

The main aim of this project is to determine the genesis, physico-chemical and water properties, as well as the environmental functions and spread of the WRB reference soil group Planosols in south-western Poland. Planosols concept was significantly modified in the international soil classification FAO-WRB in 2014 that strongly affected an understanding of this soil group in Central Europe. According to FAO-WRB classification (IUSS Working Group WRB, 2014), the reference soil group Planosols holds the soils having an abrupt textural difference at  $\leq 100$  cm from the mineral soil surface; and directly above or below, a layer  $\geq 5$  cm thick, that has: (i) stagnic properties in which the area of reductimorphic colours plus the area of oximorphic colours is  $\geq 50\%$  of the total area; and (ii) reducing conditions for some time during the year in the major part of the soil volume that has the reductimorphic colours. Important change compared to previous versions of the classification FAO-WRB is admitted glossic properties within Bt horizon, which heretofore have been reserved only for Albeluvisols. This seemingly minor change significantly expanded the soils, which can be classified as Planosols. Parent material of these soils are typically alluvial and coluvial sediments in the southern hemisphere and in southern Europe. The issue of the genesis of soils with texture differentiation is not uniquely determined in Poland, although the texturally-differentiated materials occupy large areas. In spite of many evidence of aeolian or water-aeolian genesis of overlying sand, some of the local researchers still support the concept of loam eluviation that produced pure sandy topsoil, i.e. explain texture differentiation by the intensity of pedogenic processes only.

Interdisciplinary methods used in the project will allow to determine genesis of loam and sand materials, as well as to reconstruct the transformation of these materials and soil formation in the Pleistocene and Holocene. The project will confirm or reject the hypothesis of polygenetic nature of Planosols in Central Europe.

Project will be executed in several spheres: conceptual, field-based and laboratory-based. The research areas will be selected based on the detailed geological maps (Quaternary sediments) and soil-agricultural maps in order to initially appoint the areas, where geological materials, soil texture differentiation, and also the so-called complex of agricultural suitability (which indicates the soil moisture) create the circumstance for the occurrence of Planosols. In the fieldwork phase, approximately soil 20 profiles will be excavated (and described following the requirements of Polish Soil Classification (2011) and Guidelines for soil description (FAO 2006)). The aim of this phase is to check the occurrence of Planosols in the selected research areas and to collect soil samples for laboratory analysis, as well as to complete the phytosociological descriptions (in the forest ecosystems). Due to the fact that proposed project has an interdisciplinary character, two groups of laboratory analyzes will be performed. First group includes the basic analyzes: particle size distribution, soil pH, organic carbon and nitrogen content, calcium carbonate content, cation exchange capacity and base saturation, soil density, water capacity, etc. These basic analyzes are designed to confirm the field identification of the genetic and diagnostic soil horizons, and to characterize the physico-chemical and water properties, as well as evaluation of soil fertility. Second set includes specialized analyzes like as sedimentological, micromorphological, and geochemical, which may help to identify: (1) the genesis of the soil parent materials, (2) environmental conditions which drove the pedogenesis, and (3) past and present pedogenic processes.