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Threat of landslide and geological structure of the cliff in Jastrzębia Góra in the light of data obtained by electrical resistivity tomography

Abstract

The cliff in Jastrzębia Góra has been strongly modeled by landslide processes. Landslides are a big threat for local buildings, roads, tourist routes as well as gas, telephone and energy lines. The main cause of the formation of landslides and their high activity is the unfavorable geological structure of the cliff. It's important to determine the range, depth and angle of the slope of the clay top for better predict the further development of landslides. In this reason the electrical resistivity tomography method was used. There were six ERT profiles parallel to the edge of the cliff with a spacing of electrodes every 10m. In this way a three-dimensional geophysical model was obtained. In addition were made four transverse profiles. The measurements were made with a spacing every 2m. Next ERT data were then inversion using the dedicated RES3DINV software. The results of geophysical research on the landslides showed a complicated picture of the structure of the landslide. The range and direction of slope of the clay top were determined using the three-dimensional electrofusion model of the cliff. The obtained research results are encouraging for further geological research as well as monitoring and modeling development of landslide movements.