



The Pöllau experimental basin (Eastern-Styria/Austria) - over 25 years of continuous hydrological observations and multidisciplinary research

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Experimental basins are suited for answering of different questions depending on their size. Basins with a catchment area up to 1000 km² lend themselves to studies dealing with the influence of land use on runoff generation during floods. In such areas of meso scale the influence of drainage pattern does not outweigh the influence of the land use. Thus, statements on the runoff generation process are possible.

One of the longest and continuous observed experimental basins in Austria is the Pöllau experimental basin (57.5 km²). The runoff conditions of this experimental basin lying at the eastern declivity of the Alps in the Pöllau Subbasin (altitude above sea level between 398 and 1271 m) characterise the climate region of the Styrian Basin. It is influenced trough convective rainstorms in the summer months and relatively low precipitation (snow) in winter. The scientific relevance of the hydrologic values consists in the investigation and description of runoff and flood generation due to rainstorms in consideration of the climate conditions of this region. In this way can be contributed to effective flood control.

The Pöllau experimental basin is operated by the Graz University of Technology and the Joanneum Research. The data monitoring began in 1979, presently are 10 rain gauges and 8 discharge gauges and one meteorological station operated. The density of rain gauges amounts to 16.8/100 km², the density of discharge gauges amounts to 11.7/100 km², thus about 12times greater than the gauge density of the hydrological survey in Styria. The rain gauges are equipped with tipping buckets, at the discharge gauges pressure probes are installed and discharge measurements are periodically car-

ried out to prepare rating curves. The meteorological station lying in the barycentre of the area is equipped with tipping bucket rain gauges (standard and terrain height), one rain gauge using the weighing principle, air and soil thermometers, barometer, hydrometer, albedometer, anemometer and evaporimeter.

In a small subcatchment of the basin the surface runoff and the groundwater flow on hillslope are investigated in detail. In addition to the discharge measurements the water is sampled for isotopic and hydro-chemical investigations at the subcatchment outlet. The groundwater flow is observed at a source in detail. The seepage and the mass transport in the unsaturated zone are recorded by two lysimeters in two different areas of land use (forest and grassland). At the lysimeter stations precipitation, relative humidity, air and soil temperature, matrix potential and water content data are collected. Precipitation and seepage water are sampled for chemical and isotopic analysis.

The hydrological data recorded in the experimental basin were the basis for research studies on e.g. calibration of weather radar data in different space and time scales, rainfall events in different space and time scales, calibration of tipping bucket rain gauges, distributed modelling describing the interaction between flood hydrographs and basin parameters, tracer investigations in the unsaturated zone under different cultivation types, groundwater flow dynamics in a crystalline headwater catchment, water balance analysis at different time and space scales under forest and grassland.