

## ***Interactive comment on “Upscaling reflectance information of lichens and mosses using a singularity index: a case study of the Hudson Bay Lowlands, Canada” by T. Neta et al.***

**T. Neta et al.**

talineta@gmail.com

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Reply for Reviewer 2:

First, we would like to thank Reviewer 2 for the insightful comments! We highly appreciate it, and we hope that our answers are satisfying.

2. The abstract was improved – relevant results obtained are described.

4. The criteria used for the selection of representative sites were mainly the species present at each site. That is, all four common sub-Arctic lichen and moss species studied in our previous studies (and the indices were developed for these species), were

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present at these sites. The constant height of 2.20 m above the surface was selected to obtain a spatial resolution of approximately 1 meter. Due to logistic limitations, we could not reach a greater height in order to obtain a larger spatial resolution (which would be more similar to airborne or satellite images). Then by changing the field of view, we could obtain smaller spatial resolutions, and therefore, perform upscaling experiments.

5. About the first part of this comment, a partially separation of the visible, NIR, and SWIR, already exists (where possible). As you can see in page 3559, lines 10 to 20 describe the visible region. Then, lines 20-25 describe the red edge (the region between the visible and NIR). Page 3560, lines 1-7 discusses both visible and NIR regions, and we find it quite difficult to separate these, as the literature review indicate the 500-800 nm which includes both regions. In general, we could say that there is a separation between the visible and NIR regions versus the SWIR region, and this separation exists also as a result of using two separate instruments, as described in the experimental design. Regarding the second part of this comment, the data of all sites are not available here since we have quite a lot of data, and there is a space limit here (the paper would be much longer, if we would present all of our data here). Therefore, we present representative examples of the data, and if people are interested in further information, they could contact us, as we wrote that data are available upon request.

6. The second paragraph in page 3560, discusses the interpretation of the reflectance at various scales. That is, what could cause the change in reflectance at different scales. This discussion is not directly associated with the experimental design. It simply explains scale issues, where the incident irradiation, spatial resolution, uneven reflectance at different incident angle, vegetation species, etc, all influence the spectral reflectance obtained at different scales. We think that the combination of these factors may influence the reflectance at various scales; however we do not know which one of these factors is dominant, or most influencing the reflectance at different scales.

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Therefore, we are not sure how we could further describe the schema experimental utilized in section 3.

7. To improve the linking text discussion in page 3562 and the figures from 6 to 9, the R2 values were associated with the spectral indices, as seen in table 1. In addition, to be more accurate, in Table 1 we added the following sentence: "Ref represents reflectance values in percentage (the wavelengths units are in nm)".

8. In the summary and conclusions, the affirmation that 'higher reflectance observed in the greater scales may be related to the incident irradiance of the area, or the anisotropic reflection, as well as the vegetation distribution, vegetation density, vegetation pigments, moisture content and biomass', we are not sure how we could further explain the scheme utilized, as we are not sure which of these factors is most influence. We suggest that all of these factors may influence the reflectance at various scales.

9. The R2 indicates the strengths of the relationship between the indices values and the spatial resolution. The mean square error would not describe these relationships, and we were interested to examine which index was least influence by scale, so that this index could be used in upscaling experiments and future airborne and satellite research.

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