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## Monitoring the stability of leaky dams and their influence on debris transport with innovative sensor technology on the SENSUM project

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Woody debris dams/leaky dams are an increasingly popular Natural Flood Management (NFM) measure in low order tributaries, with preliminary evidence suggesting that they are effective in attenuating flood peaks and reducing flood risk. However, the stability of these dams is not widely monitored, and thus there is a poor evidence base for best design practice with respect to the long-term integrity of such features. This is particularly pertinent given the threat posed to downstream infrastructure by woody debris carried in floodwaters after potentially catastrophic dam failure. There is also a lack of research into how effective dams of different designs are at holding back large wood and sediment transported by the flow and reducing the impact of flood debris on downstream infrastructure, including bridges, culverts etc. In the SENSUM project (Smart SENSing of landscapes Undergoing hazardous hydrogeomorphic Movement, <https://sensum.ac.uk>), we are developing and applying innovative sensor technology to assess the stability of different woody debris dam designs and build an evidence base to inform policy on this NFM practice locally and nationally. We also use these sensors to track woody debris and assess how effective dams are at trapping and retaining large wood debris and cobble-sized sediment. This paper addresses these questions at several field sites across the UK and in laboratory experiments to report quantitative data which evaluate the literal success/failure of NFM interventions and how these may impact the future design of such approaches.