



Contextualising the topographic signature of historic mining, a scaling analysis

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Mining is globally one of the most significant means by which humans alter landscapes; we do so through erosion (mining), transport, and deposition of extracted sediments (waste). The iconic Dartmoor mountain landscape of SW England (~700km²) has experienced over 1000 years of shallow (Cu & Sn) mining that has left a pervasive imprint on the landscape. The availability of high resolution digital elevation models (<=1m) and aerial photographs (@12.5 cm resolution) combined with historic records of mining activity and output make this an ideal location to investigate the topographic signature of mining. Conceptually I ask the question: how much (digital elevation model) smoothing is required to remove the human imprint from this landscape ? While we may have entered the Anthropocene other gravity driven processes have imparted distinct scale-dependant signatures. How might the human signature differ from these processes and how pervasive is it at the landscape scale? Spatial scaling analysis (curvature & semi-variance) was used to quantify the topographic signature of historic mining and to determine how it differs to a) natural landforms such as bedrock tors; and b) the morphology of biological activity (e.g. peat formation). Other forms of historic activity such as peat cutting and quarrying were also investigated. The existence of ~400 years of mine activity archives also makes it possible to distinguish between the imprint of differing forms of mine technology and their spatio-temporal signature. Interestingly the higher technology 19th C mines have left a much smaller topographic legacy than Medieval miners; though the former had a much greater impact in terms of heavy metal contamination.