Geophysical Research Abstracts
Vol. 14, EGU2012-10682, 2012
EGU General Assembly 2012

The Quaternary paleotopography in County Kerry, Ireland: Investigation using detailed 3D electrical resistivity tomography and ground-penetrating radar

D.C. Tanner (1), J. Igel (1), T. Günther (1), C. Brandes (2), and C.M. Krawczyk (1)

(1) Leibniz Institute for Applied Geophysics, Hannover, Germany (davidcolin.tanner@liag-hannover.de), (2) Institute of Geology, Leibniz University of Hannover, Germany

Glacial topographic structures that formed by processes close to the ice front have been rarely examined because of their low preservation potential. On the northern coast of Kerry Head, County Kerry in Ireland, the basal surface of the glacial Quaternary deposits on top of Devonian sandstones, is offset by two, over 4 m high, near vertical topographic scarps over a distance of 200 m. We investigated the along-strike, inland continuation of these structures using closely-spaced GPR (over a 50×60 m grid, at centre frequencies of 80 and 200 MHz) and ERT (12 sections with 0.3–1 m electrode spacing). We also mapped the coastal outcrop for comparison.

The outcrop shows that the scarps dip very steeply, even overhanging. The scarps were caused by preferential erosion of one side of a pre-existing fault, in one case due to an underlying limestone layer. ERT is able to recognize the base of the Quaternary material, while GPR is also capable of imaging the bedding of the underlying Devonian sandstones. Both geophysical methods show that the structures do continue inland, but not with the same strike as measured at the outcrop. We demonstrate that the scarps actually follow a combination of two strike directions, both of which are orientations of joints present in the outcropping sandstones. In addition, the geophysical methods suggest the scarps remain very steep. It is surprising that near-vertical scarps were preserved in such a glacial setting. It points to very quick burial by glacial outwash material after the structures formed (maybe even within hours).