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Soil and Water Research

Analysis of land use change in the Eastern Ore Mts. regarding both nature protection and flood prevention

Merta M., Seidler C., Bianchin S., Heilmeier H., Richert E.:

Soil & Water Res., 3 (2008): S105-S115

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Two different models (WBS FLAB, WaSiM-ETH) were used in the project HochNatur (flood prevention and nature conservation in the Weißeritz catchment in the Eastern Ore Mts. – Erzgebirge) to determine risk areas with quick runoff processes and to simulate the discharge. It was done in different scales, in the mesoscale Weißeritz catchment as well as two selected subcatchments with different natural and urban conditions, the Weißbach subcatchment with a well-structured landscape, the Höckenbach subcatchment with a greater part of arable land. On the basis of selected scenarios, the effect of land use changes on the runoff generation processes of an area and on the hydrograph is described. Land use changes are able to reduce the portion of quick runoff components, the water erosion and the discharge. The effect occurs especially in smaller catchments and with short heavy rains (events with a frequency of occurrence of 5–50 years). Depending on the present situation the changes have to include areas of more than 25% of the catchments area to cause a significant

effect. It became apparent that nature conservation and flood prevention agree well in their requirements with the land use. A rich structured landscape proved to be extraordinarily positive for both, flood prevention and nature conservation.

Keywords:

hydrological modeling; runoff generation; land use change

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