



## **Magnetic soil mapping and modelling for sustainable land use management in Ukraine**

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The agricultural activities need to be monitored in order to observe if they respect the sustainability principles. During the last 15 years we have been using the magnetic susceptibility measurements for the identification of soil properties and degradation risks. This method can be used to measure soil fertility. We observed a decrease of soil magnetic susceptibility values in the areas with high erosion risk. Magnetic susceptibility can be used as an indicator in identifying rates and depths of soil erosion. Compared to other conventional methods, this one, have a low cost and is time saving. This opens new possibilities to have a better cover of the studied area, collect more samples, hence, a better spatial and temporal resolution.

Another field of the soil magnetic properties study is the land use change a result of the urban sprawl and technogenic pollution. The increased risk of the soil degradation is connected to soil pollution and the high concentrations of heavy metals and other dangerous chemical elements and compounds to the environment. The main sources of the anthropogenic pollution are the vehicle circulation, power plants, cement and chemical industry. The components released by these sources contain magnetic properties, which can be identified in soils. In this way we can identify the negative impacts of these activities on the ecosystems sustainability and services and promote measures to recover it. We obtained new results on an example of the urban and industry developed sites of Ukraine.

The interpretation of soil magnetic parameter measurements depends on knowledge of a reference value. It is influenced by the type of soils and landscape topography.

Magnetic methods are an effective method for temporal and spatial soil mapping and modeling. The results of the soils magnetic studies are valuable to sustainable land use management.