Blatt NL 33-01-25 Sankt Peter in Ahrn

Bericht 2020 über geologische Aufnahmen quartärer Sedimente im Zillergrund auf Blatt NL 33-01-25 Sankt Peter in Ahrn

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During 2020 Quaternary sediments and landforms were mapped over an area of 85 km^2 in the upper reaches of Zillergrund valley in the Zillertal Alps in the south-western corner of the UTM map sheet NL 33-01-25 St. Peter in Ahrn. The mapped area encompasses the eastern side of Sundergrund, Hundskehle (Hundskehlgrund) and Zillergründl valleys as well as the main Zillergrund valley in the section between In der Au and Bärenbad settlements and neighbouring cirques: Hohenbergkar, Aukar and Oberes Bärenbadkar. The mapped valleys are dissected in the Zentral gneiss lithology and show a typical high Alpine relief comprising straight, deeply incised glacial troughs and hanging tributary cirques. The elevation range in the mapped area reaches ca. 2,000 m (always above sea level in this text), between 1,250 m in the Zillergrund valley bottom to 3,303 m in the summit of Reichenspitze. In this steep terrain, Quaternary sediments only occur in the valley floor and the hanging cirques.

Last Glacial Maximum (LGM)

The maximum ice surface elevation during the Last Glacial Maximum is evidenced on glacial erosional landforms e.g. polished bedrock on valley-side spurs, which turn to sharp arêtes above. Glacially truncated spurs (Hahn, Aukaregg) occur at 2,400–2,450 m in the neighbourhood of In der Au settlement in the Zillergrund valley and rise upvalley in the Zillergründl valley from ~2,500 m near the Plattenkopf spur, ~2,550 m in the Rainbachkopfl spur to more than 2,700 m in the area of Heiliges Geistjöchl pass. The southwestern direction of striae and crescentic gouges located 400 m northwest of this pass as well as the polished quartz vein directly on the pass confirms that there was a small scale ice overflow trough the pass to the south during the LGM. In the head of the Hundskehle and Sundergrund valleys, the LGM ice-surface reach 2,600–2,650 m and similarly, ice likely overflow the Hundskehljoch (2,559 m) and Hörndljoch (2,553 m) passes to the south.

Lateglacial, Egesen stadial

The mapped area was in the accumulation zone during the Gschnitz stadial, therefore, there are no Gschnitz moraines, however, Egesen stadial moraines and relict rock glaciers occur in most of the cirques in this area. Egesen moraines commonly occur in the elevation range 2,200–2,600 m, but the lowest lateral moraine at 1,775 m is preserved in Bärenbadkar near Bärenbadkarhütte. Mostly moraines are not preserved in the bottoms of glacial troughs due to strong filling by talus and alluvial sediments. The expectation in the Hundskehle valley where Egesen laterofrontal moraines occur in its upper section, close to Talweg at 1,970 and 2,180 m.

The Egesen stadial is recorded as multi-moraine sequences. The common is 2–4 moraines showing glacier retreating phases in the cirques. The best-developed moraine sequences with massive 5–30 m high moraines can be observed in vast cirques exposed to the west in the Sundergrund (Bockkar, Schönhüttenkar, Rosskar), Hundskehle (Rosskar below Kleinspitze, Schafkarlen) and Zillergründl valley (Zillerkar, Gamskarl, Hohenaukar). Egesen moraines are often built with large several meters diameter blocks that often occurred as openwork accumulations, which suggest a high content of passively transported material on glaciers (surficial moraine). Moraines are accompanied by relict rock glaciers, which often surround as debris aprons the lowest cirque footwalls near the truncated spurs, for example, Aukarkopf and Rainbachkopfl spur in the Zillergründl valley and Rosskopf spur in the Sundergrund valley. Most of the relict rock glaciers occur in the elevation range 2,200–2,400 m. The largest relict rock glaciers spread in the bottom of Gaulkar cirque located south of In der Au settlement at an elevation of 2,130 m.

