



A new assessment of rock glacier distribution in Tröllaskagi peninsula, northern Iceland

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The formation of rock glaciers are constrained to areas that are subjected to permafrost, and the presence of rock glaciers are commonly used as a direct indicator of present or former permafrost conditions. In Iceland, a rock glacier inventory was derived from air photo interpretation by Ágúst Guðmundsson in 2000, and in this context the extend of ice-free areas during late Pleistocene and early Holocene in northern Iceland was controversially discussed. However, it is obvious that fossil and intact rock glacier landforms comparable to those found in Scandinavia or the European Alps, are highly abundant almost down to sea level in northern and eastern Iceland. The existing inventory, however, does not distinguish between glacier-related and talus-derived landforms, neither were the landforms classified in terms of location, size and state of activity.

In this study we therefore used recently published new air photos and re-examined most areas of the Tröllaskagi peninsula. In this re-examination active rock glaciers and related landforms are defined by steep front slopes, deep ridges and furrows indicating movement. They are also related to clear source areas, facilitating material supply. Inactive landforms have stopped moving, either due to topographic constraints, lack of material supply or by climate as the permafrost in the area is degrading, but the frozen core of the rock glacier is protected from melting by the sediment cover. The active and inactive permafrost landforms were categorized as one group, namely intact landforms, because of difficulties in establishing whether a landform is moving or not based on singular aerial imagery, and also to expand the sample for statistical purposes. Fossil rock glaciers, however, show no recent movement or little, if any, ice content, and normally have extensive vegetation cover. The surface is often characterized by thermokarst structures.

Here, we show first results of an inventory of rock glaciers in the Tröllaskagi peninsula, with a different classification scheme than previously presented by Guðmundsson. However, both studies show evidence of typical rock glacier formation at low elevations, indicating longer ice-free and cold periods prior to the onset of the Holocene Atlanticum.