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‘Little Ice Age’ maxima and glacier retreat in northern Troms and western Finnmark, northern Norway

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Glaciers are important indicators of climate change and observations worldwide document increasing rates of mountain glacier recession. Here we present ~200 years of change in mountain glacier extent in northern Troms and western Finnmark. This was achieved through: (1) mapping recent (post-1980s) changes in ice extent from remotely sensed data and (2) lichenometric dating and mapping of major moraine systems within a sub-set of the main study area (the Rotsund Valley). Lichenometric dating reveals that the Little Ice Age (LIA) maximum occurred as early as AD 1814 (±41 years), which is before the early-20th century LIA maximum proposed on the nearby Lyngen Peninsula, but younger than the LIA maximum limits in southern and central Norway (ca. AD 1740-50). Between LIA maximum and AD 1989, the reconstructed glaciers (n = 15) shrank by 3.9 km^2 (39%), with those that shrank by >50% fronted by proglacial lakes. Between AD 1989 and 2018, the total area of glaciers within the study area (n = 219 in AD 1989) shrank by ~35 km^2. Very small glaciers (<0.5 km^2 in AD 1989) show the highest relative rates of shrinkage, and 90% of mapped glaciers within the study area are <0.5 km^2 as of AD 2018.