



Digital soil maps for the support of national mapping and assessment of ecosystem services

László Pásztor, Annamária Laborczi, Gábor Szatmári, Sándor Koós, Zsófia Bakacsi, András Makó, and Brigitta Tóth

Institute for Soil Science and Agricultural Chemistry, Centre for Agricultural Research, Hungarian Academy of Sciences, Department of Soil Mapping and Environmental Informatics, Budapest, Hungary (pasztor@rissac.hu)

As a member state of the EU, Hungary is also obliged to assess and map its most important ecosystem services. The Hungarian national ecosystem service assessment was started in 2016, a four-year project led by the Ministry of Agriculture and co-financed by the EU. After several steps of involvement (interviews, stakeholder analysis, participatory prioritizing workshops) thirteen ecosystem services were selected for detailed study. Majority of the thirteen prioritized ES is related to the state and functions of soils. Additionally, characterization of ecosystem condition as well as the elaboration of the high resolution ecosystem base map, which constitutes the fundament of the spatial assessment process, also demand the proper spatial representation of the soil mantle.

Provisioning and regulating services attributed to soils are generally represented by proxies and indicators, which are widely used in ecosystem service mapping. Although soil functions and services could be approximated by elementary soil features, either by the association of soil types with services as basic principle, soil property maps provide quantified spatial information, which could be utilized more versatilely for the spatial inference of soil functions and services. The activity of DSM goes beyond mapping purely primary and secondary soil properties, the regionalization of further levels of soil related features (processes, functions and services) is also feasible. Target specific digital soil mapping can produce directly applicable products.

In the course of ecosystem service assessment, it is essential to take ecosystem conditions into consideration, since only ecosystems in proper condition are able to provide the potential services. Among both the so-called service-based status indicators and indicators describing the general state of ecosystems spatial information on the state and functions of soils is of paramount importance.

The category system of the current ecosystem base map, which serves as the basis for the assessment, includes natural and near-natural habitats that cannot be identified or delineated with sufficient certainty on the basis of available spatial databases and remote sensing information. Therefore, the idea has arisen to use environmental information on habitats, because the occurrence of certain feature combinations may make the presence of a particular habitat and thus the ecosystem probable. Spatial representation of abiotic habitat characteristics with relatively large spatial resolution at national level is mainly constrained to digital soil property maps on the physical and chemical properties of soils. During the investigations of the relationship between abiotic habitat features and habitat types, pedological and habitat characteristics of grasslands, wetlands and certain forest types have been examined using data mining methods based on map reference data classified according to Á-NÉR (General National Habitat Classification System). The identified relationships and the elaborated classification rules have been used to the spatial estimation of habitats.

Our poster present, how formerly elaborated together with intentionally targeted digital soil maps have been supporting the national mapping and assessment of ecosystem services in Hungary.