Fingerprints from past charcoal burning - lessons learned and future perspective studying Relict Charcoal Hearths (RCH)

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Digital Elevation Models (DEM) recorded by LiDAR are now available for large areas, providing an opportunity to map small landforms for the first time in high resolution and over larger areas. The majority of these small earth surface structures is of anthropogenic origin, and their formation is often ancient. The newly visible microrelief can therefore reflect the imprints of centuries or millennia of past land uses. Among the anthropogenic structures identified in the new high-resolution DEMs, Relict Charcoal Hearths (RCHs) are particularly widespread and abundant. RCHs are remains of past charcoal burning and mainly found in pre-industrial mining areas of Europe and North America. They normally have a relative height of fewer than 50 centimetres on flat terrain and a horizontal dimension ranging from about 5-30 metres. Despite the small spatial dimensions, RCHs can reach significant land coverage due to their enormous numbers. Recent LiDAR data show that a remarkable area of our landscape has this human fingerprint from the past. We therefore need to ask about its effect on soil landscapes and ecosystems in general. The growing relevance of RCHs is also noticeable in the rising number of RCH case studies that have been conducted. This study reviews the state of knowledge about RCHs mainly by addressing three coupled legacies of historic charcoal burning: the geomorphological, the pedological, and the ecological legacy. We are going to present recent findings on these three legacies.