

BEDROCK

Solid pre-Quaternary bedrock in western Sørkapp Land can be grouped into three very different complexes:

- 1) the most extensive and oldest rocks, from the Middle Proterozoic to the Silurian, folded in the Caledonian Orogeny, formerly called Hecla Hoek, and Pre-Old Red basement today. This includes different types of dolomites, phyllites, schists, quartzites, limestones, sandstones, breccias and others; between them, Pre-Cambrian rocks are rather high-grade metamorphic rocks and Palaeozoic rocks are mainly low-grade metamorphic rocks;
- 2) Early Carboniferous clastic sediments in the northwest of the peninsula (protruding between the open Greenland Sea and Hornsund Fjord): sandstones, including quartzitic sandstones, siltstones and shales (see cover photo);
- 3) Triassic sedimentary rocks that occur discordantly at some locations on the two aforementioned complexes: mainly sandstones and conglomerates.

None of these complexes lies horizontally. The rocks of the Pre-Old Red basement feature the largest dips: up to 90° and more (overturned folds). Dips of the next two complexes' rock strata tend to be much smaller: from 10 to 25° , sometimes more. All the complexes are cut by faults. The most important fault direction is NNW–SSE (Winsnes et al. 1992; Dallmann et al. 1993; Dallmann 1999).

Loose (unconsolidated) Quaternary deposits (marine, glacial, glacialfluvial, fluvial, organic, frost-weathering, eolian, slope, including talus and solifluction) are not continuous.

Coastal plains are partly covered by thin (up to 2–3 m), fragmented in many places, deposits of the Pleistocene and Holocene marine accumulation (rounded boulders and gravels, and sand). They are weathered to a substantial degree, apart from boulders and gravels of the Early Carboniferous quartzitic sandstone. Tørrflya, built of marine deposits up to ca. 10 m thick, is the exception.

Glacial deposits, both moraines and glacialfluvial deposits, may be thicker in places (up to several meters), especially on coastal plains and mountain valley floors. Most are very young Holocene – from the Little Ice Age and the 20th–21st century (i.e. from the past several centuries), rarely from the end of the Pleistocene, such as numerous limestone (of the Slaklidalen formation) erratics.

Steep mountain slopes cut in solid rock are devoid of any superficial Quaternary deposits due to erosion-denudation processes which remove any regolith down.

Talus and talus-torrent fans up to 10–20 m thick, in places connected into a one talus slope, lie at the bottoms of slopes. Less steep slopes (under 28–30°) can be overlain by weathering-solifluction deposits 1–2 m thick; the smaller the slope gradient, the more frequent and the thicker the deposits.

Flat areas (0–3°) are mostly overlain by weathering (on top plateaus) or accumulation types of cover, which can be as much as 2 m thick. Flat areas undergo further weathering and frost segregation. A thin (up to 30 cm) soil-vegetation cover is deposited across flat areas.

A unique superficial micro-relief is a feature of each type of Quaternary deposit.