Spatial analysis of charcoal kiln remains in the former royal forest district Tauer (Lower Lusatia, North German Lowlands)

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Archaeological excavations have revealed more than thousand charcoal kiln remains (CKRs) in the prefield of the active opencast lignite mine Jänschwalde, situated about 150 km SE of Berlin (SE Brandenburg, Germany). The charcoal was mainly produced for the ironwork Peitz nearby, which operated from the 16th to the mid-19th centuries. In a first approach, to estimate the dimension of the charcoal production, CKRs were mapped on shaded-relief maps (SRMs) derived from high-resolution LiDAR data (Raab et al. 2015). Subsequently, for a selected test area, identified CKRs on the SRMs were compared with archaeologically excavated CKRs in the field. This survey showed a considerably number of falsely detected sites. Therefore, the data was critically re-evaluated using additional relief visualisations. Further, we extended the CKR mapping to areas which are not archaeologically investigated.

The study area, the former royal forest district Tauer, consists of two separate areas: the Tauersche Heide (c. 96 km2 area) N of Peitz and the area Jänschwalde (c. 32 km2 area) NE of Peitz. The study area is characterized by a flat topography. Different former and current anthropogenic uses (e.g., military training, solar power plant, forestry measures) have affected the study area, resulting in extensive disturbances of the terrain surface.

The revised CKR abundance in the study area Jänschwalde was considerably smaller than the numbers produced by our first approach. Further, the CKR mapping revealed, that a total record of the CKRs is not possible for various reasons. Despite these limitations, a solid database can be provided for a much larger area than before. Basic statistic parameters of the CKR diameters and all comparative statistical tests were calculated using SPSS. To detect underlying spatial relationships in the CKR site distribution, we applied the Getis-Ord Gi* statistic, a method to test for local spatial autocorrelation between neighbouring sites. The test is available as part of the ArcGis 10.1 spatial statistics toolbox. The outcomes are discussed in consideration of our archaeological, archival and dendrochronological research results.

Raab, A., Takla, M., Raab, T., Nicolay, A., Schneider, A., Rösler, H., et al. (2015). Pre-industrial charcoal production in Lower Lusatia (Brandenburg, Germany): Detection and evaluation of a large charcoal-burning field by combining archaeological studies, GIS-based analyses of shaded-relief maps and dendrochronological age determination. Quaternary International, doi:http://dx.doi.org/10.1016/j.quaint.2014.09.041.