



Comparison of WaSiM-ETH 6.4 and 7.5 with regard to the influences of different landuse and tillage practice on runoff formation and runoff concentration

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As is generally known it is not possible to reproduce the hydrological interaction between the processes which are influenced by different landuse and tillage practice by using empirical or conceptual models. For such an investigation models with a physically based approach for the vadose zone, like the hydrological model WaSiM-ETH, are required. WaSiM-ETH uses the Richards-equation for the simulation of the water fluxes within the unsaturated soil zone. This is done vertically within a layer discretised soil column for each grid cell. Now with the latest update of WaSiM-ETH it is also possible to simulate processes like macropore flow.

The aim of the project which is founded by the German Science Foundation is to investigate the influence of different tillage practice on runoff formation and runoff concentration for small catchment areas (lower mesoscale $< 6,3 \text{ km}^2$). Hereby the main focus lies on the quantification of the hydrological interaction between the processes which are influenced by different landuse and tillage practice and the consequences of local measures to reduce runoff. Thereby data of conventional integrated and ecological farmed catchment areas are used.

The area under investigation belongs to the test site Scheyern which is part of the Munich Research Alliance on Agricultural Ecosystems (FAM) and is located 40 km north of Munich. The test site contains an area of 114 ha thereof 46 ha are conventional integrated and 68 ha ecological farmed. The surface runoff is measured in 14 partial watersheds over a period of 8 years.

This presentation discusses the applicability of the new modules of WaSiM-ETH 7.5

and compares it with the performance of the old version 6.4. Moreover it is analysed which further modules are required to reproduce in detail the processes for runoff formation and concentration in consideration of different tillage practice. Furthermore the influence of landuse within a small watershed which is conventional integrated farmed will be shown. Therefore the crop rotation consists of winter wheat, maize, winter wheat and potatoes.