



## **Experimental investigation on wood diffusion for a channel with a symmetrical narrowing**

Elena Nucci and Elisabetta Persi

CUDAM- Department of Civil, Environmental and Mechanical Engineering, University of Trento, Italy (elena.nucci@unitn.it)

Large wood transported by the flow tends to accumulate at critical sections, such as bridge piers or check dams, reducing the span and preventing the flow of water, sediments and other driftwood.

The resulting reduction of openings leads to the rise of the upstream water level and to the impairment of the structure functioning, especially for check dams, with increasing risk for surrounding areas.

To better understand how the wood moves when transported in a flow, an experimental campaign was carried out in a bended channel with a symmetrical side narrowing at its mid-length.

Cylindrical samples were released parallel to the flow, their trajectories and orientations being recorded and analysed with a statistical approach, obtaining streamwise, transversal and angular diffusion coefficients. The samples employed had variable diameter and length and were released at three different distances from the right channel side.

Literature diffusion coefficients are then taken as a benchmark for the comparison with the new results, highlighting how trajectories and orientations of the logs change when they approach and cross channel constriction which resemble critical sections.

This analysis gives a significant contribution for the development of Eulerian numerical models that simulate wood transport, providing a set of coefficients depending on the log streamwise position and on the flow Froude number. These series of experiments can be used also as a reference for numerical models calibration.

This work was supported by Water JPI Joint call 2015 as part of STEEP STREAMS project.