



Possible flood retention in an alpine landscape: A case study from the Upper Iller, Germany

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During the last decade the Upper Iller has been subject to several flood events, where two events had a return period of approx. 300-400 years with discharge peaks above $850 \text{ m}^3/\text{s}$ at the gauge Kempten (mean discharge: $47 \text{ m}^3/\text{s}$). The study investigates the potential flood mitigation effects of two different non-structural water retention measures: 1) land-use change in order to increase retention of water in the leafs, litter and soil, and 2) establishment of many small, environmental friendly water retention ponds. In an extensive field campaign we searched for the potentials for land-use change and/or the establishment of small water retention ponds depending on the topography and land-use. Some different land-use change scenarios were derived and they were used as basic land-use information for simulation with a process-oriented hydrological model. The approximation of the effectiveness of small ponds is also based on application of this hydrological model. The results are compared with the actual conditions and the effectiveness of both measures is evaluated both for the whole Upper Iller catchment (950 km^2) as well as for some sub-catchments. These impacts are then compared with the flood mitigation effects of flood polders along the Iller River.