

## ***Interactive comment on “Decay of a long-term monitored glacier: the Careser glacier (Ortles-Cevedale, European Alps)” by L. Carturan et al.***

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Carturan et al (2013) provide an important documentation of the demise of a glacier with excellent field data on mass balance and areal extent change. This paper is a valuable contribution as no other glacier has such long term detailed records that will soon disappear. The paper also indicates the importance of replacing such a glacier in the mass balance record, with forethought. The figures are an excellent documentation of the glaciers decline. The specific suggested comments below are all minor.

Specific Comments:

3302-7: What percentage of the stakes have been abandoned?

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3304-15: How has the elevation of the snout changed from 1897 to 1933 and 1933 to 1961?

3304-17: When did the nunatak first develop?

3304-27: This comment could be addressed either here or later near 3310-14. Pelto and Hedlund (2001) in a study of North Cascade glaciers noted that a group of glacier that did not advance, similar to Careser Glacier, were those with a slow response time and were still adjusting to the post Little Ice Age climate. There are glaciers with similar histories and characteristics in the Alps with terminus records ie: Cavagnoli, Calderas, Gran Desert, Paradies in Switzerland, and Lobbia or Sforzellina Glacier in Italy. A comparison to Sforzellina Glacier, Cannone et al (2008), would be ideal since there is mass balance and terminus data for this glacier as well.

3306-10: The AAR of 0 indicates a lack of an accumulation which a glacier cannot survive without (Pelto, 2010).

3310-6: The response time of 35 years is based on the ablation rate and glacier thickness? This response time represents the adjustment to 2/3 of the total climate response as defined by Jóhannesson et al. (1989), is that why the correction from Braithwaite and Raper, (2009)?

3310-28: There is limited loss of glacier area up to 1980 at a higher elevation indicating a glacier that may have been adjusting to climate change. The maps from 1933-1980 indicate even some areas of thickening at the top of the glacier during some periods. After 1980 the high elevation changes are dramatic indicating disequilibrium response. This is further corroborated by the AAR record which becomes 0 with frequency in 1980. This indicates an important change from an equilibrium response to a disequilibrium response.

Figure 9: At what point are the five stakes in the four separated ice masses discontinued in the Careser Glacier mass balance assessment?

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Cannone N., Diolaiuti G., Guglielmin M., Smiraglia C.: Accelerating climate change impacts on alpine glacier forefield ecosystems in European Alps. *Ecological Applications*. 18: 637-648, 2008.

Pelto, M.S. and Hedlund, C. : The terminus behavior and response time of North Cascade glaciers. *Journal of Glaciology* 47, 497-506, 2001

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Interactive comment on The Cryosphere Discuss., 7, 3293, 2013.