



Silent play in a loud theatre – soil development in a geomorphically active proglacial area

Piet Harlaar (1), Arnaud Temme (1,2), and Tobias Heckmann (3)

(1) Wageningen University, Soil Geography and Landscape, Wageningen, Netherlands (arnaud.temme@wur.nl), (2) Institute for Arctic and Alpine Research, University of Colorado, Boulder, United States, (3) Physical Geography, Katholische Universität Eichstätt, Germany

Proglacial areas are scientifically famous for two sets of processes: first, the tumultuous geomorphic response to glacial retreat including enhanced fluvial activity and mass movements such as debris flows, rock fall and landslides. Second, the slow and somewhat regular development of soil and vegetation. These two sets of processes have usually been studied in isolation: soil development is best observed in wide, flat proglacial areas where not much geomorphic work is done. This has left questions unanswered that relate to the effect of geomorphic disturbance on high mountain soil formation, and vice versa. We attempted to characterize these interactions in the geomorphically active proglacial area of the Gepatsch Ferner in the Kaunertal in Austria. Geomorphic activity in this area is intensively studied in the PROSA project. In our study, several dozen soils were sampled in order to describe soil properties. Sampling locations were selected with Latin Hypercube sampling to best cover the variation in soil-forming factors. Results clearly showed that soil properties were not only a function of age, but also of erosion-deposition amounts and geomorphic regime. In contrast to what is reported in literature, soil pH in very young soils rose before it dropped as soils became older. The early pH rise probably reflects the leaching of pyrite in the parent material.