Extent and timing of the Late Weichselian Scandinavian ice-sheet maximum and the following deglaciation in northern Atndalen, east-central southern Norway

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Atndalen is a valley orientated N-S east of Rondane in east-central southern Norway, and is located between the former ice divide and the present main watershed to the north within the suggested cold-based ice sheet region of central Scandinavia. In northern Atndalen there exist extensive lateral meltwater channels and eskers after downwasting ice sheets from the final stages of deglaciation. Except for cirque glaciation at an altitude well below the present glaciation limit, there are no clear indications of erosive valley glaciers since the vertical downwasting of the Late Weichselian Scandinavian ice-sheet maximum (20-18 ka) started, and the final deglaciation.

The general deglaciation pattern of northern Atndalen has been reconstructed by mapping of lateral meltwater channels and related overflow gaps, ice-dammed lakes, the occurrence of low-altitude cirque glaciation and stratigraphical investigations. The timing of events has been dated by using three independent methods; optically stimulated luminescence (OSL), terrestrial cosmogenic nuclides (TCN) and AMS radiocarbon dating on terrestrial plant macrofossils. Suggested to be the result of precipitation starvation, the vertical extent of the late Weichselian glacial maximum of the Scandinavian ice sheet in northern Atndalen is much less than previously suggested, and except for cirque glaciation, no or limited glacier activity took place during the Younger Dryas. Deglaciation events in northern Atndalen may be linked to contemporaneous events along the coastal ice margins of southern Norway during the Allerød, Younger Dryas and Preboreal chronozones.