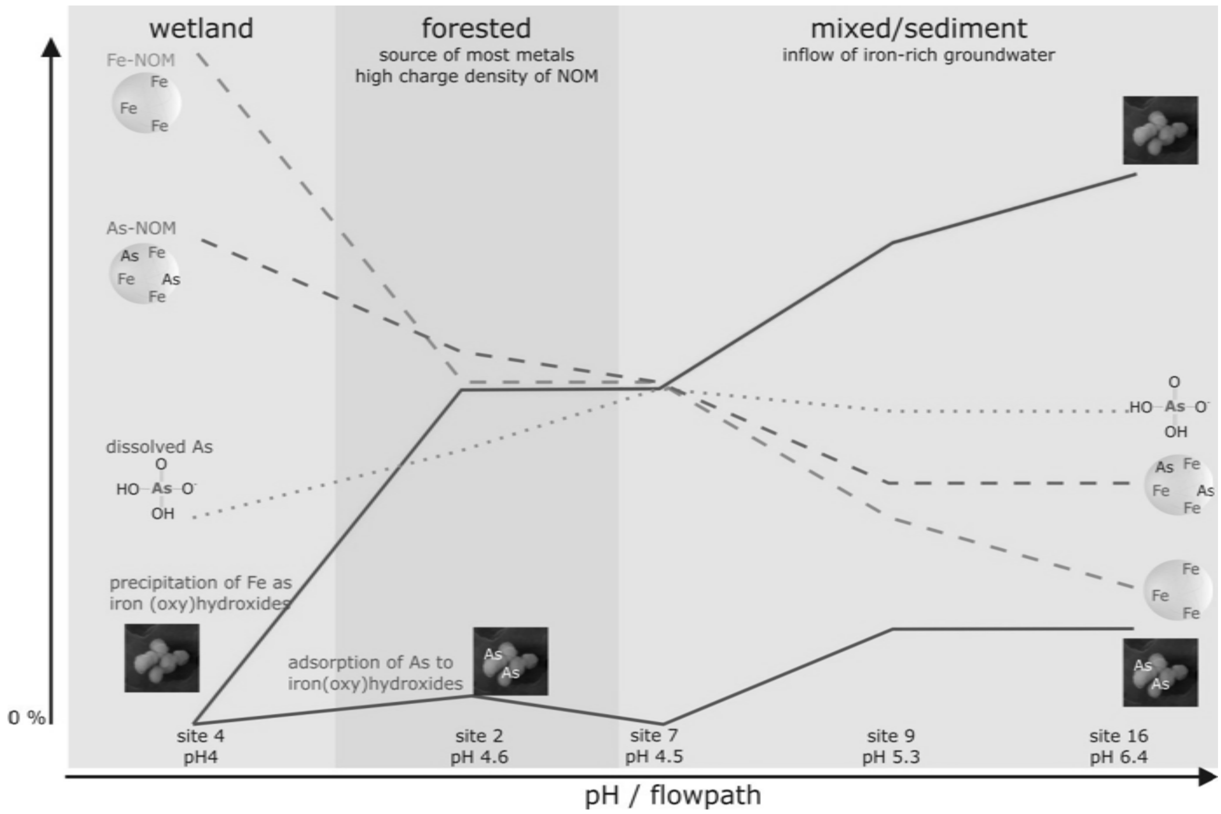


[1] Monteith et al. (2007) Nature 450 (7169) 537-540. [2] Vasyukova et al. (2010) Geochim. Cosmochim. Acta 74(2), 449-468. [3] Björkvald et al. (2008) Geochim. Cosmochim. Acta 72(12), 2789-2804. [4] Neubauer et al. (2011) J. Chromatogr., A. 1218 (38), 6763-6773.

**Structure of the Austroalpine basement and cover units between Radstadt Mts. and Tennengebirge, Austria**

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A lithological and structural study of the low-grade metamorphic Lower Austroalpine Quartz-phyllite nappe (QN), the retrogressed medium-grade metamorphic Koppen nappe, the Wagrain Phyllite nappe (likely correlating with the Greywacke zone), all mentioned units are exposed south of the SEMP fault, and of the low-grade metamorphic Greywacke zone and of its Permotriassic cover in the Mandling wedge and Northern Calcareous Alps (NCA) north of the SEMP fault allow recognize a number of important structural events, which were in part not known before. In this paper, the deformation stages are used as a temporal succession independent from tectonic unit. In general, the new data show a downwards punctuated progression of ductile deformation between ca. 102 and 50 Ma. Possible reasons are discussed within the frame of the tectonic evolution of the Eastern Alps. The Greywacke zone and the Permotriassic NCA base is affected by D1 ductile deformation at ca. 102 – 95 Ma overprinted by open, mostly upright folds indicating N-S semi-ductile shortening (tentatively assigned to D4, see below for tentative age).

