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An early industrial charcoal production area in Lower Lusatia (Germany) – a GIS-based reconstruction of past land use and environmental change

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As by-product of systematic archaeological research in the prefield of the open-cast mine Jänschwalde (Lower Lusatia, Germany) archaeologists of the Brandenburgisches Landesamt für Denkmalpflege und Archäologisches Landesmuseum (BLDAM) revealed Germany′s probably largest investigated charcoal production area. Until know c. 700 ground plans of circular upright kilns are excavated and additional c. 300 kilns are prospected. The numerousness of charcoal kilns and in particular the large diameters of the ground plans (up to 20 m and more) suggest an industrial charcoal production for the smelter at Peitz nearby where bog iron ore was processed since 1567.

The investigation of this early industrial charcoal production is part of the collaborative work between geomorphologists, soil scientists and historians of the Brandenburgische Technische Universität Cottbus (BTU) and archaeologists of the BLDAM. A core piece of the interdisciplinary research is the development of a new paleoenvironmental model based on a Geographical Information System (GIS). The model uses airborne laser scanning data with an accuracy of 1 m, archaeological finds, geographical data like topography, soils, geology, hydrology and land use, but also historical maps from the 18th century onwards, information from historical archives as well as data from absolute and relative age determinations. The location of the charcoal hearths and other finds are examined with regard to physio-geographical settings and land tenure. The model has a scale of 1:10000 and will be calibrated and supplemented with data from ongoing archaeological, geomorphological and pedological investigations.

We present the status of our model approach as well as first results. Special emphasis is given on the reconstruction of past landforms and geomorphic processes documented by buried soils and late Holocene eolian sediments. Due to the excellent outcrop situation in the open-cast mine our model results are very well proven and thus are most reliable.