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# Braided river morphodynamics as a driver of driftwood dispersal: a flume experiment

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Driftwood is widely recognized as a relevant component of riverine systems. Strong links have been identified between wood dynamics and channel morphodynamics, but limited information is available for braided rivers. In these systems, the high spatial complexity and the rapid evolution of the channel pattern determine very specific wood dispersal phenomena. Our laboratory-scale study provides a quantitative analysis of wood transport, deposition and remobilisation in multi-thread systems.

A physical model was set up in a 3x25 m flume located at the University of Trento, Italy, reproducing typical discharges and slopes of natural gravel-bed braided rivers. Wood dispersal simulations were carried out over self-organised networks using cylindrical wooden dowels with cross-shaped bases as surrogate logs. A first set of simulations focused on wood originating from bank erosion and dispersed under a range of steady flow conditions. A second set of runs addressed the remobilization of in-channel wood due to flood events. Bed topography and wood deposits were mapped using a laser profiler and a high-resolution camera.

Wood accumulation patterns were found to be clearly linked with network morphology in terms of both planar and vertical distribution. Under steady flow conditions, driftwood deposition is driven by the bar pattern both at the bar and reach scale, with wood mostly accumulating at bar heads and on the first bar downstream of the input location. Wood dispersal is also driven by discharge, which determines the activation of different retentive sites at various flow stages. In addition, discharge fluctuations govern wood remobilization over two time scales, through changes local hydraulic conditions and bed reworking. The formation of jams was observed to exert a major stabilizing role for wood accumulations.