Holocene moraines intact rock glaciers

In the mapped area, Holocene/Little Ice Age (LIA) moraines occur only in the hanging cirques. They record the extent of 30 individual glaciers during the maximum Little Ice Age advance covering in total 12.7 km^2 of area. Most of these glaciers are now close to or have already disappeared. The total area of glacial and small residual glaciers and snow patches is 2.26 km^2 (mapped on the base of the laser-scanning model and recent orthophoto imagery). Relatively large glaciers Zillerkees (0.4 km^2) and Kuchelmooskees (0.57 km^2) are still found in the Raichenspitze massif in the Zillergründl catchment area. During Holocene advances these glaciers formed large moraine systems, with moraines up to 60 m high, e.g. the left-hand lateral moraine in the Zillerkar cirque. In the forefields of these glaciers, there are also moraines and glacier deposits older than 1850 advance. These moraines are found in the outer position and have a denser vegetation cover. Large Holocene moraine complexes occur also below Rauchkofel mountain in the upper part of the Zillergründl valley and northeast from the Napfspitze mountain in the Hundskehle valley. A good example of a large LIA glacier that has completely melted is found in the Rosskar cirque located northwest of Napfspitze mountain in the Sundergrund valley. The LIA moraines mark the extent of 1 km long and 0.56 km^2 large glacier. Currently, there are only small snow patches there. Similar length (1 km), size (0.6 km^2 large) and exposition (NW) had Dreieckerkees glacier in the head of the Zillergründl valley, which is now completely melted. The LIA terminal moraine of this former glacier is found in the flat alluvial infill of an overdeepening basin close to small lake Seewl (2,467 m), 1.1 km north from the Heiliges Geistjöchl pass. There are two moraine walls, the outer one 1 m high and the inner one 2 m high, made mainly of glacially deformed alluvial sands and gravels (push moraines). On the proximal side of the moraine walls, there is also typical material transported by small mountain glacier – large angular, openwork boulders. Push moraines are unusual in the Zillertal

Alps. Apart from the described one in the Zillergründl, such moraines are only known in Schwarzensteinkees glacier forefield in the Upper Zemmgrund valley (Zasadni, 2011).

In the mapped area occur 38 intact rock glaciers (active or inactive rock glaciers, undistinguished). They are related to climate condition and permafrost creep during the late Holocene/Little Ice Age. Fronts of intact rock glaciers are on average at an elevation 2,590 m. The lowest ones occur in Gaulkar cirque (~2,200 m) located south of In der Au settlement and Magnerkare cirque (2,350 m) located south of Zillergründl reservoir lake. In the head of Zillergründl valley near Heiliges Geistjöchl pass, between Winkelkopf mountain and Oberboden site occur the largest rock glacier in the Zillertal Alps. It is only 800 m long but covers an area of 0.56 km^2, which makes it twice the size of the largest rock glaciers on the northern slope of the Tuxer Hauptkamm massif. Its front is 20–40 m high and stands at an elevation 2,410 m.

Landforms and sediments related to mass movements

Large landslides and deep sated gravitational deformations do not occur in the mapped area. The only evidence of deep sated rock flow occurs in the western side of Aukar cirque where several gravitational antithetic faults occur in the Aukar alp, from ~2,000 to ~2500 m. Down from this cirque occurs large rockfall scarp and massive boulder accumulation comprising several meters up to 20 m in diameter blocks. Similar debris accumulations with exceptionally large blocks occur also near In der Au settlement and the lower section of the Sundergrund valley. These debris accumulations are distinguished from common talus slope and cones not only by the large size of blocks but also by the less segregation of the material, which is typical for taluses. Most likely, they were formed as the result of larger single or several rock falls or rock avalanches just after the deglaciation of the valleys. Today these landforms are inactive.

