



Riparian zones in Swiss Jura region – Results of hydro-geomorphologic process analysis and evaluation of influencing factors

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The Länenbach Valley (2.61 km², first order) is one of two river catchments within the Regio Basiliensis (NW-Switzerland) investigated by the “Applied Landscape Ecology in Rural Areas” working group at the Institute of Geography.

The superior objective of the research project is a better understanding of nutrient dynamics within a catchment and of the interactions between different landscape elements. More specific aims of the studies are the quantification of major hydro-geomorphologic processes (surface and shallow subsurface runoff, soil erosion, bank erosion etc.), the localisation of sediment and nutrient sources, the identification of source controlling factors (land use, soils etc.) and the scrutiny of the general retention function of riparian zones.

Because of the complexity of riparian dynamics, it was necessary to combine different methods for various scales. One crucial approach is the mapping of geomorphology, land use, bank erosion and vegetation of riparian zones. Furthermore, at seven selected, differently structured river-bank sites sediment and nutrient yields are determined by plot experiments under natural rainfall conditions. Soil water is sampled by suction cups and soil water contents are measured and logged by Tensiometer. The water samples are subject to water quality analyses, especially regarding PO₄ and NO₃.

Mainly hydro-geomorphologic processes in riparian zones shall be discussed in this presentation. Surface runoff, interflow, base flow and other main processes are evaluated. As a result the dominant processes in riparian zones of the investigated area are base flow and fluvial river bank erosion. Interflow and surface runoff are only sec-

ondary for lateral water movement. Furthermore these processes have only local and temporary occurrence.

Evaluation of process influencing factors is possible because of monitoring seven stations with differences in geocological characteristics, mainly the riverine vegetation. The results for the area studied are diverse. Riverine vegetation has only secondary importance to water flow and dissolved material transport in general. According to quantity of transportation, fluvial erosion and drainage system transport dominate. In contrast surface runoff and related soil erosion depend on natural cover and composition of riparian zones.