



Magnetic classification of forest topsoil profiles from south-western Poland

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The study was performed on area of 3 provinces of SW Poland (Silesian, Opole and Lower Silesian). During the field work in the frame of MAGPROX project 269 topsoil cores (0.3 m long) in regular 10 km grid were collected. The core profiles placed in plastic tubes were measured using a Bartington MS2C sensor, with a step of 1 cm along the profile. The profiles were classified according to typical pattern of vertical distribution of magnetic susceptibility. In general seven different types and two sub-types of susceptibility profiles from forest areas were identified. Four types are classified as natural profiles, with a minor influence of anthropogenic deposition, including mainly lithogenically controlled type G developed on mafic igneous bedrock. Three others had the magnetic susceptibility distribution typical for anthropogenically influenced soils with strong susceptibility enhancement in depth of 3 to 4 cm. To distinguish between anthropogenic and natural profiles the mean susceptibility value from the horizon 3-7 cm (usually the horizon of the highest anthropogenic enhancement) and the basal horizon of 15-20 cm was calculated. If the topsoil susceptibility enhancement in organic horizon (3-7 cm) was higher than 30 and the ratio of upper diagnostic horizon to lower diagnostic horizon was higher than 2, the profile was classified as anthropogenic. These requirements meet 73 of collected cores, which were classified as doubtless anthropogenically influenced soils. However the small topsoil enhancement that could be result of anthropogenic dust accumulation was observed in over 66% of measured cores. The majority of anthropogenic soil profiles are located in Silesian Province and close to the large industrial and urban centers.