The bottoms of the main valleys are filled with talus and debris flow cones and alluvial sediments. Unusual talus accumulations occur in the Hundskehle valley – particularly near Mitterhütten and Grumala sites and south of Karlahner site (1,850–2,190 m). They occur only on the foot of rock walls on the western side and are made entirely of debris and blocks without a fine matrix. The surface of these debris cones often reaching the counter slope so the debris is accumulated in an upslope direction. The morphological shape and also the common occurrence of fine debris on the top of larger blocks on their surfaces (snow avalanche perched debris) prove that the main process of debris accumulation in these cases is snow avalanches. The Hundskehle Valley is blocked in three places with such debris cones, which gives a very interesting phenomenon of sinking and flowing out of a relatively large stream. The fact that the stream flows underground through the cone material proves that they are mainly made of openwork large blocks.

References

Zasadni, J. (2011): Bericht 2009 über geologische Aufnahmen der quartären Sedimente im Zemmgrund, Schlegeisgrund und im Bereich Dristner und Tuxer Joch auf Blatt 149 Lanersbach, 150 Mayrhofen und 176 Mühlbach. – Jahrbuch der Geologischen Bundesanstalt, **151**, 138–140, Wien.

Blatt NL 33-02-03 Waidhofen an der Ybbs

Bericht 2018–2019 über geologische Aufnahmen auf Blatt NL 33-02-03 Waidhofen an der Ybbs

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In den Kartierungssaisonen 2018/2019 wurden hauptsächlich kalkalpine Abschnitte im Mittelteil des Kartenblattes Waidhofen an der Ybbs geologisch neu aufgenommen. Das Arbeitsgebiet 2018 erstreckte sich von Waidhofen an der Ybbs nach Osten bis nach Gstadt und im Süden bis in den Bereich Rabenstadl (Niederösterreich). Im Jahr 2019 wurden die Arbeiten im Gebiet von Großgschnaidt, Lindau und Weyer (Oberösterreich) fortgesetzt. Zusätzlich wurden Bereiche der Rhenodanubischen Flyschzone südlich des Nellingbachtales begangen.

Abschnitt Waidhofen/Ybbs, Gstadt, Rabenstadl

Am südlichen Stadtrand von Waidhofen an der Ybbs sind Gesteine der Grestener Klippenzone (Ultrahelvetikum) aufgeschlossen. Bei diesen handelt es sich überwiegend um dunkelgraue bis schwarze, variabel (wenige Zentimeter bis max. 40 Zentimeter) gebankte, sandige Mergel mit häufig Hellglimmerschüppchen auf den Schichtflächen und eingeschalteten ebenflächigen Sandsteinlagen. Dabei wechseln sich dünnblättrig spaltende, tonigere Lagen mit kompakteren, kalkigeren Bänken ab. Zusätzlich treten dickere Kalkmergellagen mit Crinoidenschutt auf, selten sind auch Hornsteinknollen enthalten.

Die besten Aufschlüsse in diesem Gestein befinden sich unmittelbar südlich der Schmalspurbahn am Hang und in den Gräben oberhalb der Bahntrasse zwischen der Haltestelle beim BRG Waidhofen/Ybbs (Schiller Park) und dem östlich gelegenen Sportplatz (Vogelsang). Weitere Aufschlüsse sind am Weg von der Stadt zum Naturpark und im Graben, der südlich des Parks in den Schwarzbach mündet, vorhanden.

Dieses Gestein entspricht lithologisch dem von verschiedenen Autoren beschriebenen „Posidonomyenmergel“ (Geyer, 1909: 60–62, 1911: 32–33) – „*Posidonia alpina* Mergel“ (Trauth, 1921: 176ff.) – und der „Mergelentwicklung mit *Bositra buchi* (Roemer)“ (Faupl, 1975: 11, 41–45), die im Hangenden der Gresten-Formation folgt und als marine Ablagerung des Obersten Unterjura (Lias) bis Mitteljura (Dogger) anzusehen ist.