

Author reply to Editor Decision and suggested technical corrections

We thank the Editor and the Reviewer for their useful suggestions. The author replies are reported in *Italic* after their comments.

Editor Decision: Publish subject to technical corrections (08 Mar 2016) by Etienne Berthier

Comments to the Author:

Carturan et al.,

Revised version, March 2016

Dear Authors,

Thanks for the revision of your paper and for taking into account or answering to the reviewer's comments.

I have thus the pleasure to accept your manuscript for publication in *The Cryosphere* after taking into account the minor edits provided below by reviewer 2 and myself.

Thanks a lot for choosing *The Cryosphere* to publish your work,

Best regards,

Etienne Berthier

My final editorial comments:

TC discourages citing papers that are not finally accepted (was not an issue in TCD because there is often sufficient time for the paper to be accepted meanwhile). So Carturan, 2016 should be replaced with "unpublished data" except if, meanwhile, the paper has been accepted.

Author reply: ok, replaced with "unpublished data" and reference removed.

L130. In the abstract Oct-May and June-Sept should be replaced with October-May and June-September (and the abbreviations defined when they first occur in the main text, an alternative would be to keep the month written in full)

Author reply: ok modified accordingly

L233. ± 0.05 and " ± 0.30 m w.e.

Author reply: ok, added

L374. "These comparisons may be affected by the loss of spatial representativeness of some glaciers (e.g. Careser in the Italian Alps and Sarennes in the French Alps)". What references support this statement for these two glaciers? Does it come from Huss et al., 2015?

Author reply: references to the original works by Carturan et al., 2013a and Thibert et al., 2013 have been added.

L417. Minus sign before the 0.65 lapse rate.

Author reply: ok added

L499. "Rapid geometric changes may also lead to a non-linear response of B a to atmospheric changes, at least for some glaciers". I also miss a reference here. Maybe (Elsberg et al., 2001) ? Or a more recent reference.

Elsberg, D. H., Harrison, W. D., Echelmeyer, K. A. and Krimmel, R. M.: Quantifying the effects of climate and

surface change on glacier mass balance, *J. Glaciol.*, 47(159), 649–658, 2001.

Author reply: references to the papers from Elsberg et al., (2001) and Paul (2010) have been added.

L576. E. Thibert agreed to have his email reveal to the authors.

Author reply: ok, added in the Acknowledgments

Final comments by referee 2 (Emmanuel Thibert)

From my opinion, the paper can be now accepted after minor changes:

Line 160 : I suggest to add « ...because of their southern locations in the Alps, of the differences in glacier... »

Author reply: modified accordingly

Line 172 : « ...glaciological method... »

Author reply: ok, corrected

Line 220 : here and elsewhere in the text, I would not use the shortening vs. but versus.

Author reply: modified accordingly

Line 268/294. I missed where Table 2 is introduced in the text. I suggest this to be done in lines 268 or 294.

Author reply: Table 2 is introduced in Section 4.1, sub-section “Comparisons in the common period from 2004 to 2013 and spatial representativeness”

Line 285-290. I would specify here which NAO data series is used rather than in line 439.

Author reply: Ok, modified accordingly

Line 298 ; Change points are visible in Figure 4 which could be introduced here.

Author reply: in our opinion Figure 3 better shows the change points mentioned in this part of the paper, therefore we prefer keeping the text as is

Line 414 : Specify « the June-September warming... » ?

Author reply: actually we mean warming trend in general, not relative to any specific period of the year, because ablation tends to extend outside the June-September period

Line 445 : « ...season, with a higher link than the NAO signal. »

Author reply: sorry but we do not understand the suggested change

Line 480 ; especially in early and late winter in the accumulation period.

Author reply: ok, specification added as suggested

Line 507 : to conclude this paragraph, the authors could suggest to analyse in a further work point balances at a single stake trying to quantify/overcome the geometry feedback held in the glacier-wide mass balance series.

Author reply: we prefer to avoid introducing this concept, because it would require additional discussion and considerations that are beyond the aims of this paper. Indeed, single stakes are also affected by geometric adjustments, which modify local slope, exposure, sheltering by the surrounding relief and, notably, the air temperature variability and the cooling effect (e.g. Carturan et al., 2015)

Carturan L., F. Cazorzi, F. De Blasi, G. Dalla Fontana. 2015. Air temperature variability over three glaciers in

the Ortles–Cevedale (Italian Alps): effects of glacier fragmentation, comparison of calculation methods, and impacts on mass balance modeling. The Cryosphere, 9, 1129-1146.

Line 515 : add « of » between higher-reaching and La Mare.

Author reply: “higher-reaching “ is referred to the glaciers, not to their higher portions.

Line 516 : « area » instead of « eareal »

Author reply: ok, modified

Line 526-532 : also should be investigated the common the year-to-year deviations of the mass balances between new and glaciers to be replaced

Author reply: the concept of parallel observation programs has been introduced as suggested

Line 540 : I would specify «...related feedbacks, such as the lengthening of the ablation season ».

Author reply: ok, specified

Line 576 « Etienne Berthier »

Author reply: Ok, corrected

Table 1 , head line, 4th column, inverse the bracket after m a.s.l.

Author reply: ok, corrected

Table 2. “standard deviation” (no shortening SD).

Author reply: ok, corrected

In captions of Tables 3, 4 and 5, I would write “...indicate significant Spearman correlation coefficients at the...”

Author reply: ok, modified accordingly

An alternative to one-triple stars is to used italic, underline and bold face values in Table 3 to 6.

E. Thibert, 29/02/2016

Author reply: we prefer keeping Tables 3 to 6 unchanged, if possible.