

## RC2 – Author Response

In this contribution a series of seven datasets is presented, collected almost weekly during the 2017 melt season in the Colorado Rockies at around 3,500 m ASL. RGB, NIR and TIR imagery was collected over a 40 ha study site using a custom-built multi-rotor system. All imagery was processed using SfM-photogrammetry to generate corresponding orthorectified mosaics. These are complemented by an NDVI mosaic generated from radiometrically calibrated imagery. Extensive and robust ground control and error handling ensured cm-level georeferencing. The site, data collection and processing, as well as accuracy and challenges are very well described and documented. Overall, the manuscript is clearly structured, succinct and very well written - a joy to read! Figures and Tables are well presented and organised, captions are clearly written and comprehensible.

*We would like to thank the reviewer Marc Adams for his comments and detailed review of the manuscript. We have included responses to the specific comments raised in italics below each bullet point. Furthermore, we will complete a thorough edit for clarity and typos to identify any issues that may have been missed.*

For specific and technical comments, please refer to the attached PDF.

*PDF comments Copied below:*

### Specific comments

From what I saw, only a single SfM-DSM was published from the snow-off flight? Since RGB-imagery from all dates was processed and ground control is available for all dates, it might be interesting to add DSMs and/or DPCs from the snow-on dates too. This could give potential users of the dataset the possibility to investigate the evolution of snow depth as well as snow melt patterns during the studied time frame.

*Agreed this is a useful dataset. The snow depth data are currently being QA QCd against additional snow depth validation data will be released as part of a different publication addressing specific science questions around snow depth.*

### Technical comments (non-exhaustive)

- Line 17: Consider using the term ‘uncrewed’, rather than ‘unmanned’ (corresponding to ‘crewed aircraft’ mentioned in line 40) – here and throughout the manuscript

*Agreed, we will make this change*

- Line 19: Our unique [...]

*We’re unsure what this refers to?*

- Line 19: [...] 5-25 cm [...] for consistency here and throughout the manuscript i) consider switching to SI-units i.e. only use meters rather than switching back and forth between cm, m and km; ii) I advise using a hard space between numbers and units

*We will maintain SI units where suitable. However when working with this high resolution cm scale imagery we feel it is often easier to use appropriate non SI units e.g. cm. We will make changes to the manuscript where this may cause confusion.*

*Agreed re hard spaces, and this is the preferred format for ESSD. Most of are already formatted this way, however some may have been missed. We will complete a careful proof-read of the manuscript to catch any that are incorrectly formatted.*

- Line 21: [...] Normalized Difference Vegetation Index imagery [...] → maps? calculations? mosaics? I'd reserve the term 'imagery' for the actual imagery, rather than processed products

*Agreed, we will make this change*

- Line 21: [...] vegetation productivity at [...] → maybe better to use 'vitality' here

*Agreed, we will make an appropriate change, e.g. health/vitality*

- Line 23: A 10 cm High-resolution digital surface model [GSD 0.1 m] and dense point cloud [add point density] are [...]

*Agreed, we will make this change*

- Lines 28ff: 16 references in a single sentence strike me as being a touch too many – consider reducing to the most relevant ones.

*Agreed, we will make this change*

- Lines 32ff: ...and conversely maybe add some references to the rest of the paragraph. Although of course this reasoning follows common sense for any reader with a background in remote sensing, a few well-placed references could nicely underpin your arguments.

*Agreed, we will make this change*

- Line 56: Here or better in the Figure 1 caption, you might want to add a brief description of a), b) and c), to the effect of 'overview / terrestrial / aerial image on the study site...' - for completeness' sake

*Agreed, we will make this change*

- Line 135: [...] a high resolution 1 m [...]

*We're unsure what this refers to?*

- Line 135ff: I would have thought the main reason was to sustain a defined ground sampling distance over the whole study site. Not sure I get the point raised here about DEM errors (only impacting automated RTL).

*In this case we are talking more about operational/navigational challenges, and will edit to make this clearer. However, we agree with the point re flight altitude above ground level and consistent ground sampling resolution. We will edit this appropriately.*

- Line 139: [...] in a ground resolution of [...] Could be substituted by ground sampling distance (GSD)

*Agreed, we may make this change in our final proof read.*

- Line 188: [...] a full data stack of data collected [...]

*We're unsure what this refers to? However grammatically it appears awkward, we will edit as appropriate.*