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Thresholding Soil Surface Images

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Soil erosion is a complex phenomenon involving the detachment and transport of soil particles, storage and runoff of rainwater, and infiltration. The relative magnitude and importance of these processes depends on several factors being one of them surface micro-topography, usually quanti[U+FB01]ed trough soil surface roughness (SSR). SSR greatly affects surface sealing and runoff generation, yet little information is available about the effect of roughness on the spatial distribution of runoff and on flow concentration.

The methods commonly used to measure SSR involve measuring point elevation using a pin roughness meter or laser, both of which are labor intensive and expensive. Lately a simple and inexpensive technique based on percentage of shadow in soil surface image has been developed to determine SSR in the field in order to obtain measurement for wide spread application. One of the first steps in this technique is image de-noising and thresholding to estimate the percentage of black pixels in the studied area.

In this work, a series of soil surface images have been analyzed applying several de-noising wavelet analysis and thresholding algorithms to study the variation in percentage of shadows and the shadows size distribution.

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