In the NW Radstadt Mts., the QN represents the basal plate boundary to the underlying Penninic units of the Tauern window and this boundary is affected by post-thrust folding and shortening. The Lower Austroalpine nappe complex of Radstadt Mts. is characterized by largely inverted nappes, e.g. the QN with Permian Alpine Verrucano, Lantschfeld Quartzite (Lower Triassic) and Middle-Upper Triassic carbonates. QN rocks show a dominant D2 foliation and a ca. WNW-trending stretching lineation formed during NW-directed nappe transport during Late Cretaceous (40Ar/38Ar white mica: ca. 78–80 Ma) as well as isoclinal km-scaled D2 folds with subhorizontal axial surfaces and local internal thrust splays. The QN is thrusted over Penninic tectonic units (D3 of this work; 40Ar/38Ar white mica of ca. 50–54 Ma in the Hochfeind nappe; Liu et al., 2001, Tectonics 20, 528–547). In the interior of the QN, the foliation S2 is overprinted by kilometer- to meter-scaled open N-vergent, asymmetric D4 folds, which also affect the D3 thrust boundary of the Penninic to Lower Austroalpine nappe complex. D4 folds plunge gently to E/ENE and have amplitudes of ca. 1 – 2 km connected with outcrop-scale D4 folds with a steeply S-/SSE-dipping, mainly cataclastic axial surface foliation. The D4 folds indicate a previously unrecognized stage of shortening of Lower Austroalpine units with a minimum shortening estimate of ca. 30 percent. The new data are similar to D4 N-S shortening structures occurring over the whole N-S section in the Eastern Alps and include internal thrusting within the Northern Calcareous Alps.

**Quaternary deformation structures in Pleistocene conglomerates of the Salzach valley, Austria and on the Dachstein peneplanation surfaces**

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The recognition of Quaternary deformation structures within northern sectors of the Eastern Alps remains poor, although geodetic strain measurement indicate shortening of Esatern Alps up to its northern margin. Only a few examples of deformation structures have been reported. The study of Pleistocene conglomerates (Nagelfluh) within Alpine valleys is particularly promising, e.g., ESE-directed normal faulting and NE-SW compression has been reported from the Enns valley (Keil & Neubauer, 2011). Deformation structures are found in Pleistocene conglomerates of the Salzach valley between Salzburg city and Golling and these resultss are complemented by structural observations on the glacially overprinted and elevated Dachstein peneplanation surface (at an altitude of ca. 2.200 m) on satellite imagines. Glacial overprint at this elevation allows distinction of faults and fractures predating last glacial polishing from such postdating it. A first field example for such a post-glacial fault was described by Frisch et al. (2001).
The Pleistocene conglomerates of the Salzach are affected by three types of tectonic structures: (1) Deformation bands in conjugate Mohr-type arrangement are particularly widespread in three-dimensional exposures of the Hellbrunnerberg. These structures mainly indicate ESE–WNW extension. (2) Normal faults with up to 1.5 m displacement show a similar ESE–WNW extension direction. In contrast some outcrop-scale thrust faults with ca. 20 – 30 cm were found, too. (3) Finally, subvertical open NW-trending extensional faults are interpreted to indicate NW-SE extension. Together, these structural data suggest at least two different regimes, and the mutual relationships remain still unclear.
Satellite images of the elevated Dachstein peneplanation surfaces consistently indicate pre-glacial NNE-SSW fractures interpreted to represent NNE-SSW contraction (of likely Oligocene-Miocene age). Post-glacial unpolished fractures trend NW–SE and in rare cases NE-SW (some with sinistral displacement).
Together, the new field data indicate at least two different tectonic regimes during Quaternary and, therefore, a possible change in kinematics during Middle-Late Pleistocene. Supposedly, glacial loading might have increased tectonic strain, which was released during melting after the last glacial maximum.

References

Frisch, W., Kuhlemann, J., Dunkl, I., Székely, B., 2001. The Dachstein paleosurface and the Augenstein formation in the Northern Calcareous Alps - a mosaicstone in the geomorphological evolution of the Eastern Alps. Int. J. Earth Sci. 90, 5009–518.
Keil, M., Neubauer, F., 2011. Neotectonics, drainage pattern and geomorphology of the orogen-parallel Upper Enns Valley, Eastern Alps. Geologica Carpathica 62, 279–295.