The Cryosphere Discuss.,
https://doi.org/10.5194/tc-2017-290-RC1, 2018

The Cryosphere Discussions
Open Access
EGU

Interactive comment on "Rock glaciers in the Daxue Shan, southeastern Tibetan Plateau: an inventory, their distribution, and their environmental controls" *by* Zeze Ran and Gengnian Liu

J. Müller (Referee)

johann.mueller@geo.uzh.ch

Received and published: 12 March 2018

The authors introduce a novel rock glacier inventory of the Daxue Shan mountain range in the southeastern Tibetan Plateau. They use Google earth imagery to visually identify and map rock glaciers in the entire area. Summplementary data such as the ASTER GDEM and lithological information are implemented to assign localized geomporhometric and subsurface attributes which is used for quantitative and qualitative analysis. The methods applied in this manuscript are well established and the analysis also doesnt hold any surprises but it is still a novel dataset presenting the rock glacier oc-

Printer-friendly version

Discussion paper

currence and distribution in the south eastern Tibetan Plateau. It is overall a further step towards a global rock glacier map. I therefore recommend the publication of this manuscript after moderate revisions. Please finde some remarks in the following and very specific comments in the attached pdf where i implemented some comments.

Specific comments : Methods P5L2 You need to elaborate more on the topographic specifications of active, inacitive and fossil rock glaciers. Bc with your approach it is hard to idnetify between the three but there are certain proxies such as subsidence and vegetation which can be used to determinte the state of the RG You mention in the abstract that you also use field data for the analysis but you never mention what kind of field data you acquired and how you use dit. You mention environmental controls like temperature and temperature dynamics like freeze thaw cycles numerous times in the manuscript but you never show any data. Maybe you have access to some high mountain temperature data in the area which you can show and help you with your argument. Not just the annual means as table 3 but also the annual or multiannual dynamics

4.Results and Discussion Since you manually derived the RG geomoetries it would be great if you could elaborate on the accuracy of your method. Did you have several persons working on the digitization of the RGs and did they perform differently or do you have more accurate field data which you could compare to the manual mapping and are there any differences ? I would suggest to refrain from using latitude and longitude to analyse RG properties since lat and long do not describe any environmental parameter but rather the regional topographical setting is more important. And thats the parameter that changes with Lat and Long. Focus more on the regional settings such as aspects, debris sources and valley/slope oreintation to interpret RG properties. It would be very beneficial if you include a descritption of the topographical characteristics of the study site in relation to the formation and evolution of rock glaciers. This would also help to understand the spatial setting which goes with the latitudinal impact.

4.2.3 Lithological controls on rock glaciers The lithological setting influences RG forma-

tion mainly by steepness and sedimentation rates contributing debris to the landforms. Please include this aspect into your elaboration and cite some references supporting the influence of lithology towards RG formation and evolution.

Also you mention the existence and application of g in-situ ground truthing data but you never explain how, where and what kind of data you gathered and used. Please include this either in the method or discussion section.

References Morris, S. E.: Topoclimatic Factors and the Development of Rock Glacier Facies, Sangre de Cristo Mountains, Southern Colorado, Arct. Alp. Res., 13, 329, doi:10.2307/1551039, 19

Wahrhaftig, C. and COX, A.: Rock Glaciers in the Alaska Range, Geol. Soc. Am. Bull., 70, 383, doi:10.1130/0016- 7606(1959)70[383:RGITAR]2.0.CO;2, 1959

Please also note the supplement to this comment:
https://www.the-cryosphere-discuss.net/tc-2017-290/tc-2017-290-RC1-supplement.pdf

Interactive comment on The Cryosphere Discuss., https://doi.org/10.5194/tc-2017-290, 2018.