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Interactive comment on "Warming permafrost and active layer variability at Cime Bianche, Western Alps" *by* P. Pogliotti et al.

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General comment of Referee#1

The manuscript "Warming permafrost and active layer variability at Cime Bianche, Western Alps" by Pogliotti et al. describes a record of measurement results of per- mafrost properties. In general, the methods are sound, and the manuscript is written in a clear and well-structured way. From a technical point of view, the manuscript is state-of-the-art. The presented data basis is a bit at the edge of what deserves to be published in "The Cryosphere", and "new" effects or processes are not described. I nevertheless recommend it for publication subject to some revisions. I am of the opin- ion that such baseline studies

deserve to be published in a journal like The Cryosphere since they provide well-documented in-situ observations which will be of high value for many years to come.

Dear Referee#1,
we are grateful for the positive consideration about the manuscript and the analysis. In the following we discuss the comments and how the manuscript was modified to take into account your suggestions. We are confident to have fully answered all questions and incorporated most of the recommendations in the revised paper.
All the modifications are reported in red in the revised manuscript. In the following, your comments are in bold while our response in italics.
Best regards,
Paolo Pogliotti and co-authors.

Major comments

1.The authors basically only describe results from one single area. While they do put it in the context of other monitored areas in the Alps, the authors should describe in more detail why the results from Cime Bianche are relevant. If there are three similar installations on other mountains close by which behave similarly, the findings would definitely not warrant publication. Does this site fill a geographical gap within the Alps? Maybe a map with other borehole sites in Switzerland/France/Italy would be helpful. Is it meant to be a baseline study for a permanent permafrost observatory?

We agree with referee#1 that is important to highlight why the results of Cime Bianche are relevant and why they fill a geographical and knowledge gap in the Alps. For these

reasons we added specific sentences on that. Modifications on the revised manuscript: P3.L9-14, P21.L8-9

2. The authors should check once again the English language. While it is generally good, there are a few sentence fragments and other minor errors.

We sent the manuscript to a mother tongue for checking the English. We are confident that the revised manuscript is improved.

3. Section 4.3 The authors should briefly discuss why the trends are only statistically significant below a certain depth. This most likely has to do with the stronger interannual variability of the ground temperatures above. However, they of course do not behave independently, but temperatures at deeper depth are influenced by a much longer period. Therefore, trends in the deep layers represent longer-term trends of the surface forcing, which, if present, can be secured statistically more easily.

Thanks for this comment. We added a sentence for explaining why the trends are not significant in the first meters. Modifications on the revised manuscript: P18.L17-20.

Minor comments

4. P4038,l18: This sentence is unnecessary, this is also a result of this study. The information on permafrost in the area is published in this manuscript for the first time, so a reference to unpublished data is unnecessary.

The sentence has been removed.

5. P4044,l6: Reword the second part of this sentence.

This first sentence of section 3.1 has been simplified. Modifications on the revised manuscript: P11.L6-8.

6. P4053,l24: phenomenon

We corrected the typo. Modifications on the revised manuscript: P5.L9, P20.L17

Interactive comment on The Cryosphere Discuss., 8, 4033, 2014.