

Towards a better understanding on how large wood is controlling longitudinal sediment (dis)connectivity in mountain streams – concepts and first results

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Large wood (LW) provides various ecological and morphological functions. Recent research has focused on habitat diversity and abundance, effects on channel planforms, pool formation, flow regimes and increased storage of organic matter as well as storage of fine sediment. While LW studies and sediment transport rates are the focus of numerous research questions, the influence of large channel blocking barriers (e.g. LW) and their impact on sediment trapping and decoupling transportation pathways is less studied. This project tries to diminish the obvious gap and deals with the modifications of the sediment connectivity by LW.

To investigate the influence of large wood on sediment transporting processes and sediment connectivity, the spatial distribution and characterization of LW (>1 m in length and >10 cm in diameter) in channels is examined by field mapping and dGPS measurements. Channel hydraulic parameters are determined by field measurements of channel long profiles and cross sections. To quantify the direct effects of LW on discharge and bed load transport the flow velocity and bed load up- and downstream of LW is measured using an Ott-Nautilus and a portable Helley-Smith bed load sampler during different water stages. Sediment storages behind LWD accumulations will be monitored with dGPS. While accumulation of sediment indicates in-channel sediment storage and thus disconnection from downstream bed load transport, erosion of sediment evidences downstream sediment connectivity.

First results will be presented from two study areas in mountain ranges in Germany (Wetterstein Mountain Range) and Austria (Bohemian Massif).