# Multidecadal analysis of paraglacial landscape changes in the foreland of Gåsbreen - Sørkapp Land, Svalbard

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## Abstract

The change in the structure of the polar landscape since the termination of the Little Ice Age (ca. 1900) is expressed by widespread retreat of glaciers, progressive exposure of glacial landforms at ice margins and opening ice marginal zones to increasing paraglacial and periglacial processes operating synchronously in adjacent areas. This study provides insights into the rate of post-LIA deglaciation and associated paraglacial transformation in foreland of Gåsbreen, a glacier situated in north-western Sørkapp Land, region characterized by one of fastest deglaciation rates in the entire Svalbard Archipelago. During the investigated period, 1938-2020, Gåsbreen was in a recession that accelerated after 1990 and as a result the area of its marginal zone almost tripled from 2.2 km$^2$ to 5.8 km$^2$. This process had a significant impact on the development of the relief in glacier foreland. The dynamics of landscape transformation in the glacier marginal zone manifested in degradation in the surface of ice-cored moraines and the forms that are underlain by dead-ice. Mass movements and debris flow on ice-cored moraines and fluvioglacial processes had a great influence on this transformation. Larger volume of proglacial waters intensified denudation, transport and accumulation of sediments, which resulted, in: an increase in the surface of sandurs and proglacial riverbeds, an increase in the area of lakes, extending and changing of the course of rivers in marginal zone.

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