

Preliminary geological maps of Quaternary units in Austria 1:500,000 and 1:1,500,000

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Sedimentary and erosional processes acting in the Quaternary significantly affected today's landscape and morphology of Austria. The Pleistocene glaciers in particular have shaped the striking landscape of the Eastern Alps. So far, geological overview maps of the Geological Survey neglected (with few exceptions like e.g. Vetter, 1933) the sediments and landforms formed during this period. The presented preliminary maps in the scales 1:500,000 and 1:1,500,000 aim to close this gap. The maps were generated using available map sheets in smaller scales (1:50,000, 1:200,000) and no additional field work has been conducted so far. The aim of both maps is to distinguish areas, where erosion or deposition in different stages of the Quaternary prevailed. In the following, the main features visible in the new overview maps are described: First of all, the most obvious observation is that most Quaternary sediments occur in the Northern Alpine foreland and especially outside of Austria. Looking at the end moraines of the last four major glaciations of the Middle to Late Pleistocene (from old to young – Günz, Mindel, Riß und Würm), it is obvious that the Mindel glaciation was the largest compared to the Riß glaciation and especially to the Würm (Last Glacial Maximum). The deposits of large piedmont glaciers occur north of the Alps from Bavaria to the southwestern part of Upper Austria, where some glaciers left glacial sequences of all four major glaciations consisting of terminal moraines linked to proglacial deposits. In contrast, the easternmost glaciers left their traces within the orogenic belt. In the Klagenfurt Basin for example, the extent of the former Drau Glacier tongue during the climax of the Würm glaciation (= Last Glacial maximum) is evident in the map, even though lots of the moraines were eroded close to their formation as obvious by extensive fluvial deposits of nearly the same age ("Niederterrasse"). Extensive, terraced fluvial deposits also occur in the northern foreland north of the piedmont glacier deposits. Between Salzburg and Munich, wide areas are covered by these sediments, whereas to the west of Munich and in Upper Austria, recent rivers incised deeper into Neogene sediments suggesting that these areas have been uplifted since the Pleistocene. Similar evidence occurs in the Styrian Basin, where only terrace bodies indicate deposition during this time. In contrast, the Vienna Basin is characterised by wide, flat areas, where Pleistocene and recent rivers and their alluvial sediments prevail. In this context, the distribution of aeolian sediments (loess) is also remarkable. They only occur outside of the Alps as small bodies on the Bohemian Massif, in the Alpine foreland tracing fluvial sediments (e.g. Weinviertel, Tulln Basin), or covering huge areas in the Vienna Basin and the Hungarian lowlands. The effect of climate warming is illustrated by large rockslides happening since the deglaciation and by the limited amount of recent deposits in comparison with huge amounts of Pleistocene ones. Since the Lateglacial (Gschnitz, Egesen, Little Ice Age stadials), less sediment was delivered due to glacier retreat into the high-up Alpine valleys and an increasing vegetation cover.