



Sediment and phosphorus fluxes - monitoring and modelling from field to regional scale - connectivity implications

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Agricultural landscape management has a strong influence on sediment and nutrients flow paths from field to streams and reservoirs. According to many studies water erosion driven phosphorus can play an important role in total phosphorus budgets in catchments and accelerate eutrophication processes in vulnerable reservoirs.

Research team of CTU Prague focuses on research of sediment transport processes from a small plot scale to regional scale. Using field rainfall simulator the data are collected to assess the fluxes in the scale from one to several square meters and to analyze the plot size effect on the runoff, solid particles and phosphorus transport processes (see corresponding posters of Jachymova et al., Kavka et al., Laburda et al., Zumr et al.).

Running fully agricultural experimental catchment of 49 ha (Nucice, Czech Republic) and experimental soil erosion plots (Bykovice, Czech Republic) we analyze runoff and soil erosion with the aim to upscale the results from single plot studies to the catchment scale. Soil erosion is also monitored by means of spatially distributed soil sampling and photogrammetry analyses. The water flow pathways via subsurface and surface runoff and the temporary variable catchment connectivity are studied here. Finally the research team produced a unique large extent study, performed by WATEM/SEDEM model adopted for erosion driven phosphorus fluxes modelling, for the area of 1/3 of the Czech Republic (ca 31500 km²) in the resolution (pixel size) of 10 by 10 meters, with estimated connectivity from single field to outlet reservoirs of large catchments, including stream topology, sediment trapping efficiencies of all ponds and reservoirs within the system.

All these studies were dealing with connectivity issues, land-use boundary effects, detailed morphology consequences and (not last) data accuracy implications. In the presentation these issues for various monitoring and modelling scales will be raised.

The paper was prepared within the project of Czech Science Foundation No. 13-20388P using project results of VG20122015092, QI102A265, QJ330118, QJ1230056 and SGS14/180/OHK1/3T/11 grants.