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Understanding the geomorphic impacts of Leaky Wooden Dams (LWDs) through utilising analog physical models, structure from motion photogrammetry and surface velocimetry.

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In the UK Leaky wooden dams (LWD) have become an increasingly popular method of Natural Flood Management (NFM) and river restoration. LWD are in and/or across channel structures made from woody material designed to mimic naturally occurring woody debris that is often found in riverine environments. LWDs aim to reduce flooding downstream by holding back water and promoting flow onto the floodplain, increasing connection with the floodplain and infiltration by diverting water onto the floodplain. A key difference between woody debris and LWD are that LWD are usually secured and unable to move and adjust within the river and LWD are sometimes placed in areas where woody debris would not naturally occur. With the large scale and quick implementation of LWD there is a lack of critique or investigation into the geomorphic impacts of LWD. Instead, researchers and practitioners have been using what is known about the geomorphic impacts of natural woody debris to explain and predict the geomorphic impacts of LWD – even though it has been established that they are fundamentally different. This project investigates the geomorphic impacts of different styles and configurations of LWD through the use of analog physical models, surface velocimetry and structure from motion photogrammetry. Using these techniques this research aims to identify any patterns in flow and sediment dynamics both up and downstream of LWDs and to further our understanding of the specific geomorphic impacts of different LWD structures. Identifying the specific geomorphic impacts of LWD is important to be able to understand if they are having a detrimental impact to the river systems where they have been installed in the UK and to be able to inform best practice for the future.