Geophysical Research Abstracts
Vol. 19, EGU2017-8079, 2017
EGU General Assembly 2017

Soil properties, soil functions and soil security

Laura Poggio and Alessandro Gimona
The James Hutton Institute, Aberdeen, United Kingdom (laura.poggio@hutton.ac.uk)

Soil plays a crucial role in the ecosystem functioning such as food production, capture and storage of water, carbon and nutrients and in the realisation of a number of UN Sustainable Developments Goals. In this work we present an approach to spatially and jointly assess the multiple contributions of soil to the delivery of ecosystem services within multiple land-use system. We focussed on the modelling of the impact of soil on sediment retention, carbon storage, storing and filtering of nutrients, habitat for soil organisms and water regulation, taking into account examples of land use and climate scenarios. Simplified models were used for the single components. Spatialised Bayesian Belief networks were used for the jointly assessment and mapping of soil contribution to multiple land use and ecosystem services. We integrated continuous 3D soil information derived from digital soil mapping approaches covering the whole of mainland Scotland, excluding the Northern Islands. Uncertainty was accounted for and propagated across the whole process. The Scottish test case highlights the differences in roles between mineral and organic soils and provides an example of integrated study assessing the contributions of soil. The results show the importance of the multi-functional analysis of the contribution of soils to the ecosystem service delivery and UN SDGs.