The Cryosphere Discuss., 9, C514–C516, 2015
www.the-cryosphere-discuss.net/9/C514/2015/

The Cryosphere
Discussions
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Interactive comment on "Evolution of Ossoue Glacier (French Pyrenees) since the end of the Little Ice Age" *by* R. Marti et al.

Anonymous Referee #1

Received and published: 21 April 2015

The presented paper provides very interesting and novel information on the evolution of one of the most representative and largest glacier of the Pyrenees. There are presented results from many different techniques that considered separately contains several uncertainties (as identified and recognized by the authors), but all together permits to elaborate a robust reconstruction of the major phases in the evolution of the glacier, that are properly related with regional climate evolution. Despite some comments (most of them minor) on the content and the analyses, my major concern is on the presentation of the manuscript as it results quite difficult to be followed. I recommend several changes in the structure of the manuscript and I also encourage to check carefully the English. I am not English speaker but I have noticed a numerous mistakes and in general it results hard to be read.

The most important changes in the structure of the manuscript are: - I would drastically reduce the length of the methods section and I would add specific information on the different techniques (glacier mass balance, geodetic techniques, GPR, radar, etc) as supplementary material. Otherwise, it results unbalance the length of the method′s section and the one devoted for presenting results. - I would move the presentation and discussion of figures 11 and 12 to results sections. Specifically, figure 11 should be moved to section 5.4 (linkage between glacier′s evolution and climate) and Figure 12 should be presented in section 4.5. - I would rewrite the conclusions section as it contain information that does not summarize the main findings, but are hypothesis that should be presented in discussion.

Regarding the methodology, I do not have major comments, except that prior to correlate mass balance and climatic series, both should be previously detrended. As authors correlate series that both exhibit significant trends, the correlation between them may be spuriously enhanced.

Minor comments

I think that references of Chueca-Cía et al., 2007; Trueba et al., 2007 and López-Moreno et al., 2006b should be used in more detail to support different parts of the introduction section. page 2434- Why does temperature range decreases over time? Which variable (Tmax or Tmin) is exhibiting a sharper trend to cause such effect on diurnal range? - Study site: Authors should provide information about mean temperatures over the glacier and the estimation of the elevation of the ELA. - More references should support the use of Pleiades for estimating changes in glaciers′altimetry. - Section 4.6. Which is the resolution of CRUTEM 4? - Section 5.1 presents mixed the information on changes in the length of the glacier and on the area. I would clearly separate. - I would remove the supplied information about the depth of the moulins as it result very uncertain and it is not easy to interpret the progressive increase of their depth. - I would recommend to remove section 5.3 it can be used to summarize results in discussion and/or conclusions sections.

I hope the comments will help to the authors for preparing a better revised version

Interactive comment on The Cryosphere Discuss., 9, 2431, 2015.