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Rainfall-runoff processes in the Seitengraben Hydrology Open Air Laboratory (HOAL), Lower Austria

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Runoff generation mechanisms are important in understanding the spatial and temporal nature of water flows at the catchment scale. Understanding these processes in great detail will enhance the possibility to predict flood events in small and large catchments. This study will focus on rainfall-runoff processes in the Seitengraben Hydrology Open Air Laboratory (HOAL), with particular focus on discharge measurements and surface runoff. The Seitengraben catchment has a size of 64 ha and is located 100 km west of Vienna.
The major runoff channel comprises of a small stream which flows continuously through the catchment. Water enters the main stream through four different water flow pathways: springs, small surface waters, erosion gullies and subsurface drainage pipes. The water flows will be measured at each point where water can enter the main stream as well as at the catchment outlet in order to gain a better understanding of the flow rates and the response times in the catchment. The subsurface tile drainage system is present in the wetter parts of the catchment. Some drainage outlets are continuously discharging into the stream, therefore interference between the drainage pipes and the groundwater should be investigated.

Surface runoff is an important part of the rainfall-runoff process. The detection of the surface runoff will be performed with cameras aimed towards the concave parts of the catchment where most surface runoff is expected. The images from the cameras will be analyzed in order to gain insight in the development of surface flow patterns during precipitation events. Total surface runoff will be quantified from the cumulative discharge through the erosion gullies entering the main stream.
Soil moisture will also be measured at different locations in order to observe differences in soil moisture content throughout the catchment. Measuring the soil moisture in an extensive way gives the opportunity to correlate this parameter with surface runoff. This correlation can be used to establish relationships between soil moisture content and the spatial and temporal pattern of surface runoff. The soil moisture measurements and the emerging surface runoff patterns will also give insight in the infiltration capacity of the top soil layer.