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Soil erosion survey using remote sensing images

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Soil erosion is one of the most effective soil degradation processes reducing crop production on arable fields significantly. It also leads to serious environmental hazards such as eutrophication, mud and flesh floods. Beyond the processes there is an urgent need to survey and descript the current degree of erosion of arable lands in order to provide adequate land use techniques and mitigate the harmful effects. Surveying soil erosion is a very time consuming process since soil loss and deposition take place next to each other resulting a rather diverse erosion pattern even within a plot. Remote sensing is a possible way to determine the degree of soil erosion without special efforts taken in the field. The application of images can provide high resolution erosion maps of almost any type of arable fields. The method is based on the identification of the origin of the surface soil layer, i.e. whether it represents an originally deeper laying horizon (e.g. B horizon), or the parent material. A case study was carried out on a Cambisol formed on loess parent material. The soil and the parent rock have various reflectance spectra in the visible range, so this strip was used for the investigations. For map creation "training sites" were used in ArcMap environment. The obtained results suggest that the method is highly effective and useful, however, other properties like moisture content and plant cover can limit automated application. In this case new training sites are needed.
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