Final response to review by Frank Techel (egusphere-2025-2217).

Abstract and Conclusion

- I suggest emphasizing more strongly a key applied takeaway: despite declining SWE values and a lower frequency of RLMA, truly extreme RLMA years remain possible, as the 2019 cycle has shown. This message has high practical relevance for forecasting, mitigation, and infrastructure planning – and likely also for policy makers.
  Response: We emphasized this more in the Abstract (lines 37-40) and Conclusion (lines 583-587).

- Abstract L14: When introducing size ≥ D3, consider clarifying this as "(destructive size ≥ D3)."
  Response: Added 'destructive'.

Data

- The number of trees sampled (1,023 trees, 1,188 samples) currently appears in Section 3.1 under Results. It may be clearer to introduce this earlier, for example as Section 2.2 under a Data heading. Sections 2.2–2.5 could then form the Methods. This restructuring would improve the logical flow.
  Response: We moved Section 3.1 to Section 2.2, changed the header, and renumbered the sections in Section 3.

Methods

- L218–222, L225: An overview figure displaying the three analysis periods (1980–2019, 1900–2019, 1806–2019), and how each is used, would help orient the reader. Since the 1900–2019 period is further subdivided, this could possibly also be indicated within the same figure.
- The methods section is very dense. A flowchart or schematic illustrating the workflow - showing how analyses were conducted and how each step informed the next - would improve accessibility. This could even be combined with the overview figure suggested above.
- *Response to both points*: We added a new schematic detailing the methodology and data types used throughout (Figure 3).

Results and Figures

- The Results section is very rich in findings, with far more described in the text than shown in Figures 3–7. Many additional results are in the Supplement, which is fine, but the density of the main section makes it challenging to follow.
  Response: We revised the Results throughout, specifically Section 3.2 (revised).

- Section 3.1: The mean age of sampled trees is 127 years. Could this partly reflect the legacy of the 1899 extreme avalanche year, which may have removed older trees, like the effect of 2019?

Response: Yes, there are several factors that could impact the mean age of sampled trees: the 1899 cycle, deforestation, and wildfires among others. Given that we were able to sample trees older than this throughout the study domain coupled with our hierarchical Bayesian modelling approach, we are confident that the tree-ring record adequately represents a regional record of large magnitude cycles. We added an explanation of this to Section 4.1 of the Discussion.

- Figure 2: Consider adding a timeline showing the proportion of trees alive in each year. This would clearly illustrate why uncertainty grows further back in time. While Figure 2b and Figure 3 partly address this, a dedicated visualization would be clearer.
  Response: We added a new panel (d) to Figure 2 illustrating the number of trees alive in each year.

- Table 1: Consider moving this detailed table to the Appendix and keeping a more concise summary (table or figure) in the main text.
  Response: We revised Table 1 and included the full table in the Supplement (Table S2).

- Figure 3: A central figure, but visually complex. Colors are difficult to distinguish, simplifying or improving contrast would help.
  Response: We improved contrast in Figure 3 in the revised manuscript.

- Figures 4 and 5: Clarify more clearly which colors represent RLMA years vs. non-RLMA years in a legend.
  Response: We added a legend representing RLMA and non-RLMA years at the bottom of the plot for these figures (now Figures 5 and 6).

- Figure 5: The order of panels (December, March, November, winter) is not intuitive, reordering to a chronological sequence would improve readability.
  Response: We revised this figure (now Figure 6) to a chronological order.

Final response to review by Zachary Miller (egusphere-2025-2217).

Thank you, Mr. Miller, for your time and review of our manuscript. We are pleased that you find this work valuable and with the overall positive review. Please find our responses to each of your comments below.

Line-specific comments:

45: "CAIC" needs capitalization
Response: Corrected.

69: Citation list is alphabetical despite all others being chronological
Response: Corrected.

306: Was there an attempt to sample any avalanche paths within the region that were not affected by the 2019 cycle but are suspected to have been affected by previous RLMA events?
Response: Good question. We ultimately decided to sample paths with clear evidence of large magnitude avalanches in 2019 for two reasons. First, the 2019 cycle provided ample material (i.e. dead and downed trees) from which to sample allowing us to collect such a large dataset. Avalanche paths without dead and downed trees lacked material from which we could sample. Second, given the widespread nature of this avalanche cycle, we deemed any avalanche path without clear evidence of avalanche impact either unrepresentative or potentially unreliable.

Figure S2: Winter “SWE” needs to be capitalized in the plot
Response: Corrected.