



Land use impacts on Soil Organic Carbon Stocks in Vilnius (Lithuania)

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Land use change has tremendous impacts on soil organic carbon stocks (SOCS), especially in urban areas. Soil organic carbon is an important variable for soil quality as well as climate change regulation and mitigation. Given this, it is important to know the impact of urbanization on SOCS, especially in areas affected by intense urban sprawl and land use change such as Vilnius. The objective of this work is to study the SOCS in 8 different land uses such as forests – *Quercus robur*, *Acer plantanoides*, *Pinus sylvestris* and *Picea abis*, grasslands – semi-natural grasslands (SNG) and managed semi-natural-grasslands (MSNG), both dominated by *Taraxacum officinale*, artificial grasslands (AG), and urban. In each land use, 10 topsoil samples (0-10 cm) were collected, and sand, silt, clay, stoniness, pH, bulk density (BD) electrical conductivity (EC) and SOC were analysed. The results showed that sand content was significantly lower in urban soils compared to the other land uses, with the opposite being true regarding silt, clay, stoniness and BD. Soils affected by human management (MSNG, AG and urban) had a high pH and EC compared to the other land uses. SOCS were significantly higher in *Pinus sylvestris* (121 g/kg) land use than in urban soils (38 g/kg). Principal component analysis showed that the high values of silt, clay, stoniness, BD, pH and EC were related to soils affected by intense human disturbance (AG and urban), while high levels of sand and SOC were observed in forest areas. Overall, land use change had an important impact on soil properties and SOCS, especially in AG and urban soils. The rapid conversion from semi-natural grasslands and forests to AG and urban areas will cause profound changes in natural soil conditions and the quality of the services provided.

This research was funded by the European Social Fund according to the activity 'Improvement of researchers' qualification by implementing world-class R&D projects' of Measure No. 09.3.3-LMT-K-712. Project: Lithuanian National Ecosystem Services Assessment and Mapping (LINESAM) founded by the Lithuanian Research Council