Paleoenvironmental analysis of Nowolesie gully sediments (Strzelin Hills, SW Poland)

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Reconstructions of Early Neolithic relief evolution in loess regions in SW Poland are well described only by archeologists and historians. Studies on transformations of the relief under the influence of human activity following neolithization in the Polish territories largely ignore the area of Lower Silesia. Our study aims at complementing research thereby studying special geo-archives: Created landforms and sediments containing fossil soils constitute a spatio-temporal record of the relief transformations due to anthropogenic land use along with local climate changes.

The research was carried out in the loess areas of the Sudeten Foreland where they occur as isolated patches – with particular reference to the Strzelin Hills. This region is characterized by the occurrence of longitudinal stretches of hills whose highest elevations exceed 300 m a.s.l. The bedrock is made of gneisses, quartzite and mica schists, marbles, and amphibolites. However, the most important element of the geological structure in terms of the agricultural settlement is loess and associated fertile soils, which largely cover the slopes and feet of the hills. The study area features a relatively continuous loess cover with a considerable thickness of on average 3-6 m and a set of typical landforms, of which the most spectacular element are gullies. A specific area of interest includes a gully located near the village of Nowolesie (λ17.05 E/φ50.71 N) on the western slope of the Strzelin Hills.

Analysis were carried out in the laboratory of ground science at the University of Wroclaw and include grain size analysis of sediments (laser diffractometry, Mastersizer 2000), measurement of carbon content (Turin method), measurement of the content of geogenic as well as heavy metals in samples (Cu, Pb, Zn, Cd, and Fe by AAS). In cooperation with the Silesian University of Technology, sediments were dated (radiocarbon and OSL methods).