



## **Geocological legacies of pre-industrial charcoal burning – Research questions and approaches**

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The very first metre of the earth surface is a crucial interface in ecosystems and a study object not only for soil science but also for geomorphology, biology and ecology. The human fingerprint of past cultures and historical land uses on this interface is often ignored, although the relevance of land use legacies is increasingly recognized and acknowledged. Since some years, Digital Elevation Models (DEMs) recorded by LiDAR are available for many areas, allowing mapping of small landforms in high resolution and, at the same time, for large areas. Geoscience, life science and archaeology are just at the beginning to take full advantage of these new data. Ongoing technical development and continuing LiDAR flights will enhance spatial resolution and coverage and thus make these accurate DEMs the standard basis for earth surface studies of any kind. Like the invention of microscopes in the 19th century LiDAR images today give us a completely new insight into a cosmos of small landforms never seen before. Obviously, the majority of these small earth surface structures is of anthropogenic origin, and their formation is often ancient. The newly visible microrelief therefore can reflect the imprints of centuries of past land use. Among the anthropogenic structures identified in the new DEMs, Relict Charcoal Hearths (RCHs) are of particular significance. Recent LiDAR data shows that a remarkable portion of modern woodlands has this human fingerprint from the past and we thus can call these areas RCH landscapes. We need to ask if RCH landscapes may have immanent ecosystem properties controlled by a small-sized landform mosaic. Amongst others, there are three main aspects that address this question in the form of different legacies: (i) the geomorphological, (ii) the pedological, and (iii) the ecological legacy. Topics for joint research approaches are presented to enhance activity on interdisciplinary studies in RCH landscapes.