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The impacts of peat slides on upland blanket peatland hydrology, ecology and soil structure. A paired catchment approach.

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Rainfall-induced landslides are difficult to forecast and often evolve into highly destructive flows, as such, they are one of the most dangerous natural hazards globally. While our understanding of peatland hydrology has improved greatly in the past two decades, there has been less focus on the response of peat hydrology following perturbations such as wildfires and landslides. Here we report on a new paired catchment experiment in Ireland. Our focus is to quantify the hydrological changes following peat landslides and further, to establish the short-term and longer-term impacts on local peatland hydrology, ecology and recovery.

The two paired sites are located in Co. Leitrim, Ireland, in two adjacent, small upland blanket bog catchments. The first peat catchment (0.2km²) is an area of a recent (June 2020) slope failure. According to preliminary estimates ~178,000 – 188,000 tonnes of peat were transported downstream during the peat slide event, resulting in a large landslide scar section (~0.059 km²) in a special area of conservation [SAC]. Preliminary impacts are assessed to include: habitat loss, decreased slope stability, impacts on hydrology and water quality, as well as increased local erosion.

This catchment is paired with an adjacent upland blanket peat catchment (0.11 km²) which is deemed to have been under the same anthropogenic pressures (grazing, upslope forestry plantation).

A hydrometric suite, including weather station, piezometers, and water level recorders to evaluate the surface and subsurface hydrology has been installed at both sites. In addition, we are monitoring the response of landslide deposits (e.g. rafted peat, some with still-standing sika spruce), ecology, soil structure, permeability and shear strength in both catchments.

Here we will report on the initial results of our monitoring.