

Peer Review Report

Review Report on Geomorphology and sedimentology of a rapidly retreating Alpine glacier: insights from the Taschachferner, Tirol, Austria

Original Research, Earth Sci. Syst. Soc.

Reviewer: JULIA Garcia-Oteyza

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EVALUATION

Q 1 Please summarize the main findings of the study.

The article studies in detail the geomorphological forms of an area in which there are no such works, thus providing new and relevant information to understand the configuration of the present and future glacial and post-glacial landscape and its associated processes. They use new technologies such as the use of terrain models generated by UAV and complement it with satellite images and good field work.

Q 2 Please highlight the limitations and strengths.

Although they use a simple methodology that leaves a lot of room to implement other methods (for example, dating methods for the different landforms and sediments), the results obtained are quite useful, especially for future studies of the area.

Q 3 Please comment on the methods, results and data interpretation. If there are any objective errors, or if the conclusions are not supported, you should detail your concerns.

I think that in general everything is quite well explained and the descriptions are sufficiently detailed although throughout the text I would suggest that the authors unify and accompany the names of the places with 'valley' or 'glacier' for example because for those who do not know the area it is difficult to follow (I have left several comments regarding this).

Q 4 Check List

Is the English language of sufficient quality?

Yes.

Is the quality of the figures and tables satisfactory?

Yes.

Does the reference list cover the relevant literature adequately and in an unbiased manner?

Yes.

Are the statistical methods valid and correctly applied? (e.g. sample size, choice of test)

Not Applicable.

If relevant, are the methods sufficiently documented to allow replication studies?

Yes.

Are the data underlying the study available in either the article, supplement, or deposited in a repository? (Sequence/expression data, protein/molecule characterizations, annotations, and taxonomy data are required to be deposited in public repositories prior to publication)

Not Applicable.

Does the study adhere to ethical standards including ethics committee approval and consent procedure?
Yes.

If relevant, have standard biosecurity and institutional safety procedures been adhered to?
Not Applicable.

Q 5 Please provide your detailed review report to the editor and authors (including any comments on the Q4 Check List):

Here are some annotations (indicating page and line numbers) that I have made while reading the text:

Page 1. Abstract

- The use of words like demise, grapples... feel a little dramatic to me. I would recommend to find some synonyms.
- Line 11-12: maybe use a synonym for forefields? twice in the same line
- Line 13: with bedrock slope... maybe you want to talk about hillslope? slope inclination? Rock-slope?
- Line 16: what's Taschachferner? A valley, a glacier...? you say after that is a glacier but I think you need to specify. Whenever Taschachferner is talked about throughout the text, specify what it is, valley, glacier, etc. Same with the other names that the Reader doesn't necessarily know.
- Line 29, specify what you are referring to: The Taschachferner what? The Taschachferner valley? The Taschachferner glacier? The Taschachferner study?

Page 2. Introduction

- Line 34. from where this info is coming from? I supposed model but it is better to mention it.
- Line 41 based on what? what Stocker-Waldhuber studied to argue that? what are those clear indications?
- Line 42. didn't mention before what GPR stands for

Page 3. Study area

- Perhaps I would restructure this section a little, clearly describing this valley, what it is like and what is known about it, going into the background of the studies carried out in it. Always going from the general to more detail: eastern Alps > Otztal Alps > Kaunergrat-southern Pitztal area > Taschachferner area/valley
- Line 73: is this area (Kaunergrat-southern Pitztal area) marked on the map in Figure 1?
 - Line 91: specify how much steep?

Page 4. Methods

- Line 100: "chief aim" sounds weird... main goal...? or other synonym
- Line 212: The Pasterze glacier? Specify. same with Gepatschferner.

Page 6

- Line 138. The use of 'gleaned' I'm not sure it's a good adjective... use something simpler?
- Line 146: to me a sedimentary facies is a set of sedimentary or metamorphic rocks with specific characteristics... These are types of deposits or geomorphological forms...
- Line 152: unify, always Pasterze glacier and if it is possible show it in the localization map (figure 1)

Page 7

- Line 157. 'elsewhere' where? nearby? more details
- Line 162: more detail about flute dimensions? centimetres? metres? both wide and high
- Line 16-164: small lakes, minor deltas, small meltwater channels... specify sizes, numbers will help.

Page 8

- Line 181: Go from line 164 (page 7) to line 181 (page 8)... looks like this phrase is incomplete?
- Line 187. I think this needs to be in past tense? Re-read
- Line 194. 'the Taschachferner' valley? Glacier?

Page 9

- Line 211-213: why you give this example from Nepal? Why from there? It is far away from your study area.. maybe it needs some justification. On the following lines (214-216) it is not clear from where you are talking about, still Nepal? I would rewrite this entire paragraph again. Furthermore, after the example in Nepal, it is necessary to link better with the return to Taschachferner.
- Line 223: Comparative images from when and where?

- Line 223-231: It would help if terms and indications such as the places names and what is or where is the sandur, the scoop-shaped ice, the fracture swarms...

Page 10

- Line 253: Gornergletscher, Switzerland specify where it is. South?, north? Distance from the study area...?

Page 11

- Line 264-265: Where? Those lake deposits where are located? and with respect to your study area where are they

- Line 270-274: This entire paragraph appears to be formatted differently, centered instead of to the left?

- Line 278: 'The rapid retreat of the Taschachferner since 2015 has'

- Line 282: I would rewrite this sentence: 'Collectively, dramatic geomorphological and sedimentological changes have therefore occurred in the forefield' the word dramatic does not sound very formal.

Page 12

- Line 286: indicate Pasterze glacier size. And maybe compare with yours?

- Line 288: near term? Specify please.

- Line 289. How it is expected the local microclimate to be modified? From 288 to 290 I think it needs more details.

- Line 292 and 293. Why these examples? How do these glaciers resemble the one studied or why can they be compared?

- Line 307. I think you didn't define what is a glacial cycle in the text before. It would be helpful.

- Line 309. When was the deglaciation in this area? Give more details

Page 13

- Line 319-320: Again, why this example? Why this far from your study area...? Are you comparing both and if so, why?

- Line 320 Himalaya or Himalayas?

Page 14

- Line 344 it is ending with ;

FIGURES

Figure 2.

- I would name it just a geomorphological map rather than geological-geomorphological. In this map you don't distinguish between lithological units, only appear landforms.

- I would change the colour of the moraine crest... made them blue/grey like the lateral moraine filling colour and maybe thicker

- I would prefer the black line around the Glacier to be more grey rather than black...

- The red lines inside the debris cone unit are difficult to see

Figure 3. can't read very well the words put on the photos, try to put another color maybe

QUALITY ASSESSMENT

Q 6 → Originality	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Q 7 → Rigor	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Q 8 → Significance to the field	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Q 9 → Interest to a general audience	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Q 10 → Quality of the writing	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Q 11 → Overall quality of the study	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>