Mass flows and earthquakes are, and were in geological past, among the most hazardous dynamic processes causing natural disasters. They both can significantly deform the Earth's surface and shallow subsurface sediments, causing massive destruction of the infrastructure. As only the one example of the scale of those geohazards, the recent study of Polish Geological Survey shows that 15% of the area of Poland, including over a million of buildings and about 7.000 km of roads, is susceptible to landslides. **After the years of extended research, the mechanisms deforming the uppermost part of the Earth's crust are still not fully recognised.** To understand them as well as to predict and mitigate their future consequences, the wide range of methods including the sedimentological studies of the geological record of prehistoric earthquakes and mass flows, has been applied.

The project will be focused on the detailed studies of sediment samples from the study sites (natural geological exposures, sand and gravel pits) located on the Southern Peribalticum area (northern Poland, north-eastern Germany, western Latvia). The sites preselected for the further research, include Pleistocene successions with sediments that were interpreted, during the previous research, to be gravity driven or seismically induced mass flows deposits.

The overall aim of this project is to understand the mechanisms and factors controlling the transport and emplacement of soft-sediments in response to gravity driven and seismically induced mass flow events. The detailed microstructural and microsedimentology analysis of orientated thin sections taken from samples collected at different levels within the palaeo-mass flow deposits will fully characterise the nature of the sediments and provide the evidence required to reconstruct the deformation histories recorded by these deposits.

The project was divided into the five stages: 1) fieldwork, when the interpretation of sedimentary succession will be verified and the sediment samples will be collected, 2) scanning and obtaining of the high-resolution microscope image in the big magnification, 3) microstructure and microsedimentology analyses, 4) reconstruction of soft-sediment deformation mechanisms for each of study sites, 5) interpretation of processes causing sediment deformation, their succession and relationship.

The expected study results will allow the reconstruction and better understanding of the subsurface sediments deformation processes and environmental conditions in the geological past. Additionally, they can be used for the recent geohazards assessment as well as the prediction of future natural disasters.

The project will be carried out in the cooperation with scientists from the British Geological Survey, what is believed to significantly increase the scientific impact factor of the expected results.