Dear Authors, Dear Editor,

I consider the recent study as being principally suitable for publication. However major and numerous changes are still necessary before acceptance.

1. Structure

The manuscript in its present state appears patchy and confusing. A clear structure, leading the reader through the manuscript is missing. Instead there are many repetitions, the same themes are started at one point in the document and are continued somewhere else in a different section. The Abstract should be shortened. No clear difference is distinguishable between the Introduction and the Background chapter; both should be considerably shortened. The background chapter contains everything from methods L156. ff, site description L171. ff, literature review, accuracy analysis L189 ff or L218 ff, datasets 201 ff, description of rock glacier phenomena L114 ff all chaotically mixed together. All this has to be completely rewritten.

I recommend shortening the Introduction and focusing on a basic message: Initial situation/State of the art -> problem/research gap -> what is this study about, How will these issues be improved -> Aims. You are not so far from this here.

Most of the Background section belongs somewhere else (Methods / Results/ Discussion). I would rename it in "Theoretical background" and include just the following points: What are rock glaciers, what are their characteristics, what do you use them for, in short: what is your basic concept, preliminary studies in this field.

Methods: perhaps use subsections: A short site description would be nice, datasets, and mapping is part of the methods. The detailed remarks below cover numerous other structural problems.

2. Content

In general you should discuss more critically what your study can achieve and what not. To base too much on rock glaciers as representing the lower border of permafrost is moving onto very thin ice. You have no evidence for this in your region. Probably this does not apply for both very arid regions (lack of ice) and very humid ones (glaciers) and depends on other factors like lithology. Communicate from the beginning that you can verify the existence but not the absence of permafrost. Inactive, vegetation covered rock glaciers often still contain ice although they do not move anymore. You cannot examine this, which results in additional uncertainties in your study. Therefore a more intensive accuracy estimation would be beneficial, summarizing error sources of data geo-referencing, mapping and decision on the presence or absence of ice in rock glaciers. Furthermore, be critical as to whether the relatively low number of rock glacier records is always significant enough to verify the permafrost maps. Verify whether your statements about permafrost distribution can really be supported by your data. My own English is not very good but I feel you should perhaps have the English in your paper checked.

Detailed Remarks

Line	Remark
48	One of many possible ways? What does this tell the reader? Skip it or describe the other ways.
73-85	Do not go into so much detail describing PZI. 1-2 Sentences & Reference are ok here. You can probably explain it closer in Methods -> Datasets
86	The application of **both** maps..? Hard to understand. Why application? Not validation?
96 ff	Shorten it, kind of wordy…
108	You did not use the term evaluation before
110	Point (a): This cannot be achieved by your study. You conclude this yourselves later in your study (no rock glacier does not mean no permafrost)
123	I do not understand this sentence. Where is the context?
124	1. This should be under methods 2. It is impossible for your study to distinguish between rock glacier containing ice and those without. Also inactive, vegetation covered rock glaciers often still contain ice. Several cases are known from the Alps. You can just make an estimated distinction between active (moving) and inactive (non-moving) rock glaciers. This is however no clear differentiation between Permafrost and No Permafrost and this is one of the main weaknesses of this method. You should explain this to the reader.
140	Careful! You yourselves found out that this is not always the case e.g. in very arid regions
141	Several other factors influence rock glacier development e.g. precipitation, very steep slope angles, lithology, erosion. For example you will find hardly any rock glaciers in the eastern Glarner Alps (Switzerland) despite the fact that there is a lot of permafrost. This is mainly due to humidity and sedimentary rock.
144	Due to the elevation of the valley floor? Why?
146	What is the "concept of permafrost limits"?
145-155	Whole section is confusing and I see no need for it
156-163	These are Methods
164	This is wrong. 1. You cannot compare differences between relict and active Asian rock glacier with those in the European Alps 2. Elevational differences between active and relict rock glaciers are already very heterogeneous in the Alps (e.g. Frauenfelder 2000)
186	This is the 3rd time you bring this statement
187-188	You already mention Gruber (2012) over half a page in the background section… No need for this sentence here.
187 ff	Accuracy – this belongs in Results or Discussion
198	Trivial statement, you do not need this.
201-224	Belongs in methods…. Keep it shorter!
240	This is the 3rd time you explain the rock glacier morphology (L114; L160; and here). I would concentrate on ONE general description of rock glaciers in the background section (A rock glacier consists of ice oversaturated ground…. Occurs on… develops… is characterized by) Here you should focus on a clear description of the "precise mapping instructions" as you mainly did. You also describe the methods of assessing the rock glacier state

	here a second time. Delete it in the background section!
262	The mapping instructions are not so precise, if one operator maps the rock glacier until the headwall and the other captures just the creep structures Fig2b. Here it does not disturb the results so take it as a comment for future work.
270	And then? You have to tell the reader here how two mapping datasets can reduce subjectivity. Not two passages later in L303
280	Which standard deviation? What is this about? Where does it come from? Which Threshold?
258	This should be (is already) part of methods, you already started describing the mapping methods with the first sentence of the method section and going on through the whole chapter. There is absolutely no need to start another section here. Correspondingly there are numerous repetitions in this section. Restructure it and merge similar contents!
290	I would rely on describing the mappers' expertise here
293	Repetition and still no explanation why 2 mappers
308-311	The total number of rock glacier records in all samples should be given to get an impression on the statistical basement.
343-345	I do not understand the last sentence here. Do you mean the inaccuracies do not disturb the results due to the big redundancies? If yes, 1. Write it more clearly. 2. Redundancies just help you to reduce random errors. How can you know that you do not have systematic errors, e.g. large scale offsets? 3. I do not have the feeling that records in 4% of the samples are a highly redundant dataset for investigating thousands of square kilometres of high-altitude mountains
359-361	1. Confusingly written, had to read it 3 times to understand. Express it more clearly. 2. This does not belong here but must be merged with the explanation of the "candidate area" in the method section. See comment to line 280!
361-362	Heavy mental leap from one sentence to the other…
385-393	Important points - but this belongs in the Discussion!
426	This is absolutely right and very important but contradicts your statement in the Introduction L110 (a)
Fig 3.	I do not understand the barplots and the distribution legend on the right. What does the vertical axis show? What do RM-IQ and the other differences mean?
Fig 6.	Add to the axis description the colours the axis refers to (right axis intense vs left axis pale colours).
Fig 7.	The same remark as for Fig 6
Fig 8 L624-625	Small square symbols mean little potential candidate area (PCA) and are thus a proxy for the expectable number of rock glaciers. However I do not see how the size of PCA tells you anything about the PZI zone in which the actual rock glaciers occur.