

A flume experiment on the lateral distribution of driftwood according to piece characteristics and flow patterns

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The presence of driftwood is one of the influential components in river dynamics, especially in forested catchments and fluvial corridors. As they are transported by the flow, driftwoods can be trapped in critical sections of river (e.g. bridges, weirs or floodplain edges) and may increase the destructive effects of floods. Whereas many recent studies provided significant results on wood transport and jam formation, limited knowledge is available on the lateral distribution of wood in the river section during transport according to flow pattern.

In this work we investigate the influence of flow and wood characteristics on the lateral distribution of wood pieces in a controlled laboratory experiment. The experiments are carried out in a straight rectangular (6 m long and 0.80 m wide) glass-walled flume, where different surface velocity profiles and flow conditions can be generated. Natural stems and rootstocks of different sizes (5 to 15 cm long and 0.5 to 1.5 cm in diameter) are dropped at the flume entrance and tracked with a camera as they are carried away by the flow. In addition to the flow characteristics, a special attention is given to the wood properties, in order to identify the influence of buoyancy (that can vary due to the immersed time as well as the type of wood) and geometry (e.g. stems, rootstocks or both) on the lateral distribution. An estimation of driftwood preferential paths and stream lines could provide useful insights into driftwood management and the prevention of the associated risks.