Review of „Rock Glacier Inventories (RoGI) in 12 areas worldwide using a multi-operator consensus-based procedure "

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This article presents the results of a first standardized global rock glacier mapping approach. The approach is implemented as a consensus-based multi-operator mapping exercise, involving 41 participants / operators. It uses the recently established guidelines for creating rock glacier inventories (RoGI) developed by the IPA Rock Glacier Inventories and Kinematics (RGIK) community and a standardized QGIS tool to map rock glaciers for 12 different areas around the globe. The dataset includes three GeoPackage files per area: Primary Markers (PM) for rock glacier characterization, Moving Areas (MA) for surface movement detection via InSAR, and Geomorphological Outlines (GO) for delineating rock glacier boundaries.

Such a consistent dataset with rock glacier outlines from different mountain ranges around the globe is of high value for multiple use cases in the future as also nicely described in the conclusion of the manuscript. However, there are few parts which need to be improved in order to be of full use for future users. In the following, general issues of the manuscript and data are described first before adding specific comments on the manuscript.

General comments – manuscript:

- **Section 3.3 Output data and naming convention**
  The structure of this section is a bit confusing for an unfamiliar reader. Files with naming convention are used in the first part of the section, before the naming convention itself is introduced and explained in the second part. For a more comprehensive way, I'd suggest starting with the naming convention of the files first and then describe the folder structure using the previously introduced names. Otherwise, please consider avoiding the names of the naming convention in the first part.

- **Section 4 RoGI result description**
  The overall results section has a very comprehensive overview on the results. However, the results are difficult to compare as the size of the investigated area differs quite strongly (ranging from 7 to 82 km²). Therefore, at least one figure should take that into account and provide measures such as RGUs/km² (number of units per square kilometer) or rock glacier area / km² (proportion of entire area covered by rock glaciers), even though the latter might be misleading in cases with a lot of uncertain rock glacier units.
  Another important factor, which is not described anywhere in the manuscript yet, is the availability of different data for each area. Could you incorporate information (maybe in Table 1), which data was available for the mapping exercise (orthophotos (possibly with information about resolution), DEM / hillshade (yes - no)). Further, which type of InSAR data was available (sensor, methodology: stacking, interferograms, PSI) to assess the RGU activity? That should be documented for each area and discussed later, how it is affecting the result (see also comment further down).

- **Section 5.1 Use of the terms "uncertainty" and "reliability"**
  - o The term uncertain is used at several different attributes of the PM (*"uncertain rock glacier"* for ambiguous areas; activity attribute). However, it remains partially unclear, how uncertain is defined: Is it uncertain because of lacking data? Or because of diverging opinions of operators? Please specify that more clearly. For the activity attribute it is defined in the guidelines as the former but should be mentioned in the manuscript itself under section 5.1.
  - o Similarly, it is mentioned in the discussion that there is the option to document reliability. However, the definition of the reliability should be described in more detail at least in the table in the appendix, possibly also within the manuscript in section 5.1. This should be done for the reliability of the outlines (Appendix C, GO dataset) and the kinematic attribute (Appendix A, PM dataset). They are defined in the guidelines but should be shortly described here to avoid the necessity to search for such definitions in the guidelines. A good example for such a description is the reliability of moving areas in Appendix B, MA dataset.

    Such explanations can be very helpful, when the data is used in the future. This is especially the case for machine learning processes, which can take qualitative measures into account.

- **Section 5.2 Consistency across the different sites**
  - o I had a detailed look at the generated results of the different investigated sites and had the impression that there are remaining inconsistencies between the different sites, despite all efforts to reduce them to an absolute minimum. Especially the assignment of certain vs. uncertain landforms seems to be sometimes site-specific and maybe driven by the available data or local knowledge? Could you please add a paragraph or two about that in the discussion?
  - o Besides, please include, how the availability of different data (especially different InSAR products) affects the detection and outlining of RGUs for each site individually. So far only the influence on MA is discussed, but it can be expected that with a broader range of InSAR products also potentially more RGUs can be detected and, thereafter, outlined.
  - o Further, the quality assessment chapter (5.2) is quite difficult to follow and a lot of site-specific issues are mentioned in the text but hard to get an overview. However, such an overview on the quality of the results for each area could be beneficial to select sites to avoid specific uncertainties or specifically address these issues in the future. Therefore, please elaborate in a more comprehensive way (possibly a Table), which sites are affected by certain issues and which are not.

General comments – dataset:

- Disko island data:

There seems to be a projection error with some of the outlines, specifically those towards the east. Or is it a shift in the used WMS layer? Please check units 176 – 183, 194 – 197, 220 and 225.

- Not a rock glacier data:

Specifying and mentioning special landforms as *"Not a rock glacier"* does make sense, when looking at your data. However, this information is only useful, if they have an explanation, why

it is considered to not be a rock glacier. Please add such comments to those (for instance in area 5-1 and 14-1), which do not have it yet, or remove them from the dataset.

Specific comments:

L51, L54:

There is a typo in one of the citations: correct citation is Kellerer-Pirklbauer et al. 2024

Table 1:

In the table there is listed the number of **certain final RGU**, which is a result and should therefore not show up in the introduction. Such information is also not necessary at this location.

L54:

"Conversely, as degradation continues, rock glaciers tend to stabilize and transition progressively into relict landforms"

Please change "stabilize" to decelerate. Otherwise, it could be understood that all rock glaciers first need to destabilize, which is not the case.

L103-104:

*"Each operator received a common folder including a **similar** dataset organized within a QGIS project (see Section 3.1),"*

Please rephrase the sentence. It should be the same dataset for each operator and site, but probably they differ between the different RoGI areas due to different availability of data. So far, this sentence can be misunderstood.

L401:

*"The assigned KA has contributed to classify the RGU activity as **uncertain (2 RGU) relict (8 RGU)**, transitional (13 RGU), active (20 RGU), and active uncertain (6 RGU)."*

This way of counting is misleading. Please rephrase to "The assigned KA has contributed to classify the RGU activity as **relict (8 RGU), relict uncertain (2 RGU)**, […]"

L411-414:

"Rock glacier velocity, on average, was found to increase linearly with elevation up to the 2600–2800 m band, beyond which an inflection occurs, and consistent decimetre annual velocities are attained (Bertone et al., 2024). The activity that characterises rock glaciers in this region below and above 2600 m are consistent, respectively, with transitional and active rock glacier types."

It is a bit unclear; do you compare your results with previous studies here? If not, consider removing these sentences.

L450:

Remove "Limited". Some of your other sites may also have similar little coverage by research. Therefore, I would not specify it here.

L507:

Remove *"(from LiDAR DEM to filter out the vegetation)"*. A digital terrain model should automatically exclude vegetation. If you want to specifically highlight that vegetation could obscure your results, please consider mentioning it more explicitly.

L531:
"some are very slowly creeping and so fall into the transitional–relict category"
Rephrase: some are very slowly creeping and so fall into the transitional or relict category

L547:
Remove *"indeed"*

L627 – 632:
This paragraph very difficult to understand without detailed knowledge on the documentation procedure. Please consider rephrasing it.