe that in the Method section.

Figure 5: it might be better to use bar chart with different colors. It is a bit difficult to differentiate color the marker styles on this scatter plot.

Section 3.3.3: there is only one line in the Method section (line 267) discussed about the partial relationships of predictor variables with snow depth. It is still not very how that is calculated. Please add details in the Method section.

Figure 7, it looks like the model is not performing very well at Saint-Maurice and Montmorency. The slope of the predicted vs. observed is not close to 1. What would be the reason that the trained RF model is underfitting and has this systematic bias?