Active rock glaciers at sea level in Finnmark, Northern Norway?

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Rock glaciers occur in continuous permafrost zones, and their current activity state therefore indicates occurrence of either present or former widespread permafrost. Today, active rock glaciers in Norway are found in the mountain permafrost zone, in both Southern and Northern Norway.

Recently, a series of seemingly active rock glaciers have been observed at sea level in Nordkinnhalvøya, Finnmark county, Northernmost Norway. These rock glaciers creep from talus slopes onto flat terrain; in this case raised post-glacial beach lines. This is a well-known landform configuration for rock glaciers terminating at sea-level in various other places, but always as part of the Arctic permafrost zone (e.g. Svalbard; Prins Karls Forland, Kapp Linné etc.). If these landforms are in fact active and creeping, this indicates that the very northernmost part of Norway should be considered as part of the Arctic permafrost zone rather than the mountain permafrost zone of Scandinavia.

A recently updated permafrost model of the Nordic countries (CryoGRID1; Gisnås et al., *in prep*) simulates permafrost at similar elevations elsewhere in Finnmark, but mainly in connection to mires. Permafrost in mires, as palsas, is considered azonal. However, unlike palsas, the presence of active rock glaciers can not be considered azonal permafrost phenomena.

With permafrost thaw occurring wide-spread in the Arctic, this area could serve as a time-space substitute of high-Arctic landscapes like Svalbard in a changing climate. Further, this area serves as a perfect link between mountain permafrost processes in Scandinavia at large and Arctic permafrost affecting Svalbard.

References:

Gisnås, K., Westermann, S, Schuler, T.V., Melvold, K. and Etzelmüller, B., *in prep.* Sub-grid variation of snow in a regional permafrost model. Submittet to The Cryosphere.