

General comment

This is an interesting and valuable manuscript. I fully agree with the authors that there is little research on past changes in natural and managed snow reliability in ski resorts (i.e. there is more research on future changes in snow reliability in the context of climate change). I am also fully aware of the data problem (lack of data!) and, therefore, I was happy to learn that more data is available in France (or at least in Savoie) than in many other ski tourism markets. Given the data, the methodology is appropriate. The manuscript clearly highlights an important feature, and that is the heterogeneity of ski areas or ski resorts – with regard to size, elevation ranges (to distinguish between ski slopes above and below 2000 m, for example, is very helpful), snowmaking development paths and, although noted in the margin only), business models. Recently, quite a few scholars suggested to pay more attention to this heterogeneity; the authors of the paper at hand did it – in a good way. Consequently, this manuscript is a valuable contribution/addition to the existing literature and worth to be published.

Specific comments

Line 30f.: "... explicit assessments of the impact of climate change on ski resorts operations, based on past observations, have remained limited (Beaudin & Huang, 2014, Hamilton et al., 2003). Here, you should add the analogue studies, e.g. Rutty, M., Scott, D., Johnson, P., Pons, M., Steiger, R., & Vilella, M. (2017). Using ski industry response to climatic variability to assess climate change risk: An analogue study in Eastern Canada. *Tourism Management*, 58, 196–204 or Steiger, R. (2011). The impact of snow scarcity on ski tourism: An analysis of the record warm season 2006/2007 in Tyrol (Austria). *Tourism Review*, 66(3), 4–13.

Line 38ff.: "The strongest evidence on climate change impacts to ski tourism has therefore been inferred primarily from future climate change projections, which is then used to interpret past and present situations, in the absence of solid studies assessing impacts based on past observations." This is a strong statement, and open to debate. I refer to the sensibility analyses and the risk perception studies (see Steiger et al. 2019 for an overview) and recommend to reconsider the wording/phrasing.

Table 1: There is another figure often seen in the literature, although referring to investment costs per km (and not hectare): investment costs of approx. 1 million Swiss Francs per km ski slope (see www.seilbahnen.org and look for l'enneigement technique).

Fig. 4 (and therefore also Fig. 7): These are interesting figures. The corresponding explanation in the text, however, is very brief. For a better and/or faster understanding of these figures, it is suggested to add some explanatory text.

Further, in line 267 (referring to Fig. 5 and 6), you write about "... the lower values at the beginning and end of the winter season ...". The lower values at the beginning of the season are clear. The lower values at the end of the season are not, maybe in April but this is not shown in the figures (and in March, the values are high).

Discussion (and limitations) is well done. In chapter 4.4 you could add Abegg, B., Steiger, R. & Trawöger, L. (2017). Resilience and perceptions of problems in Alpine regions. In R. W. Butler (Ed.), *Tourism and resilience* (pp. 105–117). Wallingford: CABI Publications. Conclusions and perspectives, though, are very brief. I would have expected to read more about the wider consequences of your research (e.g. the feasibility of future snowmaking investments in low and middle altitudes). And, apart from more company-/site-specific data is needed to refine this kind of research, what are exactly the perspectives, or more precisely, what is the research outlook?

Some technical corrections

General point: I am not a native English speaker but I think there is room for improvement in the use of the language.

- Line 34: led (instead of lead)
- Line 73: ... snow cover simulation ~~produced~~ using ...
- Line 83: what do exactly mean by ski lift maintenance? Replacement of old ski lift by new ones?
- Line 110: "... it is not fully certain ..." – this is a bit cryptic, please clarify.
- Fig. 3: divide into top, middle and bottom graph (and not into top, bottom and last row)
- Line 233: in 2018 (not: en)
- Line 247: it is with grooming only (and not without grooming), right?
- Line 456: These figures (not: this)