

Characterization of Riikonkumpu fault scarp in Kittilä

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The recent availability of high-resolution LiDAR-based digital elevation models provides an outstanding possibility to discover and map postglacial fault scarps that crosscut glacial sediments and landforms (Palmu et al. 2015). In addition to establishing their geographical distribution, direction, and height in DEM surfaces, there is also apparent need to document their stratigraphic geometries in more detail in order to understand and estimate their possible implications for seismic hazards.

The Riikonkumpu postglacial fault (PGF) scarp in Kittilä, northern Finland, was investigated with airborne LiDAR DEM, GPR, and lithostratigraphical studies of a 80 m long and 5 m deep trench excavated during the fall 2015 fieldwork. The maximum height of the PGF is 1.5-2 m and its SW-NE trending geometry can be traced about 15 km. The Riikonkumpu PGF is parallel to the Isovaara PGF (Sutinen et al., 2014) located ca. 10 km SW of the Riikonkumpu site.

The trench through glacial sediments was orientated perpendicular to the LiDAR-detected fault line and excavated to reach the surface of intensively weathered meta-phyllic bedrock. Quaternary sediments and bedrock features on the vertical sections the trench were logged and photographed to create 3D imaginary of the sedimentological details. This information was used to study and interpret the lithostratigraphical and structural features of the fault rupture in Quaternary deposits and the bedrock underneath. This paper describes results of these investigations.

References:

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Sutinen, R., Hyvönen, E. and Kukkonen, I., 2014. LiDAR detection of paleolandslides in the vicinity of the Suasselkä postglacial fault, Finnish Lapland. International Journal of Applied Earth Observation and Geoinformation 27, 91–99.