



Sheet erosion rates determined by using dendrogeomorphological analysis of exposed tree roots

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This work describes the determination of sheet erosion rates by using dendrogeomorphological methods on exposed tree roots. A popular trail in a Scots pine forest (Senda Schmidt, Valsain) located on the northern slope of the Sierra de Guadarrama, Central Spain, was studied. This site was selected because showed high denudation morphologies due to accelerated soil-erosion processes caused by human influence (trampling by continuous trekking), resulting in exposed roots. The method applied is based on the morphological pattern of roots, defined by the growth-ring series of the sampled roots. The study entailed a statistical analysis of exposure time and erosion depth. The influence of environmental factors affecting the variation in velocity of the erosion processes was also examined. Climate conditions in Senda Schmidt and the accuracy of dating Scots pine indicate that the evaluation on *Pinus sylvestris* roots is fairly reliable.