



Human impacts on fluvial systems - A small-catchment case study

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Regulations of nearly two-thirds of the rivers worldwide have considerable influences on fluvial systems. In Austria, nearly any river (or) catchment is affected by humans, e.g. due to changing land-use conditions and river engineering structures. Recent studies of human impacts on rivers show that morphologic channel changes play a major role regarding channelization and leveeing, land-use conversions, dams, mining, urbanization and alterations of natural habitats (ecomorphology). Thus 'natural (fluvial) systems' are scarce and humans are almost always inseparably interwoven with them playing a major role in altering them coincidentally.

The main objective of this study is to identify human effects (i.e. different land use conditions and river engineering structures) on river bed sediment composition and to delineate its possible implications for limnic habitats.

The study area watersheds of the 'Fugnitz' River ($\sim 140\text{km}^2$) and the 'Kaja' River ($\sim 20\text{km}^2$) are located in the Eastern part of the Bohemian Massif in Austria (Europe) and drain into the 'Thaya' River which is the border river to the Czech Republic in the north of Lower Austria. Furthermore the 'Thaya' River is eponymous for the local National Park 'Nationalpark Thayatal'.

In order to survey river bed sediment composition and river engineering structures facies mapping techniques, i.e. river bed surface mapping and ecomorphological mapping have been applied. Additionally aerial photograph and airborne laserscan interpretation has been used to create land use maps. These maps have been integrated to a numerical DEM-based spatial model in order to get an impression of the variability of sediment input rates to the river system. It is hypothesized that this variability is primarily caused by different land use conditions. Finally river bed sites affected by river engineering structures have been probed and grain size distributions have been analyzed. With these data sedimentological and ecological/ecomorphological effects of various river engineering structures (i.e. dams, weirs, river bank- and river bed protection works) on river bed sediment composition and on limnic habitats are evaluated.

First results reveal that 'land use' is a dominant factor concerning river bed sediment composition and limnic habitat conditions. Further outcomes will be presented on European Geosciences Union General Assembly, 2010.