

After the large-scale transformation of landscapes – both anthropogenic (caused by mining activities) and natural (caused by fires, for example) – the ecosystem succession process begins. The process of ecosystem succession is closely related to the rate of pedogenesis. This process (in post-mining sites with primary succession) aids the formation of soils from freshly exposed soil substrates as a result of mining activities. In large-scale, post-fire sites with secondary succession, it supports the regeneration of soil function. In the early stages of pedogenesis, the main process is the accumulation and humification of organic matter. This is because soil organic matter plays a key role in the determination of the biological and chemical properties of soils.

The aim of the research project is to determine the mechanisms of stabilisation and dynamics of soil organic matter in different scenarios with primary succession on large-scale, sand excavation, secondary succession on post-fire sites and with impact of different tree species (Scots pine, silver birch and black alder).

In project, soil and ecological research will be conducted, for example rate of decomposition of organic matter and fine roots biomass study, measurements of soil organic matter, physico-chemical and biological properties of soils. The planned research will contribute to the development of knowledge in the field of ecosystem restoration, soil science, and forest ecology, especially in the aspects of the mechanisms and dynamics of the stabilisation of SOM in the early stages of pedogenesis in degraded areas and the potential of tree species to transform ‘raw’ substrates into self-sufficient forest soils.