

Dear Editor,

Thank you for taking time reading our revised manuscript. We believe that your suggestions and the ones of reviewer are very helpful to improve our work. We improved the manuscript according to such suggestions and responded to all the comments (please find in the following a point-by-point response). We also generally improved the manuscript, e.g. ordering the macro-basins in the table according to the proper hydrographical order and checking the overall paper in general.

Best regards

on behalf of the authors,

Paolo Colosio

Reviewer comments:

All points raised during the revision have been addressed. The manuscript as clearly gain in readability.

In the following some minor editing:

The knowledge gain on the snow depth and snow water equivalent trends can still be better presented: in my opinion, the expected knowledge on the snowpack evolution in the Italian Alps cannot be reported in the abstract (line 14-16) and conclusion (line 478-479) only for one of the sub region. The Authors should consider for example to give the trends range and shortly identified (seasonality, elevation range, geographical zone) the 57%/44% of the cases that exhibits significant snow depth/SWE decreasing trend (line 284 and 361) to clearly address the first objective of this research as state line 80-81.

R: We thank the reviewer for this comment. We improved the presentation of the results, showing general results about decreasing trends valid for all macrobasins in the abstract and in the conclusions. Specifically in section 3.1 (line 284-289) and 3.3 (line 365-370) we presented the average and the standard deviation of all the observed trends and highlighted the influence of seasonality, altitudinal difference and geographical zones. We also improved Tables 2 and 5, reporting the percentage of timeseries showing statistically significant trends and the average trend for the macro-basin).

in figure 2 caption and in figure 2, it is not easy to identify the subplots. Also, it would be nice to report the other case studies in supplementary, so that a reader specifically interested in the other region can access your results.

R: Thank you, we added borders to make the subplots clear. For the supplement, we added the timeseries of the same basins (figure previously removed by the manuscript). If the editor thinks it is interesting, we can prepare the supplement with all the timeseries in the preferred representation (simple timeseries as reported in the current supplement or MARTA triangles).

in figure 8f, units of the color code ("relative decrease of SWE) is missing and the panel is not commented in the text, which is a pity, as it is a nice and compact way to present the mean impact of C.C on SWE along season and elevation. In the caption, the macro basin should be indicated not only for panel f, but for all figure 8.

R: The relative decrease is unitless, we specified it in the text. It is computed as $(SWE_{1967-1993} - SWE_{1994-2020}) / SWE_{1967-1993}$. Yes, thank you: we prepared a comment but it was probably not saved in the file during the editing process. We added: "In Figure 8f we report the relative difference between the modelled climatological SWE in the two sub periods, computed as $(SWE_{1967-1993} - SWE_{1994-2020}) / SWE_{1967-1993}$. The representation of the modelled climatological SWE relative difference highlights an almost complete disappearance (decrease >90%) of SWE below 750 m asl. Above such elevation, the relative decrease is stronger moving towards the melting season, with the weakest decrease at high

elevations at the beginning of the year, in agreement with the results previously presented.”

line 504, I guess the authors refer to figure 4 (not 8)

R: Yes! Thank you for noticing.

Editor comments:

Dear authors,

Thank you for submitting an improved version of your manuscript. I asked one of the previous reviewers to evaluate your revised manuscript and the replies to the comments you received. The reviewer and I think that you have well addressed the comments and clarified the objectives and the novelty of your work. Besides these considerations, the reviewer suggests improving the presentation of some figures and of the results in the abstract and the conclusions. Regarding figures and tables, I recommend the following additional improvements.

- Figure 1: Please increase a bit the size of the dots and squares and change the colour of the dots.

R: thank you for this suggestion, we prepared a new version with more visible squares and, first of all, dots (from black, possibly misleading due to the background color, to green).

- Figure 6 and 7: Please increase the size of the labels and improve the resolution of the figure. Furthermore, please add the description of a), b), c), d), e) and f) in the caption.

R: Yes, we improved the figure and explained the panels in the caption, as done for figure 2.

- Table 4: the authors could try to report the results of this table by using a figure. Otherwise, to improve the readability of the table, I suggest using only two decimal numbers for R2, and for very low R2, the authors could write “<0.01”.

R: Thank you. We adjusted the table keeping only two decimal numbers for R2.