

EGU2020-19645

<https://doi.org/10.5194/egusphere-egu2020-19645>

EGU General Assembly 2020

© Author(s) 2023. This work is distributed under the Creative Commons Attribution 4.0 License.



## How extensive was the Younger Dryas glacier advance in Austria? New insights from the Großsölk Valley

Gerit E.U. Griesmeier<sup>1</sup>, Jürgen M. Reitner<sup>1</sup>, and Daniel P. Le Heron<sup>2</sup>

<sup>1</sup>Geological Survey of Austria, Vienna, Austria (gerit.griesmeier@geologie.ac.at)

<sup>2</sup>University of Vienna, Department of Geodynamics and Sedimentology

Modern systematic studies on the record of the Alpine Lateglacial (~ 19 – 11.7 ka) are missing for the Eastern Alps east of the Hohe Tauern mountain range. In order to fill this gap, a study has been started in the Niedere Tauern mountain range, which reaches 2862 m in altitude and comprises crystalline rocks. The recently non-glaciated mountain range is famous for a glacially shaped morphology with a series of cirques. During the Last Glacial Maximum (LGM), it was part of the transection glacier complex, which covered the western and central parts of the Eastern Alps. Thus, the conditions for studying the glacial chronology after the LGM are excellent.

In recent decades, three phases of glacier advances from cirques or higher altitude valleys have been distinguished within the Alpine Lateglacial, i.e. phase of ice-decay (immediately after the breakdown of the large valley glaciers like the Enns glacier), Gschnitz Stadial (correlated with the Heinrich 1 ice rafting event) and Egesen Stadial (marking the beginning of the Younger Dryas). A first step for additional paleogeographic, geochronological and palaeoglaciological studies in the Niedere Tauern is the identification and characterisation of the legacy of these three glacial phases within the Großsölk valley.

In this paper, we deal with the Egesen Stadial. New fieldwork reveals geomorphological and sedimentological evidence for glacier advances in three cirques in the Großsölk valley. Peaks bounding these east facing cirques are at 2400-2600 m altitude. The cirques contain lateral and end moraine ridges surrounding small tongue-shaped lake basins. These up to 5 m high ridges consist of boulder-bearing sandy to gravelly diamicts, which are interpreted to have formed during discrete phases of glacier stabilisation. The observed features in the three cirques allow us to interpret the following, from south to north:

- 1) A glacier at Lake Schimpelsee that extended down to 1930 m and which deposited three sharp crested end-moraines and one marginal moraine ridges during three stabilisation phases.
- 2) A similar glacier at Grünsee that extended down to 1920 m and underwent two stabilisation phases. An end moraine ridge is not observable, because in the suspected position there is a lake today. Evidence for the second stabilisation phase is partly overprinted by a relict rock glacier.
- 3) At Weißensee, large angular boulders along smoothed ridges testify to a debris-covered glacier in this area, which extended to 2000 m a.s.l.

Considering the altitude of the catchment area, the eastward facing orientation, the altitude of the maximum extent of the ancient glaciers as well as the geomorphologically constrained multiphase glacier retreat, we associate these glacier advances with the Egesen Stadial. Future radionuclide work will provide better age constraints for the Großsölk valley, extending knowledge of the Würmian Lateglacial to less investigated eastern parts of Austria.