

3D fold geometry at Panixer pass

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At the Panixer Pass in the eastern Swiss Alps the Panixer Pass Transverse Fold is oriented approximately perpendicular to most alpine structures. It represents a plunging fold with Verrucano in its core, which is cut by the Glarus Thrust; hence Verrucano can be found below the Glarus Thrust (Figure 1). The structural buildup of the Infrahelvetetic Complex changes considerably across the Panixer Pass Transverse Fold.

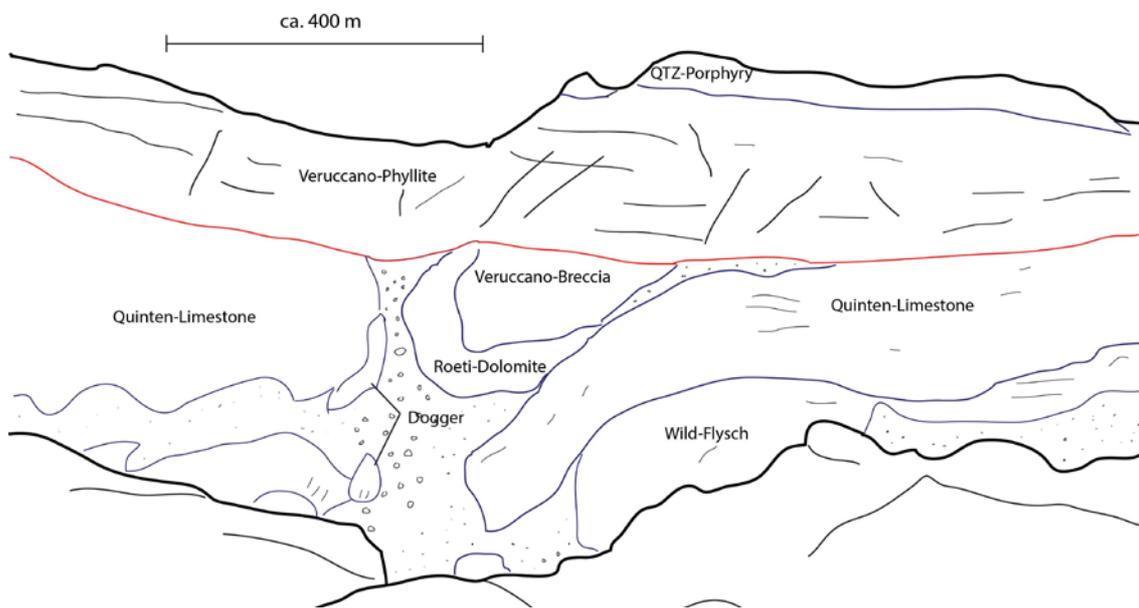


Figure 1. Sketch (after photograph) of the Panixer Pass Transverse Fold, seen from NW.

This Panixer Pass Transverse Fold has been known for a long time and multiple theories on its evolution have been published (Oberholzer, 1933; Wyssling, 1950). However, none of those is satisfying, especially under modern structural geological and tectonic viewpoints. The main aim of this study is to get a better insight into the Panixer Pass Transverse Fold by field mapping and structural analysis in combination with producing a 3D structural model using the GeoModeller software. To produce the 3D model, geologic contact data and orientation data gathered in the field were used in combination with interpreted data in the form of cross-sections.

A 3D structural model was created (Figure 2) that honors the observed surface geology and the expected subsurface geometry. It is in good agreement with earlier cross-sections (Wyssling 1950; Pfiffner 1978). Additionally, idealistic foliation planes were added to the 3D model. The aim is to compare the foliation orientation to the 3D geology and to illustrate the difference of foliation orientation below and above the Glarus Thrust.

Based on the observed structures in the mapping area, a series of deformation events was worked out. Generally, the result relates well to the deformational phases defined by Milnes & Pfiffner (1977). Some differences may be due to the difference in scale of the studies.

The results show that the Panixer Pass Transverse Fold formed simultaneously with the thrusting in the Infrahelvetic Complex. A combination of lateral ramp and strike-slip fault is presented as interpretation of the Panixer Pass Transverse Fold. Due to heterogeneity in the Verrucano trough, a lateral ramp developed, which caused the difference in the structural style on either sides of the transverse fold. A sequence of block diagrams was created to illustrate the deformation events.

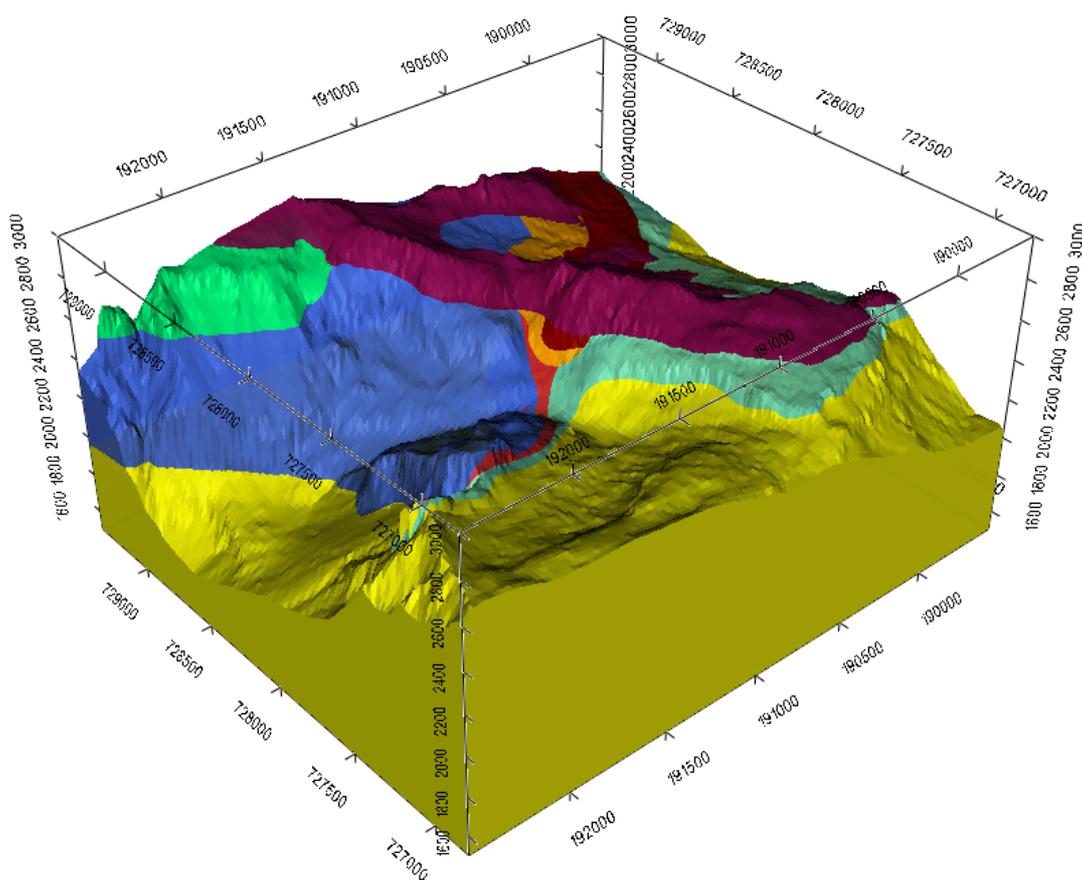


Figure 2. 3D structural model of the Panixer pass area, seen from NW. The box is 1500 m high.

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