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Monitoring the effect of drying-wetting cycles on soil aggregate breakdown using SPECIM hyperspectral camera

To monitor soil surface changes, such as aggregate breakdown, it is important to understand the interaction between soil surface and the surrounding environment at high temporal resolution. Within different spatial, temporal and spectral resolution remote sensing (RS) provides continuous data that are suitable for assessment and monitoring of environmental conditions. Using a SPECIM hyperspectral camera under laboratory conditions at a micro-plot scale, we aim to detect and estimate soil aggregate changes over time. We designed an indoor experiment by exposing triplicates of four soils susceptible to detachment (silty loam with various amount of organic matter content and silty loam mixed with hematite) to drying, field capacity and wetting conditions. Twelve soil samples were kept at field capacity for the entire period that the experiment ran. The rest of soil samples were imposed to drying and wetting conditions which were alternated with field capacity condition every three days. All the soil samples were scanned with the SPECIM hyperspectral camera each three days. We collected images data from April to June 2016. When an image has a sufficient high spatial resolution, pixels are smaller than the object so grouping of pixels is possible in order to obtain real-world homogeneous features. Therefore, object-based image analysis (OBIA) is a suitable approach for soil aggregate change detection. However, finding an appropriate method for monitoring soil aggregate breakdown using object-based image analysis for hyperspectral data is required. Moreover, our focus will be on quantifying soil aggregate break down over time using hyperspectral imagery.

Biography

Irena Ymeti is following the PhD program at the Earth Systems Analysis department at ITC, University of Twente, The Netherlands and working on monitoring soil aggregate breakdown using remote sensing technology. She started to work at the Institute of Geosciences, Energy, Water and Environment at the Polytechnic University of Tirana, Albania building a geo-information (GIS) and RS laboratory for processing and analyzing data for earth science applications.

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