



Photogrammetric reconstruction of forest floor microtopography: difficulties, advantages and application

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Soil heterogeneity plays important role in many soil processes. The microtopography of forest floor is one of the key factors that influence on such processes as water and nutrients movement (vertical and lateral) and distribution, the speed of the decomposition processes, temperature, and soil fluxes. Many previous studies of soil processes have shown importance of the spatial distribution component in experiment design, data acquisition, analyses and interpretation. Digitalizing of soil surface with minimum destruction and maximum speed is an issue for many studies especially for heterogeneous sites.

The work is based on the Structure-from-Motion (SfM) photogrammetric method. To quantify the microtopographical features, high-resolution 3D models of sample plots were reconstructed from imagery acquired with high resolution camera. Using such models it is possible to determine the location of trees, collars for soil respiration measurements, position of moisture and temperature sensors, to calculate depression (pits) and elevation (mound) areas, trees stem diameter. Obtained digital surface models can be used for modeling of soil processes and mapping, data interpretation, monitoring, and quantification, geostatistical analysis.