

**Sailer, R., H. Kerschner and A. Heller** (1999): Three-dimensional reconstruction of Younger Dryas glaciers with a raster-based GIS. *Glacial Geology and Geomorphology*, 1999/rp01 (<http://ggg.qub.ac.uk/ggg/>).

### **Abstract**

Glacier surfaces and equilibrium line altitudes (ELA) are reconstructed from Younger Dryas moraines (Egesen Stadial) in the Ferwall group (western Austria). Traditional manual reconstruction and a raster-based Geographical Information System (GIS) are used. The interactive GIS-based reconstruction uses the theoretical profile of a glacier tongue for the glacier tongue and a constant shear stress model for the cirque areas. A Digital Terrain Model with 20 m grid mesh width provides the geometrical basis to the GIS. Moraines and other ice marginal features are used as input data. The results of the manual and computer based reconstruction agree surprisingly well. Therefore, the calculated shear stress values and ELAs should be reliable. Shear stresses range between 1.23 bars for the Egesen maximum (early Younger Dryas) and 0.39 bars for the Egesen III advance (late Younger Dryas). Equilibrium line depressions relative to the mid-19th century maximum range between -290 m and -120 m respectively. In total, the GIS-supported models based on simple glaciological theory seem to be reliable tools for the reconstruction of former glacier surfaces.