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Recent rock fall activity in the Wetterstein Mountains revealed by a time series of terrestrial laser scans

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The north face of the Hochwanner in the Reintal valley, Wetterstein Mountains, southern Germany, has been a site of frequent rock fall activity for the past several hundred years. The so-called "Steingerümpel" rock fall included an estimated volume of 2.3-2.7 x 10^6 m^3 and led to damming of the Partnach river. This event was dated to 1400-1600 AD. The rock fall left a prominent scar in the rock face where subsequent rock fall activity was concentrated, postulated to be a "delayed consequence" of the Steingerümpel event. Previous workers used airborne and terrestrial laser scan data to evaluate the volume of the detached material and the deposits on the talus cone at the foot of the slope from the "delayed consequence" activity between 2006 and 2008 (Heckmann et al., 2012). The largest event during this period was a 5 x 10^4 m^3 rock fall in August 2007.

We compared the data of six terrestrial laser scans, which were acquired in June and September 2008, September 2010, June 2011, August 2013, October and November 2014, in order to assess the volumes of detached material after the large rock fall event of 2007. The aim is to investigate the post-event activity at a site of a large rock fall in order to give estimates about the timing when the activity is back to normal conditions in relation to the magnitude of the large event. Although no large rock fall occurred in the observation period, the comparison of the laser scan data indicate that the average rock wall retreat at this site is still higher compared to the mean annual rock wall retreat rate of 0.54 mm/yr for the last millennium in the Reintal valley (Krautblatter et al., 2012). This shows that sites of large rock falls remain active even years after the event.

Heckmann, T.; Bimböse, M.; Krautblatter, M.; Haas, F.; Becht, M.; Morche, D. (2012): From geotechnical analysis to quantification and modelling using LiDAR data: a study on rockfall in the Reintal catchment, Bavarian Alps, Germany; Earth Surface Processes and Landforms, 37(1), 119-133.

Krautblatter, M.; Moser, M.; Schrott, L.; Wolf, J.; Morche, D. (2012): Significance of rockfall magnitude and carbonate dissolution for rock slope erosion and geomorphic work on Alpine limestone cliffs (Reintal, German Alps); Geomorphology, 167, 21-34.