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The Soil Degradation Subsystem of the Hungarian Environmental Information System

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Regular data collection on the state of agricultural soils has not been in operation in Hungary for more than two decades. In the meantime, mainly thanks to the Hungarian Soil Strategy and the planned Soil Framework Directive, the demand for the information on state of Hungarian soils and the follow up of the harmful changes in their conditions and functioning has greatly increased.
In 2010 the establishment of a new national soil monitoring system was supported by the Environment and Energy Operational Programme for Informatics Development. The aim of the project was to collect, manage, analyse and publish soil data related to the state of soils and the environmental stresses attributed to the pressures due to agriculture; setting up an appropriate information system in order to fulfil the directives of the Thematic Strategy for Soil Protection. Further objective was the web-based publication of soil data as well as information to support the related public service mission and to inform publicity. The developed information system operates as the Soil Degradation Subsystem of the National Environmental Information System being compatible with its other elements.
A suitable representative sampling method was elaborated. The representativity is meant for soil associations, landuse, agricultural practices and typical degradation processes. Soil data were collected on county levels led by regional representatives but altogether they are representative for the whole territory of Hungary.
During the project, about 700,000 elementary data were generated, close to 2,000 parcels of 285 farms were surveyed resulting more than 9,000 analysis, 7,000 samples and 28,000 pictures. The overall number of the recorded parcels is 4500, with a total area of about 250,000 hectares.
The effect of agricultural land use on soils manifests in rapid changes -related to natural processes- in qualitative and quantitative soil parameters. In intensively used agricultural areas, particularly because of inappropriate land use and agricultural practice soil degradation occurs. To detect the soil degradation processes, and determine their type and degree, soil condition indicators were defined, which are based on analysis of the different soil state variables.
In addition to state, also load indicators were defined based on the recorded data, for the determination of the type and level of loads in connection with the agro-technical elements of the agricultural cultivation. The indication models for determining the load indicators were quantified based on the relationship of the collected load parameters. The indication models as analytical queries were built into the TERRADEGRA system. Thus with the expansion and temporal repetition of the load- and status data an increasingly accurate picture of the environmental status of our soils can be drawn.
Based on the built-in queries pilot data analysis were performed, whose results are available through a public web query-graphic surface (http://okir-tdr.helion.hu/). The web publication visualizes the load indicators related to agro-technical elements, the physical, chemical and biological degradation indicators of the identified human induced soil degradation processes as well as the load-state relationships using photos, thematic maps, diagrams and textual explanations.