Monitoring Soil Erosion of Agricultural Land

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Czech soil erosion legislation is predominantly based on USLE, the long term average soil loss equation. However, soil erosion is episodic process depending on combination of single rainfall event under current soil and vegetation conditions and relief. To get broad knowledge about where, when and why soil erosion occurs a project of Soil Erosion Monitoring supported by State Land Institute started in 2011 in Czechia. The project involves concept of citizen science to build spatial database of erosion events. The website, available on http://me.vumop.cz, is used as a tool to keep records and browse through the information about the monitored events. Until now around 1200 events were announced across Czechia and analysed by authorized workers covering information about localisation, rainfall, vegetation, applied erosion measures and protection requirements given by law, together with photo documentation. The database provides valuable statistics about the process and great source of data for many other applications.

The Soil Erosion Monitoring is broadly interconnected both, with soil protection legislation design and soil erosion research. Since 2017 the Monitoring database has become a valid tool to target obligatory soil erosion protection measures within the European Cross Compliance GAEC 5 Standard. Beside the general GAEC 5 Standard implementation in Czechia much more strict protection requirements are applied to those land parcels, which were announced more than once in the database of Soil Erosion Monitoring. Thanks to this advancement in legislation, the really endangered localities can be protected effectively.

The current methodology of the data acquisition within Soil Erosion Monitoring shows some shortcomings mainly introduced by high involvement of human factor. Methodology of erosion event classification has to be unified to describe the erosion events. Beside this not all erosion events are reported as their announcement is highly dependent on active citizens. Usually erosion events close to urban areas or roads accompanied by property damage or conflicts with farmers are announced, which doesn't provide complete and independent data. To eliminate above mentioned shortcomings prediction model selecting possibly affected areas is being developed. The model will automatically send information about preselected localities to authorized workers from State Land Institute based on real-time land-use data obtained by remote sensing methods and real-time radar rainfall data.