

The Cryosphere Discuss., referee comment RC2
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Comment on tc-2021-270

Anonymous Referee #2

Referee comment on "Past changes in natural and managed snow reliability of French Alps ski resorts from 1961 to 2019" by Lucas Berard-Chenu et al., The Cryosphere Discuss., <https://doi.org/10.5194/tc-2021-270-RC2>, 2021

I assess the study to have a high potential to contribute to the ski climate literature by focusing on (1) historical data, (2) climate variability, and (3) compensation potential of snowmaking for adaptive capacities. I believe the manuscript is good for publication but it could discuss some of my suggestions along with some minor points to be corrected below:

- The authors intuitively claim that "there is more literature regarding future projections than past observed impacts." Can this be quantified, e.g. based on the Steiger review? It should also be noted that most of those future projections studies do bear (yet most often implicitly) past observations/reanalyses at least at some of point of their modellings (e.g. validation, calibration, bias correction etc).

- I am not sure if the focus should be on the "developed" countries in the introduction especially now that we have China at the forefront of installing snowmaking systems and even promising an entire Olympic based on this technic.

- "Based on interviews with ski resort managers and ski tourists, several studies": Which "several" studies? You add a couple more in section 4.4, but is there any more to make them "several"?

- How do you justify the 25 cm (compared to the more commonly used 30 cm) threshold in your modelling? Is it field informed maybe for this particular case of the Savoie?

- Please run a grammer check for Fig. 1.

- Lastly I would like to suggest two papers for your consideration as they may support your departure and enrich the discussions: Firstly, in a Swiss case, Gonseth (2013, Climatic Change) concludes that "an increase in the snowmaking percentage coverage from 30 % of the total length of ski runs to 50 % could counteract a 42 % increase in the natural snow conditions' variability" - a point to add to your discussions of snowmaking's added value to adaptive capacities. Secondly, in terms of a historical approach to climate variability, you can compare your innovative Q20 method and results to Mayer et al. (2018, Sustainability) study which uses the ARCH/GARCH model to determine a significantly volatile historical visitation pattern, attributable to weather/climate variability, in the case of an Austrian glacier ski area.