Profile of a city: characterizing and classifying urban soils in the city of Ghent

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Worldwide, urban lands are expanding rapidly. Conversion of agricultural and natural landscapes to urban fabric can strongly influence soil properties through soil sealing, excavation, leveling, contamination, waste disposal and land management. Urban lands, often characterized by intensive use, need to deliver many production, ecological and cultural ecosystem services. To safeguard this natural capital for future generations, an improved understanding of biogeochemical characteristics, processes and functions of urban soils in time and space is essential. Additionally, existing (inter)national soil classification systems, based on the identification of soil genetic horizons, do not always allow a functional classification of urban soils. This research aims (1) to gain insight into urban soils and their properties in the city of Ghent (Belgium), and (2) to develop a procedure to functionally incorporate urban soils into existing (inter)national soil classification systems. Undisturbed soil cores (depth up to 1.25 m) are collected at 15 locations in Ghent with different times since development and land uses. Geotek MSCL-scans are taken to determine magnetic susceptibility and gamma density and to obtain high resolution images. Physico-chemical characterization of the soil cores is performed by means of detailed soil profile descriptions, traditional lab analyses, as well as proximal soil sensing techniques (XRF). The first results of this research will be presented and critically discussed to improve future efforts to characterize, classify and evaluate urban soils and their ecosystem services.